

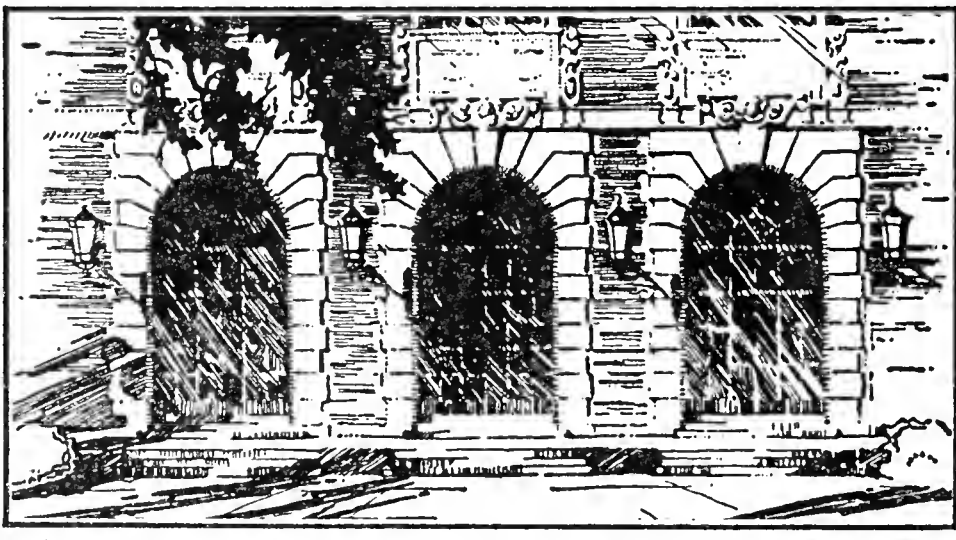
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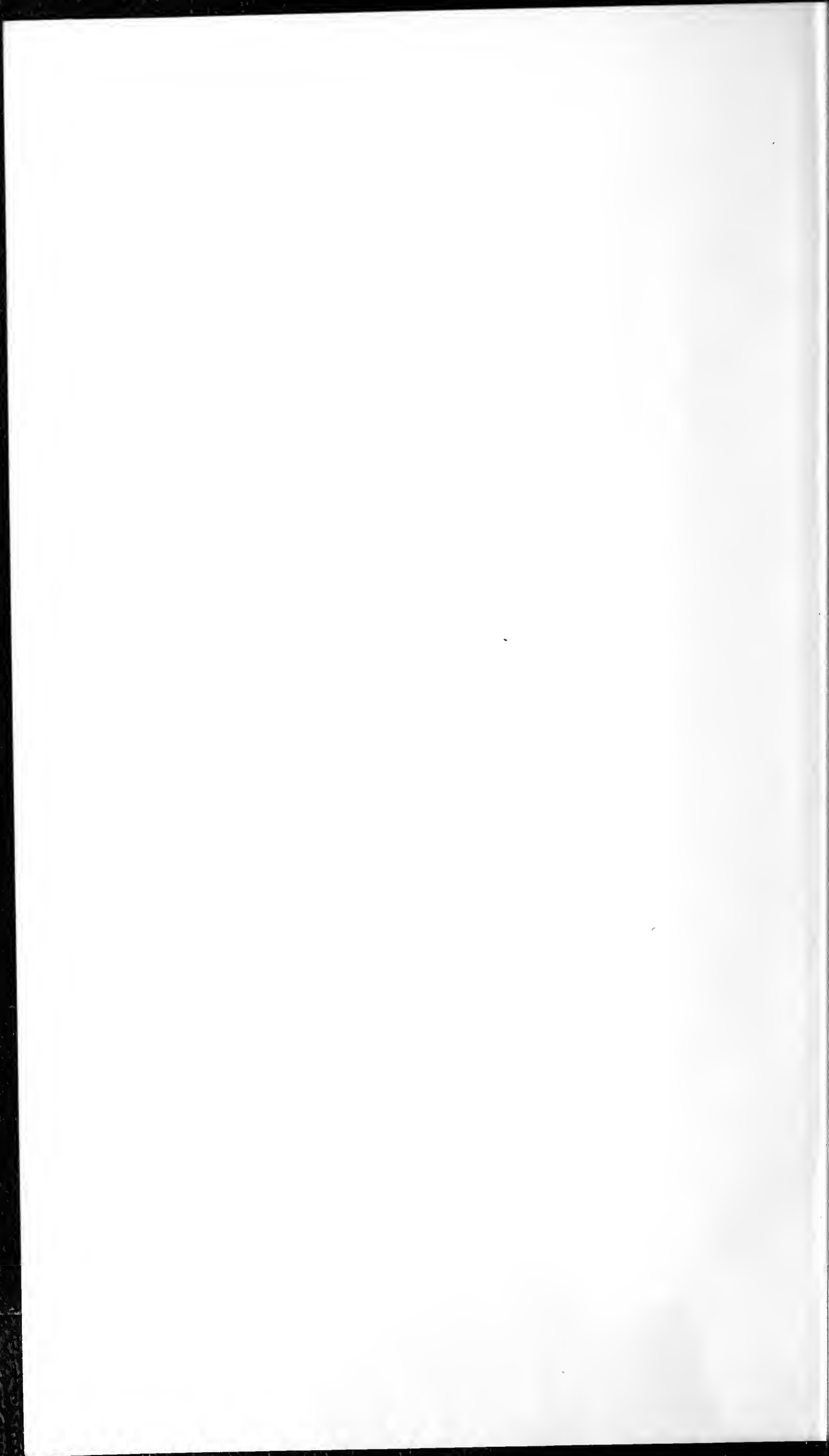
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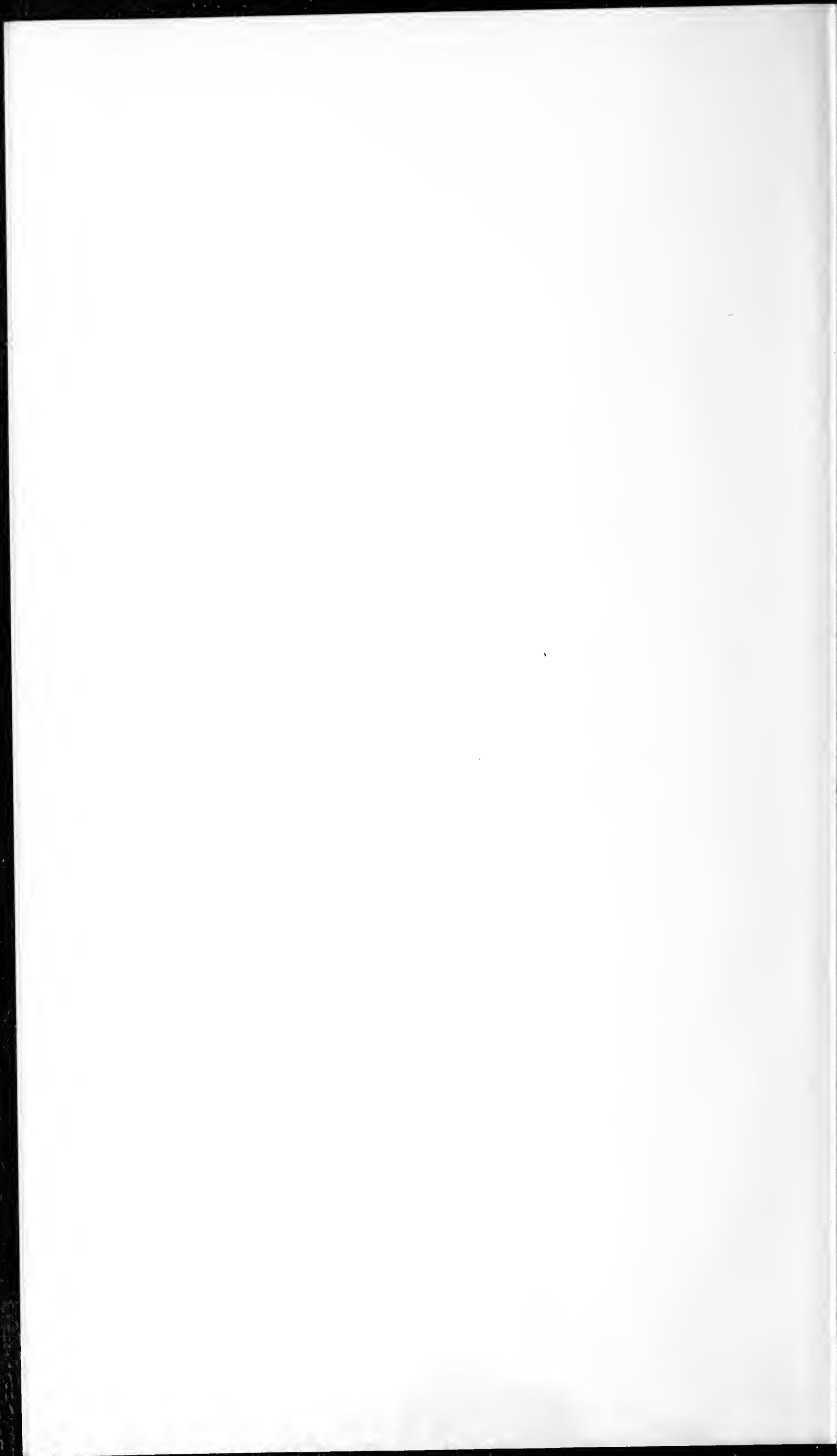
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THE AVICULTURAL MAGAZINE

BEING THE JOURNAL OF THE
AVICULTURAL SOCIETY

EDITED BY
PHYLLIS BARCLAY-SMITH, M.B.E.

ASSISTED BY
Dr. C. J. O. HARRISON

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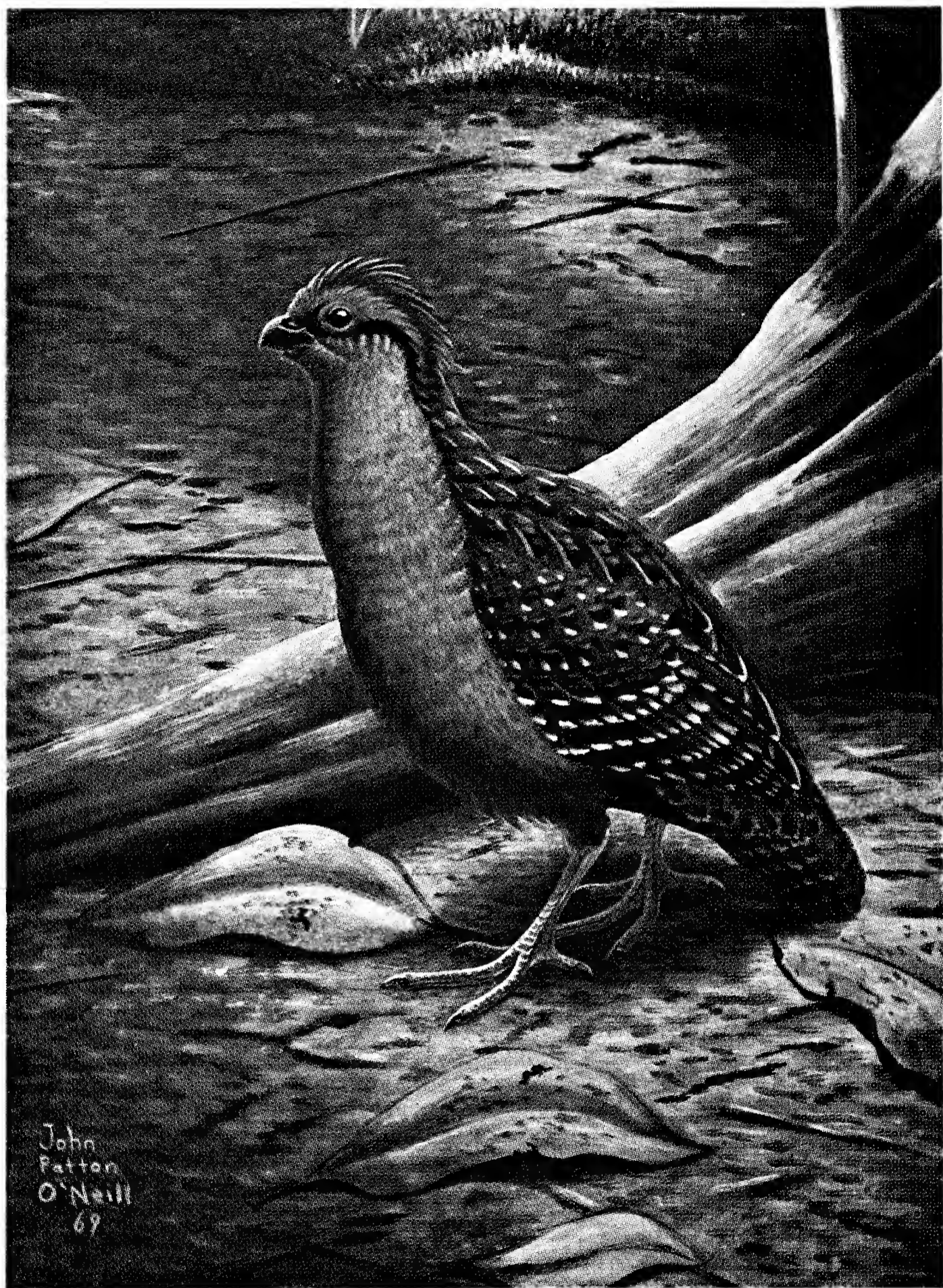
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SPOT-WINGED WOOD QUAIL

[J. P. O'Neill

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THE JOURNAL OF THE AVICULTURAL SOCIETY

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JANUARY-FEBRUARY 1970

OBSERVATIONS ON THE FIRST NORTH AMERICAN BREEDING OF THE SPOT-WINGED WOOD QUAIL

(*Odontophorus capueira*)

By G. MICHAEL FLIEG (St. Louis Zoological Park, Missouri, U.S.A.).

The Spot-Winged Wood Quail, also known as the Capueiria Partridge or Uru, is a small stocky game-bird found on the ground in the dense tropical forest of eastern Brazil, Paraguay and northeastern Argentina. It is very beautiful, but not gaudy. The ventral parts are lead grey, the back is spotted brown and black, and there is red bare skin around the eyes. It has cinnamon eyebrows and a dark spot behind the eye.

The overall size is just a bit larger than that of the Bob White (*Colinus virginianus*). This species was fed on game bird crumbles and trout chow. It was kept in a heated barn when the weather dropped to less than 45° F. These birds are kept in the barn normally from November through March and have free choice at other times barring very inclement weather.

In April 1965 three Spot-Winged Wood Quail began to build a nest in their cage at the St. Louis Zoo. They were housed with Cinereus Tinamou (*Nothoprocta cinereus*) in a pheasant aviary 7 × 3 m. Although the sexes were undetermined, we have since found out that two males and one female were involved in nest building. They gathered nesting material by picking it up and throwing it over their shoulders to the next bird in the line, finally transporting it to the nest site. The unique nest of the genus *Odontophorus* is domed and about 40 × 50 cm. in size and is similar to the nests of many neotropical passerines. The domed nest took about three days to complete, and five white, size 40 × 28 mm. eggs were laid at daily intervals. These were removed and a second clutch of three eggs was laid about two weeks later. Three eggs hatched on 14th May 1965 after an incubation period of 26–27 days, although one pipped 10th May 1965, four days prior to hatching. The newly hatched young looked very much like Bob White, (*Colinus virginianus*), but were a bit larger with blood red beaks and dark legs.

Although they grew very quickly at first, when they reached about half the size of the adult they slowed down and did not reach full size until about two months old.

At this age they still had not developed contour feathers on the back and rump. At the age of three and a half months they could be detected from the adults only by darker colouration and grey cheeks.

This breeding by the St. Louis Zoological Garden was cited as a first in North America by the American Game Bird Breeders Cooperative Federation. We would surely like to know if it could be a first captive world breeding and would appreciate hearing to the contrary.

* * *

HELPERS AT THE NEST IN THE PURPLE GALLINULE

(*Porphyrio porphyrio*)

By C. J. O. HARRISON (Perivale, Middlesex, England)

It is well known that the young of the first brood of the Moorhen, *Gallinula chloropus*, in each year will help to feed the young of the second brood, often taking food from the parents and passing it on to the younger chicks; but such sociability ceases at the end of the season. Ridpath (1964) found that the large flightless rail, the Tasmanian Native Hen, *Tribonyx mortierii*, might form groups of three or four birds instead of pairs, and that such groups, which remained together persistently, consisted of several males with one female. This social behaviour does not, however, appear to have been more widely noted in the rail family, but as in the case of the Purple Gallinule, *P. porphyrio*, this may be due to the fact that behaviour which becomes apparent in an open aviary is very difficult to observe with much more timid birds in the depths of a swamp or reedbed.

The Snowdon Aviary of the London Zoo houses, among other species, some individuals of the pale-headed Indian race of the Purple Gallinule, *P. porphyrio poliocephalus* (this is the Old World species, not the North American Purple Gallinule, *Porphyryula martinica*). The birds of this race are a light purplish blue with a paler, whitish head, and the usual white under tail coverts and red bill and legs. They have bred in this aviary for several successive seasons. On a visit during July 1968 I noticed two adults with three half-sized young in blackish down with smooth foreheads. A third adult was collecting a bill full of grass and leaves which looked like nest material. It walked towards the other two, one of which joined it, followed by two of the chicks. The third bird dropped the material it was holding and these two adults and young went to a food tray where the adults fed the young. Even at this stage one of the young tried to emulate adults by holding food up in one foot and balancing on the other, although not with complete success. The other adult and other young one remained at the nest-site. As far as I was aware the adults should have been a pair and the young of a previous year.

Next year, at the end of August 1969, I made further observations. The aviary appeared to have seven apparently adult birds. There was one group of four which moved around the lower part of it, near the canal. There were another two which kept together and did not normally approach to within more than nine or ten feet of the others, but would occasionally pass more closely when moving from one part to another or to food trays, and appeared to share some of the area. One odd bird was alone in an upper corner of the aviary. It was not possible to distinguish any obviously immature birds among these. From my observations it appeared that the group of four constituted a social unit, but there was no sign of any interaction with the other two birds nearby, nor was it possible to assign any particular role to any one of the four, as the following notes indicate.

I had previously seen three of the four squatting close together, one apparently on a nest, near the S.W. corner of the aviary. Two were now resting with bodies pressed together on a more central site near the main pool and among growing plants, no. 1 just resting, no. 2 with a wing held a little apart from the body, the pale bill and dark head of a chick just visible under the wing. No. 2 broke off small pieces of surrounding plants and fed them to the chick. No. 3 stood near no. 2 and also fed the chicks at intervals. From subsequent brief views at least three chicks were present. Occasionally no. 3 passed food items to no. 2 who gave them to the chicks. No. 4 appeared carrying a piece of food and broke off pieces which it passed to no. 3 who fed the chicks directly or passed it to no. 2 for them. No. 4 moved off, returned with more food and this time stood near no. 3 and passed the food directly to no. 2 who fed the chicks with it. After a pause, no. 4 thrust its head and neck under no. 2, forced its way under and pushed no. 2 off the chicks, taking over the brooding.

No. 2 now left the nest and walked to where no. 3 was breaking up a large piece of food held down in its foot. No. 3 then began passing small pieces of food to no. 2. Some of these were eaten, but in several instances a small piece of food was passed backwards and forwards a number of times before finally being eaten by one or the other. The piece of food would be held in the bill by one bird, and taken from the bill by the other bird. Later I noticed that when young were being fed, if a piece of food proved too large for them to swallow, the adult would repeatedly take it back from the bill of the young one and then offer it again; and if two adults were present they might repeatedly take it from each other's bill before passing it back to the chick. The repeated taking of the fragment from another bird's bill appears to result in the food being broken into successively smaller pieces; and I think that this passing back and forth, and retrieving from the bill of the chick, is behaviour which results in portions too large to swallow being broken down to a convenient size for eating. The passing of small morsels between the two adults in the instance above probably arose from the fact that their feeding was associated with the presence of young birds.

After a break in observation I returned later to find one bird brooding the young while the others were scattered, odd individuals bringing food at intervals. Towards the end of the afternoon two of the four birds were seen collecting bills full of leaves and grass, apparently nest material, and passing this to the bird brooding the chicks who built the material up around itself as a nest, probably a temporary structure on which to brood the young.

REFERENCE

- RIDPATH, M. G. 1964. The Tasmanian Native Hen. *Australian Natural History* 14 : 346-350.

* - * *

BREEDING OF THE LARK-LIKE BUNTING

By K. S. HARRAP (West Somerton, Bellevue, Bulawayo, Rhodesia)

Lark-like Buntings, *Fringillaria impetuani*, are a pale edition of the well-known Cinnamon Rock Bunting, *Fringillaria tahapisi*, their size being about that of the European Linnet.

DESCRIPTION

Male, Adult.

Head. Crown and nape, buffy brown, finely streaked olive-brown.

Upper parts. Mainly buffy-brown with streaking on mantle.

Under parts. Throat, pinkish buff; breast, tawny olive changing to dark buff on belly; under wing coverts and axillaries, pinkish buff.

Tail. Olive-brown.

Bill. Upper Mandible, slate; lower mandible, flesh colour.

Female, Adult.

Resembles male, perhaps lighter on wings.

Juvenile.

As adult.

This bird is very nomadic in habit and will invade an area, stay for several months then completely disappear, especially here in Rhodesia. A bird of dry country, it seems to favour Matabeleland which is in the southern part of the country. One of these invasions was in 1962 and several were trapped by local aviculturists. My pair were two of these and, as they showed no signs of breeding over the years, were classified as two of a sex. The birds came into my possession in 1968 and were put in an aviary 20 ft. × 16 ft. with Rock Buntings, Golden Breasted Buntings, Finch Larks, Quail Finches, Waxbills of several species, and Doves as companions.

The two birds completely ignored one another until August of 1969 when one was seen singing lustily from a rock in the aviary, stopping only to chase the other round the aviary with drooped wings, not unlike the courtship of the domestic canary. A week or so later I missed the female and on searching through the aviary I found her sitting on two brown speckled eggs in a little nest made at the base of a large clump of bamboo. The composition of the nest was mainly coarse grass bents and small broken twigs, the lining consisted mainly of the fine down from Pampas Grasses and Hessian taken from an old sack which had been placed in the aviary to attract white ants (termites).

Both eggs hatched after being incubated by the female only for about twelve days. The chicks were covered in a long white down but unfortunately I could not see the skin colour as the hen sat very close. Pin feathers were observed growing on the young at a week old and both left the nest at fourteen days, their tails being half grown.

FEEDING

Both birds assisted in feeding the young and became very tame, waiting for me to put in their daily feed of termites. The male would go to the nest and feed the brooding female who in turn passed on the ants to the young. Later as the young grew both adults would fill up with ants then regurgitate them to the young. I do not think that the parents fed seed to the chicks until they were about nine days old. As the aviary is a planted one I should say that the old birds caught a lot of live food for themselves. Mixed seed and grit was given as the staple diet, also cattle lick (rock salt) of which all the birds are very fond.

The young birds are now self-supporting and the female is already incubating two more eggs in a new nest not far from the old one.

* * *

BREEDING THE BLACK-NECKED STARLING

(Sturnus nigricollis)

By A. E. HALL (Lower Haselor, Evesham, Worcestershire, England)

This species is resident throughout Burma generally, across to southern China and is probably more widespread than this but little seems to have been published about this bird. A hand-reared pair was sent to Mr. W. R. Partridge in March 1967 from Hong Kong by Dr. K. C. Searle.

The length of the birds is 11 inches. The bill is black, iris pale buff-white and the legs and feet are pale bluish pink. The elliptical shaped area of bare skin around the eye is yellowish in the adult male and bluish in the adult female. The head, breast, rump and underparts are white, the neck and back is black. A narrow band of white runs across the base of the hind neck and joins up on each side with the white on the breast giving the bird a completely separate black collar. The wings are black with a patch of white flecks on the shoulder, the thumb (false wing or bastard wing) is white with a broken white line running from that point across the tips of the median wing coverts and the secondaries are also tipped with white. The tail is black tipped with a narrow band of white. The white rump is only seen in flight.

For a few weeks after arrival they were housed in a large cage in the bird-room and settled down quickly even though their diet was changed slightly. Fruit, in the form of apple and orange with the occasional piece of banana and a few grapes, was taken readily and mealworms were relished. Coarse insectile food and raw minced meat soon formed an equal part of the diet to the fruit as the quantity of mealworms was reduced. Maggots were left and only eaten when other more desirable foods were finished. As the birds settled down, fruit was reduced to just soft, sweet apple.

When all signs of hard frost had gone and spring was set in its ways the birds were moved to a planted aviary measuring 22 ft. × 8 ft. with an adjoining shelter of 10 ft. × 8 ft. Since we knew little about the breeding habits of these birds they were furnished with a hollow log hung about 7 ft. from the ground as well as there being many possible nest sites in the bushes. In the summer of 1967 they chose a site on top of the nest-log and began building a large untidy nest, mostly of dead grasses from the aviary floor and hay which was supplied to them. Eggs were laid, incubated, and hatched but the chicks were lost in the early stages of rearing. The birds remained in the aviary throughout the winter and in the summer of 1968 began to build once again. This time they chose a site on a wire platform in the corner of the aviary and everything went well until the chicks were about a fortnight old when unfortunately they were lost once again.

In 1969 they seemed to start in a haphazard manner, carrying nesting material to many possible sites, then quite suddenly after two weeks of this undecidedness they chose an entirely new site about 6 ft. from the ground in an elder bush, and had completed the nest in three days. On the 23rd May I noticed during feeding that only the cock was visible and this continued until 28th May when the hen appeared. The nest contained five eggs and this was the only time that I saw the hen off the nest during incubation. The first sign of anything happening came on 10th June when I saw the shell of a hatched egg on the ground. Maggots were fed ad-lib. and on 12th June another shell appeared plus the sounds of chicks in the nest. The consumption of maggots began rising and after the first few days a small quantity of mealworms were supplied also. The amount of live-food being utilized by the birds reached a peak of one and a half pints of maggots and a handful of mealworms daily on 22nd June, then remained constant for five days before starting to reduce. Nest inspection on 28th June revealed only one chick, quite well feathered, and the remains of a chick which must have died a few days earlier. The parent birds were living almost entirely on live food themselves because the amount of minced meat and apple being taken was negligible. On 1st July the chick was sitting on the edge of the nest entrance and two days later it had left the nest completely and was hopping about on the ground and lower branches of the bushes. After seeing the chick out in the open I realized that its legs were twisted and splayed as if due to calcium deficiency. This chick died a few days later and the parents very quickly began building again but due to the overgrown state of the bushes I did not know where.

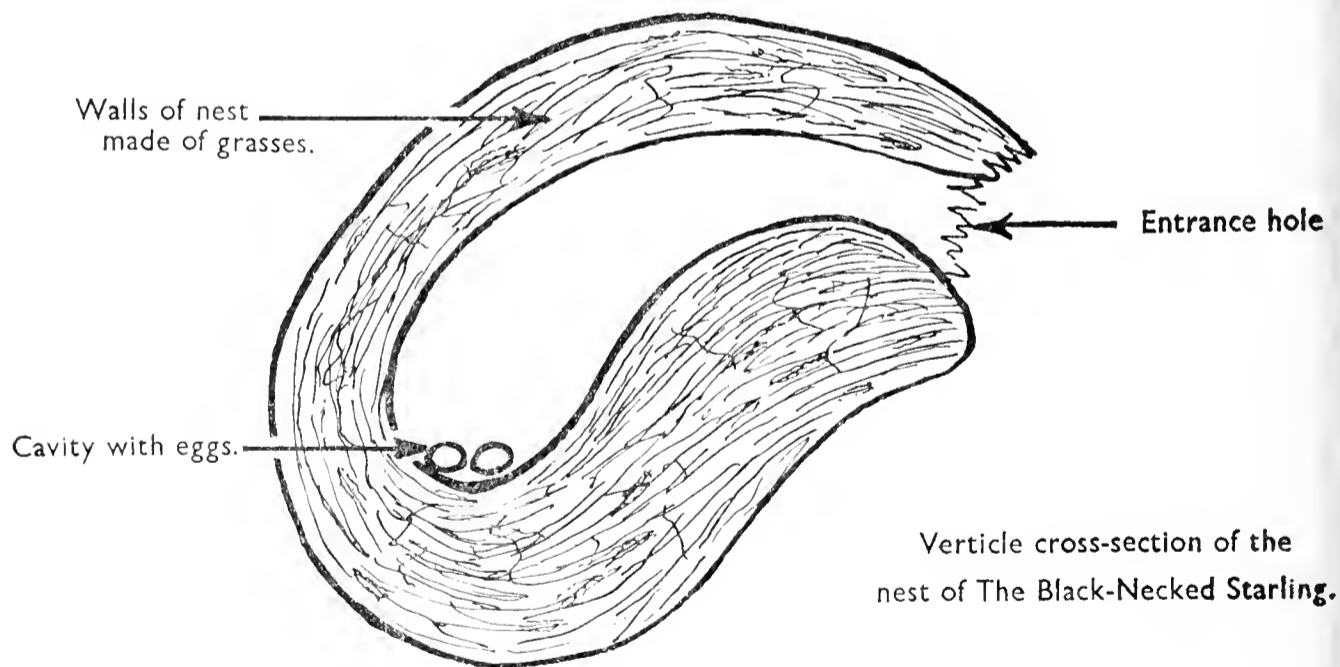
Again the hen was lost from view and on 30th July, after seeing both birds out in the open, I inspected the old nest to find that it had been renovated and contained partly incubated eggs. An empty shell appeared on 4th August and again maggots were fed ad-lib., but this time with additions to try to overcome the deficiencies of the chick which was lost earlier. To one pint of maggots I added one teaspoon of "Stress" calcium and phosphorous powder, one teaspoon of Gevral protein food and one c.c. of "Abidec" multi-vitamin. The birds took to this quite readily and an ad-lib. supply continued until consumption reached one pint daily then they were restricted to this amount. Minced meat was increased to meet the demand and a few mealworms, pupae and beetles were given also. On 22nd August a few maggots were left over from the day before, previous to this everything had been eaten and food-pots were strewn everywhere in the search for live food. Three days later a chick was sitting on a branch just outside the nest and over the next few days it ventured further afield. This youngster appeared quite strong and showed no signs of any outward deformities, then on 29th August it was found dead. For the first time I saw two more chicks in the seclusion of the elder bush so every attempt had to be made to save them.

A quick post-mortem revealed that suffocation due to gape worms could have been the cause of death, everything else appearing to be normal and the bird in excellent condition bodily. "Thibenzole" powder was mixed into a solution with water following instructions on the packet and given at the rate of 1 c.c. per lb. body weight. The dead chick weighed 4 ozs. and I estimated each parent to be about 6 ozs., then put $1\frac{1}{4}$ c.c. of the solution on the maggots, rather than risk possible losses from catching to give direct dosage to each bird. This treatment was omitted for a day then given again the following day and once a week thereafter as a precaution.

The juvenile plumage is greyish fawn and brownish black with rather indistinct borders between the two colours. Adult plumage is attained in the first moult.

After the chicks had been out of the nest for three weeks I had to transfer them to another aviary because the adult hen was driving them around in an unsociable manner. The youngsters, now on their own, feed entirely on raw minced meat, leaving the maggots, both with and without the additives mentioned earlier, untouched. By the end of October they had completed their first moult and now look exactly like their parents.

The adult birds made another attempt at breeding after the youngsters had been removed but gave up after two eggs had been laid. I examined the nest and found it approximately 18 in. in diameter and of the cross section shown. The egg measurements were $1\frac{1}{4}$ in. \times $\frac{7}{8}$ in. and of a light turquoise blue colour.



As described above A. E. Hall has bred the Black-necked Starling *Sturnus nigricollis*. It is believed that this may be a first success. Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

NOTES ON BREEDING THE COMMON WHITE- THROAT, NUTHATCH, WILLOW WARBLER AND WAXWING

By F. MEADEN (Cheshunt, Hertfordshire, England)

I have, for many years, been keeping birds of British and European species, trying to discover the conditions and diet which will keep them in good health in aviaries and induce them to breed. The birds described here were kept in a suburban garden at Slough, where the aviaries, at first at the bottom of the garden, gradually spread over a large part of it. In order to check what was happening I kept a record of the various nestings on large cards which could be filed to form a permanent record. The following account gives details of some of the breeding achieved. Since it is difficult to discover with certainty which of these species have, or have not, been bred in aviaries I had not attached very great importance to these, with the possible exception of the Waxwings; but the Assistant Editor informs me that there appear to be no adequate published records of the breeding of these particular species, and has asked me to prepare these notes on them.

COMMON WHITETHROATS

A pair of Common Whitethroats, *Sylvia communis*, after spending the winter of 1953 in an unheated birdroom were, in early April 1954, given the freedom of an 8 ft. × 3 ft. × 7 ft. outdoor aviary built alongside the garden fence on what had previously been a flower bed. The roof, although of wire, was almost covered by polythene sheet, the rear along one of the 8 ft. sides was overgrown with hops, and one end was shut off completely by a dense lilac bush, which also sent up a host of shoots through the earth of the aviary floor. The end portion where the lilac branches encroached into the enclosure was packed with gorse to a height of about two or three feet and this, with a blackberry bush growing in its midst, the lilac and hops all contributed to provide quite a dense growth. The remainder of the enclosure was fairly clear except for a turf or two of grass, a small wood ants' nest and the birds' bathing facilities. On 14th April the birds were seen carrying some small white feathers into the gorse. After throwing down a few mealworms at the opposite end of their aviary to keep the birds occupied, we removed a ply-wood sheet which hid an observation hole into the bush. We found that a nest was almost completed. When we provided a wad of dog hair they showed no further interest in feathers and lined the nest fully with the latter material. On 17th April the first egg appeared and four more were laid on consecutive days. Three young had hatched by 5th May and we noticed a sudden change in the parent birds' food consumption; little fruit was now taken but the Farex and maggot intake was doubled, and

mealworms were cleared from the dish directly they were given. Whether ants were taken I do not know, there were however no eggs at that time. The hops which covered the side of this aviary were absolutely smothered with greenfly, the back of each leaf being thick with them. These too must have formed a large part of the nestlings' diet because the parents were often seen working the vine-like stems. The pear so avidly taken prior to rearing was left almost untouched but by 25th May the soft pulp of the fruit was once again taken and only the hollowed-out skin remaining. Previous to 28th May only two young had been seen moving around the aviary, but on that day we observed three and the two adults. One youngster seemed very large but two were far smaller. Even so all were seen to be taking grated cheese, Farex, pear, grated carrot, maggots, greenfly and even the soft food and mealworms. The old hen died suddenly on 7th June. She appeared perfectly fit in the morning but was dead at 6.30 p.m. The young and the adult male were all in excellent condition. The young were now also taking soaked household currants, a favourite with many warblers. With Autumn the four remaining birds fed almost exclusively on ripe elderberries. The amount of weight which was now put on was amazing and there was now little if any disparity in size or weight of any of the birds.

NUTHATCHES

A pair of Nuthatches, *Sitta europaea*, were given me by a friend in the autumn of 1954. They were overwintered in a large aviary with a number of other species, but made themselves a nuisance by stealing the sunflower seeds intended for the finches, however great the quantity, and concealing them in crevices and in the ground at the foot of wooden supports. They were therefore moved to another aviary, an all-wire structure of irregular shape, about 9 ft. × 6 ft., which they shared with a pair of Reed Buntings *Emberiza schoeniclus*. A major part of the aviary was occupied by a pond 6 ft. × 3 ft. with a lot of water iris. The aviary was built around the trunk of an old, 30-foot apple tree, the enclosed part of the trunk being covered with honeysuckle and having a "V" shaped fork into which a nest-box was secured. The box was of a horizontal type, made of wood and covered with bark, and with one side fitted so that it could be removed. Maggots, mealworms, grated cheese, beetles, earwigs, a marrow bone, suet, soaked sunflower seed and Avi-vite soft food was the standard diet, and in addition either the Reed Buntings or Nuthatches were taking tadpoles and small frogs from the pond, for on a ledge of the aviary were the remains of dozens of these creatures.

During the season the Reed Buntings tried to nest, building low in a gorse bush, but the Nuthatches destroyed four nests of eggs, which I took to be sheer vandalism on their part. Friends had visited us one Sunday in June 1955, one intending to take some photographs of the birds, the other merely to see the collection. We were all relaxing in the sun when

one called out, "Do you know your Nuthatches are feeding young?" My immediate thought was that, as was their customary habit, these birds were carrying up and hiding food. However, when I investigated the box to prove that he was wrong I found four strong youngsters with feathers just breaking through. The parents continued to rear them on the diet provided without difficulty.

In the autumn bickering between the birds had commened in earnest and since space was short we decided that the Nuthatches had to go. We had at that time a flat near Kensington Gardens and thought that this would be an ideal spot. We housed the birds separately for the winter, having sexed them as three definite pairs, and in April 1956 we liberated the old pair and one of the young pairs. They were released very close to Bayswater Road, nearly opposite Lancaster Gate Church. An interval of 25 minutes was allowed between releasing the pairs, and in each case they remained within a few feet of each other, climbing the trees as though they had known the place for years. We chose this area mainly for sentimental reasons, having spent many leisure hours watching the park's birds. The releasing of these birds had a rather unexpected conclusion. In the *London Evening News* there appeared later a report entitled "Rare birds back in Royal Park after 50 years" and referring to the nuthatches. We notified organizations which would be interested of the part we had played in this new sighting. This resulted in correspondence between the Nature Conservancy and ourselves, clearing up the matter. However, it is nice to know that the birds did breed at a later date.

WILLOW WARBLERS

An adult pair of Willow Warblers, *Phylloscopus trochilus*, were given me in the autumn of 1959 by an old friend, Mr. R. C. Tout. I kept them over winter in an unheated birdroom and put them out in spring into one of the aviaries along the side of the garden. This structure was 8 ft. × 7 ft. × 3 ft. The rear was covered by hops and convolvulus, at one end a wisteria completely hid 2 ft. of the structure, while at the other end and over a fair amount of the aviary front was a well-grown grape-vine. Inside the aviary grew Everlasting Pea.

With all this cover observation was not easy, but on 3rd June 1960 we noticed that there were more birds in their enclosure than there should have been. After watching for the best part of an hour we found that at least three young were being fed by the old pair. Further examination of the aviary from the inside revealed a nest low down in an old dead fir which was overgrown with convolvulus. The adult pair, normally so tame, were now behaving like mad things, calling frantically and keeping as far as possible from me. One youngster had joined them and the other two went to ground. For fear of treading on them I had to retreat from their enclosure.

The fouled and used nest was composed of grasses, honeysuckle skin from branches growing in the aviary, what appeared to be old leaves of iris, and the lining was of hair and feathers. They must have worked really hard to gather all these items, for I had provided no nest material, being under the impression that both had sung and that they were two birds of the same sex. Two young were of the same size as the parents but the third was a weakling. From the nest I recovered the body of a fourth chick so dried into the hair and feathers that no age could be assessed from the remains. From this data it would seem that they must have nested about the first week in May.

In the enclosure was a nest of wood ants acquired from a nearby beechwood and a bamboo cane pushed through the wire netting, inserted into the anthill, and moved from side to side, uncovered many pupae daily. They were small but were avidly taken. It was noticed that if an ant got onto a bird's leg the bird would peck at it in fear and fly off. All the climbing plant growth within the aviary produced much greenfly and a profusion of mixed insect life. We saw the adults feeding the young on greenfly, but since the maggot dish was emptied more quickly than usual I imagine that these too were being taken for them. What had first caught our notice was the male actually regurgitating a sort of white liquid. It was probably only Farex but the regurgitation surprised me. The food prior to the young being observed had been grated cheese, Avi-vite softfood, wax-moth larvae (normally only given at week-ends when time permitted), ripe pear, fruit fly which they took on the wing or from a bucket containing over-ripe fruit, and Farex to which we added calcium phosphate during the breeding season. Our only addition now was a handful of mealworms in a dish at their late afternoon feed, together with increased quantities of the other foods.

According to my record card, on 6th June all the young were thriving and searching for insects through the aviary vegetation. One male was rather bare about the head, and the adult male was seen to attack it when it ventured close to him or the female, whether because it was a male or because of its begging for food I do not know. The runt of the three had now improved, and although still a shade smaller in size was as strong on the leg and wing as the others. A number of people saw the young, but none were more surprised than I by the successful rearing of them. Had I even suspected that they were a true pair at the start, or that some attempt to nest and breed was being made, I would certainly have gone to a lot of trouble to assist; but I feel certain that the abundant supply of greenfly weighed the balance in their favour.

WAXWINGS

I had kept a number of Waxwings, *Bombycilla garrulus*, for some years, but although I had successful hatchings in previous years it was not until 1962 that the young were actually reared. I published some notes on

breeding these birds in the magazine (Meaden 1964) but did not give the actual nesting account. The flock of a dozen or so birds was kept in a fairly large aviary with overall dimensions about 30 ft. × 14 ft. × 7 ft. They were sociable birds and even in the breeding season would rest within inches of each other, the males showing no territorial aggression even when nesting unless an interloper actually alighted at the nest, when the reaction was limited to a forward threat with widely gaping mouth. The flock was not made up of equal pairs. Females predominated in a ratio of about two to one. The breeding displays have been described elsewhere (Meaden 1964; Meaden and Harrison 1965).

It was in June that our birds started nesting. As usual dried chickweed and grasses formed the basis of the nest, some birds using home-made nest-baskets, others using natural twigs. All the nests were lined with animal hair or fur, and with vegetable down from seed-heads. There were at one time seven nests in use, the two closest being about 9 in. apart at the most, while one of the lowest I have known was about 3½ ft. off the floor. Most were under some sort of overhead cover. The enclosure had a small apex roof covering a through path and two nest were built up under the corrugated plastic roof; while others were under a felted 1-ft. wide sheltered portion around the perimeter of the aviary roof. Apart from this proximity to overhead cover, the nests themselves were in relatively open sites.

The hens all went to nest within a few days of each other, the first seeming to trigger off the impulse in the others; although courtship display had been witnessed since early spring and the displays had increased in frequency until one could hardly ever look into the enclosure without seeing some birds displaying. In addition to being highly sociable among themselves these birds were very tame, although all these northern species seem to be highly tractable. I found that if, when a hen was brooding, I moved a finger towards the tip of her bill and then quickly drew it back, she would tend to snap at it. I took advantage of this behaviour and after concentrating for a few days on the hen which appeared to be the most co-operative I had her snapping a mealworm, maggot, waxmoth larva, sowthistle head or even a small blob of Farex from my fingertip. I carried on with this procedure until she readily took whatever was offered. The females were normally fed by the male when incubating and in the early stages when the young were in the nest, and to some extent this taking of food from my fingers might have been an extension of this behaviour.

This female was one of the earliest to go down, and the chicks hatched on 14th June after an incubation period of approximately 14 days. I usually take an annual holiday at this period of the breeding season and luckily, on the day the young hatched, a good supply of fresh wood ant pupae had been collected from a nearby locality. Although a few pupae had been given prior to this, we were now able to offer dishes of them, and in addition the co-operative hen was continually offered them while

she sat on the nest. I cannot recall ever seeing her off the nest while with eggs or small young, though she might have left it during my absences from the aviary. Now, with newly-hatched young, immediately we fed her with ant pupae, waxmoth larvae, or Farex she would raise herself up, reach down and feed the chicks. Since on the day this first happened I had been able to check earlier that only two of the eggs were hatched some of this food may have provided their first meal. At this time we had started to use a high protein invalid food, Casilan, of which a friend had given me a little and which we sprinkled on maggots and mealworms, and now also on the food offered to the Waxwings. We continued to feed this bird on the nest frequently and this extra food, in addition to that brought by the male, was probably critical in that the young of this brood survived to fledge while others did not.

In other years we had lost the young, apparently because they were choked by soaked currants given them by the adults. With the hatching of these young I was anxious to prevent this happening again without suddenly removing a major part of the food supply and possibly impairing the fitness of the birds or causing discomfort to those not nesting. We finally decided to mince the currants so that even if they were fed to the young they would not choke them. We found, however, that the intake of currants stopped drastically in any case at this period, and since apple was still available in quantity and since all the birds were now taking ant pupae in addition to the usual basic diet there was little harm in stopping the supply of currants for a short while.

In the nest where the hen had extra food four young hatched but only three were reared. The young in other nests reached varying stages up to five days and I feel that the losses were probably due to the impossibility of providing sufficient live food of the ant pupae type for a flock of 12 adults and three or four broods of young all requiring it at once, with the result that each only received a limited supply. The male was not seen to feed the young directly until they were seven or eight days old. The three young fledged at about a fortnight, at the beginning of July. About two months later they began to moult into adult plumage. In doing so they went into a very heavy moult. I wondered whether this was due to the relatively warm weather. Waxwings seem to suffer from the heat and I had noticed that the incubating females would sit with open bills, or rise slightly on the nest in apparent discomfort on warm days. The young ones moulted so heavily that they could not fly up to their usual roost perches and therefore roosted in a more open part of the aviary. They became saturated and chilled during a very heavy rainstorm and two subsequently died, only the one surviving through to full adulthood.

There is a great deal of nonsense written about this species, including recommending as a staple diet food such as bread and milk, which might help as an addition but which is otherwise a poor diet item, or the withholding of some normal foods such as fruits for fear they might stain the

plumage; while writers without breeding experience solemnly recommend only one pair to an aviary. Some of our birds had been with us for 13 years when they were stolen and one must have been 15 years old since it was fully adult when it first came. I am certain from my experience that this is one of the simpler birds to keep healthy and in a wonderful plumage.

As regards the diet, I would still recommend the foods I mentioned in the previous article—i.e. soaked household currants (strained before use), grated carrot, greenfood such as brassicas, spinach, watercress, comfrey, dandelion or similar plants, Farex mixed with milk, softfood, small quantities of grated Cheddar cheese, together with an occasional pinch of calcium phosphate and a few drops of multivitamin. This together with plenty of sweet apple.

A dish of maggots and similar live food is necessary at some times of year; but in my experience the Waxwings almost completely dispense with live food in winter, unless the diet is deficient in other respects, in which case they may take all kinds of exceptional foods. Their intake of live food rises to a peak in July and August when they would be feeding young. Berries of Mountain Ash, Elderberry, Blackberry, Berberis and other berries are very valuable parts of the diet when in season. We give Sowthistle with seedheads which are pulled off and swallowed whole, the base going first and the downy end disappearing down the throat last. This does not seem exceptional since they are said to take similar soft, ripe seedheads in the wilds. I am doubtful about keeping them with seedeaters that require hemp in the diet since the Waxwings will remove and eat these seeds immediately, and I am not sure that the cumulative effect may not be harmful and overfattening.

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OBSERVATIONS ON THE BEHAVIOUR OF A PAIR OF GREEN BROADBILLS

(*Calyptomena viridis*)

By DAVID HOLYOAK (London, England)

During April and May 1969 I made brief notes on the behaviour of a pair of captive Green Broadbills (*Calyptomena viridis*) whilst studying other birds at the London Zoo. Virtually nothing has been published regarding the calls and behaviour of this species, so it seems worth recording these observations.

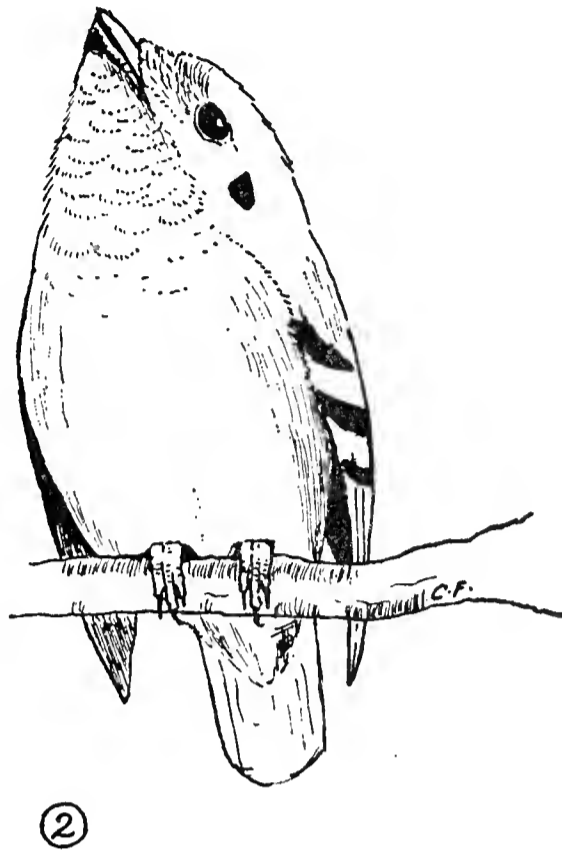
The Green Broadbill is a plump, short-tailed bird, rather larger than a Starling, from the forests of Borneo. The plumage is emerald green throughout in the female, with black wing-bars and a black spot behind the eye in the male bird. The bill is partly hidden by stiff feathers growing from the base. These observations were made on a male and a female kept in a cage about 5 ft. × 8 ft. × 12 ft. high with several growing plants and numerous perches, in a large heated room. Even for captive birds they were rather lethargic, remaining perched except for infrequent bursts of fast whirring flight, and visits to food trays on the cage floor.

Both birds have been heard to give a variety of high-pitched piping calls, sounding variously like *kweea* varying to *kwee-weer*; and a high *tui-tor* call. These notes were given in a wide variety of circumstances, and some of them probably function as contact calls. A distinctive, soft, but penetrating, *kwoi kwoi kwoi* call, repeated about five to ten times, was often given by both birds; the head of the calling bird being bobbed in time with each note. This is probably an alarm call, as it was most often given when I was very close to the wires of the cage, and when the wires were rattled.

The flight intention movements have two components common in passerines, a quick upward flick of the wing-tips in which they are lifted up to a centimetre or so, and at higher intensity, a quick crouching movement.

The appearance of these birds can change abruptly as they fluff or sleek their plumage, but besides the fact that the female often fluffed as a response to slight aggression from the male, and when soliciting copulation, it was not possible to investigate this with a single captive pair.

Copulation was seen twice, and the associated behaviour was similar each time. First the male hopped towards the female and perched on a branch near to, and facing her. He then gaped widely two or three times, bending the upper mandible back to a remarkable extent and exposing the bright orange-pink interior of the bill. Before the gaping movements and interspersed with them the head was tilted back away from the female with the neck feathers fluffed. On both occasions the



DISPLAY POSTURES OF THE MALE GREEN BROADBILL

(1) Gaping to expose the bright orange-pink inside of the bill; (2) tilting the head back with the neck feathers fluffed.

The female responded by crouching low on her perch with the tail horizontal, the body plumage fluffed, and the wings held partly open and shivering slightly; then the male fluttered onto her back and mated for three or four seconds with fluttering wings, before hopping off and perching nearby preening.

Both birds have been seen to make the wide gaping movement at other times (the female also has a bright orange-pink inside to the bill) when mating did not follow. The male bird has been watched regurgitating food and then swallowing it again, and once the female hopped towards him as if expecting to be fed, but I have not seen courtship-feeding take place.

I am grateful to Dr. Peter Olney, the Curator of Birds at Regent's Park, for affording me facilities to study the birds in the collection, and to Clifford Frith and Colin Harrison for drawing the display postures.

* * *

KEEPING AND BREEDING FLAMINGOS AT SLIMBRIDGE

By S. T. JOHNSTONE (The Wildfowl Trust, Slimbridge, Gloucestershire, England)

Although the Wildfowl Trust started in 1946, it was not until 1961 that we obtained our first Flamingos. These were 12 Chilean, followed by more Chilean the same year, and later by a consignment of Greater and Lesser Flamingos from Kenya. In the case of the Chileans, these had been bought from dealers in Holland and had arrived each with the legs folded in a flour bag. Of course, the journey was very short and the birds appeared to be in excellent condition. Unfortunately, the consignment of Greaters and Lessers from Kenya had travelled in crates, in which they were in a standing position. The divisions in which each bird was put consisted of rather rough sacking. They had rubbed their hocks on this sacking and, as a result, the abrasions so caused had become infected. This appeared to effect the Lesser Flamingos more so than the Greater and we had considerable losses in the former. Infection of the joints of the legs of Flamingos would seem to be a most difficult condition to deal with. Of the antibiotics used Chloromycetin was the most successful in effecting a cure, but experience shows that great care must be exercised in the design of the travelling crates. Caribbean Flamingos were not obtained until the following year, when Antwerp Zoo very generously presented us with a pair. Subsequently these were added to by birds purchased from Florida. In 1965, we obtained our first Andean and James's Flamingos from Mr. Cordier.

Flamingos are related to wildfowl, but I am afraid our knowledge of their husbandry and their feeding habits, etc., was not our strong point, and, having decided that these birds should be added to our collection, it was imperative that we increased our "know-how" as to keeping them. So whilst collecting the various forms we were, at the same time, visiting experts in the Zoos seeking their advice, not only as to how the birds should be fed, but also how to retain their colour and how they should be kept in winter. The information obtained from the principal collections both in Europe and America varied a great deal but from it we have developed our own method of keeping the birds, of providing adequate nesting sites, and of the way in which they should be fed.

The collection now consists of some 225 birds. 37 Rosy, 74 Chilean, 20 Andean, 50 Lessers, 30 Greaters and 14 James's.

In order to facilitate their breeding, we designed and built Flamingo atolls, this involved a considerable amount of work. The draining of the ponds and then building up with hard-core and rubble two banana shape ridges, leaving at the ends an opening between them. The rubble was covered with concrete smoothed down and at an angle of 30 degrees to the bottom of the ponds. Between the ridges was then filled with



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Andean Flamingo with chick

[Philippa Scott



mud and sea sand, a small entrance at each end left so that water could flow in and keep the mixture of mud and sand at the right consistency for the Flamingos to build their mounds. Encouragement was offered them in the form of concrete replicas of nests, several built close together at one end of the island.

It was not until 1967 that any nest building activity was apparent. In this year the Rosy Flamingos built a number of nests. They even planted a little mud on some of the concrete replicas. There was slight activity amongst the Chilean Flamingos as well, but no eggs were laid. However, in May 1968 the activity amongst the Caribbean Flamingos was such that in a relatively short time some 16 nests were built. In the middle of May, two eggs were laid on successive days. One must explain that the pen where the Caribbean Flamingos are kept is overlooked by our Restaurant and tea terrace, which is separated from the sward of the pen by a low stone wall. Although a fairly continuous watch was kept to see that visitors did not enter the pen and disturb the two sitting Flamingos, one person we had forgotten about, and, one day, when no member of the Staff was near, the window cleaner arrived to clean the outside of the restaurant windows. He went over the wall with his ladders and immediately the incubating Flamingos left their nests. Fortunately a visitor realized something was wrong and came for a member of the Staff. The window cleaner immediately left the pen and the birds came back to their island but one of the two birds at once rejected the egg from its nest, whilst the other one sat down quite comfortably. The rejected egg was replaced, but the flamingo again rolled it out. It was thought that if we continued to return the egg we would cause the second bird to do likewise, therefore one more attempt was made with a wooden egg and the rejected egg was placed in an incubator. Likewise the wooden egg was rolled out.

On the 14th June, slight tapping and squeaking was heard from the egg in the incubator. We decided that the possibility of rearing a young freshly hatched flamingo was beyond us. We could not reproduce the regurgitated food with which the parents feed the young. The remaining egg, that was being incubated by the parent, was therefore examined and found to be infertile. It was exchanged for the live egg and within 24 hours the first flamingo to be hatched in Britain made its appearance. The hatching was followed by foul weather for about a fortnight and one saw the chick on occasions almost covered in mud. It did not leave the nest during this time and was first seen out of the nest on the fifteenth day. Both birds shared brooding and both birds fed the young one at frequent intervals of about 20 minutes; the male taking the major share of this work. After 17 days, the downy young was seen to be attempting to feed itself although its main sustenance came from its parents. This was continued until the bird was almost fully grown and it was seen that the parent birds were gradually losing their bright pink coloration. The young one was removed and put in with our James's Flamingos for a

period of about a month. After this, on account of it seeming not to be very happy in its new surroundings, we returned it to the main Caribbean flock. On its return, the parents, or foster parents as they really were, showed no further interest and junior fended for itself. After a year its plumage is bright pink and, if it were not for the fact that its legs are grey and its hocks black, it would be indistinguishable from the other members of the flock.

Our Andean Flamingos, of which there are 20, live in a small pen compared with those of the other flamingos at Slimbridge and are very close to the public. The only place where we could build their atoll was within some three or four yards of the main pathway. Here, this year, they built nine nests and seven birds laid eggs. We were highly excited as this was the first time that this species had produced eggs in captivity and we had high hopes of hatching the first Andean Flamingo chick. But as the termination of the incubation period of each egg occurred there was no sign of hatching. By this time we had just about given up hope and decided that the reason for the failure to hatch was that the birds were pinioned and could not balance themselves for proper copulation, but on examination, five of the eggs were found to be fertile. Then to our great joy the seventh egg hatched on the 29th day of incubation. The chick behaved quite differently from the Caribbean Flamingo. It happened to fall out of the nest on the day it hatched and it crawled back in, but on the second day it left the nest of its own volition and after a very short time it did not bother to return except at night. It is now well grown, its legs are black and the bill shows no sign of yellow as yet although the wings are quite pink.

Whilst this activity was going on with the Andean Flamingos, our flock of over 70 Chilean started a major nest-building campaign. Some 50 odd nests were built and at least 30 eggs laid, from which 10 young birds have hatched. As in the case of the Andean, some chicks left the nest after the second day and scarcely ever returned, except to be brooded by the parent.

The Rosy Flamingos showed two separate nest-building activities and we are sorry to say that on neither of these occasions did the birds lay. Whether flamingos lay every year one has not been able to ascertain. One suggestion for the failure to lay this year has been that the young should be removed from the flock or the birds will not re-nest the following year. This, one feels, has yet to be proved.

A difficulty we have experienced is the wintering of the flamingos, in particular, the Lessers and Caribbean. The weather at Slimbridge is far too bleak to leave these birds out, so we have developed a building where they can be housed, and at the same time, where they can be seen during the winter months by the visiting public. These consist of rectangular wooden sheds some 50–60 ft. long by 20 ft. wide—one side of which contains a number of windows, not only to give light to the birds, but also

to allow the public to see them. The houses are built over a water course so that the water is constantly flowing through the buildings and over the waterway is a large door through which the flamingos can be walked into an adjoining pen where, if the weather is sufficiently bright and sunny, they can spend a little time outside. The water runs close to the window side of the building and represents about a third of the width. The other part is a gently sloping concrete surface which is trowelled over and then painted with a rubberized paint to prevent damage to the feet of the birds. Infra red lamps and strip lighting are provided.

Considerable trouble has been taken regarding the diet of our birds and various forms have been tried. Finally, the following meal is made by milling together equal quantities of wheat, dried shrimp, maize, poultry biscuit and turkey starter crumbs. To this is added minced lettuce, carrot and beetroot. The whole is then mixed with water containing Canthaxanthin, Rodophyll and Tylan, into a soup-like consistency. The soup is fed twice a day.

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THE AUSTRALIAN PENGUIN

(*Eudyptula minor*)

By HARRY FRAUCA (Canberra, Australia)

Although penguins are associated with ice floes and the barren wastes of the Antarctic, some species never see a chunk of ice in their lives and among these the Australian fairy or little penguin, *Eudyptula minor*, is an interesting example.

An attractive bird standing about 18 in. tall, it has dark blue dorsal plumage and silvery white breast. Like all penguins it is totally flightless, its wings being modified for paddling and swimming. It walks in an upright posture and its appearance, antics and general demeanour captivate anyone who has the good fortune to encounter it.

There is no difficulty in finding this penguin. There are thriving colonies of the species on Phillip Island, just a short distance from Melbourne, on most Bass Strait Islands and all along the coasts of Tasmania. Others are encountered in different parts of coastal southern Australia with an occasional straggler reaching Moreton Bay, in south Queensland.

Phillip Island, the Bass Strait islands and Tasmania carry the largest colonies of this species. In Tasmania, the little penguin appears not to mind humans at all and may live in the suburbs of Hobart undisturbed.

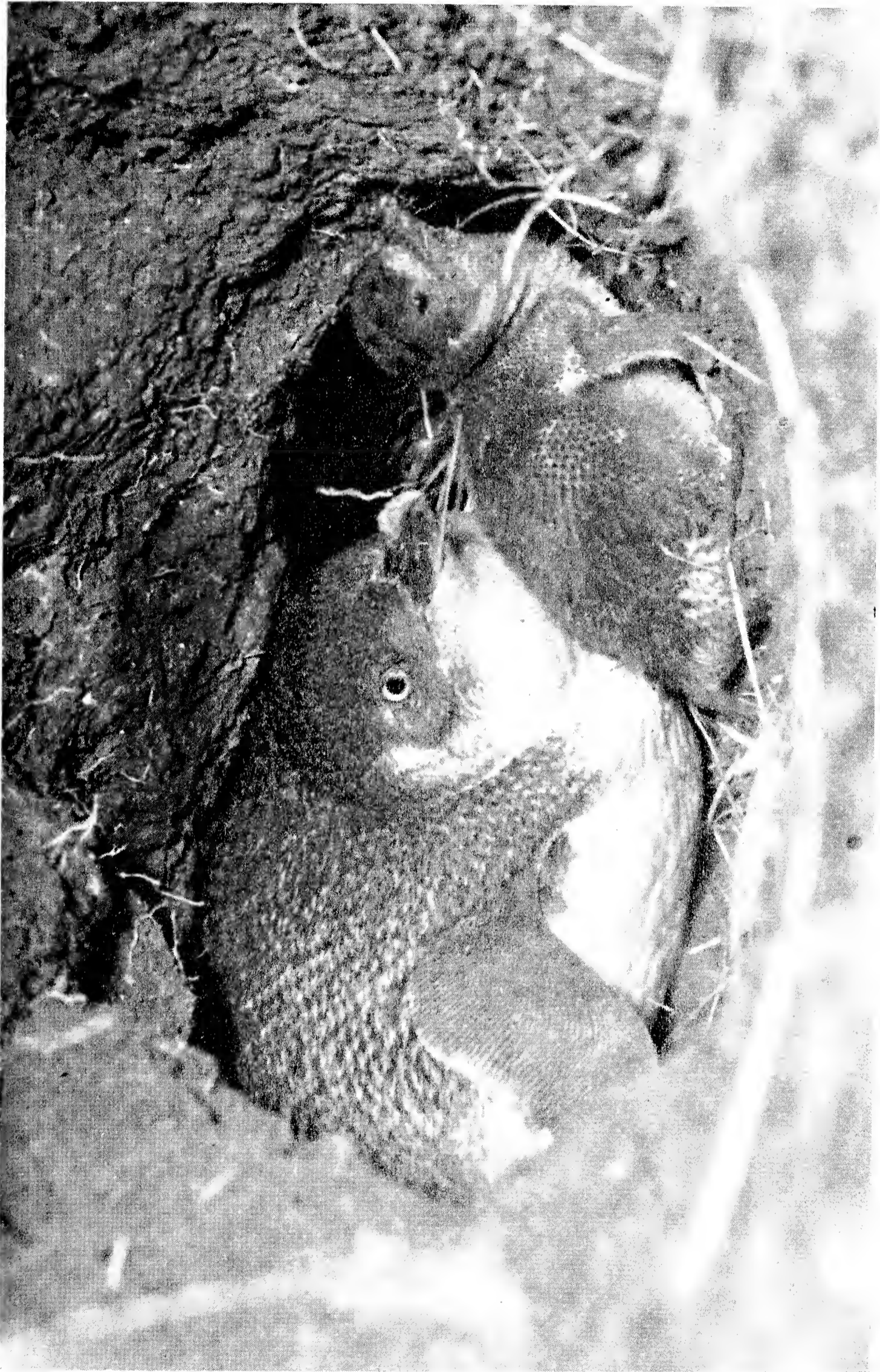
The well-known Tasmanian ornithologist-author Mr. Michael Sharland has recorded fairy penguins breeding "under boatsheds along the Hobart waterfront. It is a noisy bird and often disturbs people living close to the water".

The Fairy penguin never goes south and although its movements are not known, its daily routine has been observed frequently. Usually, the bird (in parties varying in numbers) spends the day swimming and feeding on aquatic animals and plants with occasional resting spells on rocks or sand-bars. On many occasions, during my years in Tasmania, we passed rocks half-awash in the sea each crowded with a multitude of penguins taking a rest. There is probably no other bird that can be watched more easily or at closer quarters. In fact, you can have too much of its sometimes.

During my student days in Tasmania, we would often go to spend the night at the penguin rookery on Bruny Island, off the east coast of the island State, an experience that is unforgettable. The best time for observations is during the breeding season which extends between August and March but appears to reach its climax around October–November, depending on the year. The penguin rookery is situated on the isthmus linking north and south Bruny and consists of several high sand dunes rising a couple of hundred feet partly covered with tussock grass. On the western side of the rookery there is a road with a notice that reads "PENGUINS CROSS HERE, DRIVE CAREFULLY". Beyond the road there is the D'Entrecasteaux Channel and beyond this the coast of Tasmania. On the eastern side the dunes slope down to a wide desolate beach and to the Southern Ocean often bleak and stormy-looking.

Life on the rookery during the day is quiet and peaceful, lulled by the sounds of the surf and the occasional call of a sea bird. Motor traffic on the road is rare to say the least. There is not a single penguin to be seen and you wonder if you are really in a rookery of this species at all. The penguins are there, right enough. They are in the countless burrows excavated in the sand, some visible to the naked eye, others concealed by the tussock grass. At this time of the year, the birds are brooding their eggs, which are spotless white. A hen penguin may lay one or two or even three eggs, but there is evidence that one or two form the average clutch. The burrow varies in depth from about 2 ft. to 3 ft. with the entrance hole about 6–7 ins. in diameter.

The penguin can be very pugnacious at all times but more so if disturbed in the burrow during the incubation period. On many occasions, in order to inspect the bird and the clutch or the parent and the young, we would thrust an arm into the burrow, an action which caused the adult bird to emit a series of calls and hammer the hand savagely with its strong bill. Because of this we had to protect our hands either with gloves or with socks padded with grass. The fairy penguin is one of the strongest little wild creatures I have known. As you hold one in your hands you cannot help wondering at the toughness and compactness of its body. It is a solid mass of muscle with a thick coat of fat (between the feather covering and the skin) which forms an insulating layer. The feathers are





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Fairy Penguins returning to the nest, Phillips Island, Victoria.

[Australian Information Service

so short and compact that they look as though the bird was covered with a skin rather than with an ordinary plumage coat.

In conversation with some ornithologists I was told that many fairy penguins at the Bruny rookery—and in others—appear not to make the burrows but to appropriate burrows excavated and abandoned by the short-tailed shearwater or mutton-bird. *Puffinus tenuirostris*. This is possible because the mutton-bird, after breeding in Tasmania, departs on its fantastic long-distance movement to northern Japan, Alaska and back to Tasmania again the next breeding season. Thus, if the fairy penguins become in breeding condition while the mutton-birds are travelling, they can appropriate empty mutton-bird burrows without finding any opposition. On several occasions, we found the Bruny rookery containing brooding penguins occupied the lower burrows while the mutton-birds occupied the ones closer to the top of the dunes.

One of the most interesting scenes to be seen in Australia is the penguin parade on Phillip Island when, at dusk, parties of penguins swim ashore and cross the beaches to the delight of tourists. But few people have seen the penguin parade at Bruny Island. I am lucky to have. After dusk, during the breeding season, dozens of penguins that had spent the day at sea, swam ashore in parties of four or five or a dozen with an occasional solitary bird. On landing each penguin would stand in the sand and shake itself vigorously. Hundreds of them lined the beach at the water mark, their bodies glistening in our spotlights.

The noise they made cannot be described in words. Their calls rose high above the pounding of the surf and the wind and mingled with the calls of the birds that had stayed in the burrows. The result was such a terrific din, such a fantastic pandemonium, such an extraordinary intensity of vocal sounds that you seemed to be in a mad world. Nobody could forget that experience. Calling intermittently, the newly-arrived penguins would make for the burrows, waddling across the beach, scaling the sand dunes, pushing their way through tussocks of grass. Some strayed into our tents from where they had to be shooed away in no uncertain terms. The function of the sounds, however, was clear enough. They served for communication so that each newly-arrived bird eventually reunited with its partner that had been left behind to incubate the eggs. The two birds would stand side by side in front of the burrow in a typical "nest-relief ceremony". They would call softly as though whispering to each other and bow and touch each other before the two would enter the burrow. Once the pairs had reunited and retired inside the burrow, a profound silence fell on the rookery. The sounds of the sea and the wind were all you could hear.

The silence did not last long though, for around dawn the insane cries would break the stillness. Leaving its partner in the burrow, a penguin would now head back for the sea, calling stridently, and it was then when one of the most amusing scenes in penguinland took place. The penguins

that had emerged from burrows high on the dunes would slide down the sand slopes on their bellies. It was indeed a quick way of getting down the dunes and there is no doubt that the fairy penguin is an expert at it. Some slid down distances of 40 yards or more and fetched up at the foot of the dunes where they became almost buried in the soft sand. Long before sunrise, the rookery would be silent again, a contingent of penguins incubating the eggs in the burrows, the rest swimming in the Southern Ocean in pursuit of food.

So the cycle went on. And to me the memory of those nights in the penguin rookery has remained as one of the most gratifying experiences in my career as a naturalist. Although occasional penguins are shot by fishermen for crayfish bait, they are wholly protected throughout Australia and the thriving rookeries on Bass Strait and Tasmania ensure that we shall have *Eudyptula minor* with us for many years to come.

* * *

THE BIRDS AT CLÈRES IN 1969

By J. DELACOUR

The summer of 1969 has been one of the best I can remember, as far as the weather goes, in Western Europe. But it has not been a good breeding season for birds. The spring was dull and cold and the number of clear eggs high. Certain species even did not lay at all, particularly Waterfowl. I suspect that the exceedingly wet and chilly summer of 1968 is partly to blame for it. Just as a number of plants and shrubs flowered poorly because they had failed to mature their growth properly the previous season, birds never got into good breeding condition.

A large number of young birds and animals, however, were reared at Clères: five Emus, a dozen Rheas, six Black-necked Swans and many ducks and geese, including Ringed Teal and another brood of five Black Brants. But there were only six Emperor Geese, while none of Red-breasted or Ross laid at all. By luck, the only hybrid produced was from a male Black Brant and a female Lesser Whitefront (an almost entirely black bird). A brood of Ruddy Ducks did not survive, the six chicks having been carried away by the flow of the running water. We now have two pairs of Trumpeter Swans, sent by the United States Government.

The Tasmanian Water Hens raised 18 young, six under a bantam hen. All the others were reared in the park by two pairs, which never interfered. Five Brush Turkeys came out of a mound, a number of Peafowls, including five green, grew up. Many pheasants and a pair of Naked-faced Currasows (*Crax fasciolata*) were raised, as well as ten Sonnerats and a few Ceylonese Junglefowl.

A number of new birds were acquired during the last season: pairs of West African Ostriches, Two-wattled Cassowaries and Wattled Cranes, several Hornbills, Victoria and Sclater's Crowned Pigeons, Great Argus, Ijima Copper Pheasants (a gift from Mr. Ed. Fitzsimmons), White-headed and Ross Touracous, also a number of small tropical birds for the new accommodations which have been built during the last summer; a modern bird gallery in what used to be the drawing-room of the chateau (50 ft. × 25 ft.), destroyed by fire in 1939. There is a dark passage in the middle of the room, 9 ft. wide, with ten cages on each side, seen through windows—16 small compartments (3 ft. × 3 ft. × 5 ft.) and four larger ones which constitute aviaries. They are all properly heated, ventilated, decorated and planted. The backs slide up and down, and the cages are serviced from back corridors. There are no signs of doors or food and water vessels, which are hidden by rocks, logs and plants and all located at the back. The hidden tops of the cages and the openings into the gallery are covered with very thin wire netting, which we prefer to glass.

The collection of small birds in the gallery is varied. There are only one, two or three birds in each of the smaller cages, while the four flights can accommodate up to 70. They consist of Hummingbirds, Sunbirds, Sugarbirds (including *Dacni lineata* and a *Iridophanes pulcherrina*), Mexican Golden-browed Tanagers (*Chlorophonia callophrys*), all the species of American painted Buntings (*Passerina*), Red-breasted Parrot Finches, a pair of small Red-headed Barbets (*Eubucco bourcierii*), a Cock of the Rock, a Blue and White Indian Flycatcher and several Toucanets. The two larger aviaries contain big Tanagers (Scarlet, Black-throated, Mountain, Red-rumped and White-winged Blue), Blue and White Kingfishers, Pittas (Irena's and Large-billed), Bellbirds, Amethyst Starlings, Bulbuls and Leafbirds, Rosita's Buntings, Black-headed Sugarbirds, Roulrouls, Silver Chinese Quails, Sand Grouse and a few Waxbills. The two smaller ones are the home of Calliste Tanagers (10 species), Sugarbirds and Sunbirds.

Larger aviaries in adjoining halls are inhabited by several species of Toucans, including the Mountain Blue *Andigena laminirostris*, Barbets, Troupials, Weavers, Whydahs and Starlings.

Some of those birds come from the collection of the late Mrs. Milton Erlanger, as are five Knysna Touracous, all reared in her aviaries at Elberon, New Jersey, during the past few years. They were presented to me by her family and they constitute a living memorial to a great bird-lover and a perfect friend.

We hope to build in 1970 a large tropical garden aviary where exotic plants and chosen birds will be displayed as they used to be in my greenhouse before 1940. But it will be planned to allow the visitors to walk through. It no doubt will prove to be an outstanding addition to the park.

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BREEDING MITCHELL'S LORIKEET

By PAUL FARRANT (Trimley St. Mary, Suffolk, England)

My pair of Mitchell's Lorikeets *Trichoglossus haematod mitchellii* were housed in an aviary 10 ft. × 6 ft. × 3 ft. I gave them a nest-box 1 ft. square, facing S.E., in the bottom of which I put a thick layer of sawdust.

I had obtained the cock bird in August 1968 and in January 1969 I got him a mate. They were in this outside aviary all the winter. I fed them on condensed milk and sponge cakes, also fruit. I tried other things but without success.

I do not know when egg-laying occurred. I had decided to exchange these two birds, and one morning at the beginning of May I went into the aviary to catch them for this purpose. Quite by chance I looked into the nest-box and saw there were two eggs in it, so naturally I decided to keep them. The hen did not appear to sit on the eggs except at night, unless it was cold in the day. I think the hot summer helped.

About a month later I saw that one egg had hatched, and the other one hatched the following day. I searched in various books to find out what to feed the young on, and decided to stick to the usual diet, but added maggots. I looked into the nest-box every time I fed the parents, which was twice a day. The young were very noisy when being fed. They were fed mostly by the cock bird and soon developed into plump youngsters covered in greyish down.

One point I found very interesting, the excreta in the nest-box was over to one corner as though it had been moved there, since the nest had appeared dirtier on an earlier examination, and the young birds remained on the clean sawdust the other side.

About two months after they were born (this would be about August) two heads appeared at the hole in the nest-box. This happened frequently for about another month and then one bird came out and a few days later the second one. By this time they were fully feathered and more or less identical with their parents both in colour and size.

They are now four months old and are flying around with their parents and feeding themselves on the same diet of condensed milk and sponge cakes.

When the youngsters first emerged their beaks were black, but they are now nearly the same colour as those of the parents.

I was very surprised to find these birds much less timid than I had been led to believe.

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SOME BIRDS IN SOUTH-EAST AUSTRALIAN ZOOS

By MARVIN L. JONES (Oakland, California, U.S.A.)

My visit to Australia took place in mid-June 1969, with very little forewarning, as my R & R tour from Vietman. I spent six days in the land "down-under" visiting the zoos in Adelaide, Melbourne and Sydney, plus the Sir Colin Mackenzie Sanctuary in Healesville. This article devotes itself only to the bird collections in those parks visited. Unfortunately there was not sufficient time to visit any of the many private aviaries or even time to notify these people that I was in the country, much to my great regret. Hopefully on my next visit I can be more leisurely and see all of the zoos and many of the excellent private collections as well.

Birds are of course one of the most cared for parts of any animal collection in Australia due to the total, complete ban on import of all species that we would call exotic. This ban has been in effect for almost 20 years, thus those specimens of Touraco, Birds of Paradise, exotic Cranes, Macaws, and many others not native to Australia and New Zealand that I saw, were at least 20 years old. Most were far too old to breed. Some were in very poor condition with broken toes and drooping wings, but since each was the last to be seen alive for many years, were cared for like pieces of gold. The Birds of Paradise in Sydney Zoo for instance are in many cases establishing new world longevity records, and the male Ribbon-tail was perhaps the finest I have seen. All came from New Guinea more than 20 years ago to the private collection of Sir Edward Hallstrom, who in turn donated them to Taronga Park, Sydney. They are the last Birds of Paradise alive in Australia.

Because of this total ban, zoos and private fanciers are restricted to the show of species that are native to Australia, or which were introduced many years ago and have since become resident, and to New Zealand as well; species that have reproduced well under captive conditions such as certain pheasants, finches, weavers and psittacines; the occasional wild migrant; and of course those still alive that were in zoos at the start of the ban. It has been reported that one zoo in New Zealand recently imported a pair of Mute Swans from Europe, however this has not been substantiated and must not be regarded as a normal experience.

All of the zoos that I visited have large programmes under way to breed as many foreign or exotic species as possible, and also those native to Australia. Young from the latter can be used in exchange programmes with zoos outside of Australia and New Zealand not only as credit for purchase of exhibitable mammals and reptiles, but as a means of preventing the large scale smuggling of Australian birds for private fanciers. Hundreds of individuals of rare species, such as the Golden-shouldered Parrot are killed each year in the attempts to take them out of the country to dealers

in America and Europe. This species is very rare in Australia, and all efforts are made by zoos and private fanciers to increase the native population. However, more common forms in Australia, which are still rare and expensive overseas are those in general bred in large numbers by the zoos for export. This leaves the native wild population alone, and of course actually increases one's knowledge of bird breeding. It would be wonderful if other zoos, in other lands, used this method to send native species to zoos, instead of resorting to the capture of wild specimens to fulfill the needs of collectors. It has placed upon the Australian zoo the burden of doing its best, and I found that in some zoos the bird curator has been given greater liberty than in past years. For instance, as many pens as possible have now been converted to more natural exhibits in Sydney than previously was the case, resulting in improved hatching successes.

This of course also has brought not only the zoos closer together (there is now an Association of Australian and New Zealand Zoo Directors, formed just six years ago) but has even more importantly joined the private fancier and the zoo curator into partnerships that has been of great value, especially in preserving blood lines of exotic gallinaceous birds, doves and pigeons and psittacines. There remains more to be done with respect to trading between New Zealand and Australian bird fanciers and zoos, but a start has been made, brought together by a common need to maintain stocks as long as possible. As regrettable as such a law is certainly it has had many beneficial results in bird breeding and husbandry, so that emphasis has been placed on raising as many forms as possible, and keeping them alive and healthy as long as possible; actions that zoos in other lands could well imitate, instead of striving to import as many species as possible, and breed only those that meet the eye of the interested curator or fancier. How the wild populations would benefit from such a more enlightened view!

In describing the collections I will take them alphabetically.

ADELAIDE ZOO, SOUTH AUSTRALIA

I am going to put myself out on a limb so to speak here, by stating that the Psittacine collection of this zoo impressed me far more than any other zoo that I have visited in my life. Every feather on almost every bird was in just the right place, feet were in good condition, and breeding is taking place among a great many species. In fact all of the birds at Adelaide look good. There are about 225 species and forms exhibited, which is about the same number as at Sydney Zoo, so the collection is large by Australian standards. The emphasis is on psittacines and gallinaceous birds, about 70 species of the former and 25 of the latter, many breeding with success. In the attempt to keep macaws as long as possible a pair has been induced to breed, which has resulted in a series of hybrids of just about every colour variety possible. Over a half dozen

hybrids have been reared thus far, admittedly many with vivid oranges, golds and greens predominating (the parents are the Blue and Yellow Macaw *A. ararauna* and Scarlet *A. macao*). There are both the Red and Yellow-fronted New Zealand Parrakeets, Barrabands (which in Australia are called Superbs), Regents and several fine Princess Alexandra's (again the name locally is simply Princess Parrakeet). It was noted that a great many parrots and parrakeets are named differently in Australia than in America and Europe, which no doubt is confusing to many working in this field. The Rosella collection at Adelaide is complete, with all species and subspecies exhibited, and most raising young. The Red-capped or Purple-capped Parrots (*P. spurius*) were exceptionally well coloured here. There were also Barnards, Cloncurry, Twenty-eight and Port Lincoln's Parrakeet; almost all of the species of *Neophema* and *Psephotus*; and of course many cockatoos such as Slender-billed, Rose-breasted or Galah, Pink or Major Mitchell (never called Leadbeater's in Australia), Great Palm and all of the other species of Black Cockatoo. The family of Yellow-tailed was very good looking. In the gallinaceous birds, which are housed in a series of large runs, I noted perhaps the finest Swinhoe Pheasant cock that I have ever seen (and a good breeder) several Razor-billed Curassows, my first Mallee Fowl (*Leipoa ocellata*), very large Brush Turkeys or Megapodes, California Quail, Viellot's Fire-backed Pheasant, Germain's Peacock Pheasant, and some very handsome Burmese Green Peafowl. Dozens of quail and ornamental pheasants are raised here each year and traded to other zoos. Of note in the collection are the last European Flamingoes in Australia; several Little Pied Cormorants; Yellow-billed and Royal Spoonbills; Blue-winged Shoveller (*A. rhynchotis*); Australian Little Eagle (*Hieraeetus morphnoides*); many Boobook Owls; South African Crowned Crane; North Island Weka Rail; Pacific Gull, Nutmeg Fruit Pigeon; several Wonga-Wonga and Nicobar Pigeons; all of the large flightless birds—Ostrich, Emu, Rhea and Cassowary; Little Blue Penguin; and a fine series of waxbills finches and weavers. Unfortunately many of the aviaries are very old, however, replacements are being constructed as fast as funding will allow. All zoos in Australia are finding it difficult to secure money for capital improvements, and for many there is a need for new and more modern exhibits. Zoos are popular in all of Australia, and many now have various education programmes under way involving the school age children and adults. Again almost all are now directed by men who have been in the job less than six years, men with far more vision than their predecessors and more willing to co-operate with sister institutions. Here at Adelaide the Director is Dr. W. E. Lancaster, a veterinarian who formerly lived for many years in Malaysia, working in fact with a colleague who now runs the Toronto, Canada Zoo (Dr. Norman Scollard). Adelaide of course is well known for its large mammal collection, however this will not be discussed here. The zoo unfortunately has rarely been visited by Americans or Europeans

in the zoo field, an oversight that I hope will be rectified in the future, for it is well worth taking the extra effort to visit.

THE SIR COLIN MACKENZIE SANCTUARY, HEALESVILLE, VICTORIA

Another zoo that has been rarely seen by fellow Americans, but known due to the work some years ago of a former Director, Dr. Fleay, is this paradise called the Sir Colin Mackenzie Sanctuary. Actually the fauna park that is open to the public, in a setting of large gum trees and native shrubbery, is only part of the 448 acres devoted to the sanctuary, located about 40 miles from the centre of Melbourne. I was very impressed with the care taken not only of the animal collection but the botanical preserve. Much like my colleague, Dr. Grzimek of Frankfurt, I could have spent days here enjoying the wonderful scenery and observing the fauna. Many species are of course wild within the vast limits of the sanctuary (which cannot be visited by the public) and free within the park itself are over 200 White Ibis (*Threskiornis molucca*) and about 100 King Parrots (*Aprosmictus scapularis*). The latter especially are beautiful, alighting in several areas of the park, much like pigeons in the zoos of the United States, and feeding from the hands of visitors. But the prize of Healesville, and I might add, its proudest possession, are the Superb Lyrebirds.

The Lyrebird (*Menura superba*) is the only species of bird that cannot be exported alive under any circumstances. Under complete protection it has managed to increase in numbers and in fact wild birds may be found not too many miles from the fauna park. It is however very nervous and secretive, and wild birds are rarely seen by human observers. Within the fauna park there is a huge cage, several hundred feet long, replete with dense vegetation and only a narrow twisting path for visitors (and then open to the public only for a few hours in the afternoon), for just one pair of birds. It was my great thrill and pleasure to be allowed by the Director, Mr. Vernon Mullet, to see the male Lyrebird in his mating dance. Just a few minutes after I came to the park, about ten in the morning, he started to call, and what a piercing call it is. The Lyrebird is a mimic, and a superb one at that, but the range is high and one could hear it all over the park. We entered the cage, and moving about quietly and softly came upon him at the start of his dance. Fortunately I was able to get a few pictures of this, despite the darkness of the cage, and the denseness of the planting. The dance lasted about 15 minutes and all the while he would call. Certainly a sight that I will long remember, and one seen by few Americans. Nothing can quite describe the beauty and the gracefulness of this performance, the long tail feathers moving like so much rustling silk, so unlike the feathers of any other bird. The sanctuary has been able to hatch one bird thus far, and a new aviary is planned for it. In fact two large new aviaries were under construction for the expanding Brush Turkey collection, the aim being to breed as many as possible and to keep them for further study. Most of the aviaries, except for a few small parrakeets, are set in the landscape and

one comes upon them rather unexpectedly. There is a fine walk-through aviary for native waterfowl and shorebirds. Nearby is a large man-made lake, holding many millions of gallons of water, on which many rare Australian waterfowl will be kept. On my visit I managed to see my first ever living Musk Duck (*Biziura lobata*), and also of note were a dozen Eyton Tree Duck. Other birds in the collection were several Brolga or Australian Cranes (which also have been bred here); Fairy Penguins; seven Wedge-tailed Eagles living in a very large and quite unusual cage that was rectangular in shape, and merely was netting hung on large telephone poles, placed at outward angles. The cage was large enough for the birds to fly about, and in it were many living trees. I also saw several Satin Bowerbird; 12 Chestnut-breasted Teal; nine Cape Barren Geese; over a dozen Royal Spoonbill; four Gang Gang Cockatoo; about 15 Turquoise Parrakeets; several Swift and Musk Parrots; Pale-headed, Crimson, Green, Adelaide and Western Rosella; Blue-bonnet and Red-rumped Parrakeets; and four Boobook Owls. Again there are many mammals here such as Platypus (which also lives wild even within the great fauna park) and native reptiles. The overall theme of course is species native to Australia and Tasmania. Like the larger zoos it charges admission. While in some lands it might not be called a zoo, it is recognized by the federal Australian Government as one of the six class A zoos in the nation.

MELBOURNE ZOO, VICTORIA

Well known to many American and European zoo men due to the fact that it carries on a large animal exchange programme, Melbourne is again an old zoo, struggling to build new quarters and expand its collection, despite strict import regulations. Unlike some of its sister institutions, however, it has secured funds necessary for a ten-year programme of construction, already evident in the largest in-zoo Lion Park anywhere in the world, a new Reptile House and new exhibits for large mammals. The zoo has a long series of aviaries which are used exclusively for the raising of native Australian species for export and for fanciers. I would say there are about 80 pens, all are relatively new, adequate and successful. Breeding probably is carried on more than at Adelaide, although there does not appear to be quite as full a range of species. I would say about 40 species of psittacines. There are large flight cages, perhaps larger than any in Europe or North America for terns, gulls, cormorants, waterfowl, and birds of prey. In addition there are dozens of conventional cages, and of course some in need of replacement. All are kept clean and the birds look well. Of course many forms that we would consider exotic here in America, are common in the areas right outside Melbourne, such as cockatoos, so one finds all too often cages that are literally crammed with birds. I counted at least 100 Sulphur-crested Cockatoos and then gave up. There were several dozen Pennant Parrakeets, which again are native to this part of Australia. Melbourne is especially successful in the

raising of Cape Barren or Cereopsis Geese, over 20 hatched in 1968 alone, and I counted no less than 16 birds in various parts of the zoo. I also noted a new race of Skua for me, *S. skua lonnbergi*, the Southern Skua; one Australian Pelican (this species is rarer in Australian zoos than in Europe or America); a pair of Indian Adjutant Storks that have been in the zoo for 40 years, but which only last year started to make a nest, after being moved to a new cage—their first next-building attempt in the zoo (extraordinary!); many Philippine Land Rails; Nankeen Night Herons (which are also wild in the zoo and raise many young each year); about 17 Eyton Tree Duck; five Semipalmated Geese; a pair of Sarus Crane; Whistling Eagles (*H. sphenurus*); Gang Gang Cockatoos, and again both of the New Zealand Parrakeets. The collection is good, well cared for, and well worth seeing.

TARONGA PARK ZOO, SYDNEY, NEW SOUTH WALES

This is of course the zoo best known outside of Australia, although its specific collection may not be. It is the largest overall zoological garden, both in land area and in terms of size of the animal collection. There are about the same number of bird species as Adelaide, however, the variety is somewhat different. It is the last zoo with Birds of Paradise, all having come from the collection of Sir Edward Hallstrom, who no longer has a collection at Mona Vale. Unfortunately, as is well known, Sir Edward has a passion it seems for concrete, and almost all of the aviaries were floored with tons of concrete and in fact many cages are of this material alone, save for the wire. In recent years much of this has been torn up, and an effort made to make the aviaries as natural looking as possible. Emphasis has been shifted also to hatching and breeding as many species as possible. The bird keeper here is a gifted man and is doing a wonderful job. The zoo also is the recipient of many birds that have been taken from airplanes and ships in the smuggling process, too many do not survive being placed in tight airless quarters, but of those that do make it, the zoo does its best to house them properly. It was here that I saw some of the unique devices used to try and smuggle Golden-shouldered Parrots out of Australia, really just cages inside attache cases, with little air, and no room to move. But with fanciers and zoos in Europe and American willing to pay several thousand dollars a pair, the traffic goes on. I would like to add here, that collectors should insist on knowing the origin of all birds of this rare species bought from exotic animal dealers, and not traffic in illegal birds. For it is the birds that are suffering.

What of the collection at Taronga Park? Well it is growing in many areas, in fact in some species hatching has been so successful that birds are being offered to foreign zoos as well as to collections within the nation. Many however, are very rare, and care is being taken to keep them alive and healthy as long as possible. Here are the highlights of the Taronga collection of birds: six Australian Cassowary (and three other cassowary

species also); four Kiwi; over 40 Little Blue Penguins; one Australian Pelican; two Blue Herons (*Demigretta sacra*); two White-faced Herons; 17 Chilean Flamingoes (all over 20 years of age); about two dozen Semi-palmated Geese; about 15 Eyton Tree Duck; four each of Australian and New Zealand Shelduck; two Grey Teal (*gibberifrons*); about 20 Black Swan; one female New Guinea Harpy Eagle (*Harpiopsi novaehollandiae* the only one in captivity, and again over 20 years old; eight Wedge-tailed Eagles (this species is still killed by farmers in Australia); a trio of Andean Condor; six Brush Turkeys; about two dozen King Quail (*Excalfactoria chinensis*); about two dozen Blue Peafowl; Lineated Pheasant; one Sarus Crane; one East African Crowned Crane (last in Australia); one Stanley Crane; two Australian Bustard; about 150 Jobi Dove (*Gallicolumba jobiensis*); about 50 Nicobar Pigeon; 20 Victoria Crowned Pigeon (all over 20 years old); several Spinefex Pigeon; about 55 Rainbow Lorikeet (*Trichoglossus h. moluccanus*); five Palm Cockatoo; six male Eclectus; a pair of Glossy Black Cockatoo (*C. lathamii*); about 80 Sulphur-crested Cockatoo; about 40 Little Corella Cockatoo; about 70 Pink Cockatoo (*Leadbeater's*); 25 King Parrots; 30 Pennant Parrakeet; 20 Pale-headed Rosella; about 60 Elegant Grass Parrakeets; 15 Swift Parrots (*Lathamus discolor*); more than 100 Rose-faced Lovebird (one huge group); nearly 50 lutino Indian Ring-necked Parrakeet; the last White-crested Turaco in Australia; a male New Guinea Coucal; about 15 Tawny Frogmouths; one pair of Blue-winged Kingfisher (*Dacelo leachi*) with one bird hatched in Taronga this past year; no less than three dozen Kookaburra (this is a common local form, brought to the zoo like starlings are brought to zoos in America); a female Dollar Bird (*Eurystomus orientalis*); many rare Australian Honey-eaters such as Lewin (*Meliphaga notata*), Noisy Miner (*Myzantha*); Noisy Friar-bird (*Philemon*); two male Superb Lyrebirds; Black-backed Piping Crow (which also is wild in the park); Brown and Pied Currawongs (*Strepera intermedia* and *graculina*); a pair of Regent Bowerbirds; Great Bower Bird (*Chlamydera nuchalis*); eight Satin Bower birds; about 100 Java Sparrow; 60 Zebra Finch; and in birds of paradise—four Black Manucode (*Phonygammus keraudreni*); one Green Manucode (*Manucodia chalybeata orientalis*); male Ribbon-tail (*Astrapia mayeri*); female Lesser Sickle-billed Bird of Paradise (*Epimaches meyeri*); male Prince Rudolph's Blue; female Finsch's Lesser Bird of Paradise; female Emperor of Germany's Bird of Paradise; male Stephanie's Bird of Paradise and a single male Count Raggi's Greater Bird of Paradise, all of these birds having been in Australia almost 20 years and captured adult. Director at Taronga is Dr. Ronald Strahan, a professional zoologist who is creating a new staff with emphasis in education.

I might have added that labelling in all of the zoos is excellent; in most there are coloured paintings of the birds and range pictures, this perhaps best at Sydney and Adelaide.

* * *

OBITUARY

A. S.

1879-1970

Allen Silver died in Llantarnam, on 4th January, 1970, in his 91st year.

Born at Long Melford, Suffolk in 1879, he had the inborn interests of a countryman. Very early his leanings veered largely in the direction of British passerine birds and although he specialized in passerines and picarenes he was, nevertheless, keenly interested in all birds, whether ornamental pheasants, waterfowl, show or utility poultry or pigeons; in addition, he took no little interest in mammals, fish and insects. At one time or another he owned examples of the majority of European cage-birds and a very large proportion of the imported exotic species, varying from sunbirds to macaws.

As far back as 1895 he was appointed a judge of cage-birds and from then until very recent times he officiated at shows throughout the country. He judged at many Crystal Palace Shows, both before and after the first World War, and the National was not, of course, complete without his presence.

In his time he was a very prominent exhibitor, staging as many as sixty birds at a single show. In the late 1920s he won all the principal Budgerigar trophies, several outright.

He was elected a Member of the Foreign Bird Club in 1903, and of the Avicultural Society in 1904, of which he was doyen and Vice-President since 1958. With several others he founded the Budgerigar Club, of which he was Chairman for the first three years, also Editor of the *Budgerigar Bulletin* for the same period. Long before this he was closely connected with the National British Bird Club, the London Cage Bird and London Provincial Ornithological Societies, and in 1911 he resuscitated the Foreign Bird Exhibitors' League.

Allen Silver contributed only infrequently to the Magazine but his writings were many and varied. He revised Bradburn's *Book of British Birds*; compiled *The Birdkeepers' Guide*; wrote *British Bird Management*, *The Parrot Book* and the bird section of *The Wonder Book of Pets*. He was on the staff of *Canary and Cage Bird Life* during its existence, British and foreign bird expert to *The Feathered World*, and, of course, foreign bird expert to *Cage and Aviary Birds*.

Despite the incredible hardship of losing a leg in the 1914-1918 War, Allen Silver was ever cheerful and always so willing and helpful. A natural gentleman and a great bird-lover his passing leaves another unfillable gap.

A. A. P.

NEWS AND VIEWS

E. Nørgaard-Olesen, Janderup, Denmark, reports the rearing of a Fire-fronted Bishop. One Blue-naped Mousebird *Colius macrourus* was bred and the Red-faced *C. indicus* had eggs.

* * *

The Simon Harvey Memorial Medal, awarded annually by the Avicultural Society of South Australia for the most outstanding breeding achievement of the year, has been awarded to Russ Rowlands, for breeding the Green Catbird *Ailuroedus crassirostris*, 1968-69.

* * *

Paul Farrant: "I bred five young Redrumps, and was interested to find that when the hen died, the young were only three weeks old, the cock carried on and brought up all five young quite successfully."

* * *

Major Iain Grahame reports that Vulturine Guineafowl have again been bred at Daw's Hall Wildfowl Farm. Up to October, three young have been successfully reared, and more eggs are expected in November and December. Other birds bred this year include Satyr Tragopans and Red-breasted Geese.

* * *

The Society's Certificate of Merit was awarded to the Zoological Society of London for its success in breeding the Grey-backed Thrush *Turdus dissimilis hortulorum* in 1968, when nests of four and two were reared. Some of the young ones went to Derek England and a brother and sister successfully carried the breeding to the second generation. England is naturally anxious to obtain some new blood!

* * *

G. R. Phipps, Greenacre, New South Wales: "I was very interested to read Guthrie Hall's report (1969, 113) on the Golden Pheasant which "changed its sex". I, too, have a hen in my collection which except for the lack of a white ring around the eye, and for the fact that the wing primaries are heavily suffused with brown, is in every way identical to a cock."

* * *

Allen Silver wrote: "A correspondent, Mrs. P. Shepherd, Dukeswell, nr. Honiton, Devon, informs me that her pair of Quakers raised seven in one round in 1968, and this year ten youngsters in two rounds—17 in two years. The breeder lost two from the first round; one from a burst blood vessel(?) and another from coming out too early and dying from exposure to deluge from storms."

* * *

The Cream-coloured Courser *Cursorius cursor cursor*, an Ethiopian and S. Palaearctic species is a rare vagrant in Great Britain.

The advent of one in a sugar-beet field, near Great Yarmouth, towards the end of October, caused very great interest and many ornithologists

visited the area in the hope of seeing it. But unfortunately it survived only a few weeks: it was found badly mauled, presumably by a cat.

* * *

Dr. E. P. McCabe, Jr., San Antonio, Texas: "I reared five Cloncurry Parrakeets during last spring and summer. The first clutch of two proved to be a pair. The adults again went to nest in May. The cock died soon after the hen commenced incubating but she hatched three chicks which I hand-fed and successfully reared. As they were two cocks and a hen I now have three each of both sexes."

* * *

The Royal Zoological Society of South Australia reports that during the 1968-69 season 134 birds of 37 species and varieties were bred in the Adelaide Zoological Gardens. The outstanding event was the breeding of three Banded Landrails *Hypotaenidia philippensis*, a probable "first" in the Gardens. For the fifth year running a Blue and Yellow × Scarlet Macaw hybrid was reared. A Leadbeater's Cockatoo was reared, the first in 15 years, also six Queen Alexandra's Parrakeets. The Rosellas did particularly well, six of the ten species in the Collection—Yellow, Northern, Western, Eastern, Golden-mantled and Pale-headed—reared 16 young between them.

The Brush-Turkeys *Alectura lathami* again did well, 24 young hatched from the mound and only three failed to survive.

* * *

Hartley King: "We have had a very dry winter here in Western Australia, and there is little prospect of much rain during the forthcoming summer. The effect of this is very noticeable in the breeding habits of our wild birds and wildlife generally.

The marsupials are withholding their young; the waterfowl have had such a poor season that duck shooting is to be prohibited; our parrots that would normally have young on the wing have not gone to nest yet, and so on.

Most of the farmers' dams are dry, and water restriction will be inevitable before Christmas.

This trend is reflected in our aviary birds, but not by any means to the same extent. My pair of Banded Plovers have already raised three young and are nesting again. (Last year—from June to June—they raised six lots of chicks.)

My Neophemas have made a good start; Scarlets, Turquoisines and Bourkes have chicks; Crimson and Pale-headed Rosellas, Barrabands, Kings and Cloncurries have gone to nest. Likewise the Blue Mountain, Scaly and Varied Lorikeets.

The finches have been in full swing for some time: Masked, White-eared Masks, Gouldians, Long-tailed, Parsons, Diggles, Stars, Pictorellas, Chestnuts, Orange-breasteds, Fires, Double-bars, etc."

* * *

A world record auction price for a printed book of £90,000 was paid at Sotheby's on 24th November 1969 for a copy of Audubon's "The Birds of America". Sold anonymously it was bought by Mr. Kenneth Nebenzahl, a Chicago bookseller. The almost unbelievable price is accounted for by the fact that this very rare work is a superb copy 'in the finest possible condition'.

John James Laforest Audubon (1785-1851) was the illegitimate son of a Creole and a French naval officer, who adopted him and took him to France, where he studied painting and developed a love for natural history. North America became his home but due to his passion for bird painting various business ventures did not thrive and he was forced to support his family by painting portraits. Returning to Europe in 1821, successful exhibitions in Liverpool and Edinburgh encouraged him to issue a prospectus of a work that was to ensure him a place amongst America's immortals.

"The Birds of America" was issued without text (which followed in 1831-39 under the title "Ornithological Biography") during 1827-38, in 87 parts of five plates each. It was published at two guineas the part, or £182 14s. od. the set (\$1,000 in the U.S.A.). The 435 copper-plate engravings, coloured by hand, contain 1,065 life-size figures of 489 supposedly distinct species. It is believed that fewer than 200 complete sets, usually four volumes, were bound up.

* * *

In a review of "Henry Walter Bates", by George Woodcock, in *The Geographical Journal*, September 1969, 456-7, Dr. Edward Hindle refers to a plate in *The Naturalist on the River Amazons*, by H. W. Bates, showing the author being mobbed by toucans. It may not perhaps be without interest to recount Bates' account published in 1863, of the affair with the Curl-crested Toucan *Pteroglossus beauharnaisii*. He writes: "I had an amusing adventure one day with these birds. I had shot one from a rather high tree in a dark glen in the forest, and entered the thicket where the bird had fallen, to secure my booty. It was only wounded, and on my attempting to seize it, set up a loud scream. In an instant, as if by magic, the shady nook seemed alive with these birds, although there was certainly none visible when I entered the jungle. They descended towards me, hopping from bough to bough, some of them swinging on the loops and cables of woody lianas, and all croaking and fluttering their wings like so many furies. If I had had a long stick in my hand I could have knocked several of them over. After killing the wounded one I began to prepare for obtaining more specimens and punishing the viragos for their boldness; but the screaming of their companion having ceased they remounted the trees, and before I could reload, every one of them had disappeared."

A. A. P.

NOTES

THE ADVENTURES OF AN ESCAPED RED-BILLED BLUE MAGPIE

Last June the cock of a pair of Red-billed Blue Magpies escaped. This I discovered when it appeared suddenly on a fence, bowled a grey squirrel head-over-heels, stole a nut it was eating, and disappeared into the blue. Normally I get innumerable reports when one of my birds escape but strangely enough I heard nothing of this bird until mid-November when I received a telephone call asking if I could identify a strange bird which had been resident in a strip of woodland in Riddlesdown since last June, and which regularly visited four or five gardens backing onto the wood. Apparently a report had appeared in the local press two weeks previously, but I had missed it. From the description I was pretty sure it was my magpie, so on the following Sunday I took the hen, in a large parrot cage, and a trap cage, up to one of the gardens it was said to visit daily; arriving at 8 a.m. when it was still only just getting light.

As I was hoisting the cage onto a shed roof I heard the bird "chuckle" some distance off, and the hen promptly replied. The trap cage, baited with mice, I put on top of the parrot cage, and retired to a garage with a convenient window overlooking the garden. Within five minutes the cock was on the shed roof, rushing round and round the cage, displaying just like a golden pheasant, with tail spread, wing trailing and body twisted towards the hen. Twice he fell off the roof in his excitement, once he caught the tip of the hen's tail through the wire and nearly pulled it out. Then he sat still for about five minutes, apparently to recover his breath before again circling the cage, and at last jumped up on top, onto the trap, where he spotted the mice and without hesitation dived in. The lid came down with a smack but he never even glanced up, just grabbed a mouse and commenced eating. By 9 a.m. he was back in his aviary, both he and the hen having eaten five mice between them on my journey home.

The next day he sulked, but the day after was completely rehabilitated and seemed tamer than he was prior to his escape. He was in perfect condition, having evidently moulted during his freedom, his bill and legs being now deep orange (they had faded to dull yellow in the aviary), and strangely, one central tail feather which had always been slightly faulty was now pure white.

K. A. NORRIS.

* * *

CORRESPONDENCE

VITAMINS AND FRENCH MOULT

So much has been written on feather malformation generally, and French Mould in budgerigars in particular, that I hesitate to take up more space on this subject. It is, however, an important matter, especially to the afflicted birds, in whose interest I feel prompted to write.

One of the main factors making birds aware of the advent of the breeding season is the production in their bodies of vitamin D by the action of the ultra-violet rays in sunlight on a substance called ergosterol in the body. This oil-soluble vitamin is popularly called the sunshine vitamin. Most budgerigar breeders start the season early, in the short winter days when little ultra-violet light penetrates our atmosphere, and they therefore add vitamin D to the diet, usually in the form of cod-liver-oil added to the seed. However, Vitamin D is not something of which it may be said that if a little is good a lot will be better. Too much is harmful to human beings, causing excess calcium and phosphorus retention and a rough skin condition. There is, of course, no harm done in feeding the small amount of cod-liver-oil recommended by the makers to bring the birds into condition, but it must be remembered that what is the correct amount in the short winter days can be excessive when the birds are producing their own vitamin D in spring and summer conditions.

I believe that the supply of vitamin D by oil-soaked seed should stop well before the young are due to hatch, as apart from the vitamin being cumulative in the body, in the wild state the young of virtually all parrot-type birds do not emerge from a dark nest-hole until fully feathered, and clearly will receive only the very small amount of vitamin D provided naturally by the parents during the feather-forming period.

No theory can be proved without a number of controlled tests (which I unfortunately do not have the opportunity to carry out), but in support I can quote from my own experience some years ago when breeding from four or five pairs of budgerigars. The birds were kept outside and the first early round with cod-liver-oil and artificial light to lengthen the feeding hours was quite successful. Cod-liver-oil was continued throughout the season, and all subsequent young with the exception of two albinos had malformed feathers to a greater or lesser extent, many being cases of French Moulting at its worst.

It would be wrong to suggest that only budgerigars can be fitted into this theory, but they are the species most prone to French Moulting and they do feed their young on a regurgitated paste derived from the seed provided. I would also, in conclusion, like to quote from an excellent little book which I read recently "Halfmoon and Dwarf Parrots" in which the author, William Allan, advises strongly against keeping a caged bird by a window. Apart from the draught possibilities he writes (in Dallas, Texas, where the sun is the large de luxe model) that the sunlight causes the bird to undergo a continuous moult.

I find the connection between excessive vitamin D and feather abnormalities inescapable, but it would require a lot of feeding trials to prove it.

THE GARDEN HOUSE,
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MAIDENHEAD, BERKSHIRE.

R. W. PHIPPS.

RELEASING BIRDS AT LIBERTY OR SEMI-LIBERTY

Like many members, I am sure, the correspondence about foreign birds being released in the countryside—whether by accident, intention, or "controlled liberty"—has been of great interest to me. I am certain that the participants in the debate have all seen the current issue of *Ibis*, but for members who have not it may be of interest to make note of a letter from R. O. Vicente in Portugal. The letter is headed "A new introduced species in Europe: the Red-eared waxbill". The substance of the letter is that *Estrilda troglodytes* has been observed living and breeding in the wild in Portugal on several occasions during the past five years. Flocks of up to 300 have been observed, and both nests and juvenile birds have been seen on various occasions. The purpose of Mr. Vicente's letter was to ask for any ornithologists holidaying in Portugal to keep an eye open for the species and report it.

Having newly arrived in Madrid where I expect to live for the next couple of years, the letter is of extra interest to me. This is not the point though. The existence of ringed individuals in the flocks shows that they are almost certainly from an avicultural source, so the culprits are known though their motives are not. It remains to be seen how well the Red-eared waxbill establishes itself in Portugal; if holidaying bird watchers do oblige Mr. Vicente, and the species can be shown to have claimed an ecological niche in competition with local avifauna then the contributors to the debate will surely be nearer a conclusion.

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ROBIN L. RESTALL.

LONGEVITY IN PARROTS

I am writing in response to your request in the September–October issue of THE AVICULTURAL MAGAZINE for information on cases of longevity in parrots.

On 12th May 1960, I obtained from Mrs. Dale Ellenberger of this city the body of a male *Amazona aestiva aestiva* (the Brazilian race of the Blue- or Turquoise-fronted Amazon). This bird had been in the continuous possession of Mrs. Ellenberger's family, and I was told that it had been purchased in Rio de Janeiro approximately 70 years before its death; the family did not have the exact year, but according to family tradition, the bird was about 75 years old at its death.

The bird was in excellent condition, with moderately enlarged gonads, and was just completing a moult. I made no attempt at autopsy; in view of the known great age of this bird, I thought its body might conceivably be of interest to some researcher, so I prepared a study skin (Carnegie Mus. no. 139,369) and preserved the remainder of the carcass in spirits (C.M. alcoholic collection no. 844).

I hope this information is of interest to you.

CARNEGIE MUSEUM,
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KENNETH C. PARKES, Curator of Birds.

Concerning the note in THE AVICULTURAL MAGAZINE about longevity in parrots, I wonder whether the following may be of some interest. A good many years ago, while I was at the London Zoo, I was called upon to go to the house of a Harley Street specialist—actually to remove a closed ring from the leg of a canary, which had become embedded in the flesh and which, incidentally, was successfully accomplished without any harm resulting. In conversation afterwards, the gentleman showed me an African Grey Parrot which was in a large cage in a front room overlooking Harley Street and told me that to his undoubted knowledge, it had stood there for the last 60 years. As it was in excellent condition, there could have been no reason to suppose that it might not continue to stand there for many years afterwards. Judging between this species and the common species of Amazons usually kept, it does seem in my experience that the former often excels in longevity, as I, when Overseer of birds, received many queries by phone and otherwise, concerning Amazons which through weakness apparently due to age, were unable to perch after reaching an age of from 30 to a maximum of 40 years to their owners knowledge; although, of course, there may be many exceptions. Cockatoos, as everyone knows, are very long-lived but one does not hear so much about Macaws, perhaps because they are not so easy to house for the ordinary person.

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E. B. TANNER.

The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

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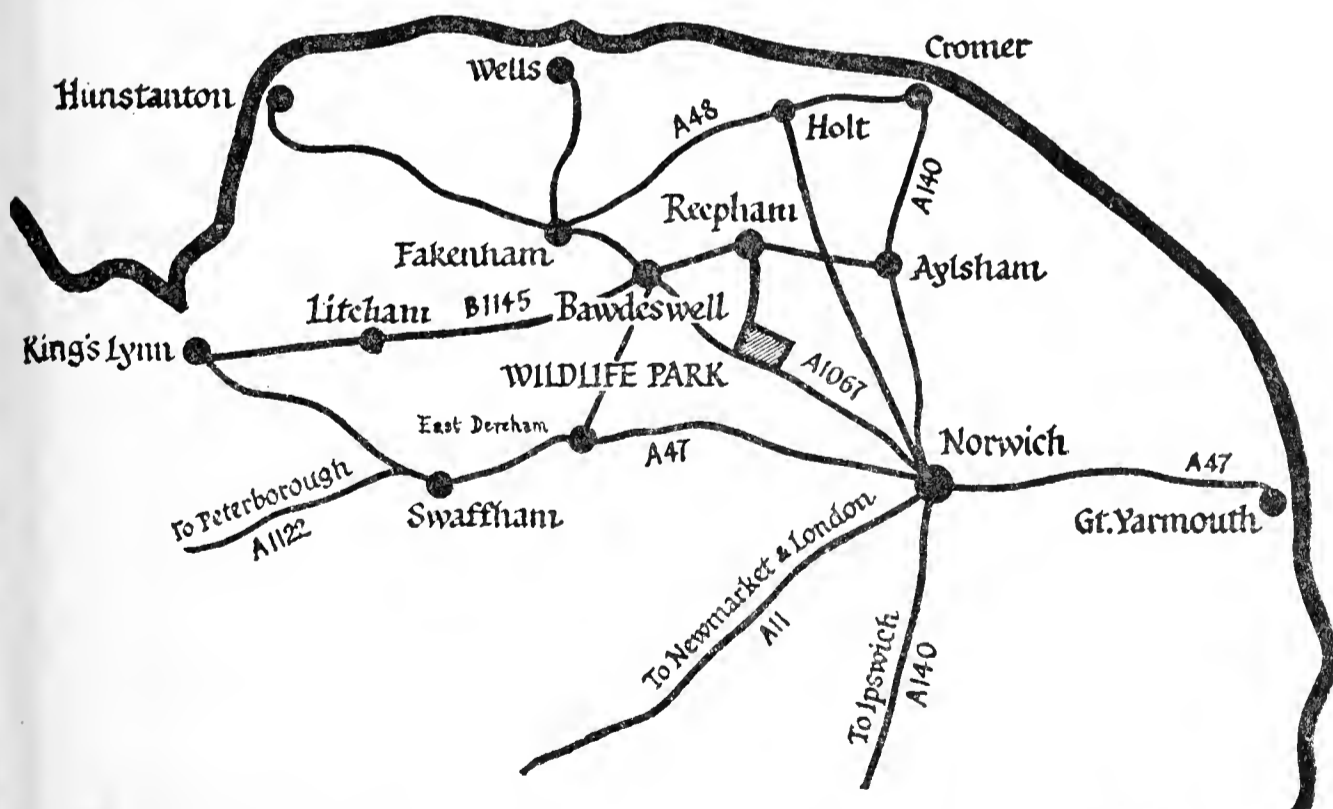
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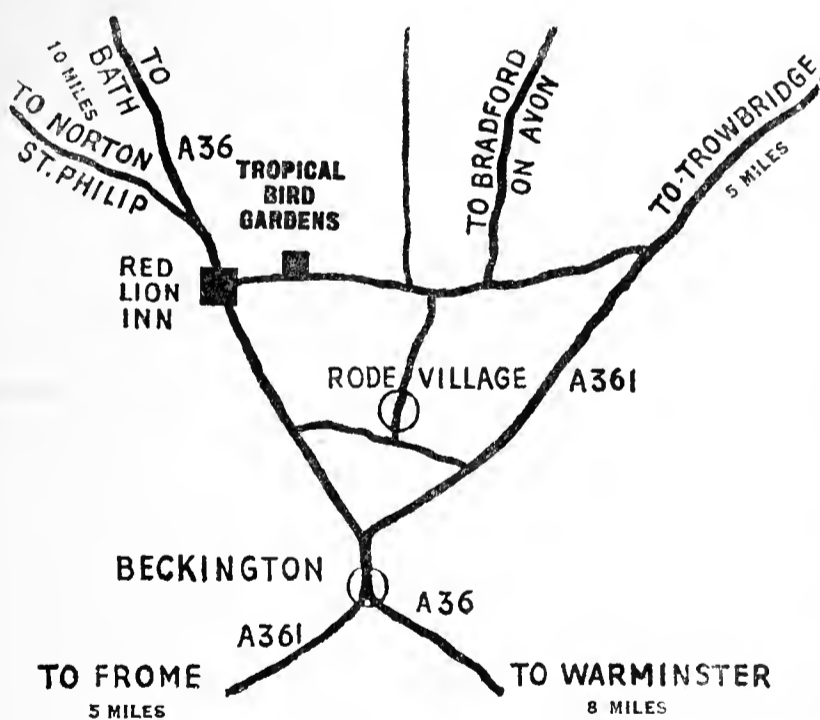
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THE AVICULTURAL SOCIETY

Founded 1894

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ELEGANT BUNTING

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MARCH-APRIL 1970

THE ELEGANT BUNTING

(*Emberiza elegans*)

By ROBIN L. RESTALL (Madrid, Spain)

Some years ago I noticed an advertisement by Mr. C. Hill of Pinner in Middlesex for "Unidentified male Siberian buntings, five only, looks like Shore Lark". Nobody could blame Mr. Hill for not being able to identify the species, for a friend of mine who is a professional ornithologist and whom I regard as an expert, was unable to identify it on sight. Subsequent investigation on his part identified it as the Elegant Bunting *Emberiza elegans*. I contacted Mr. Hill and discovered that he only had one bird left, but I was fortunate to be able to obtain it. Mr. Hill was very helpful and told me all he knew about the bird, including what he was feeding it on, and we arranged for a mutually convenient transport date.

Eventually the bird arrived. I was looking forward to seeing it very much for of all the reference books I have the only one to mention the species was *Aviculture*, which said of it: "Said to be a favourite cage-bird of the Japanese on account of its song and doubtless, also, of its charming colouring (then followed a description). . . . This pretty bird breeds at Ichang and Sechuen, is probably resident in Japan, visits Manchuria and the valley of Amur in summer, and is a common winter visitor of China, where it frequents the hillsides, bamboo clumps, and rough scrub around farm clearings; its nesting-habits are probably similar to those of other species of the genus".

More recently I have referred to the books by La Touche (1925), Seebohm (1890) and the Caldwells (1931) to pull together notes on distribution, local habitat and description of the races. I have not had the opportunity of examining skins of the species, but have learned of the areas from which those in the collection at the British Museum (Natural History) have come, and these have been borne in mind. Yamashina's book on the birds of Japan only gives the barest reference, so I have not used it. Mr. Allen Silver very kindly wrote to me on the subject as follows ". . . the Zoo had it previous to 1929 but have no account of it since. Taka Tsukasa in *Aviculture in Japan* (see page 36) mentions it as being kept among other buntings there. . . . These several buntings are kept for their song, which like the quails kept in the past for their call, are repetitious rather than musical to our ears".

The English names for the species are confusing, but Yellow-browed and Yellow-throated Bunting are the commonest. I have chosen to call it the Elegant Bunting, the name used by Mr. Silver, but one which he thought particularly inappropriate. Personally, I find this bird extremely attractive and elegant, and, in fact, one of the most appealing of all buntings I have kept (*Emberiza* or *Passerina*).

As it is virtually unknown in this country I will describe it in some detail. The adult male is about 6 in. long. Its forehead and crown, sides of head, chin and a large crescent-shaped patch across the breast are all black. The superciliary (eyebrow) and sides of the neck, back of the crown and throat are bright yellow. The nape is black, while the lower hind neck is grey, marked with black and chestnut. The feathers of the crown are elongated into a half crest which can be erected at will. When fully depressed, the yellow crescent immediately behind the crest is covered by it. In winter the black head feathers are edged with brown and the feathers of the hind neck are more noticeably streaked.

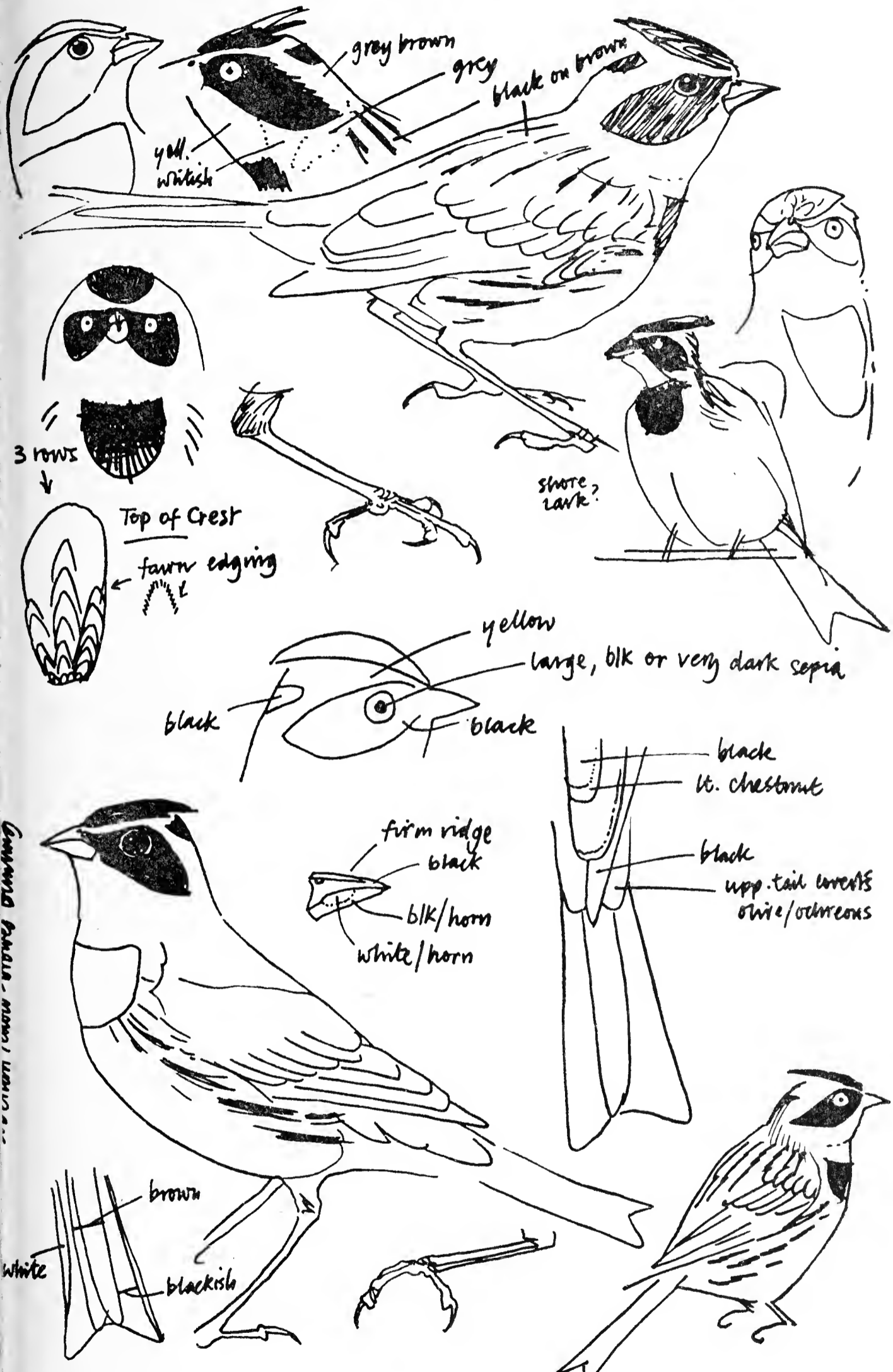
The back is chestnut, the rump is grey, and the upper tail coverts and tail are greyish brown. The outer edges of the outer tail feathers are white. The wings are mainly black, with pale chestnut edges. The tips of the median and greater wing coverts are very pale buff, nearly white, forming two broad wing bars. The innermost secondaries are black, broadly edged with brown, while the secondaries and primaries are dark brown edged with brown. Below, the bird is white, tinged with rufous on the flanks which are also streaked with long chestnut stripes.

As the winter proceeds the brownish edges to the feathers of the head and neck wear away and the bird looks sharply and more strongly pencilled above.

The adult female is similar to the male, but differs in the following respects: the black of the head in the male is brown in the female, the yellow of the head is duller and less extensive, and only a tinge on the throat. The breast crescent is reduced to vestigial traces, and in some individuals is missing altogether. In the winter plumage the throat and upper parts are more infused with brown or buff.

The edges to the feathers being broader the back looks browner. In both sexes the iris is brown, the legs are flesh, and the bill is black in summer and brown in winter, with paler lower mandible. Immature birds resemble adult females but are possibly browner on the throat and head.

It is a bird of great character, imparted largely by the head characteristics—the strong bandit's mask and the stylish crest which is raised and depressed at will. The only illustration I have found is a photograph of a male on the nest (Hanzak, 1967), but Mr. Silver's encyclopaedic knowledge wrote: "... there is a figure of it in *Jap. Aves*, 1850, pl. 55, by Temminck and Schlegel. The one I possess is that in *Birds of Japan*, by Ksisuke Kobayashi, illustrated by Takashi Miyamoto on plate 6".



Emberiza elegans

Emberiza elegans - Robin L. Restall

RACES AND DISTRIBUTION

Professor Sushkin defined three races which are briefly as follows:

Emberiza elegans elegans (Temm.), which has been referred to elsewhere as Temminck's Yellow-browed Bunting. It is distinguished by having strongly streaked flanks, black on chestnut. This is the northern race, an uncommon resident in Japan and Manchuria, breeding in Amurskaya (Amur or Amoor in the literature) and probably resident in Korea. It winters in China wandering as far south as the Yangtse Kiang.

E. e. sibirica (Sushkin), sometimes called Sushkin's Yellow-throated Bunting is the Chinese race, ranging from Kiangsu southwards to Kwangtung (Hong Kong, to assist the reader in his geography). It is the least strongly marked, being greyer on the nape and having the flanks scantily marked with narrow streaks. It is the race in my plate.

E. e. elegantula (Swinhoe) is browner and darker above than either of the others, and the flank stripes are very broad. It is the mountain race ranging from Manchuria down to N.W. Fukien. It, too, breeds in the northern parts and winters in the south.

HABITAT AND HABITS

According to Hanzak its favourite haunts are young oak woods, but the Caldwells are more helpful, saying it is found working on grassy plots under certain hardwood trees, scratching under the leaves for buried seeds. They say it is friendly and confiding being found usually in loose colonies which permit a close approach for observation and study. All that La Touche has to say on the subject is that it winters in south-eastern Manchuria in sheltered woods and valleys, and Butler's comments are mentioned earlier above.

Unfortunately my bird had a broken wing, and so its behaviour could hardly be termed normal. However, it was in excellent physical condition and certainly seemed full of bounce and energy. It was placed in a roomy outdoor aviary (house 11 ft. × 9 ft., flight 11 ft. × 17 ft.) which is planted with *Cupressus*, *Pinus* and various other shrubs, including some ground St. John's Wort (*Hypericum calycinum*) and a standard privet. The bunting shared this enclosure with a pair of Rustic Buntings, California Quail, Mesias and a few other medium-sized birds. It settled in immediately, and soon established two favourite spots, the first under a small *Lonicera nitida* where it was perfectly hidden and from where it could sally forth on food hunting forays. The second was in the heart of a *Cupressus* where it roosted along with a few other birds. Naturally, I suppose, it spent more time in company with the Rustic Buntings (*E. rustica*) than any of the other species present. On many occasions, it could be seen working over the grass looking for insects and other items, the three birds forming a loose group. I never saw it doing this alone, although it foraged through the undergrowth by itself (perhaps I should

explain that the aviary is divided longitudinally, the front half being "lawn" and the rear being shrubbery).

I put it outside at the end of the autumn, 1967, and there it stayed until mid-March when it was given to Mr. Yealland at the Zoo. I always throw a handful of mealworms around the aviary at feeding time, as this prompts rather more natural behaviour than simply using pots on a shelf. On several occasions, the bunting would dash out from beneath the *Lonicera* and seize one, mumble it in its beak for a minute, and then run back under cover. It never seemed to show the slightest sign of aggression, although this could be explained by the fact that its injury must have kept it below peak condition. It never sang either. The Pekins are said to prize it as a songster (*La Touche*), and it is kept as a cage bird for this reason. What its song is really like I cannot say, but there is no doubt that Oriental ears like different sounds or qualities to western ones, and several species that are kept as cage birds for their song could hardly qualify in the west.

The crest is completely inconspicuous when depressed and runs down into a black crescent on the nape; mostly, however, it is very slightly raised giving an impression of slightly elongated feathers. Frequently it is raised to the extent shown in my picture, and higher. Mr. Hill made the following comment in a letter to me about them: ". . . have noticed they raise their crest when aggressive and trill like a waxwing, but their alarm note is just like a Yellowhammer's". It seemed to me that the crest was raised whenever the bird was excited, be it alarm, curiosity or what.

FOOD

The natural food must be described as various small seeds and insects, the callow young being fed entirely on insect life, which is predictable and not very helpful. Most avicultural text books suggest "canary seed, millets, oats and hemp" for buntings *en masse*, but the bill of the elegant is fine and light and seems inadequate to deal with dry hemp and oats. Mr. Silver kindly gave me a reference for an article in the *AVICULTURAL MAGAZINE* (3rd series, Volume XIII, 1922) by Taka Tsukasa which apparently describes how the Japanese feed their buntings on soft food. Unfortunately, I do not have this so cannot give details here. My Elegant Bunting had access to canary mixture, mixed millets, Haith's English Weed seeds mixture, and Sluis Universal grade Softfood. The latter was placed in a bowl on the floor and was only taken in small quantities; of the former it is impossible to say what was taken or what the preferences were. Mealworms and maggots were both taken eagerly. Mr. Hill told me that he had kept them on plain canary, mixed millets, maggots, mealworms and softbill food.

NESTING

Although there are large gaps in my study of the literature, it seems as though the species has not been bred in captivity, at least in Britain. It is a ground nester, and so would not require any special pans or receptacles, but clearly would require suitable cover. The nest is built of soft bents, fine stems, etc., and is always on the ground beneath an overhanging stone, fallen log, over-arching root, etc., amongst bracken, brushwood, or other tangled undergrowth, or Skylark-fashion, beneath a clump of grass. The clutch is normally four or five and they are dirty white with pale violet markings and dark brown spots. According to Hanzak they are double brooded.

SUMMARY

To the contemporary aviculturist, this is an unknown species and there is virtually no mention of it in the available literature. It is a lovely member of the *Emberiza* genus and would, no doubt, repay study, although it would appear to be fairly typical in most respects. It is hoped that these notes will prompt any other members who have experience of the species to contribute to the common wealth.

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* * *

THE BLUE-WINGED GRASS PARRAKEET

(Neophema chrysostoma)

By J. R. HODGES (Pinner, Middlesex, England)

There can be no more satisfying branch of aviculture than that devoted to the establishment of aviary bred strains of various species. Several members of the Avicultural Society have succeeded in breeding many species to several successive generations but unfortunately their experiences (except those of Nicholson with Red Headed Parrot Finches and Teague with Gouldian Finches) have seldom been documented. The almost complete ban on the export of native fauna imposed by the Australian authorities has provided a great incentive to establish aviary strains of the many attractive Australian species. Fortunately, most Australian Parrakeets and Finches do well in captivity and can be induced to breed. Australian parrakeets make ideal aviary inhabitants and to me the most desirable of them are the Grass Parrakeets. The members of this genus (*Neophema*) have every conceivable advantage from the avicultural point of view. They are extremely beautiful, they often become tame and confiding, they are hardy and they are not difficult to maintain and breed. Two further advantages which they possess of particular interest to those of us who are compelled to live in towns and suburbs are that they require only small aviaries and are not noisy. They are not as widely kept as they deserve to be and I have often wondered whether their comparative lack of popularity is due to the pessimistic accounts which the avicultural writers of the 1930's gave of the ease with which they were supposed to die from all sorts of diseases with almost meaningless names like contagious conjunctivitis and septicaemia. Many of these authors were repeating the gloomy prognostications of the late Duke of Bedford whose lack of success with the Grass Parrakeets was probably due to the fact that he kept them in unsuitably large aviaries in which they were inclined to panic and dash headlong against the wire netting with fatal results. In any case, he was often inclined to make sweeping generalizations about a particular species or genus on the basis of a limited experience with only a few specimens.

Since 1956, I have kept several pairs of six of the seven species of the genus. Last year I saw for the first time the other (the Orange Bellied) in one British aviary and in several South Australian aviaries. The Splendid (*N. splendida*) is probably the favourite of most Grass Parrakeet enthusiasts but, attractive as it is, I do not think it can compare with the Blue-winged Grass Parrakeet (*N. chrysostoma*). My first pair of Blue-wings were obtained more than 10 years ago. At first they lived up to their reputation of being difficult to persuade to breed, but gradually they began to produce a few youngsters and I was able to build up a small stock. In 1964 I obtained a few imported Australian aviary bred

specimens and although for a while the breeding results continued to be disappointing, they gradually improved and during 1967, 1968 and 1969 three or four breeding pairs have produced more than 20 youngsters per year. Breeding pairs have been made up only from the best unrelated youngsters and, as a result, I have been able to develop a breeding strain of prolific, large, well-coloured specimens.

The natural habitat of the Blue-wing is Tasmania and coastal areas of Victoria and South Australia. It is reputed to be the most common parrot in Tasmania and, for this reason, I was very disappointed at not seeing any in the wild during a very brief visit to Hobart and its lovely surrounding countryside in October 1969. However, I was compensated for the dearth of Blue-wings in the places I visited by the sight of large numbers of Tasmanian or Green Rosellas (*Platycercus caledonicus*) many of which came to feed on the ground within a few yards of where I stood at Port Arthur. Many Blue-wings migrate from their breeding grounds in Tasmania to Victoria and South Australia when the weather conditions become less favourable and the food supplies scarce. Melbourne aviculturists often find large numbers of Blue-wings around their aviaries at certain times of the year. These are birds on their migratory passage which are attracted by the calls of the aviary inmates.

Several of the Australian aviculturists I visited recently keep Blue-winged Parrakeets which, even in their native habitat, have the reputation of not being very free breeders in captivity. However, at the Melbourne Zoo, which possesses one particularly attractive exhibit in the form of an extremely well designed range of breeding aviaries for rare parrakeets, the species appears to flourish and one compartment of the range contained at the time of my visit 30 to 40 Blue-wings, all apparently bred at the Zoo.

The Blue-winged is one of the largest of the Grass Parrakeets and is about eight and a half inches long. The adult male is olive green on the back, pale green on the throat and chest and yellow on the abdomen and the underside of the tail. The wings are deep royal blue as also is the frontal band and the dorsal side of the tail. The lores and the areas around the eyes are bright yellow. The primaries are black, the bill is almost black and the legs are grey. The female is said to differ from the male in being duller coloured generally. However, individual specimens vary considerably in brightness of colour and the only reliable guide to sex in adults is the jet black of the primaries of the male which contrasts with the brownish black of the female. One of the most attractive features of the Blue-wing is the large round button-like eyes which give it a very bright and intelligent look. It is easy to confuse immature specimens with young Elegant Parrakeets (*N. elegans*) but in the adults the differences are very noticeable. Elegants are distinctly more slender, the green plumage has a more golden yellow hue and the frontal band extends behind the eye. The Blue-wing is more olive green and the frontal band is

less extensive. However, the greatest differences are in the blue wing patches which are much more extensive in the Blue-wing and of a deeper blue. Much of this blue is hidden by the wing coverts when the bird is in repose but when it is fully exposed, as for example in display, the Blue-winged Parrakeet is quite incredibly beautiful.

In the wild Blue-wings feed on the seeds of grasses and herbaceous plants, fruits, berries and small insects. In captivity they do well on the usual diet recommended for Grass Parrakeets. Mine are fed on a mixture containing approximately 50% canary seed, 40% mixed millets, 6% white sunflower, 3% small striped sunflower and 1% hemp. They are given fresh green food in the form of spinach beet, groundsel, chickweed or dandelion, and slices of apple as frequently as possible. They receive millet sprays dusted with P.Y.M. (Phillips yeast mixture) and Haiths Budgerigar Tonic seed at least twice a week. They have constant access to fresh water, mineralized grit and fresh cuttlefish. The water is supplied in a bowl about 8 in. in diameter and 1 in. deep in the open flight and the seed in a similar smaller container in the aviary shelter.

The aviary for a pair of Grass Parrakeets should consist of an enclosed shelter, a covered flight and an open flight. The shelter should be well lit and have perches or ledges higher than anywhere else in the aviary to encourage the birds to roost in it at night rather than in the flight. Grass Parrakeets appear to fare better in small aviaries than in excessively large ones. A satisfactory size for a breeding pair is 9 ft. \times 2 ft. 6 in. \times 6 ft. high. Mine are of these dimensions and are arranged in a series of compartments. Probably the optimum size is larger and a length of about 12 ft. is desirable. My aviaries are smaller because I live in a London suburb where garden aviary space is severely limited. In very long aviaries Grass Parrakeets are inclined to take fright at night and to hit the far end of the aviary with literally break neck speed. Grass floors are best in the open flight but they quickly become unsightly mud patches in small enclosures. The floors of my aviary flights consist of 2 ft. \times 2 ft. frames covered with $\frac{1}{2}$ in. mesh wire netting laid on the earth and covered with sand to a depth of about $\frac{1}{4}$ in. The sand beneath the perches is removed and replenished frequently. In such enclosures with sand floors it is probably beneficial for the birds to have fresh turves placed on the ground from time to time. The perches in my aviaries consist usually of apple tree branches and these are replaced about twice a year.

Blue-winged Grass Parrakeets will take to almost any kind of nest box. I use the vertical type 18 in. \times 6 in. \times 6 in. with an entrance hole $2\frac{1}{4}$ in. in diameter near the top and a wire netting ladder tacked inside. They are made from timber $\frac{3}{4}$ in. thick treated with creosote. About 2 in. of moist peat pressed well down is placed in the bottoms of the boxes and they are hung in the aviary flights at the end of March. The birds almost invariably show an immediate interest in the nest boxes and the hens usually spend long periods scratching about in the peat preparing the

nest. Laying hardly ever commences much before the end of April. In this respect Blue-wings are very different from Splendids and Turquoisines which often start laying a week or so after the nest boxes have been placed in position. I have very frequently had cases of egg binding with Splendids and Turquoisines but *never* with Blue-wings. They usually lay from four to six eggs on alternate days and commence incubation after the appearance of the second egg. The chicks hatch after 18 to 20 days and at first they are covered with grey down. They are brooded very closely by the hen for the first few days and during this period she leaves the nest only very infrequently and is fed by the cock in the nest box entrance hole. When the young are about 10 days old she leaves them for longer periods and the cock often begins to enter the box to feed the chicks. Most of my hens brood their chicks at night for at least three weeks. The chicks can be seen calling for food at the entrance holes when they are about 30 days old and soon afterwards they leave the nest boxes. They are a little timid at first but usually settle down and are flying and perching confidently within a day or so. They are dull imitations of the parents with horn coloured beaks which change to black in two or three months. The hens frequently commence to lay a second clutch of eggs before all the young from the first nest have left the nest box but the cock will continue to feed the chicks which usually become independent within a week of leaving the nest. The youngsters can be left with the parents without coming to any harm but I usually remove those from the first nest before the chicks from the second are flying. Young birds are not difficult to sex at first because the males have brighter blue wing patches than the females but this difference becomes less apparent in a month or two after which it is no longer possible to sex them until they have completed their first moult. This usually takes place when they are about eight months old.

Fully mature specimens are almost invariably double brooded. Early hatched youngsters usually have one nest during the following year but those hatched later (second "round") hardly ever attempt to breed until their second season. Blue-wings have no special extra requirements when they are breeding but they should have constant access to supplies of fresh green food, soaked millet sprays and additional hempseed.

Occasionally a hen is inclined to lay again long before her first brood has been reared, and deserts it. Hand-rearing of the chicks is very easy particularly if they are not less than about 10 days old. They should be placed in a small box with the bottom covered with plenty of peat to absorb the excreta and kept in a fairly warm place. Many different diets are suitable. I usually stir four teaspoonfuls of "Farex", one teaspoonful of "Ostermilk" and a drop of "Haliborange" with boiling water to make a sloppy mixture which can be fed to the chicks with an eye dropper. After a little practice the technique of administering the food straight into the crop becomes very simple. Birds more than 10 days old need

feeding every four hours or so and the amount of food given should be gauged so that the crop is not quite empty when the time comes for the next feed. When they are about four weeks old the youngsters begin to exercise their wings and to take short flights when they are waiting for their turn to be fed. At this stage they should be transferred to an ordinary box cage with the floor covered with grit, canary seed and millet sprays. They very quickly learn to shell seed and show their independence by refusing further hand feeding. Hand-reared birds make good specimens and, contrary to popular belief, excellent parents.

In my experience Blue-wings are the most robust of the Grass Parrakeets. Mine are kept outdoors in unheated aviaries all the year round and are never locked in their shelters at night. During cold damp weather I have occasionally found an odd bird looking unwell, producing green, very liquid excreta, suffering from enteritis. Such patients respond miraculously to heat. They should be transferred to a hospital cage and kept on a plain seed diet at a temperature of 85°F. until the excreta becomes normal. The temperature may then be gradually reduced over a period of one or two days. They can safely be transferred to the outdoor aviary again when the weather conditions are favourable. Although I have lost several Splendid Parrakeets from the same range of aviaries as the Blue-wings from infestation with *Ascaridia*, I have only once discovered the presence of round worms in the intestine of a dead Blue-wing. However, it is dangerous to be complacent about this avicultural scourge and I believe that all parrakeet breeders should use one of the non-toxic anthelmintics such as Tetramisole (Nilverm, I.C.I.) prophylactically at least. But our knowledge of diseases in birds is very limited indeed and probably the only really effective form of treatment for most bird ailments is heat. I think it is significant that I have had to use a hospital cage considerably less frequently for the Blue-wings than for any other species of parrakeet which I have kept.

Until comparatively recently Blue-winged Grass Parrakeets were rare and expensive in Europe. Like Splendids, Turquoisines and Elegants they have almost suddenly become readily available in this country mainly because of the importation of large numbers of Continental bred specimens. Many of these are bred in cages and indoor aviaries. They are not as robust as outdoor bred specimens as many purchasers have found to their cost. Some of this continental bred stock is giving the Grass Parrakeets again a reputation quite undeserved, for being delicate. Outdoor aviary bred stock is certainly not. Keeping and breeding the members of the genus *Neophema*, particularly the Blue-winged Grass Parrakeet, has given me a great deal of interest and pleasure for more than a decade. Now that aviary bred strains are well established I am sure they will give as much pleasure to many others.

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WATERFOWL EGGS

By S. T. JOHNSTONE (The Wildfowl Trust, Slimbridge,
Gloucestershire, England)

Egg identification in the Anatidae is extremely difficult, not only within the family and tribes, but also within a species itself where considerable variation can be found in colour, size and shape.

The Magpie Goose lays a large white egg, the shell of which is thick and pitted. The Whistling Ducks all have white thick-shelled eggs of characteristic shape. Among the swans, the Mute and Black lay green eggs, the rest of the forms large white ones of similar size and shape and shell texture. The exception is the Coscoroba, which of course is considerably smaller.

All the Grey geese produce white eggs which apart from the Greylag vary little in size. Even the Lesser Whitefront lays a comparative large egg for the bird.

Among the Black geese, in the numerous races of Canada Goose, they are white and of similar shape, varying in size from *maxima* to *minima*. The Barnacle and Ne-ne eggs are indistinguishable from most of those of the Canadas. The Brents are smaller, as indeed are Red-breasted Goose eggs, which are also cream in colour.

The Sheldgeese and duck eggs remain fairly consistent in colour and size according to the species. They mostly have thin creamy coloured shells.

In the duck world is the greatest variation. Colour changes from the deep brown of the White-backed Duck through various shades of stone, buff, cream and green to the beautiful eau-de-nil eggs of the Barrow's Goldeneye.

Size differs from the goose sized eggs of the Steamer Ducks and Eiders to those of the Hottentot Teal. Difference in the size and colour in a particular species of duck has been most noticeable with the Shoveler, Gadwall and Wigeon.

The following chart gives details of all forms of waterfowl eggs that have been available at Slimbridge. In most cases a large number of eggs has been examined, in a few instances only a single clutch has been measured.

WATERFOWL EGGS

Species	Size (mm)	Colour	Nature of shell	Clutch number	Incuba- tion period (days)
Magpie Geese	80 × 54	Glossy white	Thick and pitted	6-10	28
Spotted Whistling Ducks	52 × 38	White	Thin	8-12	31
Eyton's Whistling Ducks	48 × 37	White	Thick	10-12	30

WATERFOWL EGGS—*continued*

Species	Size (mm)	Colour	Nature of shell	Clutch number	Incuba- tion period (days)
Vandering Whistling Ducks	51 × 35	White	Thick	8-15	30
Mulvovous Whistling Ducks	53 × 38	White	Thick	8-16	28
Cuban Whistling Ducks	55 × 40	White	Thick	6-10	30
Galvan Whistling Ducks	47 × 38	White	Opaque	6-8	28
White-faced Whistling Ducks	47 × 37	White	Opaque	10-16	28
Red-billed Whistling Ducks	50 × 39	White	Thick	10-18	28
Coscoroba Swan	91 × 63	Whitish cream	Thin	6-8	35
Black Swan	115 × 65	Pale Green	Thick	4-6	36
Mute Swan	115 × 75	Greenish blue	Thick	4-8	37
Black-necked Swan	105 × 65	Cream	Thick	4-7	36
Whooper Swan	113 × 73	White	Thick	4-7	36
Tumpeter Swan	118 × 76	White	Thick	4-6	33
Bewick's Swan	118 × 82	White	Thick	3-5	30
Whistling Swan	110 × 73	White	Thick	4-7	36
Swan Goose	82 × 56	White	Normal thickness	6-10	28
Greylag	85 × 58	White	Normal thickness	4-8	28
Whitefront	76 × 54	White	Normal thickness	4-8	26
Lesser Whitefront	76 × 49	White	Normal thickness	4-8	25
Western Bean	83 × 60	White	Normal thickness	4-8	28
Russian Bean	84 × 55	White	Normal thickness	4-6	28
Pinkfoot	78 × 52	White	Normal thickness	4-8	28
Snow Geese	78 × 52	White	Normal thickness	4-7	25
Cross's Goose	70 × 47	Pink on laying fades to white	Normal thickness	3-6	23
Emperor Goose	76 × 52	White	Normal thickness	4-7	25
Bar-headed Goose	82 × 55	White	Normal thickness	4-10	28
Ne-ne/Hawaiian Goose	82 × 65	White	Normal thickness	3-6	29
Red-breasted Goose	71 × 48	Cream	Normal thickness	4-9	25
Black Brant Goose	70 × 50	White	Normal thickness	3-6	22
Light-bellied Brent	75 × 47	White	Normal thickness	3	—
Giant Canada	86 × 52	White	Normal thickness	4-10	28
Atlantic Canada	86 × 52	White	Normal thickness	4-8	28
Moffit's Canada	86 × 52	White	Normal thickness	4-6	28
Lawverner's Canada	80 × 50	White	Normal thickness	4-8	28
Vancouver Canada	85 × 51	White	Normal thickness	4-6	28
Dusky Canada	80 × 52	White	Normal thickness	4-6	28

WATERFOWL EGGS— <i>continued</i>					
Species	Size (mm)	Colour	Clutch of shell	Clutch number	Incuba- tion period (days)
Cackling Goose	72 × 48	White	Normal thickness	4-9	28
Barnacle Goose	76 × 50	White	Normal thickness	4-9	28
Cereopsis	78 × 55	White	Normal thickness	4-6	35
Andean Goose	75 × 50	Cream	Normal thickness	5-10	30
Ashy-headed Goose	70 × 50	Pale buff	Normal thickness	6-8	30
Ruddy-headed Goose	65 × 48	Deep cream	Normal thickness	4-6	30
Magellan Goose	74 × 50	Cream	Normal thickness	4-9	30
Kelp Goose	73 × 53	Deep cream	Normal thickness	4-6	32
Abyssinian Blue-winged Goose	70 × 50	Cream	Normal thickness	6-9	31
Orinoco Goose	60 × 44	White	Thick	6-12	30
Egyptian Goose	68 × 50	Creamy white	Translucent	8-12	30
Shelducks	70 × 50	Creamish	Translucent	8-14	30
Radjah Shelduck	60 × 42	White	Normal	6-8	30
Crested Ducks	63 × 46	Deep cream	Normal	4-6	30
Bronze-wing Duck	70 × 51	Deep cream	Normal	4-6	30
African Black Duck	62 × 43	Deep cream	Normal	4-8	28
Mallard	58 × 40	White, green or pale buff	Normal	10-20	26
Hawaiian Duck	55 × 38	Greyish white	Thin	4-8	26
Laysan Teal	58 × 33	Greenish	Thin	4-8	26
Florida Duck	57 × 38	Whitish cream	Normal	6-12	26
North American Black Duck	58 × 40	Greenish	Normal	6-12	26
Indian Spotbill	54 × 41	White	Thick	6-10	26
Chinese Spotbill	58 × 40	Creamish white	Normal	8-12	26
Grey Ducks	52 × 42	Greenish white	Normal	8-16	26
Philippine Duck	54 × 41	Pale green	Thin	8-14	26
Yellowbill Ducks	56 × 41	Buff	Normal	6-10	27
Australian Grey Teal	49 × 36	Creamy white	Normal	8-12	25
Chestnut-breasted Teal	51 × 37	Deep cream	Normal	8-12	26
New Zealand Brown Duck	58 × 42	Deep cream	Normal	6-8	28
Marbled Teal	46 × 32	Cream	Normal	8-12	25
Cape Teal	50 × 34	Deep cream	Normal	8-10	25
Hottentot Teal	43 × 33	Cream	Normal	6-8	24
Versicolor Teal	45 × 35	Cream	Normal	6-12	25
Puna Teal	58 × 44	Deep cream	Normal	4-6	26
Green-winged Teal	45 × 33	Buffish	Normal	6-12	24
Red-billed Pintail	54 × 38	Cream	Normal	6-10	25
Bahama Pintail	52 × 38	Cream	Normal	6-10	25
Chilean Pintail	52 × 40	Cream	Normal	6-12	25
Kerguelen Pintail	52 × 30	Creamish white	Normal	6-8	25
Chilean Pintail	56 × 40	Cream	Normal	6-12	26
Baikal Teal	48 × 35	Greenish	Normal	6-8	25
Chilean Teal	54 × 38	Cream	Normal	6-8	24
Sharp-wing Teal	52 × 36	Creamy white	Normal	4-8	24
Gadwall	54 × 36	Deep cream	Normal	6-15	26

WATERFOWL EGGS—*continued*

Species	Size (mm)	Colour	Nature of shell	Clutch number	Incuba- tion period (days)
Alcated Duck	56 × 40	Creamish	Thin	6-10	25
European Wigeon	54 × 35	Cream	Normal	4-10	25
American Wigeon	54 × 35	Cream	Normal	6-10	24
Niloe Wigeon	58 × 40	Pale buff	Normal	6-8	26
Belted Teal	46 × 33	Cream	Normal	8-12	24
Annam Teal	48 × 35	Pale cream	Normal	8-12	24
Arganey	45 × 33	Pale buff	Normal	6-10	23
Argentine Shoveler	52 × 36	Cream	Normal	6-8	25
Asiatic Shoveler	54 × 36	Cream	Normal	6-8	26
New Zealand Shoveler	55 × 38	Greenish	Normal	6-10	26
Common Shoveler	55 × 37	Greenish	Normal	6-12	26
Ring-necked Teal	45 × 36	White	Translucent	6-12	23
Madagascari's Duck	55 × 42	Creamy	Normal	6-8	
Common Eider	77 × 50	Olive green	Normal	4-6	24
King Eider	64 × 43	Bright olive	Normal	5-7	22
Spectacled Eider	64 × 45	Olive	Normal	5-7	24
Red-crested Pochard	54 × 42	Greenish or stone	Normal	6-16	28
Parula-bill	56 × 42	Green, cream	Normal	6-12	28
Southern Pochard	54 × 44	Creamy white	Thickish	4-8	26
Red-throated Diver	63 × 45	Bright olive	Normal	4-8	26
Common Pochard	62 × 44	Olive	Normal	4-8	27
Red-head	62 × 44	White or stone	Normal	8-14	28
Lesser Pochard	51 × 38	Cream	Normal	6-9	27
Common White-eye	50 × 37	Deep cream	Normal	6-10	26
Australian White-eye	54 × 42	Pale cream	Normal	8-12	26
Goldeneye	58 × 41	Brownish olive	Normal	6-10	25
Ring-necked Duck	58 × 41	Cream	Normal	6-8	26
New Zealand Scaup	64 × 41	Cream	Normal	6-8	26
Lesser Scaup	56 × 40	Stone or olive	Normal	6-10	27
Greater Scaup	62 × 40	Brown or olive	Normal	6-8	27
Brazilian Teal	49 × 35	Pale cream	Normal	6-8	25
Andaman Teal	49 × 36	Whitish cream	Translucent	8-12	32
Carolina Teal	52 × 40	Whitish	Translucent	8-16	32
Canada Goose	54 × 42	Creamy	Normal	8-10	30
Lesser-winged Goose	77 × 57	White	Thin	6-8	—
Red-billed Duck	56 × 42	Creamy	Translucent	8-12	30
Arctic Skua's Duck	55 × 42	Cream	Thin	8-10	32
Common Scoter	65 × 44	Cream	Normal	6-8	28
Lesser Scoter	71 × 48	Deep cream	Normal	6-8	28
Ring-necked Duck	54 × 38	Cream	Thinnish	6-8	30
Long-tailed Duck	53 × 48	Stone or pale olive	Normal	6-12	23
Lesser Goldeneye	62 × 45	Blue green	Normal	6-10	30
Common Goldeneye	60 × 42	Green	Normal	6-10	28
Lesser Goldeneye	66 × 46	Cream	Translucent	8-12	30
Red-breasted Merganser	63 × 45	Deep buff	Opaque	8-10	30
Lesser Merganser	52 × 38	White	Translucent	6-8	28
Red-billed Merganser	52 × 47	White	Opaque	8-10	28
Goldeneye	64 × 46	White	Thick	6-14	24
Lesser Goldeneye	78 × 55	White bluish	Thick	6-8	24
White-backed Duck	68 × 48	Rich brown	Thick	5-7	26
Blackland Isle Flightless					
Steamer Duck	84 × 56	Cream	Normal	5-6	30
Black-headed Duck	60 × 40	Creamy white	Thick		26

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OBSERVATIONS ON CAPTIVE TASMANIAN NATIVE HENS & THEIR INTERACTIONS WITH WILD MOORHENS

By D. T. HOLYOAK and DEIRDRE SAGER (London, England)

Ridpath (1964 and unpublished) has made extensive behaviour studies on the Tasmanian Native Hen (*Tribonyx mortieri*) in Tasmania. This note records observations on the interactions of a single captive pair of Native Hens with several pairs of wild Moorhens (*Gallinula chloropus*) at the London Zoo. The Native Hen is a flightless, chicken-sized rail with dull olive-green plumage relieved only by a white streak on each flank. This species is restricted to Tasmania; an area from which moorhens of the genus *Gallinula* are absent.

At the London Zoo the pair of Native Hens are kept on the "Three Islands Pond"; they roam freely about the pond area and the surrounding lawns and flower beds, normally walking, but sometimes swimming buoyantly or running. They have succeeded in rearing only one chick so far, although they made several nesting attempts in 1969. Two or three pairs of wild Moorhens breed on the pond, taking advantage of the food provided for pinioned ducks and geese. The Moorhens raise several broods of young each year.

The Native Hens defend land territories from the Moorhens, partly by chasing them, and partly by giving loud, harsh, two-syllabled aggressive calls; this call is a duet, the female providing a lower-pitched note than the male (this "duetting" was first noted by Ridpath 1964). Probably because of aggression from the Native Hens, the Moorhens defend only water territories from other Moorhen pairs. The Moorhens regularly give their turning away territorial display showing off the white under-tail coverts, both to other Moorhens and to the Native Hens, although the Native Hens enter the water freely when moving between the islands in the pond. This division of the pond area into land territories for the Native Hens, and water territories for the Moorhens is very clearly marked. Often a Native Hen will run ten yards to chase a Moorhen into the water, then ignore it even though it is swimming only two or three feet away with the white under-tail coverts fluffed. Because of this, the Native Hens are defending three islands and parts of the land surrounding the pond from Moorhens, but within this area two or three pairs of Moorhens are defending water territories between themselves.

In June 1968 three Moorhen chicks a day or two old (smaller than a chicken's egg) were watched as they were fed first on land by the pair of Native Hens, then in the water by a pair of Moorhens which we assumed to be their parents. Both pairs of birds showed considerable interest in the chicks, although the chicks appeared to be more strongly attracted to

the Moorhens. The chicks seemed to be reluctant to enter the water, and the Moorhens were unable to visit the chicks freely on land because of aggression from the Native Hens. During one two-hour period of watching, the chicks were fed several dozen times by both the Moorhens and the Native Hens. On land both species fed the chicks on small pieces bitten from grass leaves; in the water the Moorhens picked tiny objects (possibly insects) from the water surface.

The Moorhens made frequent attempts to approach the chicks when they were on land, but they were usually driven back into the water by one or other of the Native Hens. However, the Moorhens reached the chicks a number of times, and each time the behaviour of the Native Hens towards the Moorhens was completely different when the Moorhens were either feeding the chicks or very close to them. Instead of chasing the Moorhens away, the Native Hens maintained a passive indifference a few feet away. Nevertheless, as soon as the Moorhen moved more than a few feet away from the chicks it would be chased back into the water and sometimes savagely pecked.

This "cutting off" of the aggression from the Native Hens when the Moorhens managed to approach the chicks closely was striking. Two explanations of the behaviour seem reasonable; first aggression near the chicks may be greatly reduced because of the danger of causing injury to the chicks in birds which are as aggressive as rails (the danger of injury might be mainly from redirected aggression; the selective value of reducing this near to chicks could be greater than that involved in reducing the risk of accidental injuries), and secondly (as suggested to us by Derek Goodwin) in natural situations there may be little point in attacking a strange bird when it has reached chicks, as its ability to eat them would then seem to be assured; attacking the predator at this stage might be disadvantageous because of the risk of injury to the adult birds. Derek Goodwin has seen analogous behaviour in Song Thrushes, *Turdus philomelos*, whose nest was being robbed by a Jay, *Garrulus glandarius*. Here, the cutting off of aggression can probably best be explained by the second of the two alternatives mentioned above.

We are grateful to Peter Olney for help in studying birds at the Regent's Park Zoo, and to Derek Goodwin for helpful suggestions and encouragement.

REFERENCE

- RIDPATH, M. G. 1964. The Tasmanian Native Hen. *Australian Nat. Hist.*, **14**, 346-350.

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NYLON NETTING

By T. S. THOMSON (Hoole, Cheshire, England)

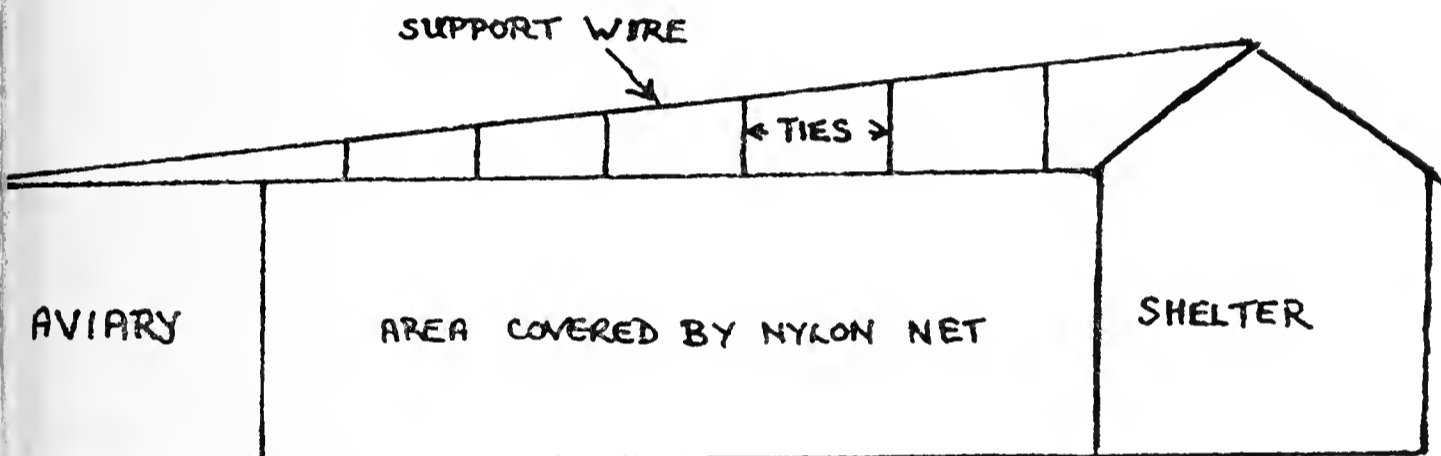
Visitors to my aviary frequently express interest in the use of nylon netting. On the other hand the material is occasionally condemned by a few who may have used it under unfavourable conditions. While nylon netting is no substitute for wire netting, it has its use in aviculture. Where quail, partridge and pheasant stock is housed, nylon covered enclosures minimize head injuries which may occur when birds suddenly rise up in flight. Young waterfowl and pheasants can be protected from winged predators by temporarily covering their open pens with netting. Here it is also used to cover extensive enclosures in which various research projects are undertaken. Normal practice is to cover an enclosure for 9 months of the year, removing the netting for the winter.

Nylon netting, being so light in weight, can be used to cover very large areas by the use of a few cross wires. It is not subject to temperature changes or frost, but like all other synthetic netting is liable to damage from the ultra-violet rays of the sun, and for this reason it is necessary to treat it every year or so. It is quite a simple process to bundle the netting in a bale by tying it up with twine, the neater the mass is compacted the easier the next stage, which is simply dipping it in whatever preparation is being used. The net-makers recommend black tar or bitumen. A creosote and bitumen mixture acts very well. This dipping process can be carried out in a bath, drum or any handy container, the treated netting being left to become drip dry. The object of such treatment is to dye the netting a dark colour, this being necessary when it is being used out of doors.

The breaking strains of the twines from which the nylon netting is made are very high. The netting is sold in several grades, according to the number of twines used. Complete nets of any size are made to measure, where rectangular measurements are given. There is a wide range of mesh sizes and the netting sets squarely without any stretching. It is an advantage to have the netting corded on all sides at an extra cost of a few pence. All twine nettings are subject to abrasion and although nylon is very strong it will gradually rub through on wires or other supports if there is any undue movement. It is therefore very necessary to see that the nets are securely tied down in order to prevent as much movement as possible. This has not always been carried out here and nets have suffered by the wind creating a continuous rippling wave action, resulting in netting fatigue, especially at the edges where it was secured.

One system tried out here could be called the suspension method. Wires were strung across a 60 ft. \times 60 ft. unit at about 3 ft. intervals from north to south and east to west, giving a criss-cross pattern. Ex W.D. telephone wire was used. The netting was laid on top and secured

around the sides by using 3 ft. long, 1 in. \times $\frac{1}{2}$ in. strips of wood nailed to the surrounding framework. Wires were strung from the apex of an adjacent roof running parallel to one side of the unit and across to the other side (see sketch). Ties from the suspension wires were made to the criss-cross wires on which the net lay. It was thus possible to suspend the complete net from above, the absence of ground supports being desirable since mechanical cultivators were used to till the soil. While this method proved satisfactory it took some time to set up and there was trouble removing the net, there being so many ties to undo. Also there was some chafing of the netting where the vertical ties made contact. The following season one central pole, placed in a few minutes, did away with the suspension idea. Where one central pole is used it is necessary to fix the cross wires which come in contact with it underneath all other wires in order that all other wires are raised when the pole is placed in position.



Rats occasionally try to establish themselves in the area and can be very destructive to nylon netting. The pests run up the surrounding woodwork, bite a hole in the netting and gain access to the aviary. Frequent visits results in the netting being destroyed. To overcome this a perimeter of wire netting was fixed around all sides of the aviary. The perimeter is a 1-3 ft. width of wire netting forming the edge of the aviary roof and attached to the top edge of the side walls, projecting inwards and supported below by horizontal or slanting wood supports. The nylon netting which forms the main part of the roof of the flight is attached to the inner edges of this wire netting, with a small overlap. If the flight is not built on to another flight or shelter there is some advantage in allowing the wire netting perimeter to project outwards around the top edge of the aviary for about 6 in. This acts as a barrier to cats and similar predators. This proved 100% successful. In addition, with frequent use the edges of nets became frayed and by the use of the wire netting perimeter nets were given a new lease of life. The wire netting surround also prevented cats from gaining access to enclosures when the nylon netting was removed for liberty experiments. Some cheap grades of nylon netting can be torn by Tawny Owls striking at birds in aviaries.

When fixing on a large net it is first taken to a neighbouring field, pegged out, the corners marked and the net rolled up in one long strip and then folded up for easy carriage. Taking the wind direction into account, the netting is unfolded along one side of the aviary and made secure. It is then unrolled, the wind being a great help. When netting is removed it is usual practice to mark the corners with some ties and again make full use of the wind. A soft broom is also used to prod upwards at the netting in order that it be rolled or folded to one side.

The net-makers do not state how long nets last as this very much depends on the prevailing local weather conditions during the time that they are in use. Nylon netting is not intended as a permanent cover for aviaries but is primarily used during the breeding season. However, in order to put it to some sort of test a square yard was permanently fixed over a safety door entrance. The net of $\frac{3}{4}$ in. mesh made up of the cheapest quality one strand netting withstood $6\frac{1}{2}$ in. of snow. The netting sold as aviary quality is several times stronger, in fact it can support a man grasping with one hand. It is, of course, several times the price. The cheapest grade of nylon netting costs less than wire netting of the same mesh, while the top grade of nylon is more expensive.

While we do seem to receive sufficient sunlight to affect nylon nets in this country, snow presents the biggest problem. Aviaries are flimsy structures and where nylon is employed this is even more so the case. Tests were carried out by leaving a 50 ft. \times 50 ft. unit cover by nylon all the winter. Result, total collapse after a $6\frac{1}{2}$ in. fall of snow. The structure withstood 3 in. and 4 in. falls. It was the surrounding framework and the cross wires which fractured, bringing the netting down over trees enclosed in the aviary. The netting was extensively torn. The total weight of snow was calculated at over 3 tons, assuming 1 in. of rain is equivalent to 1 ft. of fresh snow and one cubic foot of water weighs $62\frac{1}{2}$ lbs.

Where the perimeter wire netting is fixed it has been found unnecessary to remove members of the pheasant family when the nylon roof was removed. While nylon netting has never been fixed here in the vertical position, reports have been received of birds being caught up under such conditions.

* * *

THE RUFIOUS-BACKED SHRIKE

(Lanius schach)

By M. D. ENGLAND (Neatishead, Norfolk, England)

The following most unscientific—not to say sentimental—notes were prepared for publication before the interesting and informative article by Herr Reinhard Hoppe appeared in print (AVICULTURAL MAGAZINE 5, 75, 1969, 161–164). Since there is so much that he says with which I agree—though not all, which is hardly surprising—and the case-history of the one bird which I have recorded here bears out so well some of the points which he makes, I have amended slightly what I have written so as to emphasize points of agreement and disagreement. I feel sure that what both he and I have written will, at the very least, cause a lifting of the eyebrows of both the “for and against mealworm” brigades, but this will be all to the good if future aviculturists benefit from our experiences.

On the question of mealworms, may I say at once that I am very much on the side of the “ayes”, and that I use them almost exclusively for hand-rearing. My wife and I have hand-reared, from the small nestling stage, Hoopoes *Upupa epops*, Rollers *Coracias garrulus*, Black-eared Wheatears *Oenanthe hispanica*, Rufous Bush-chats *Agrobates galactotes*, Woodchat Shrikes *Lanius senator*, among many other species, on practically nothing else, most of the birds living to a ripe old age. The Black-eared Wheatears bred at seven years old (for the first time, having fought bitterly until then!) and one of the Rollers is now at Birdland, Bourton-on-the-Water, hale and hearty in his tenth year. I am sure that it is most important to remember that all these birds had “a good dietetic start”, in that they were fed on natural food by their parents until about ten days old, a quite different matter from being fed only on mealworms from hatching. May I hasten to add that I know that many outstanding first-breedings have been achieved on mealworms alone but, however much I favour them, I think it fair comment to say that it is probable that in such cases success has been despite the mealworms and not because of them!

It may be of interest to note here that Great Grey Shrikes *Lanius excubitor*, though eating mealworms with relish and disgorging pellets which contain only the skin, heads, and claws, do not eat maggots readily and seem quite unable to digest them, bringing up a mass of whole maggots shortly after swallowing them. On the other hand, they eat blow-fly pupae and the resulting pellets contain the cases only. My pair killed off two broods of their nestling by giving them nothing but these. The young could not digest the cases and were not old enough to regurgitate pellets. As a result, post-mortem examination showed death to be due to an impacted mass of blow-fly pupal cases. I shall take good care that the parents do not have access to them again during the breeding season.

I obtained my Rufous-backed Shrikes by mistake. A year or two before, the female of my pair of Bay-backed Shrikes *Lanius vittatus* had died, and all my efforts to find a replacement had failed. They are such lovely little shrikes, with most intriguing ways, that I thought I would make one last attempt by accepting responsibility for a whole consignment from India of up to a dozen, in the hope that there would be an odd female among them. Dealers tell me that they do not like shrikes since they are often difficult to sell. I cannot understand why, because it would be hard to find a family of birds which is more rewarding in captivity and with such interesting habits.

In due course a telephone message told me that ten had arrived "but only seven are alive this morning". This was not surprising, since all ten had been put together in a large cage. Few birds are more murderously territorial, and out of the breeding season those at the lower end of the pecking order, if they escape death by violence, would meet it by starvation. I was also told that "there didn't seem to be any Bay-backed among them"! My unprintable reply to the effect that, whatever species they were, they must immediately be separated was, I am thankful to say, acted upon but I was in a quandary because, since I work in a hospital, I was not going to be able to get home until Friday night at the earliest and this was only Tuesday. John Yealland very kindly came to the rescue by offering to look after them all pending sorting out.

Of the original ten birds, four had been Great Grey Shrikes *Lanius excubitor* and six Rufous-backed *Lanius Schach*. There now remained two grey and five of the others, one of the latter looking very seedy indeed. On the Friday night I made a start by taking home the two greys, followed a week later by two of the Rufous-backed. The choice of a "pair" was by sheer guesswork because sexual plumage differences in the latter species, if any, require a more discerning eye than mine. They were put in a divided cage with a wire partition, which was a mistake because next morning both had their faces covered in blood. Cardboard reinforcement to the partition lasted only a very short time before they managed to "get at" each other, so they were soon moved to adjacent small flights in a bird-room. These are little more than large cages, with a floor area of less than three feet square. Although they could, of course, see each other, fighting stopped and they ignored each other completely.

The normal daily feed for the pair, except when feeding young, consists of about 25 mealworms, and/or 30 or more maggots, locusts and wasps as available, and about half an ounce of lean ox-heart chopped up small and rolled in soft-food, Vionate, powdered cuttle, yeast powder and occasionally powdered baby food.

I had no spare aviaries and, if I thought about it at all, I dismissed all thoughts of breeding until next year. Indeed, one day I found one of them sitting on the window ledge looking very sick. I was just turning away to reach for an infra-red lamp when I saw her do a little "shuffle": she



Fig. 1. Juvenile Rufous-backed Shrike *Lanius schach*, 28 days old. Note deformed feet and general retarded development.



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[M. D. England

Fig. 2. Juvenile Rufous-backed Shrike *Lanius schach*, 53 days old. Note hind toes.



was not sick but "broody". A handful of dry grass proved it, for she immediately flew down and, gathering an immense beakful, started looking for a site in her very bare quarters. I hastily fixed up a bundle of twigs and a rolled-up piece of wire netting, and within a couple of hours the latter had a nest in it. Meanwhile the other bird next door had taken no notice at all. I thought that at least I might get some indication of its sex if I put it in with the other, so, prepared for murder, I opened the communicating door. Within a very short while another nest had been built in the bundle of twigs. Two hens!

By this time John Yealland's place had been taken by Peter Olney and I quickly arranged to try the other shrikes one at a time until one gave signs that it was a male. However, by the following weekend and before I could do this, one of the first pair was incubating three eggs in the nest in the wire and was being fed by the other bird. No signs of courtship or mating were seen and, although by now we were calling the sitting one "she", the sex of the other was still in some doubt because, while it certainly occasionally fed the sitting bird, it continued to add to the other nest in a desultory way.

A fortnight later doubts were dispelled by the sitting bird, on receipt of a mealworm from the other, rising and passing it on to something beneath it, and when I cautiously put my head in the door to feed them I received a sharp blow on the nose from an enraged dive-bomber. (Although he never attacked my wife, he always came screaming down at me. When, later on, I wanted to examine the nest I must have looked pretty silly climbing in the door with a hat on!)

No parents could have tended their young more carefully, though they refused to feed them with anything but mealworms, despite the fact that they themselves were used to a mixed diet. Every possible alternative was tried, but they starved the young rather than give them any other kind of food. Even mealworms with the slightest touch of Abidec, Vionate or yeast powder were not touched, or only eaten by the parents. At the end of a fortnight it was apparent that all was not well, because the female was still brooding most of the time and no gaping beaks were visible when either she or her mate carried food to the nest. When they began bringing the food away from the nest uneaten, I decided that I must investigate. The enraged parents were shut away while I miserably removed two fully-feathered but moribund youngsters. One was very dead indeed, but the other had a faint spark of life. Its open beak was crammed with putrefying food, it lay limp in my hand and it had not the strength even to lift its head. Its eyes were closed, it lay on its side, and its toes were deformed and in what, had it been human, would have been described as a "talipes equino varus" position. Every now and then its whole body was racked by a violent spasm. Poor little mite, the kind thing would have been to put it out of its misery. But a Rufous-backed Shrike . . . and what an exercise in hand-rearing!

It is one thing to hand-rear a young bird which is healthy and has had a natural start from a nutritional point of view; quite another in circumstances such as these, where the most optimistic diagnosis was polyneuritis with paralysis and possibly also rickets, almost certainly resulting from a dietary deficiency. He (it quickly became "George"—even my violent dislike of anthropomorphism could not resist this) was wrapped in a cloth, with a thermometer beside him, and put under a "non-luminous" lamp set to maintain about 100°F. The food-stuffed bill was cleaned up and he was left for an hour. To our great relief he had defaecated, and thereafter his bed was lined with a frequently-changed piece of toilet paper. Force-feeding began, with chopped-up mealworms treated with Cytacón, Abidec or cod-liver oil and dipped in Meritene (a well-balanced baby and invalid food manufactured in Portugal under licence from the D. H. Doyle Pharmaceutical Company). Later he was forced to consume large quantities of Vionate. At first it was difficult to get the food down, because paralysis had affected swallowing and the little tongue hung out to one side of the bill. But soon he began feebly to gape, his eyes opened—though one appeared to be sightless—and as each succeeding morning found him still alive we began to realise that our belief that he was improving was not just wishful thinking. He could raise his head when he gaped, swallowing became less and less of an effort, he even tried to lift himself on his poor little crippled feet.

At a month old he was trying to grip with the toes of one foot, he looked around alertly with both eyes, and he called incessantly for food. It looked as though we were really winning. By now he ruled the whole household. And then, tragedy! One evening before being closed down for the night he was enjoying his usual freedom of the room, flying from shoulder to shoulder, when one of our dogs nosed open the door and, although it made no aggressive movement, George took fright. He flew to the only place where he could hurt himself—the slightly-open door of a cupboard where he caught his head in the crack and fell to the floor unmoving and apparently dead. With a heavy heart I picked up the little body. There seemed no doubt this time. And yet there was the faintest pulse, though he was completely unconscious. Once more the cloth bed and heat, though this time with no hope at all. At the crack of dawn I went sadly to look. There he lay, eyes closed, head sagging, bill slightly open—but alive.

It was not a question of "going back to square one"—we were further back than when we started. But once more—heat, force-feeding, gross over-doses of everything we knew; the blindness, the paralysis, the useless toes, the poor lolling tongue. And once more George slowly came back.

He is now, in early January, nearly six months old. He lives in a cage though he prefers to be out of it, flying from shoulder to shoulder and exploring the room. He can, of course, feed himself perfectly well, though he shouts continually to be fed, or perhaps for a game or a ride on

our hand. He grips a perch with both feet, though one will never be much good to him. During his freedom of the room, he finds it easier to hang from the curtains than to perch on slippery furniture.

When we are too busy to do more than put his food in the cage and he feels neglected, he gets in a rage and, after a period of shouting, he tears up the newspaper in his cage and fills the water pot with it or pokes it through the wire so that it floats all over the floor of the room. He also violently pecks the first outstretched hand.

By 30th October (at nearly fifteen weeks old) adult plumage had been assumed except for some very faint brown barring of the flanks. This is much quicker than any record of which I am aware for any other species of shrike. For some time it was assumed to be female because, whenever I approached closely or put out a hand to pick her up, she "crouched" in what looked like an invitational posture, to me, her supranormal mate. However, I now know that I was wrong about this, since this posture is the means whereby the parents resolve a squabble or fight. The dominant bird, though obviously still "raring to go", desists when its opponent crouches, head right down pointing at the floor, in submission. I only hope they will continue to settle their differences in this way, since I simply cannot spare separate aviaries for them.

Directly he was able to move about his cage he began trying to impale or wedge his food. Although various species of shrikes have been hand-reared before and it seems *unlikely* that they learned impaling from seeing it done by their parents, it is probable that this is the first occasion when a youngster which was blind on removal from its parents has impaled immediately it was strong enough to do so, thus showing conclusively that the action is innate. In the same context it is worthy of note that his warning notes and song are normal although he cannot possibly have heard any of his own species since he was a fortnight old. It may be of interest to add that, in addition to food, he impales pieces of newspaper.

He is now no longer as tame as he was, since we have less time to devote to him, and when his cage is approached in such a way that he cannot see that the approaching person is one with whom he is familiar, he performs bill-snapping, similar to that done by owls in like circumstances.

Since I am away from home at least three days and nights each week, the credit, if any, goes largely to my wife, who devoted herself to yet another foundling with an unshakable determination that he should live.

REFERENCE

- BEVEN, G., and ENGLAND, M. D. Impaling of prey by shrikes. *British Birds*, 62, 192-199.

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A DILUTE FORM OF THE KEY-WEST QUAIL DOVE

By DONALD G. HANOVER (Tarzana, California, U.S.A.)

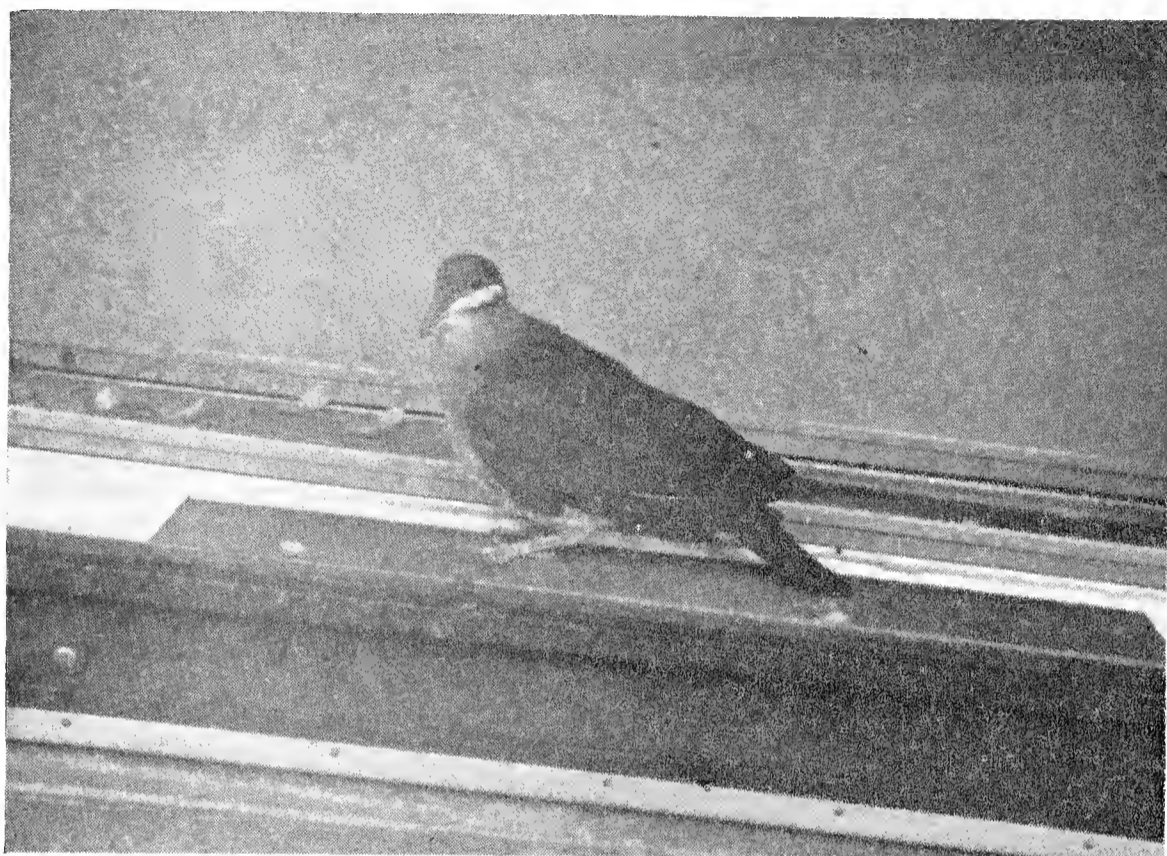
Keeping and breeding foreign doves and pigeons is a hobby that poses many problems and difficulties. Especially true is this when it comes to the rarer varieties of foreign doves and pigeons, concerning whose living habits in the wild we know but very little. Take the Key-West Quail Dove, for example, that handsome, gentle, almost pigeon-sized bird, which made its debut in this country not many years ago, and which today is found in limited numbers in a few fanciers' aviaries.

These doves are mainly chestnut-brown above and duller brown on the wings, with extensive iridescence of green and purple, not only on the top of the head and neck but also over most of the back. The sides of the head are dark brown with a conspicuous white streak below the eye; and the throat is white. The underside is mauvish-grey, browner on the flanks and whiter on the belly.

I happen to be one of the fortunate owners of several pairs of Key-West Quail Doves, *Geotrygon chrysia*, which have been living, and modestly breeding, in my aviaries now for several years. All of them, without exception, are descended from the first pair, there having been no fresh imports of this very interesting, beautiful dove in recent years. In other words, the offspring produced is the result of in-breeding, of mating closely related members of one family with one another.

On rare occasions such matings will bring forth surprisingly strange colour patterns, which in no wise resemble the plumage colour of the parent bird. Well, I am happy to report such a radical colour variation, namely a dilute form of Key-West Quail Dove, which is, in all probability, the only representative of this variant. The breast and under parts are almost white, the head, neck, back, wings, and tail are an off-white, and when closely examined are very pale buff and light grey. All the colouring is considerably reduced and the iridescence disappears. The eyes are a very bright, sharp red. At this writing the bird is nearly full grown, to all appearances lively and vigorous. In shape and form, and habit, it is and acts like a normal Key-West Quail Dove. To date its actions have not as yet revealed its sex. Depending on it, I plan to mate this unique dove back to its male or female parent in the hope of getting another dilute, or near dilute specimen, which together I might utilize to produce a strain or family of variant Key-West Quail Doves. Needless to say, I am both surprised and delighted with this happy event, and I hope to report in the future on the breeding results from this dilute Key-West Quail Dove.

Some years ago, there was a request from a conservation group in Key-West, Florida, hoping to purchase a few doves for restocking. It is



Normal Key-West Quail Dove.



Dilute variety of the Key-West Quail Dove.



Playground of Lawes' Six-Plumed Bird of Paradise.



Immature Blue Bird of Paradise.

very possible that the Key-West Quail Dove is now extinct in its native habitat, namely Key-West, Florida, and two or three Islands in the Caribbean.

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HAND-REARING AND OBSERVING BIRDS OF PARADISE

By H. SMYTH (Manley, New South Wales, Australia)

I recently returned from Papua-New Guinea after spending almost two years there, mainly in the Southern Highlands District, where I spent most of my leisure time birdwatching, though I did manage to keep a few birds in cages for short periods, so perhaps a few notes may be of interest.

Without doubt the most interesting members of my small collection were a Blue Bird of Paradise *Paradisaea rudolphi* and a Lawes' six-plumed Bird of Paradise *Parotia lawesi*, purchased as fledglings at Tari markets.

Market days are held twice weekly at Tari where the natives offer a wide range of locally produced produce, and occasionally birds, too, are offered for sale and with the possible exception of parrots, most birds I have seen for sale at the markets have been quite young and unable to feed themselves. I was first aware that fledgling Birds of Paradise could be bought, when a friend asked me to identify a bird offered to him by a local Tari boy.

It was quite clearly a Blue Bird of Paradise, not long out of the nest and though it looked healthy and gaped readily it made no attempt to fly, but sat in the boy's open hand in such a relaxed way that I believed it to have been hand-reared.

Regulations concerning the keeping of Birds of Paradise within the territory are quite definite so my friend was reluctant to buy, but after being assured by his house boy, who was acting as interpreter, that the blue bird, if not sold, would surely be eaten, he paid the twenty cents asked.

Unfortunately this bird died after a few days and I suspect that like birds subsequently bought by me it had been disabled, prior to capture, by being hit by a stick or stone thrown by the boys, who are surprisingly accurate.

On 13th July 1968 I bought at the market a young Lawes' six-plumed *Parotia* which had an injured leg but otherwise appeared healthy, and it also gaped readily.

Insects and fruit seemed a reasonable guess as to its food requirements, and after a worrying first few days the youngster settled down to a diet of insects, mostly cicadas and moths attracted to the lights at night, and paw-paw and bananas mashed together with powdered milk. Mashed

paw-paw and powdered milk later proved to be more satisfactory, for if allowed to stand for an hour or more this mush becomes quite firm, is enjoyed by the birds, does not soil the feathers to any great extent and droppings are much firmer than when banana is added, again reducing the risk of fouled plumage.

On 31st August I acquired, for 20 cents, a beautiful young Blue Bird of Paradise, similar to the one mentioned previously, though much brighter in colour but unfortunately more knocked about than the previous bird.

Again, after a very shaky start, it began to do well but later sloughed two toes which were broken when I bought it.

Both birds became very tame and when anyone approached crouched down on the perch, gaped widely and with quivering wings begged for food.

The Blue Bird made quite a feature of wing quivering and continued to do so up until the time I disposed of it at about five months old.

I suspect this is a habit of the species, for when visiting Tari at a later date, February 1969, I was resting in a thick patch of forest when a young fully grown Blue Bird perched quite close to me. This bird, though not in full colour, had lost most of its juvenile plumage and had blue in the lesser wing coverts.

Whilst studying it through my binoculars I was surprised to see a handsome bird, presumably its mother, alight alongside it. The young bird went through all the previously described begging motions, though it was fully as big as its parent and the older bird proceeded to feed it five small black berries, probably stored in its throat or beak, since it made no display of regurgitation as would a pigeon.

Both birds sat together for a while and a striking difference was the size of the adult's beak as compared with the younger bird. The pale grey colour of the adult beak may have helped give an impression of greater size and though perhaps no longer, I feel sure its other dimensions were considerably larger.

The Lawes' six-plumed in juvenile plumage resembles the mature hen, with black head and brown body, underparts barred with darker brown.

These brown birds, with occasional fully coloured males, could often be seen feeding in berry-bearing trees near native gardens and in timbered areas. One peculiarity of the young bird is two tufts of feathers on its head, probably in the position where the plumes normally grow.

These small tufts stand about a quarter of an inch above the other head feathers but are only noticeable when the bird erects all its head feathers, as it occasionally does.

What prompts the young bird to do this I am unable to say for sure, but suspect it to be an attempt at display, though I have seen the head feathers raised when a large bird flew past, but fright will not always bring this reaction.

In October 1968 I returned to Sydney and left my birds with a friend at Kagua, where they were housed in a mixed collection, including tree kangaroos, wallabies and cuscus.

It was late in November when we were reunited at Mendi and the change the separation had brought was surprising, particularly in the *Parotia*, which was extremely fit and aggressive and attacked me savagely whenever I put my arm in the cage.

I was forced to separate the birds since the Blue Bird looked so shabby as compared to its companion whose feathers, though still coloured like the female, were quite glossy.

The Blue Bird was still friendly and confiding and as mentioned previously begged for titbits and with a little extra care was soon back to normal.

Feeding was something of a problem since Mendi is cooler than other stations of similar altitude, and many fruits, such as paw-paw are not available, but both birds proved themselves adaptable and ate, reluctantly at times, tinned fruit, raisins, tomatoes, minced steak and even fish. However, the food position was not entirely satisfactory and when at the end of December 1968 I learned that a friend was going to visit the Baiyer River sanctuary I asked him to take both birds along to Fred Shaw-Mayer, who was then in charge.

Birds of Paradise appear hardy and are certainly easier to hand-rear than many common birds here in Australia.

I think the diet I gave them was not quite adequate since neither bird flew well. However, I could not detect anything wrong with their wings.

The Lawes' six-plume and the Superb are perhaps the most common of the Birds of Paradise in the Southern Highlands area.

Though more secretive and less noisy than the Superb, they, the Lawes' six-plume, are reasonably numerous both in heavily timbered country and more open areas and do not appear at higher altitudes than about 6,000 ft. They are often heard and less often seen as one walks along native tracks in timbered areas and keeping low in dense cover the birds utter their harsh call and appear at times to follow one for short distances.

Playgrounds belonging to this species are fairly easy to find in most areas and at Tari, within half a mile of the council house, in a few acres of heavy timber, adjacent to native gardens I spent some time observing and trying to photograph both Lawes' six-plumed and Blue Birds of Paradise.

There were two playgrounds in this area within a few yards of one another and whenever one approached closely, no matter from what direction, the *Parotia*'s harsh cry would ring out and usually a fully coloured male would be seen for a moment.

On one occasion, five birds, including the adult male, came on my approach and stayed close by for a while. Four were of similar colour

to the female, though one had plumes. I had seen this bird on more than one occasion and believe its head feathers to be more glossy than the others.

Both cleared areas were roughly of the same area (about 40 to 50 square feet). One roughly oval and the other very irregular, and I saw no evidence of decoration on either.

Each had a horizontal or near horizontal branch close by and within 5 ft. of the ground. These branches appeared much used and how they came to be bent over in such a way I am unable to say, obviously too strong for these birds to bend, I suspect it is the presence of a horizontal stick which influences the choice of play area. The Blue Birds of Paradise which often share this patch of timber were usually easy to find, since their call is so characteristic and loud.

At a distance it reminds me of the clang of hammer on steel, but on closer approach this resemblance does not hold, however the call is quite loud and distinctive.

At close quarters and in dense undergrowth one can often be guided to the Blue Bird by his habit of mumbling (as though talking to itself) during preening and partial display, and by following this call I have come within a few yards of a splendid male, displaying upside down, less than 6 ft. from the ground, but surrounded by heavy undergrowth. Although obvious of my presence and keeping a watchful eye on me, this bird continued to display for at least a minute.

Though these Blue Birds eat fruit, I have never seen them feeding with other species but have often watched them hopping along moss-covered branches probing about for insects and on one occasion I saw a well-plumed male bird moving up the trunk of a dead tree in the manner of a tree creeper.

The accompanying photograph of the playground of Lawes' six-plumed Bird of Paradise was taken at Karoba about 25 miles from Tari. Despite its rather untidy appearance I think this one was still in use since it was the warning calls of the bird which caused me to investigate the area. Most playgrounds, though generally similar to the one pictured, are kept very clean and free from fallen leaves, etc. Because of the much heavier timber growth and consequent poor light, the other playgrounds mentioned could not satisfactorily be photographed.

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BRAZILIAN BIRD COLLECTIONS

By J. DELACOUR (Clères, France)

Once again I had the pleasure of visiting Brazil in November 1969, spending a couple of weeks with my friend Dr. E. P. Béraut near Rio de Janeiro. His collection of tropical birds and plants looked better than ever. Gardening and bird-keeping in a warm country are particularly rewarding—there is very little trouble caused by the climate, although the most delicate species should be well sheltered from winds during the cooler season, and you can enjoy your collections outdoors every month of the year. Dr. Béraut's garden is large and hilly, situated at the foot of a rocky mountain, close to two others (Gavea and Tijuca) and also to the ocean.

It looks like a huge conservatory, as the plants are those seen in the hot-houses of botanical gardens, but, of course, grown on a much bigger scale. The trees are overloaded with orchids, bromeliads and other epiphytes. There is a rushing torrent over rocks and several pools. A few Trumpeters, Demoiselles, Crowned Cranes, Scarlet Ibises, Roseate Spoonbills and Egrets have the run of the grounds, and wild birds are numerous on the trees and bushes, the commonest of which are the Tricolored Tanager and several species of Hummingbirds. Dozens of them are always buzzing around the verandah where bottles of nectar are kept ready for them. The most numerous are the Dusky Jacobine (*Melanotrochilus fuscus*) and the Blue-headed Wood-Nymph (*Thalurania glaucopis*), but Swallowtails (*Eupetomena macroura*), Mangos (*Anthracothorax nigricollis*) and Brazilian Violet-ears (*Colibri serrirostris*) also come to drink. A female Pigmy Hermit had a nest in a nearby bush, but she never sought the bottles.

Although there are 25 aviaries, large and small, and more in the making, none can be seen when you walk through the grounds. All are built along the outer fences, sheltered by walls and hidden by shrubbery. With the exception of those occupied by parrots, all are heavily planted.

Three of the flights are of large size and full of trees and plants. They are close together, but irregular in shape. A corridor divides two of them and gives access to a bird kitchen and to shelters where caged birds and hand-fed fledglings are kept. Nine compartments run along the back of the third aviary, and plans are made for making another dozen of those breeding accommodations, where pairs of birds are secluded. At present, they consist of several pairs of Eclectus Parrots, most of them reared there, some Toucanets, Motmots, Taccazze Sunbirds, Garnet-throated Hummingbirds, Blue and Golden-breasted Sugarbirds, Fairy Bluebirds, the latter with young. When pairs of birds are showing signs of nesting in the larger aviaries, they are quickly removed to the privacy of these breeding pens. The corridor is the home of a few pets—a Razorbill Curassow, a Sun Bittern and a Purple-capped Lory.

The three large flights contain remarkable species of soft-billed Passerine birds, exotic as well as South American, of which it no doubt is the best collection existing today.

The first one is inhabited by a pair of Umbrella Birds (*Cephalopterus penduliger*), and three male and two female Guianan Cock of the Rock (*Rupicola rupicola*). They are all tame, agree perfectly well, the male Cocks of the Rock displaying together. A Lesser Bird of Paradise has been there for eight years and is in superb plumage. A pair of Blue-winged Pittas and a Brazilian Ant-Pitta (*Grallaria varia*) also live in peace as well as a few smaller birds: Golden-winged Sunbirds, a Waterton's Wood-Nymph, and a few small *Formicariidae*, including the lovely *Pithys albifrons*, a small black and chestnut ant-catcher, with a crested white face of the most unusual appearance. I have seen long ago these curious birds following army ants in French Guiana whence Charles Cordier brought some to Clères later on.

Another large flight is the home of Central American and Golden-headed Quetzals, Scarlet Cocks of the Rock, a number of Cotingas: a lovely and tame Swallow-tailed (*Phibalura flaviventris*), a Bare-necked Fruitcrow (*Gymnoderus foetidus*) and a Black-necked Tityra (*T. cayana*); a Swallow-winged Puffbird (*Chelidoptera tenebrosa*), various Tanagers, Scarlet-chested Sunbirds; several small Hummingbirds (*Sericotes holosericeus*, *Augastes lumachellus*, *Stephanoxis lalandei*); White-capped Redstarts (*Chimarrhornis*), Royal, Splendid, Amethyst Starlings, American Jacanas (nesting), different Plovers, etc.

The largest aviary (about 35 ft. × 25 ft.), heavily planted, has a little winding river where Cotton Teal can swim; there are also Roulrouls and small Rails (*Laterallus leucopyrrhus*); but it is otherwise dedicated to small species. There are Sunbirds (*N. pulchella*), Hummingbirds of several sorts, Paradise Tanagers, different Sugarbirds, Flowerpeckers (*Dicaeum*), African Paradise Flycatchers, a few Old World Robins, and Blue Cotingas. But most remarkable is the collection of Manakins, which live there in perfect condition and never quarrel: *Pipra fascicauda*, *P. erythrocephala*, *P. rubrocapilla*, *P. pipra*, *P. serena*, *Manacus manacus*, *Chiroxiphia linearis*, *C. caudata*, *C. pareola*, *Elicura militaris*, *Machaeropterus pyrocephalus*, and the magnificent *Antilophia galeata*, a fairly large Manakin from the interior of Brazil (I found it common in Goias), black, with scarlet helmeted head and back.

There are other groups of aviaries. Two good-sized ones contain pairs of African Pigmy Kingfishers, Irena's Pittas, Jamaican Long-tailed Hummingbirds, Blue-and-White Indian Flycatchers and a few others. Five more are inhabited by Ross and White-headed Touracous, Short-tailed Antthrushes (*Chamaeza*), Gnateaters (*Conopophaga*), several species of small Rails, Roulrouls, etc. There are pairs of Leadbeater's Cockatoos and Queen of Bavaria's Conures in a large flight. The conures were laying in a log, but it is interesting to note that the Cockatoos, although in perfect

condition, have never nested, probably due to the lack of a cold enough winter and of too much humidity. Elsewhere live several Toucanets (*Aulacorhynchus sulcatus*, *Pteroglossus beauharnaiesi*, *P. bitorquatus*) a number of Hummingbirds, Sunbirds, and various small insect and fruit eaters.

At the time of my visit, many nestlings collected very young in Dr. Béraut's extensive land holdings at Tapirapuan, Mato Grosso, were being hand-raised. The most interesting ones were 16 Trogons of four species (*T. strigilatus*, *melanurus*, *curucui*, *collaris*); Cotingas, Puff birds, Swallow Tanagers (*Tersina*) and 17 Jacamars (*Galbula ruficauda*). These were in broods of three or four. Very small when I arrived, they grew up rapidly and were flying and perching within 10 or 12 days. Absurdly tame, they were fed every hour on small, soft pellets composed of one-third ground beef heart, one-third grated carrots, one-third maize cake (cooked). These highly insectivorous birds are perfectly raised on that diet, which they continue to eat when grown up. They live so well on it that they have attempted to nest, digging in an artificial bank. But they are quarrelsome birds, and the female injured the male. Adult-caught Jacamars always refuse any food but live mealworms and never lived long; Dr. Béraut hardly gives any to his Jacamars, mealworms being scarce in Brazil. There was also an excellent young Squirrel Cuckoo (*Piaya cayana*) and a Nightjar, fed the same way as were the young Trogons.

Because of various difficulties in procuring certain foods, all birds in Dr. Béraut's aviaries receive that same meat-carrot-maize bread mixture, with diced cheese and for fruit, cut-up tomato and papaya, and occasionally grapes; practically nothing else. They all remain in perfect health as well as in excellent plumage and colour; all the red tones are perfectly preserved by the carotenes contained in tomatoes and carrots.

Because of lack of time, I never could visit all the different collections in the Rio area, nor pay a visit to Dr. Ruschi at Santa Teresa, in the State of Espírito Santo. But I saw those of Mr. Mario Ventura and Dr. Augusto Nim Ferreira, in Rio, as well as the aviaries of Mr. Nelson Kawall, Mr. Jorge Arnhold, and of the Zoological Park in Sao Paulo, all of great interest.

Mr. Ventura and Dr. Ferreira live in town and have very little outdoor space. They, however, keep remarkably large and fine collections of birds, both native and exotic, either in rather small aviaries or in cages.

Mr. Ventura has a number of outdoor flights, not very big, but cleverly designed to save space, in which are housed many Hummingbirds, Manakins, Tanagers, Sugarbirds and other small softbills, all in perfect condition. He also keeps, isolated in cages in his house, a number of hard-bills, mostly hybrids and colour mutations of Seed eaters (*Sporophila*) and Rice-Grosbeaks (*Oryzoborus*), many of them marvellous songsters.

It appears that there is in nature a large proportion of unmated female *Oryzoborus* because so many males are captured and kept as singing cage birds. The result is the occurrence of hybrids between them and males of various *Sporophila*. These natural hybrids are eagerly sought for.

Dr. Ferreira has even less outdoor room than Mr. Ventura and most of his birds are kept in cages. His collection is large and varied, including, besides small birds, Woodpeckers and Parrots. They also are beautifully kept and in admirable condition.

Mr. N. Kawall, in São Paulo, possesses an extensive garden, where he has built a long double row of aviaries. He also disposes of many cages in a hall. He specializes in plumage aberrations of native birds, which he propagates. He owns variants of many species. I particularly noticed a beautiful Troupial, whose normally black parts are of a light vinaceous brown, Blue Tanagers with white underparts and a series of freak Saffron Finches, some pure lutinos.

Mr. J. Arnhold, also in São Paulo, has quite a different collection. He keeps and rears on a large scale, both in extensive outdoor aviaries which fill up a large walled garden, and in breeding box cages inside galleries, very complete collections of Finches and Parakeets, mostly Australian. It is all done according to the most modern techniques and very well kept.

My visit to the São Paulo Zoological Park was a very pleasant surprise—I had not been in that city for 14 years, and at that time, there was no zoo of any importance. I knew that a new one had been built since, but I had no idea that it was either so large or so good. True to say, it has not been entirely finished and certain accommodations, mostly for the larger animals, have not yet been built permanently. But all that have been completed are particularly excellent and attractive; and it happens that many of them are dedicated to birds.

This new zoo is situated outside of the huge city, among parks and wooded hills, and extends over a considerable area. There is a large and beautiful lake, with perhaps a hundred swans (Mute, Black and Black-necked) and many other birds. There are so many Swans that pairs do not try to establish a sizeable territory, nor to fight badly. But broods with their parents are removed as soon as they hatch into breeding pens, where they are reared. It seems to work perfectly. I also noticed big broods of Orinoco Geese, and other waterfowl. There are two big buildings, with partly open roofs. Groups of Cracids occupy one, water birds the other. Several species of Curassows and Guans are there, including a pair of the very rare *Penelope ochrogaster*. It is all roomy, well designed and decorated.

Several very large flights, some still under construction, are situated in a wooded ravine, scattered along a winding path and surrounded by beautiful tropical plants and shrubbery. The aviaries themselves are artistically planted and adorned with rocks and logs. Many gamebirds,

including four forms of Whistling Guans, Tinamous and other big birds live and breed in them, and it all looks very pretty. There are other houses and aviaries for smaller birds, of which a very good collection has been assembled, but I particularly want to mention the Hummingbird exhibit. It consists of a very large, walk-in aviary 100 ft. × 50 ft. × 30 ft., very well and lightly built of steel. As you enter it, you walk across a beautifully laid out garden, with rocks, streams, trees and tender plants. Some 400 Hummingbirds live in it and can be seen here and there as you progress. The flight is so roomy that they can escape each other's attacks. It is a wonderful sight.

All these accommodations are a great credit to Dr. and Mrs. M. P. Autuori, the Director and his wife. Mrs. Autuori has the particular charge of the birds and is responsible for the excellent design of the aviaries. They both should be highly congratulated, and also praised for the excellent laboratories which have been organized for research of various sorts. The São Paulo Zoological Park certainly counts as one of the progressive institutions in the world, unique in South America.

* * *

BREEDING IN CAPTIVITY BY A ONE-YEAR-OLD SNOWY OWL

By E. CALLEGARI (Ravenna, Italy)

Having heard that Snowy Owls do not reproduce until they reach the age of three, it seems to me right to notify what happened to a pair of such birds I had bought at the Zoo of Basilea.

Towards the end of the summer 1967, I obtained a pair of Snowy Owls born in the spring of the same year. They were so healthy and strong that in the spring of 1968, they laid seven eggs. One of them got broken, five were sterile, and one gave birth to a chick which, once grown, proved to be a female.

This year, 1969, when they reached the age of two, they laid six eggs, all fertile. One chick could not be found any more a few days after hatching. Probably its brothers ate it. The other five Snowy Owls have grown normally.

* * *

NEWS AND VIEWS

Professor Alessandro Ghigi, Senior Member, elected 1911, celebrated his 95th birthday on 9th February, 1970.

Claude M. Payne was appointed O.B.E. in the New Year's Honours' List, "For public services". He has succeeded K. M. Scamell as President, Foreign Bird League.

Dr. Alfred Seitz has now retired from being Director, Nuernberg Zoo, after 20 years.

* * *

B. E. Reed has pointed out an error, possibly of Editorial origin, in his notes on the Scarlet-chested Sunbird in the November-December, 1969 number. On page 239, line 7, the full stop should occur after "shaky", not "perch". He also informs us that, after moulting, the first 1969 young one proved to be a hen, the second a cock.

* * *

Breeding results, 1969. Dr. J. R. Hodges, Blue-winged Grass Parrakeet, 20; Splendid, 12; Turquoise, one.

R. T. Kyme: Stanley, seven; Mealy Rosella, six; Golden-mantled Rosella, two; Pennant's, five; Red-rumped, three; Turquoise, five; Fischer's Lovebird, two; Weber's Lorikeets now sitting.

Clifford Smith: White-crested Cockatoo, one; Citron-crested Cockatoo, one; Leadbeater's Cockatoo, two; Yellow-fronted Amazon, two; African Grey, three (from two pairs); Double Yellow-headed Amazon, clear eggs.

* * *

Vanishing Amazons. Neil Macleod writes: "We spent a year in Dominica. Saw both male and female Imperial. Their mountain retreat is very inaccessible. The odd part is that other species differ so much between islands less than 50 miles apart, which could evince the possibility of other species of Amazons inhabiting territory in small locations within the Amazon valley. How the Caribbean parrots manage to localize themselves is a mystery."

* * *

T. Driver, Director, Kelling Park Aviaries, reports that the Mitchell's Lorikeets reared two young ones in 1968 and two in 1969. K. W. Dolton: "I bred one in 1968 which is still alive and well. Two were hatched in 1969 and although they left the nest in October they were badly plucked and only lived two weeks." L. W. Hill: "The Mitchell's Lorikeets have bred every year in a colony with other species. The Kitlitz Plovers have hatched this year."

* * *

A short time ago the B.B.C., Bristol, enquired regarding the rearing or breeding of Stone Curlews. F. W. Perowne, who is experienced in such matters, kindly supplied an account of events. He writes: "In 1964 I

picked up some eggs on this farm at South Creake because the nest was amongst sugar beet which was being hand-hoed. These eggs were already partly incubated and I had them in an incubator for about 14 days before two hatched. One lived until the winter of 1965. I have not got any proper wintering quarters and these appear essential. My interest is really restricted to water fowl, and I have about 80 varieties, kept in approximately five acres of pens. The Stone Curlews proved a very interesting and worthwhile diversion."

* * *

Last year I gave prominence to the fact that Dr. Alan Lendon had bred a Slender-billed Cockatoo, in the belief that possibly it had not been bred previously. In this I was, of course, very wrong. I am painfully surprised at this lapse. I am also surprised that only one member, Thomas Brosset, Gothenburg, pointed out that not only had there been a breeding account by Kenton C. Lint, with a photograph of a young one reared in the San Diego Zoo, in 1959 (1959, 107), but that I had referred to this and another success in my notes (1967, 21). On this occasion Homer nodded with a vengeance!

* * *

Brian J. Hill records: "I have bred Pagoda Mynas the last two seasons and so, in the last week of June I purchased a pair of Common Mynas from the Keston Foreign Bird Farm. Both had one wing clipped. I put them in an aviary that had a large nest-box. They laid on 1st September and by the 3rd had three eggs, both birds incubated. On the 14th I heard young calling. They fed the young well but I did not hear any more calling until the 28th. On 8th and 9th October a young one was sitting in the nest hole and it fledged next day. It is now at the Rode Tropical Bird Gardens. The adults have now moulted and are full-winged. They appear to be very hardy but still sleep in the nest-box."

* * *

In the *Los Angeles Times*, 10th November, 1969, an article on attempts to save the Whooping Crane by breeding it in captivity at the Patuxent Wildlife Research Center stated that the Center's Assistant Director for Endangered Wildlife Research, Dr. Ray Erickson, was insulted that the Audubon Society should have referred to him as an aviculturist (*sic*). He is quoted as saying: "I am not an aviculturist. An aviculturist is a zoo keeper. I'm a scientist, a biologist." This is a little narrow in view of Colin Harrison's definition of aviculture which was published in the *MAGAZINE* (1967, 178). We feel that Dr. Erickson should remember that it was the efforts of men in many walks of life who were not zoo keepers, but were proud to call themselves "aviculturists", that created both the background of knowledge and the climate of favourable opinion that made his present conservation work possible.

* * *

A. C. Furner, before leaving for a visit to Uganda and Kenya, wrote: "It may be of interest to report the unusual doings of two Senegal Parrots in my possession. Forty years ago I bought the first which has lived in and out of its parrot-cage in my greenhouse bird-room ever since. The second I purchased 25 years ago and it has had similar treatment to the first. Both birds were loose together in the greenhouse until a few weeks ago. They started flying on to my Gouldians' cages and generally causing uproar. My wife and I placed the two cages, open door to open door, put a hollow log for them to play with, and so confined them to cage life for the time being. They now have four eggs and the later one, which turned out to be a hen, is sitting tight and is thoroughly enthusiastic about the whole job. Naturally the eggs are unlikely to be fertile, but it does strike me as being a good effort on the part of both birds—with ages 40 and 25 years respectively, and fully adult when they came into my possession."

* * *

It is pleasing to learn that John Wilson has a Pesquet's Parrot *Psittrichas fulgidus*. Since Lesson described and named this parrot *Psittacus pecquetii* in 1831, there have been only about a dozen living specimens in this country.

It has often been said that the first known living bird was in the Earl of Derby's collection at Knowsley Hall. This assertion is probably based on Lear's colour plate in the parrot volume of Jardine's *Naturalist's Library* (1836). Like many present-day artists, Lear preferred to paint from living birds, and so it is presumably assumed that the bird depicted was living. But it is more likely that the model was, in fact, a specimen in Lord Derby's museum.

There can really be little doubt that the first live Pesquet's Parrot, a female, was owned by the Marquess of Tavistock in 1918. After being in his possession for a couple of years it passed to Mrs. M. Dalton-Burgess. It died in 1924, in which year Mrs. Dalton-Burgess acquired a pair.

Wilfrid Frost imported one in August 1921; after a short stay at the London Zoo it continued its journey to America. In October, 1926, Walter Goodfellow brought two for J. Spedan Lewis—one of which he presented to the London Zoo. Then in August, 1927, Walter Goodfellow brought a pair for Herbert Whitley. One died before Christmas: the other was his National Show winner that died in February, 1928. And there was a female living in the London Zoo in 1936. I believe I saw all of these, with the exception of Lord Tavistock's original bird. The majority seem to have been rather short-lived. It is to be hoped that John Wilson's bird will fare better.

Incidentally, who was the Pesquet later to have this parrot named in his honour? In old specific names authors have variously named him Pecquet, Pesquet, Pequet, Pequett, Pescquet and Pescquiet.

* * *

A. A. P.

REVIEWS

BIRDS OF PARADISE AND BOWER BIRDS. By E. THOMAS GILLIARD. London: Weidenfeld & Nicolson, 1969. Price 6 *gns*.

Unfortunately very few aviculturists have the opportunity of obtaining live specimens of these gorgeous birds; the appropriately named Birds of Paradise, unsurpassed in their beauty and bizarre ceremonial dances, and the Bower Birds with their extraordinary display grounds, one of the strangest and least understood phenomenon in nature. These birds are now very strictly protected in their native New Guinea and a few adjoining islands, yet the annual killing of more than 80,000 males—mostly of only three species—did not threaten any of the birds of paradise and the author advocates that small numbers of the live birds might be collected each year and exported to zoos and similar institutions, to be used for educational purposes.

The author, accompanied by his wife, an ardent naturalist, made five expeditions to some of the wildest parts of New Guinea and brought back a wealth of information regarding the habits of these little known birds. He advances the theory that the paradise and bower bird groups are derived from a single colonization of New Guinea, first arboreal monogamous birds which subsequently became polygymous and then diverged into birds of paradise and bower birds and reverted to monogamy.

The evolution of bower building is so remarkable that one naturalist has suggested that birds should be split into two categories, bower birds and all other birds. The males of some species build elaborate walled bowers of sticks and decorate them with bright objects and even with paint. Others construct towers up to nine feet high, some with tepee-like roofs and internal chambers situated on circular lawns that they tend carefully and embellish with golden resins, garishly coloured berries, iridescent insect skeletons and fresh flowers replaced as they wither. These bowers are stages on which the males perform intricate routines of sexual display and mate with the females of their species. There are only 18 species called bowerbirds, all confined to New Guinea and adjoining territory but there are in all some 85 species described as arena birds with a worldwide distribution. The bower birds are considered to be at the pinnacle of area evolution and have gone a step beyond the most richly ornamented arena birds, substituting fancy houses and jewellery for colourful plumage.

The birds of paradise on the other hand have developed most spectacular varieties of plumage, both in colour and form, combined with characteristic display performances. These are described in detail, when known, together with the breeding behaviour and other observations on the various species, including their distribution. Most of the species are illustrated by photographs or sketches the majority by the author. There

is also a useful list of ornithological explorations in the New Guinea and Moluccan Regions and a bibliography.

There are three appendices, one giving a list of ornithological explorations in the New Guinea and Moluccan Regions and another the account of a visit to Little Tobago in 1958 where Sir William Ingram, founder of the *Illustrated London News*, succeeded in placing 44 Greater Birds of Paradise in 1909. It was estimated that by 1958 there were probably less than 35 birds of paradise on the island but some were third generation birds. Recently (1964) a hurricane is reported to have driven some of these birds of paradise on to Tobago Island.

It is sad to have to record that the author died of a heart attack in New York in 1965 while the manuscript of this volume was in the editor's hands.

E. H.

* * *

AUSTRALIAN PARROTS. By JOSEPH M. FORSHAW. Melbourne: Lansdowne Press (distributed in the U.K. by Witherby: London) 1969. Price £13 10s.

With the enormous interest in the Australian parrot species and with the lack of an adequate recent work covering the whole group, this present book comes as a welcome and much-needed work consolidating the increasing but scattered information on the subject. Solid would seem to be an appropriate term since it measures $12 \times 10 \times 2$ in. and registers $6\frac{3}{4}$ lb. on the kitchen scales. The book covers all the Australian parrot species, including the Red-fronted Parrot and Kaka by virtue of their occurrence, now or in the past, on Norfolk Island. Mr. Forshaw has adopted a classification which recognizes three parrot families in Australia. This seems to be an upgrading of taxonomic subdivisions, of a type to which specialists are particularly prone since they are more conscious of the diversity of the group which they are studying, and may not recognize its relative unity when compared with other groups. There are some interesting regroupings. The Cockatiel is recognized as a cockatoo, the Galah (Roseate Cockatoo to non-Australians) separated in the monotypic genus *Eolophus*, and Bourke's Parrot (they are called Parrots in this book, which might help us to do away with that unfortunate term "parrot-like") is regarded as a dry-country *Neophema* species that has lost its green colour, and it is placed in that genus.

The introduction discusses the habitat and has six pages of habitat photographs. It also discusses distribution in general, but Spencer's classic concept of three zoogeographical sub-regions, shown on a map, is probably obsolete since Keast has shown the situation to be much more complex. There is also an introduction to the text layout, and a short introductory section on keeping parrots in aviaries.

The main bulk of the text is devoted to individual species. These are arranged in a systematic sequence. Each family, subfamily and genus is introduced by a brief indication of their special features. Each species has about three pages of text devoted to it, accompanied by a small map of distribution and one, or in some cases two, full-page colour plates. These plates are mostly close-up photographs of single birds, or more rarely of pairs. These are fine detailed studio-type portraits, but I must admit that I appreciated the occasional photograph from the natural habitat, especially one of a Galah drinking, and I felt that some of the size might have been sacrificed to include a picture of the plumage of the young, or in some cases of the female which was not always included. A few of the plates show evidence of poor colour values. Apart from the transposed pictures of the two lorikeets, mentioned by the publishers, there is another error in that the picture of the Twenty-eight Parrot is not in fact that of the race *semitorquatus*, but a bird in mixed plumage, probably from one of the areas in South-west Australia where the two forms are interbreeding. The five paintings of J. C. Yrizarry illustrate those species for which photographs are not available.

The great value of the text lies in the incorporation of up-to-date information. A description of the adults of both species is given, but the immatures are dismissed rather summarily. The distribution is summarized in the text in addition to being shown on a map. The various subspecies, where these exist, are described, and the ranges given. The type of country occupied in various parts of the species range is summarized under habitats, and a paragraph is devoted to its status, in terms of abundance, within its range. The section on habits contains information on the general behaviour, and in the more adequately studied species summarizes the normal daily routine. In a few instances it indicates the paucity of the data available. A section on movements is particularly necessary on a continent where variable drought conditions may cause many species to show seasonal or periodic movements within their range, and allowance must be made for such movements when evaluating a map of the overall distribution of a species.

The description of flight characters and voice are given, although these are probably of greater value to the field observer than to the aviculturist. The sections on feeding give information, mostly qualitative, on the food taken; identifying many of the foodplants and indicating the variety of the diet; combining both field observations and the examination of stomach contents. In discussing breeding the displays are briefly described and data on the nest, eggs, and behaviour during the breeding period, and development of the young is given for each species. There is a final short section on the keeping and breeding of the species under aviary conditions, and the known hybrids are listed.

There is a useful bibliography at the end of the book, but there is no indication of the fact that it is limited to the publications referred to in

the text. It might have been made more useful to the user if it had included a fuller list of at least the major publications on the Australian parrots. The inclusion of a gazetteer is another helpful feature.

This is a very useful work and one that most aviculturists will want to possess. In the circumstances the very high price is unfortunate. The reviewer was interested to see a recent review in an Australian ornithological journal of Immelmann's book on Australian parakeets. This costs £2 and the reviewer commented that at this price only the most enthusiastic parrot-lover would want to buy it. One wonders what he would have said about the present work! Another cause for complaint is that the large colour plates are stuck in individually on the back of pages of text, being stuck along the top edge only. Users will find that as the book is opened and closed the lower inner corners of the plates become bent in and will have to be glued down if the book is not to acquire a dog-eared appearance. Also the book is far thicker at the middle than at the edges and is therefore difficult to handle, and if used frequently the binding at the spine begins to show signs of strain. The layout of the text is lavish, with plenty of spaces, and the section headings and maps considerably reduce the amount of text on a page. One wonders whether with some economies, and with something less of a coffee-table book as the ideal, the publishers might not have produced a more reasonably-priced work which would have reached more readers; and the last point is the crucial one, for in the long run the value of a book must be judged to a large extent by its availability to a large number of readers. In spite of such criticisms it is still a work to be recommended, not only to aviculturists but also to ornithologists in general and to the non-specialist bird-lover.

C. J. O. H.

* * *

FREMDLÄNDISCHE STUBENVOGEL (Foreign Cage and Aviary Birds). By H. Dost. Published by Verlag Eugen Ulmer of Stuttgart, Germany, 1969. Price D.M.9.80.

This excellent little book is one of series on animals (Ulmer's Tierbuchreihe). It deals with a very large number of birds, including representatives from different families, that are commonly, or not-so-commonly, kept in captivity. Many species of starlings, babblers, finches, buntings, cardinals, flycatchers, thrushes, weavers, whydahs, tanagers, etc., are dealt with and 72 of them are illustrated in colour.

The illustrations are adequate rather than superlative in quality but it is nice to have so many of them. Some of the species chosen, such as the Corsican Nuthatch *Sitta whiteheadi*, are hardly likely to flood the bird markets in the foreseeable future (at least, I hope not). They have, presumably, been chosen because there was much useful information available on their behaviour and needs in captivity and this seems to me a justifiable reason for including them.

Each species is dealt with concisely but in some detail. General information likely to be of use to the aviculturist is followed by distribution; description, with age and sex differences; voice; care needed in captivity; food; and breeding. A really good feature is that full references are given (cited in text and details at back of book) to accounts of successful breeding, studies on the species in captivity and so on.

I assume that the waxbills and other estrildines are likely to be dealt with in a separate volume in this series. Otherwise their complete omission, except where some of them are named as hosts of the parasitic Whydahs, would be unaccountable.

A minor defect of the book is that the index is not in alphabetical order, the birds being listed in the same order as in the book, which rather negates its purpose. All the same this is an interesting and useful book that can be recommended to all who read German. D. G.

* * *

PAPAGEIEN IN HAUS UND GARTEN (Parrots in house and garden).

By W. DE GRAHL. 1969. Price D.M.19.80.

This is another volume in the same series as the book reviewed above. In my opinion it is a better one, perhaps I should say an even better one. It differs by including much information about the ecology and habits of parrots in a wild state. I hasten to add that I use the word "parrots", as does the author, to include all psittacines—lories, lorikeets, lovebirds, typical parrots, parrakeets, cockatoos, the lot! (It is to be hoped, incidently, that parrot-keepers will sooner or later come to their senses and use the word "parrot" as one uses "finch", "pigeon", "bunting" and so on, and drop the misleading and cumbrous "parrot-like" at present in vogue.)

To get back to my job of reviewing this useful and attractive little book. Like its companion volume it contains concise but quite comprehensive information about each species and how to keep and breed it, where such information is known. Unlike the first book, however, it does have an easy alphabetical index to both common and scientific names.

It is illustrated with many photographs of living birds, ten of them in colour. There is a colour plate showing the identifying head and forepart colour patterns of 18 species of Amazon parrots. The publisher's blurb on the back cover is painfully "twee" but it is most emphatically *not* a sample of what is between the covers, which can be heartily recommended to all who read German and are interested in parrots (psittacines).

D. G.

* * *

CORRESPONDENCE

MEAT AND PROTEIN FOOD FOR PARROTS

In view of some of the points raised in Mr. Smith's letter below, we have asked one or two other aviculturists for their experiences and will be glad to hear from others regarding the use of meat and insects as food for parrots. My own experience with a Little Corella was that it liked roots and root vegetables best; and if not carefully watched would climb up at meal times and gaily throw the meat off a plate to get at the vegetables; but once its vegetable wants were satisfied it would spend a little time delicately picking scraps of cooked meat from bones. The recently published book on Australian Parrots by J. M. Forshaw gives some references which relate to some of the points raised. The eating of wood-boring grubs by Black Cockatoos is described, and reference is made to masses of pollen in the stomach of a Purple-crowned Lorikeet, and to the eating of entire flowers by Barrabands' Parakeet (which Forshaw calls the Superb Parrot), and by the Red-capped Parrot.

14 Dawlish Avenue,
PERIVALE, MIDDLESEX.

C. J. O. HARRISON.

I often get for postmortem various parrots that sometimes between their demise and my receipt have obviously been eaten by something or other. Even budgerigars, from well-inhabited flights, almost always have the exposed limbs "chewed down to the bone" and possibly the head and some of the chest nibbled. I keep Cyanoramphine parrakeets, and to me they are the most tractable of any psittacine species. They may bicker; but a threat is as good as a fight and it is seldom if ever that even a feather is lost when a hint to move away from a claimed nest-box isn't taken. The humorous quote originating from Canon Dutton, concerning three New Zealand hen parrakeets who, to avoid spoiling a good friendship through jealousy, combined together and killed and ate the single cock provided, has always had me puzzled. Birds do differ such that no one can generalize about any species; but a *Cyanoramphus* male's beak would have been twice as large as a female's and, like birds of prey, this parrot genus has the hens one-third as small again as their spouses. One often hears of murder and cannibalism in other sorts of parrots, and I have always thought that Canon Dutton's New Zealand hens were grossly maligned.

New Zealand parakeets or, to be more specific, those two that inhabit the near-Antarctic Antipodes and used to inhabit Macquarie Island are always stated to eat a considerable quantity of dead penguin and seal-flesh. Keas, some at least, seem to have taken to eating mutton live as well as dead. In captivity most parrots and parrakeets will eat mealworms or maggots. The Keston Bird Farm used to give boiled cod to their larger breeding parrots, and Black Cockatoos of the *Calyptorhynchus* genus are reputed to eat the larvae of wood-boring beetles, while doubtless there are other carnivorous tendencies in Psittacines.

What I have found most interesting in these early Avicultural Society magazines are the references to meat-eating in this family of birds. In volume 2 of the first series, in a letter, Mr. C. P. Arthur notes that Pennants, Crimson-wings, Kings, Rosellas and Mealies all avidly took chopped fresh meat intended for a Jay that shared their aviary. Most interestedly he then goes on to say that Grand Eclectus Parrots are very fond of mice. Each of his specimens consuming two a day, when he could procure them! In volume 8, again of the first series, Mr. T. B. Whytehead writes to tell of a cockatiel, that least malevolent of parrots, which ate the head off a mouse that it had, presumably, caught in its cage.

The diets of wild parrots are not well understood. I know that crop analysis has been undertaken; but seeds are shelled and other, softer, matter is well masticated. Do Lories for example eat the insects that must be as attracted to the honey-bearing trees as the birds are? Nectar is not a sufficient complete diet—it is, after all only a solution of sucrose, glucose and/or fructose. Or do Lories digest the pollen as well—like bees (Bees feed the larvae on pollen, honey is only used to supply energy to the adult bees)? And what do Lorikeets eat when the trees aren't blooming? I have seen Platycercines, in an aviary, chewing away on an earthworm like a child with a "liquorice bootlace"; is this normal or abnormal behaviour? Sidney Porter writing somewhere in the magazine said that with a large collection of diverse, extremely rare, Amazons when these were fed on a

"natural diet" of fruit, vegetable and seed they started dying one by one. Yet when put, partly out of boredom with the birds, into small cages and fed on seed they stopped dying off. My own assumption would be that perhaps by then he had "naturally selected" and that what he had really shown was "survival of the fittest". In these early magazines, and for some later, should a bird die or start feather-plucking, the food is immediately blamed be it sunflower, safflower or hemp. And this blame becomes a correct diagnosis and woe betide anyone who feeds birds differently from the author of the article. I wish that I had such self-assurance in any of my diagnoses as to aetiology.

158 BROADWAY,
PETERBOROUGH.

G. A. SMITH.

There have been many discussions concerning the allegedly harmful effects of feeding meat to parrots. Over the past ten years or so I have given my African Grey Parrots a meaty bone for their supper, with no harmful effects, but on the contrary they have yearly produced fine healthy youngsters.

I obtain from my butcher lamb neck-bones, that have been boned from the upper shoulder. There is not a lot of meat on them but the birds pick them clean. I obtain these from my butcher once a week, when the boning is done, and chop them into small pieces which the birds can handle comfortably. These are cooked slowly for two hours in the oven in order to extract *all* the fat. I am quite convinced that any harm that birds suffer from meat eating is because of the fat in the meat.

I keep the cooked bones in the refrigerator and each day those that are used are warmed in the oven, since the birds much prefer a warm bone to a cold one. When there are babies in the nest, and they smell the appetizing warm bones, there is great excitement, the babies demanding to have their share quickly. If only one pet bird is to be fed, it can be given a lamb chop or cutlet bone left from the table, but again, no fat! I have seen people give parrots fatty bacon rinds and other fatty meats, and I am quite convinced that it is for this reason they sometimes experience trouble. A pet bird may also be given a chicken bone and will crack the drumstick and relish the marrow. No pork bones should be given as these are too rich and fatty.

Finally, I cannot stress too often, NO FAT!

SILVER SPRINGS,
BEAUFORT ROAD,
ST. LEONARDS-ON-SEA, SUSSEX.

E. WICKS (MRS.)

I understand that Mr. G. Smith has written enquiring about meat and proteins in the diet of parrots, and perhaps the following notes based on my experiences may be of interest to him.

With regard to Lories and Lorikeets I feel that there is no doubt at all that live food is taken in considerable quantities, and in captivity mealworms are always sucked dry, and never eaten whole. I do not think live food is essential to these birds, but it certainly seems beneficial, and having found a satisfactory regimen of feeding I am unwilling to change.

These are the only birds I keep on a strict diet consisting of Hastings Nectar diluted with the juice from stewed dates and sultanas, mealworms, and a few grains of soaked sunflower. I have had a pair of Yellow-backed Lories that have kept in perfect condition for 11 years. This length of time is not unusual for these birds which often seem to live to a great age, but I put them on this diet when I found that they suffered from fits when kept on a more mixed fare. Friends who have given these birds a wider variety of food seemed to lose their birds, so there was not much point in trying further. I think that live food is most essential.

With regard to the ordinary parrots, Amazons, etc., there seems such a wide variety of foods that must be eaten in the wild, and live food of a sort is probably eaten. The one thing that is certain about wild parrots is that their natural diet can bear little relationship to the food we give them in captivity. Some parrots will take mealworms, and others are not interested at all. I always give my birds nectar and soft food as well as seed, and many, particularly the Blue-headed, prefer soft food every time.

The Australian Parakeets including the Budgerigar are definite live feeders when given the chance, particularly when rearing, and they will eat a lot of mealworms then. Budgerigars certainly need to see other birds feeding on them to encourage

them to start, but once they acquire the habit they feed freely on live food. This habit of the Australian Parakeets taking live food was, I think, confirmed on the recent collecting expeditions undertaken by the Natural History Museum, South Kensington.

The habit of the Kea Parrot of New Zealand in reputedly killing sheep for their kidney fat is frequently quoted, and perhaps I may be pardoned for the following notes, which, while not strictly speaking of avicultural interest, may warrant some thought.

As a preamble may I mention that for over 40 years I have been connected with the Australian and New Zealand wool trade, and in the course of this time I have met many sheep farmers. Speaking generally this group of people once they get beyond birds that are harmful to sheep or other forms of agriculture, take little interest in birds.

A few years ago I was connected with a group of farmers who ran sheep in the high country where Keas are found, and I never met one who had himself lost sheep through these birds, or had actually seen a Kea attack one. All knew the story and it was always "Old Jim" or "Old Harry" who had supposedly lost sheep by this means. Eye-witnesses were, to me, non-existent. This does not necessarily prove that the stories are unfounded, but I think that they may well prove to be widely exaggerated.

It may be of interest if I give the results of my enquiries.

Until the introduction of pigs by Captain Cook in New Zealand, there were no mammals there apart I believe from a few mice, and the Maoris who did not settle in Kea country in any numbers. Prior to the arrival of the Maoris there were a race of people there called Moa Hunters, but nobody seems to know anything much about them. At any rate it seems more or less certain that there were no mammals in New Zealand until comparatively recent times. The native bush was therefore almost exclusively spread by means of birds, wind and insects. It was the solid pathless masses of bush that made the first settlers fear it so, and burn it off wherever possible. The Kea country was probably first put under sheep about 120 years ago.

Keas are highly intelligent birds, physically very tough, and equipped with a powerful beak. They also have a great sense of fun. One friend of mine used to go and visit a relative who was working on the marvellous fiord road near Milford Sound. The men were housed in wooden huts with corrugated iron roofs and snow fell frequently. At dawn the camp was awakened by the Keas who flew down to the ridge of the roof, and then slid down the slope for all the world like otters or children.

The late Sydney Porter, who had a pair of these birds in an aviary with a running stream spanned by a bridge found that the Keas dropped a tin in upstream, and then ran across the bridge to see it come out the other side. That Keas are highly mischievous is also true. If the hotels now opening in that area leave the windows open and unguarded, Keas will get in and rip the place to pieces. The above notes on the Keas' mental make-up are important. I have always thought that parrots, dogs and small children have a lot in common in what they find of interest. That much of this is concerned with minor destruction is also a fact. I do not know if we will ever see a parrot "Demo"—probably the activities of University Students are a little beyond them!

I understand that the high country where Keas are found was first stocked with Merino sheep from Australia, and the snow experience of these sheep would be slight or non-existent. This is another point that gives a clue to the whole puzzling business. The most likely explanation I heard was from a farmer who in the slump of the 1930s was forced to work as a shepherd in very high rough country—too rough to muster the sheep on horseback. All the work had to be done on foot. Incidentally he earned 30 shillings a week for this gruelling work, which does not seem much by present-day standards for this lonely and hazardous work. Many sheep became bogged down in snow drifts, and unless the shepherd or his dogs found them, which was not very likely, they died. This farmer suggested, and he had no great natural history knowledge, that it was probably the struggling and bleating of these sheep that brought the Keas down. Anyone who has kept mixed collections of birds has seen how something unusual, a frog or a mouse will bring all the birds down to look at it and the same thing applies if a bird catches itself up anywhere in an aviary. Parrots particularly are very prone to attack anything in difficulties.

We therefore come to a situation where an alert active bird sees something of which it has no race experience at all, struggling and crying in a snowdrift. What is more natural than that the Keas should come down, and, if they found that the strange object was harmless, should give it a hefty bite? The long powerful beak of a Kea would rip a sheepskin easily enough. I do not know if the bit about the kidney fat is factual, or is just a trimming. There is another theory that the birds were first brought down to the drying frames where the skins of slaughtered sheep were hung before shipment, but if this was the case I should think that it must have been flies that they were after. The country lived in by the Keas is heavily stocked with deer, but I have never heard of an attack on these animals. I suggest that deer being more accustomed to snow do not often get bogged in snowdrifts.

I managed to get a friend of mine interested in the problem, and he arranged a trip to try to get some facts. As he knew most of the station owners personally it would have been a good test but unfortunately he died before he could undertake the journey. Surely we have members in New Zealand who could track down this fascinating story, and there must have been some research done on what has become one of the main legends of ornithology. I may be wrong but I have a feeling that this is a classic case of where an incident has been built up into a legend.

I may be wrong and the Keas may live on sheeps' kidney fat, but if I know anything of New Zealand sheep farmers, if there had been very much truth in the story the Kea would have followed so many other New Zealand birds into extinction before the turn of the century.

This story apparently started about the 1860-70s and it is as well to look at the background of the whole thing. The South Island of New Zealand, or at any rate the southern part of it, was colonized by Scots, men who in their native land had had to cope with the attacks of eagles and foxes on their flocks. New Zealand possessed neither of these, so any further predation was unduly obvious. It is hard these days to realize the absolute isolation of these mountain sheep stations in the early days. They are hard enough to travel in now but before the country was widely settled the loneliness must have been frightening. The absence of any wild animal or other human for many miles must have led to much family talk over firesides and ideas must have become a matter of folklore, much as it was in the Scottish Highlands. The general opinion nowadays of the Victorian woman is of a frail fainting creature. This may have been the case with those in England, but anyone who thinks that the women who opened up the country in Australia and New Zealand, South Africa or South America were of that type would be well advised to think again. One of the greatest hardships was lack of news or indeed anything to think of but their daily hard round. The men always had things to do away from the Station, but the women were literally tied down. Any story, true or false was passed on, and in the absence of any firm news such stories as that of the Kea were passed into folklore. If anybody can add to the foregoing, I shall be pleased to hear.

While on the subject of New Zealand birds, I would mention that a colleague of mine made a detailed tour of New Zealand Sheep Stations recently, and in the course of this journey stayed at a Station in the South-East of the North Island named Huiarau. This is an old established station, and is named after the Huia bird. The name is pronounced hoo-yah. The Huia is, I believe, extinct or nearly so, but its main claim to fame is that the birds possessed long ivory coloured beaks, that of the cock being shorter and heavier for chopping open old logs, and the hen having a longer probing bill. The bird is about 19 in. long.

The bird was apparently shot out as no Maori considered himself well dressed without a Huia beak hanging on his watch chain. There is a rather curious parallel here with the Ivory Billed Woodpecker of Florida which was driven to near extinction for the same reason. Man has wiped out numerous species of animals and birds for one reason or another, but these are the only two cases I know of where birds were driven to extinction by male adornment.

BRACKEN,
UPPER CORNSLAND,
BRENTWOOD,
ESSEX.

HERBERT MURRAY.

The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

THE AVICULTURAL SOCIETY RECEIPTS AND PAYMENTS ACCOUNT

Year ended 31st December, 1969

RECEIPTS		PAYMENTS		RECEIPTS ANN PAYMENTS ACCOUNT			
	£	s.	d.		£	s.	d.
To Balance at Bank, 1st January, 1969	557	14	11	By Printing and Publishing Magazine	2,628	5	6
" Subscriptions	2,101	7	1	" Colour Plates	389	15	0
" Donations	116	0	11	" Artists' Fees and Photographs	34	14	0
" Sales of Magazines	456	8	11	" Sundry Printing and Stationery	143	0	10
" Sales of Books	238	19	6	" Printer's Service Charges	29	4	0
" Sales of Waterfowl Rings	11	18	6	" Honoraria	225	0	0
" Sales of Colour Plates	6	0	0	" Secretarial Expenses	104	0	0
" Advertisements	260	0	0	" Preparation of Index	15	15	0
" Dividends	94	19	10	" Expenses at Council Meetings	8	12	2
" Miscellaneous Receipts	18	0	0	" Medals and Awards	1	12	10
				" Donations	5	0	0
				" Bank Charges and Cheque Books	5	16	6
				" Postages	73	17	6
				" Miscellaneous Expenditure	28	19	1
					3,693	12	5
				" Balance at Bank and Cash in Hand, 31st December, 1969	150	15	3
	<u>£3,844</u>	<u>7</u>	<u>8</u>		<u>£3,844</u>	<u>7</u>	<u>8</u>

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LONDON.
31st January, 1970.

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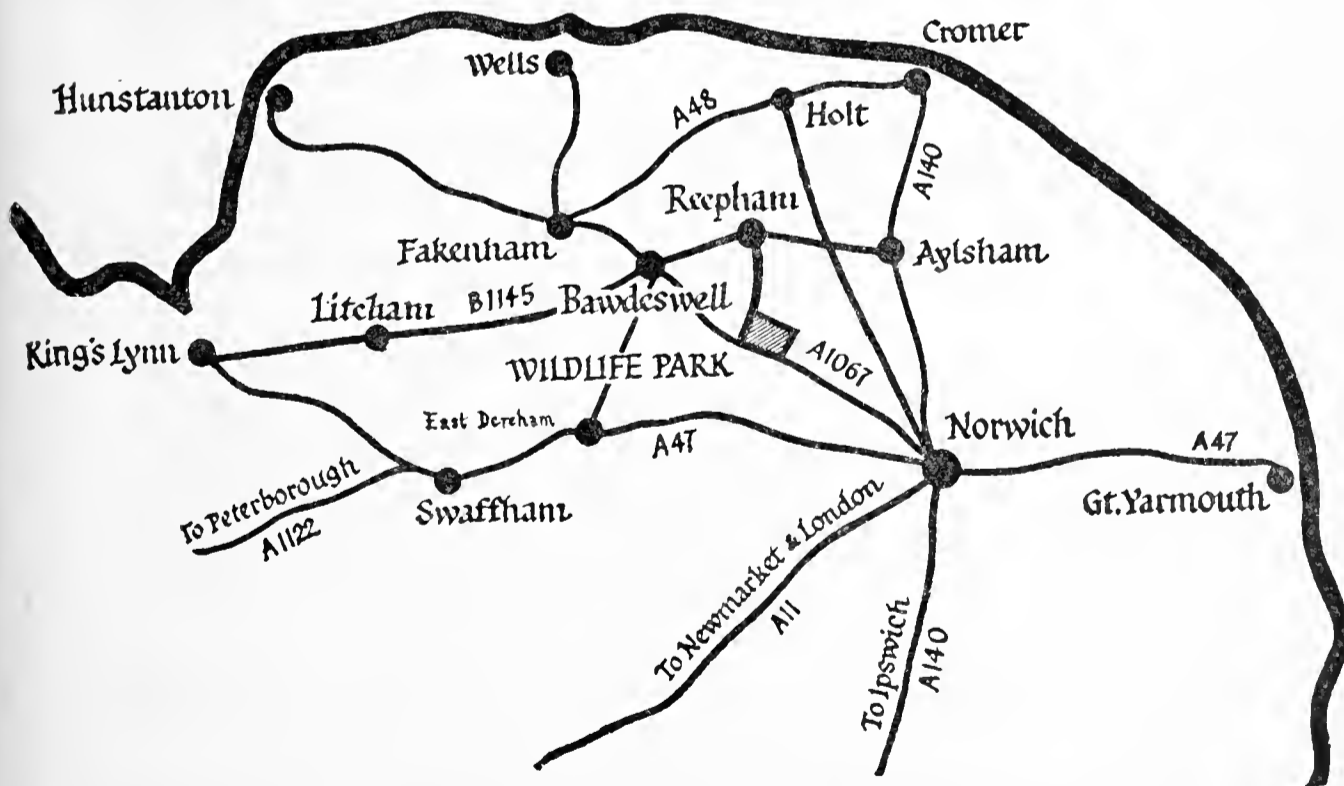
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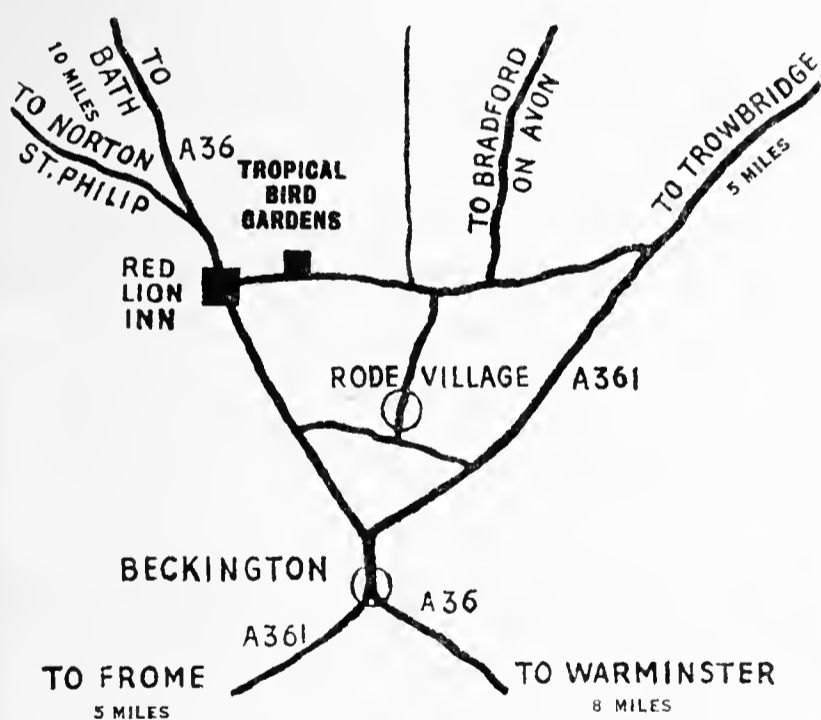
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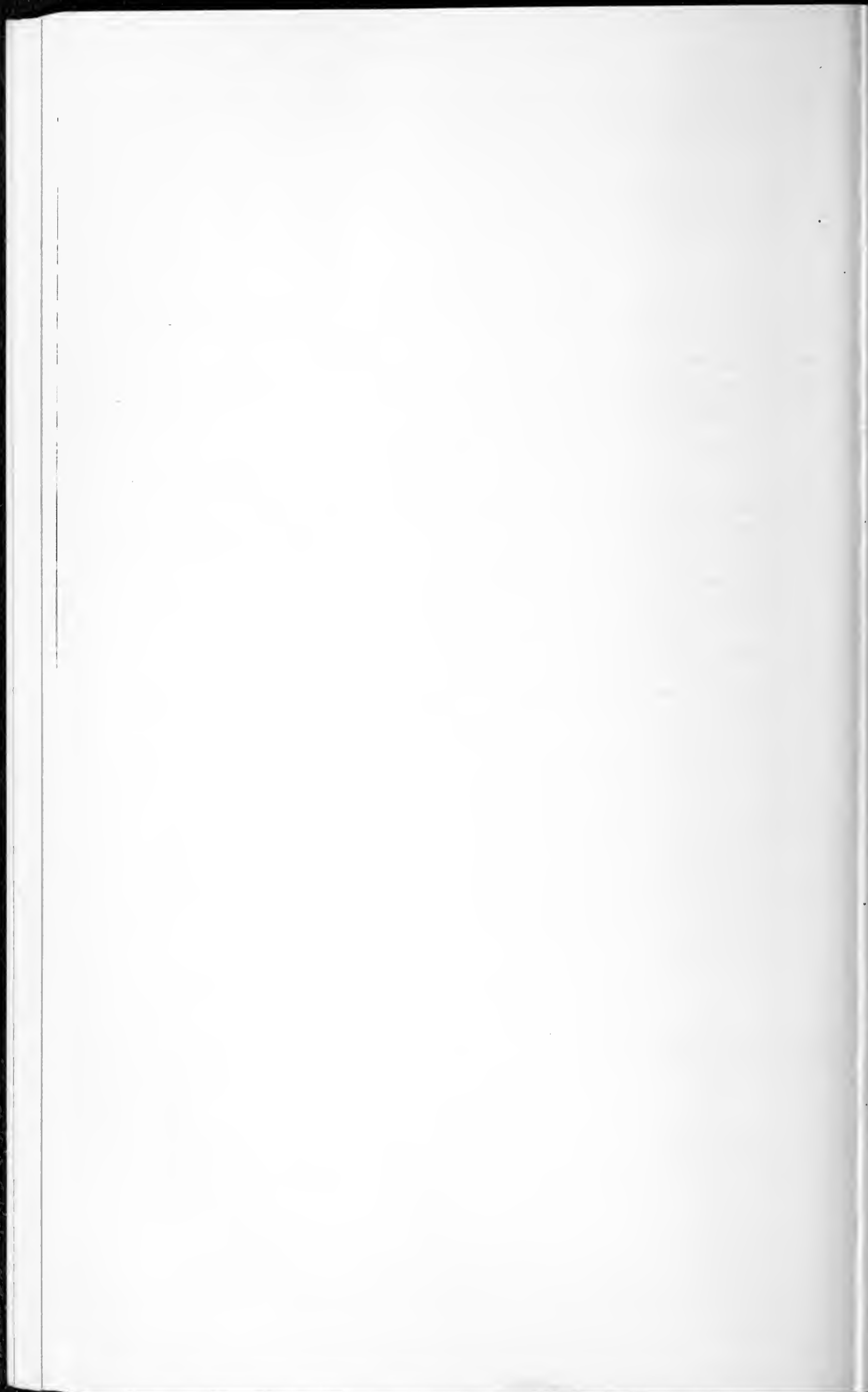
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THE AVICULTURAL SOCIETY

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NATAL PYGMY KINGFISHER

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MAY-JUNE 1970

THE NATAL PYGMY KINGFISHER

(*Ispidina picta*)

By D. M. REID-HENRY (Woodford Green, Essex, England)

There are two species of tiny kingfishers in Southern Africa which can be confused in a casual examination. They are the Malachite kingfisher, *Corythornis cristata* (Pallas) and the Pygmy kingfisher, *Ispidina picta* (Boddaert).

It is with this latter that we are now concerned, and particularly with the race *natalensis*. Briefly the main difference is in a matter of habitat. The Malachite kingfisher is a bird of the rivers and the environs of open stretches of water, whilst the Pygmy kingfisher is predominantly a dry-country bird feeding mostly on grasshoppers, tiny lizards, caterpillars, beetles and the like, often very far from any water.

Its nest is in the typical hole in some earthy bank, and is in every respect similar to that of almost any other member of the family, but the site chosen is more often the side of a termite mound into which the bird excavates the tunnel, rather than the softer, sandier site of a river bank.

The extra work involved in digging a hole through a hard sun-baked surface finds its effect in the greater wearing down of the bill, for it is very noticeable how short the beak of this bird is compared to that of a Malachite kingfisher. In captivity when the bird is relieved of all this hard work, the beak quickly becomes overgrown and out of character, despite the lesser work involved in smacking its bill against a perch in order to stun its food, which kingfishers always do!

There is not much of a white patch on the lower cheek where the Malachite carries a considerable flash, and the back of the neck is chestnut where the Malachite is blue-violet. However, there is only an iridescent small blue patch below the ear-coverts, whereas the whole of the side of the Malachite's head above the eye is blue-mauve or violet.

It is on the crown that the main obvious difference is to be seen; for the Malachite kingfisher erects an extraordinary barred and tipped black shaped tiara of long emerald green crest-feathers, in moments of excitement. The Pygmy kingfisher wears no such adornment but instead its crown centre from bill to nape is rich ultramarine blue barred with black. They are both most beautiful little birds.

The Pygmy kingfisher is much addicted to migrating at night and frequently is attracted towards lighted windows, where it often either enters houses, if the windows are open, or breaks its neck against the glass.

In one case I was told about the bird that flew into an African's house and was promptly skinned and eaten as part of the man's supper!

In another case the bird was taken alive and unharmed to school by a small boy who wanted to give it to his nature-study teacher. This lady brought it along to me in a shoe-box and I agreed to have some decent accommodation made and look after it.

I would like to describe the cage I had made for this bird in some detail because it has served me well for several purposes. It was made strongly so as to serve as a packing case as well as for other purposes. The top, when it is used as a cage is a fine mosquito mesh of copper wire, whilst the front is a sliding sheet of plate-glass, going into position from the top. The door is the side which opens as two wings and which can be screwed in solidly, or left as a door as required. The rest of the construction is of oil-bound hardboard on a stout wooden frame. It serves equally well as a cage for birds or insects, whilst the overall size is enough to give a lot of room.

The floor I covered with dead leaves and sand and I placed a water container and the daily ration of live insects, geckoes, etc., inside by simply lifting the glass front a few inches. Perches were natural branches which were laid on the floor so that the twigs could stand up in interesting positions to show off the bird.

In this cage I kept the kingfisher for about six months until it was time to return to England, when I took him out into the bush and let him go.

Feeding involved a daily stint with a butterfly net in the vlei to catch grasshoppers. Another stint with the net indoors after sundown brought me a ready harvest of moths and beetles. I found it astonishing to see how large an insect this tiny bird could swallow: large moths of the common sort would be divested of their wings and then swallowed without difficulty, but there was a danger from large and powerful grasshoppers whose enormous kicking power had to be curtailed for fear of the little bird's losing an eye.

Whilst this bird is as I have said a species of the dry country in the main, he was very keen to take several baths a day and was always ready to retrieve any food from under water, and I believe its dry-country habitat is a comparatively recent adaptation. There are other kingfishers in Africa and Asia which behave in exactly the same way.

It is evident that as a family kingfishers are very adaptable to change in dietary habits, but they have little stamina to withstand cold or the effects of prolonged fasting.

In general they are peaceable birds and may be kept in company with other species without danger. I look forward to a time when it will be possible for me to keep some of the other African species and compare my notes.

Certainly I have found kingfishers always rewarding in every way and look back on this particular bird with great pleasure, counting myself

singularly fortunate in having had the opportunity to study such an interesting bird so closely for so long.

He could stand up and look as thin as the proverbial rake, or he could sit down and look almost spherical in shape. I never saw him sit on one foot, and because of their shape and structure it would not seem possible to maintain the position for long. Their feet are short and set widely apart so that it would seem hard to balance the centre of gravity over one foot. I have kept several kingfishers as opportunity came, and I have never to my recollection ever observed them to sit other than on both feet, except to scratch their heads, or to stretch. Another reason why such a posture would be difficult lies with the structure of the toes. Like all members of the order *Coraciiformes* the proximal half of their outer toes are stuck together with the middle toes in a common sheath and so cannot be spread out to distribute weight. Hoopoes, by the way, do not have the same degree of restriction as most other members of the order.

It is a matter of wonder to me that birds with such beautiful plumage as kingfishers can bring up their young in the squalid conditions of the nest-hole. All the kingfishers, hoopoes, bee-eaters, rollers and hornbills whose domestic arrangements I have studied are united in their indifference to filth of the most offensive kind. One would imagine, if in ignorance of the provision of nature against it, that tiny growing feathers would become ruined by ordure long before the time came for their owners to leave the nest, but the truth of the matter is that these birds retain the spiny sheath in which the feather is encased during growth until almost the time when they are fully grown. Thus they are wonderfully preserved from contamination, and the plumage breaks out of the sheath only when the young birds are nearly ready to leave. They emerge from the tunnel all with unspoiled feathers and thereafter sit around on perches near to the tunnel entrance whilst awaiting food from their very industrious parents.

Unlike the passerine birds which bring at one visit enough food to supply morsels to each of their offspring, kingfishers usually can feed only one youngster at each visit. On the other hand, there is usually much more substance in one feed to a kingfisher than in one mouthful to a thrush. Nonetheless, the comings and goings of parents of these birds are very busy affairs and the industry prodigious, for the number of young in a brood is high. In the case of the Pygmy kingfisher the brood is, according to Roberts four to six, but in some other species the number is frequently eight or even more. As is so often the case there are casualties in the nest, and not all eggs laid actually hatch. Of those that do, some young get neglected and die, but the quantity of insects, particularly grasshoppers consumed by the survivors must be great.

One is disturbed to learn that the use of DDT is on the increase in various parts of Africa in an attempt to clear areas of harmful insects, but the damage to beneficial birds may well be a far greater evil in the end.

* * *

INDIAN RINGNECKED PARRAKEETS

(Psittacula krameri manillensis)

By DR. L. A. SWAENEPOEL (Lembeek, Belgium)

Indian Ringnecked Parrakeets, and indeed all the allied species, have always been great favourites of ours. Most of all, however, our hearts are sold to the beautiful mutations of *Psittacula krameri manillensis*.

We used to be the very proud owners of a pair of blue Ringnecks, who gave us three lovely youngsters in 1967 and again in 1968. Last year, however, the hen went down very early—as she usually did—but only one egg of the clutch of four was fertile. This hatched on 10th April, when it was bitterly cold after a deceiving spell of sunny Spring weather. This youngster died at the age of 10 days. It did not thrive well during the last two or three days, and I had no opportunity to put it under another hen. On the other hand, I was loathe to bring the baby in into the trustworthy hands of my wife, as I did not wish to wear her out so early in the year. As a matter of fact, she was put to very good use some months later, to try her hand at rearing Kings from the egg.

As it was, the old blue Ringneck hen went down a second time. All four eggs of this most unusual second clutch were fertile, and expectations were high. On 8th June, the hen was found dead in the nest. The eggs, due to hatch on 10th June, were tried out under Cockatiels, but unhappily all were dead in shell.

Post-mortem of the hen showed a huge haemorrhage in the lungs, in the abdominal cavity and in the crop. Apparently, the right atrium of the heart had burst. This hen died as the perfect symbol of the excellent mother: she had been covering the eggs even while her body grew cold and was discovered in the attitude of brooding.

Bearing in mind that one pair of a certain species—or of a mutation thereof—is a very poor and hazardous way to success and to build up a breeding strain, we had paired up several other birds. Two acquired split blue cocks 1967 were paired up to two of our own bred hens of that same year. The blue hens seemed a certainty: anyone could easily tell the more slender bills, the differences in the size and shape of the heads, the more elegant feet and also a decidedly different hue of the iris. The behaviour, too (many times observed), pointed the same way: the hens always sat close to the cocks, and we were delighted to possess such well behaved and loving young pairs.

Being of a rather impatient nature, I had, on several occasions, plucked some small feathers in the nape of each one of these four birds, so as to see if new feathering would show a trace of the black collar of the male.

The green split blue cocks showed some of this male colouring in the autumn of 1968, but the two blue hens, true to my expectations, grew back the blue female feathers, even when I plucked their napes in March 1969. I must confess, that I was gradually becoming prouder in my abilities for sexing immature Ringnecks. The two young pairs did not visit the provided nests, as we had hoped; still, one must not be too severe with two-year-old Ringnecks.

However, in the moult of 1969, the two blue hens grew themselves a lovely black collar; those two simulators have, since then, been two lovely, lively cocks.

In the meantime, we had built up another pair of blue Ringnecks; unrelated 1968 birds of our own breeding. The supposed hen of this young pair eventually suffered from a very bad moult, for which I have found no explanation; in fact, she went nearly bald in a few months time. No sign of plucking nor of new growing feathers, in spite of a varied diet and a supply of vitamins. I found her dead, nearly-naked body hanging on the wire netting on a cold August morning. Indeed, post-mortem showed that she was a hen. The remaining 1968 bird that had been living in the same aviary, looks like a cock though no ring is as yet visible. Still, I'd not take a bet on him!

Our last pair of this mutation consists of a blue hen with a broken and partly overgrown lower mandible, probably due to an accident when she was quite young. Occasionally, we have to catch her in order to clip the broken part of this lower mandible. She can feed all right and is in good condition, but apparently she is unable to feed a baby: on two occasions, she had newly hatched youngsters that died with an empty crop. Her mate is a green cock split for blue and for lutino; he was loaned to us by a friend. In 1966 and 1967 this pair were living at our friend's establishment; both years they had fertile eggs which never hatched. On taking them over to our aviaries, we decided to foster her eggs out with a reliable pair of normal green Ringnecks, excellent parents, while the blue hen was able to brood the green's eggs, with no results.

In 1968 we reared from this pair two blue youngsters, the third egg being infertile. This made it easy to divide the clutch, sticking to the breeding-terms.

In 1969 this pair had again three eggs, one of which was clear. Upon hatching under the normal green hen, on 26th April 1969 we noted a black-eyed and a red-eyed baby. Then the suspense started! Would the red-eyed baby turn out to be an albino? I wonder if any nest has ever been so closely surveyed. We had to wait about three weeks, wondering if the first pin-feathers were going to be white or yellow and, in the end, hardly believing that they were white, indeed! This albino baby, a hen of course, grew in a most lovely way; indeed, she has always, from hatching, been taller and heavier than her green brother (?). Having heard of the mishap of Mr. Rudkin, when he bred his first specimen of

albino Ringneck in California some years ago, and unwilling to risk its being killed by the foster-parents, the albino and the green were taken out of the nest at the age of four weeks, the albino showing a very slight sign of feather-plucking on the back. My wife hand-reared them nicely. They are very easy and gentle birds, and hand-rearing was no trouble at all. It is perhaps interesting to note that the albino when feeding had the crouching attitude of a female, while her green brother (?) stretched head and neck to be fed. Weights were respectively 165 gm. (for the albino) and 140 gm, on 25th May 1969, the day after the babies were taken into the house. They learned gradually to feed, first in a big cage and later in an inside aviary, they were then put into an outside aviary where the lovely tame youngsters turned into rather mistrusting birds.

The albino hen and her green split blue brother (?)—he might be split for lutino, too—are now out of the country in our friend's collection. The albino is, of course, not a common bird and, to our knowledge, the fourth ever bred. Mr. Rudkin had one killed in the nest some years ago but managed to breed a new one in 1968, I believe. Another one was previously reared at Keston Bird Farm but was lost after some months.

We hope to breed more of this lovely mutation and eventually to be able to build up a strain of them. The hen is pure white with red eyes, rosy beak without any trace of black and chalk-white feet. The cock should show a black collar, presumably with a rosy lining.

In the meantime we are much in trouble with our blue and split blue cocks, for which blue partners do not seem available nowadays. We have written many letters, but to no avail up till now. We are really feeling rather "blue" about it!

* * *

BREEDING THE FIRE-FRONTED BISHOP

(*Euplectes diademata*)

By E. NØRGAARD-OLESEN (Janderup, Denmark)

For the last three years I have been the happy owner of these small, beautiful weavers, the Fire-fronted Bishops, *Euplectes diademata*. The male in breeding plumage has a reddish-orange forehead, the rest of the head, neck and underside black, wings blackish with feathers edged with yellow or buff, the tail ashy and the under-tail coverts golden-yellow. The bill is black. The female has the typical streaky plumage of a weaver, streaked buff and black above; throat, upper breast and flanks buff with some darker buff streaking, and lower breast and belly white. The primaries show yellow edges. The bill is horn-coloured. The non-breeding plumage of the male resembles that of the female. In the wilds this species occurs in a limited area of eastern Kenya and Tanzania.

According to Mackworth-Praed and Grant (*Birds of Eastern and North-eastern Africa*, vol. 2 (1955)), the eggs, nest and habits of this species are undescribed.

In 1968 I discovered a nest containing a single egg in the outdoor aviary, but I never found out which bird had made it. This outside aviary measures $4 \times 5 \times 2.5$ m., and the ground inside is covered with grass except for a third which is covered with a *Juniperus chinensis*. There are several branches of elm in it. There is an inside aviary, $2 \times 2 \times 2.5$ m., and in addition the birds also have access to a greenhouse, $3 \times 1.5 \times 2.5$ m. The greenhouse is planted with vines and wildflowers. During the winter the birds are housed in the inside aviary.

At the end of May 1969 there was another nest, this time containing two eggs, plain turquoise blue, and I later discovered that the bishops were the owners. The nest was made of coconut-fibre. The only other material available to them was the grass and they used a little of this. At first it was possible to see the eggs easily through the nest, but gradually more fibres were added, until it was difficult to spot them. During incubation the male would eagerly follow the female when she was out of the nest, apparently trying to drive her back again, but she would not go to the nest in my presence.

At last one young one left the nest. It was similar to the female in appearance, only a little paler, and with an almost white bill. I estimated that the incubation took about 14 days and the young left the nest when about three weeks old. The food consisted of a mixture of seeds and mealworms. The food available in the aviary was a seed mixture of many kinds of millets, canary seed, and grass-seed. As they share the aviary with different fruit-eating species they also had access to fruit and nectar, but I do not think they used much of this; nor did they appear to touch the green plants much, but with other birds present it was difficult to observe the feeding habits. By November it was apparent that the young one was a male and it was beginning to weave nests, but was still in juvenile plumage, and at present (January 1970) has not yet moulted into breeding plumage.

* * *

THE RED-CAPPED PARROT

(Pionopsitta pileata)

By ROSEMARY LOW (Sidcup, Kent, England)

At the end of May 1969 I was offered three little parrots, of whose identity I was at first uncertain, until I remembered a plate in the AVICULTURAL MAGAZINE for October 1905. On reference to H. Goodchild's beautifully drawn and coloured illustration, I was able to identify them as Red-capped Parrots *Pionopsitta pileata*—two males and a female, I believed. The "female" unfortunately moulted out into a male.

In appearance these parrots are not unlike a large Abyssinian Lovebird, the male being green, darker above, with the forehead and part of the crown scarlet, with a little scarlet surrounding the eye. The ear coverts are very faintly tinged with red. The outer edge of the wing, the primaries, and the tail are tinged with blue. The immature cock has no red on the head, except the faint tinge on the ear coverts. The adult hen also lacks the red forehead but may be distinguished from immature birds by a small area of blue on the forehead, which is not very pronounced. The total length is only 8 in., the body being rather plump, the tail short and square.

The London Zoo exhibited this species as long ago as 1877 and subsequently in 1883, and 1894 or 1895. I can trace records of only two other importations into Britain. In 1904 F. C. Thorpe of Hull imported several, one of which was exhibited at the Crystal Palace show that year, gaining a fourth prize. In 1905 there were a pair at London Zoo and a single male in the possession of Hubert Astley, presumably from this consignment of Thorpe's. In 1923 Astley received two pairs and commented (AVICULT. MAG., September 1923, page 217) that he believed that none had been imported since 1905.

I was therefore congratulating myself on having acquired these little rarities when, two or three weeks later, about 20 more turned up. Unfortunately, several fanciers who had pairs of these birds lost them almost at once. I did acquire an adult hen from this consignment, a very nervous bird unlike the three cocks who are exceedingly steady, but she died after three months.

A veterinary surgeon and fellow member of the Avicultural Society kindly carried out a post-mortem on the bird for me and concluded that death was due to lack of vitamin A, associated with a secondary yeast infection.

It therefore follows that a varied and nutritious diet with added vitamins is essential. All my birds have "nectar" which is made from half a pint of hot water to which has been added three teaspoonfuls of honey, two of rose-hip syrup, one of Cytaccon (vitamin B₁₂) and a few drops of ABIDEC

(multivitamin solution). The nectar is eagerly taken by the Red-caps, also grapes and apple, and any wild or cultivated greenfood in season, as well as most other fruits which are offered.

They are very fond of spray millet, also peanuts, sunflower and canary seed but they ignore white millet and hemp.

They are very sociable little birds, rather like Budgerigars in their behaviour in that they constantly preen each other and warble in their soft, inoffensive voices; but, unlike Budgerigars, they are gentle, sweet-tempered and peaceable. They are therefore quite perfect birds for keeping as pets. A single young one would undoubtedly quickly become tame, for they appear to have little fear of people.

I put the three cocks in an outdoor aviary in June, where they seemed quite happy in all kinds of weather. In November I transferred them to an eight-foot flight in an outdoor birdroom so that they should have the benefit of electric light and longer feeding hours. Later in November, one of them begun to show the same disease symptoms as the hen which had died—tail pumping and a slight discharge from the nostrils. The temperature was around 38°F at the time so I brought the bird indoors to a living-room temperature. It soon recovered and appeared quite normal but when I returned it to the outdoor birdroom, the tail pumping started almost immediately.

It would appear that this species is not really hardy so I caught up all three birds. They have spent the winter indoors and appear very fit and healthy. A pair in the possession of another fancier also showed signs of discomfort in cold weather and were brought indoors for the winter. It therefore seems that these little parrots should not be subjected to the vagaries and variations of an English winter outdoors.

This species is a native of the forest regions of south-east Brazil and Paraguay. It is to be hoped that all those fortunate enough to have pairs in their possession will do their utmost to breed from them, although I doubt that a single pair would go to nest. Sociable birds such as these normally need the stimulus of the presence of at least one other pair. It would be a great shame if last year's consignment proved to be an isolated one.

* * *

THE BEHAVIOUR OF CAPTIVE PURPLE GALLINULES (*Porphyrio porphyrio*)

By D. T. HOLYOAK (London, England)

The Purple Gallinule is a bird of extensive reed swamps and other dense vegetation of waterside habitats, and the difficulties of observation of this species in the wild have prevented studies of its behaviour. A population of from seven to nine individual Gallinules is kept with many other birds in the huge Snowdon Aviary at the London Zoo. These captive birds live in an open grassy area so that prolonged observations on their behaviour are readily made. This article summarizes information obtained by watching them at intervals from January 1969 to February 1970. Most of the observations were made on the grey-headed subspecies (*P. p. poliocephalus*), but less detailed observations were made on the blue-headed, green-backed subspecies (*P. p. madagascariensis*) kept in a smaller enclosure. The behaviour of the two subspecies appeared to be identical.

Purple Gallinules are long-legged, chicken-sized rails, with bluish plumage, heavy red bill, red frontal shield and reddish legs. The various subspecies are distributed from Spain, Africa and Asia to Australia and New Zealand, occurring mainly in extensive reed swamps and other semi-aquatic habitats, but sometimes in drier areas. Gallinules walk and run strongly, although their flight is rather weak with trailing legs. They swim strongly, but apparently only do so when pressed to escape (Falla *et al.* 1966, Ali and Ripley 1969).

From the literature they would appear to be social birds, usually seen in parties or flocks, and Harrison (1970) has given evidence from the same captive birds as I studied showing that more than two birds are often involved in single nesting attempts. The captive birds studied appear to call less often and less noisily than this species is reported to do in the wild (Oliver 1955, Mackworth-Praed and Grant 1957, Falla *et al.* 1966, Ali and Ripley 1969), probably because social contact is possible in their open, grassy enclosure with less frequent vocalisations than are needed in their natural habitats. But for this difference, and certain differences in their feeding behaviour (see below), there is little reason to suspect that the behaviour of these birds differs much from that of wild Gallinules.

MAINTENANCE BEHAVIOUR

Gallinules use similar behaviour patterns in caring for their plumage and soft parts to many other water and marsh birds, but they do show some noteworthy peculiarities. They bathe standing in shallow water, by making ducking movements of the head in bursts alternating with

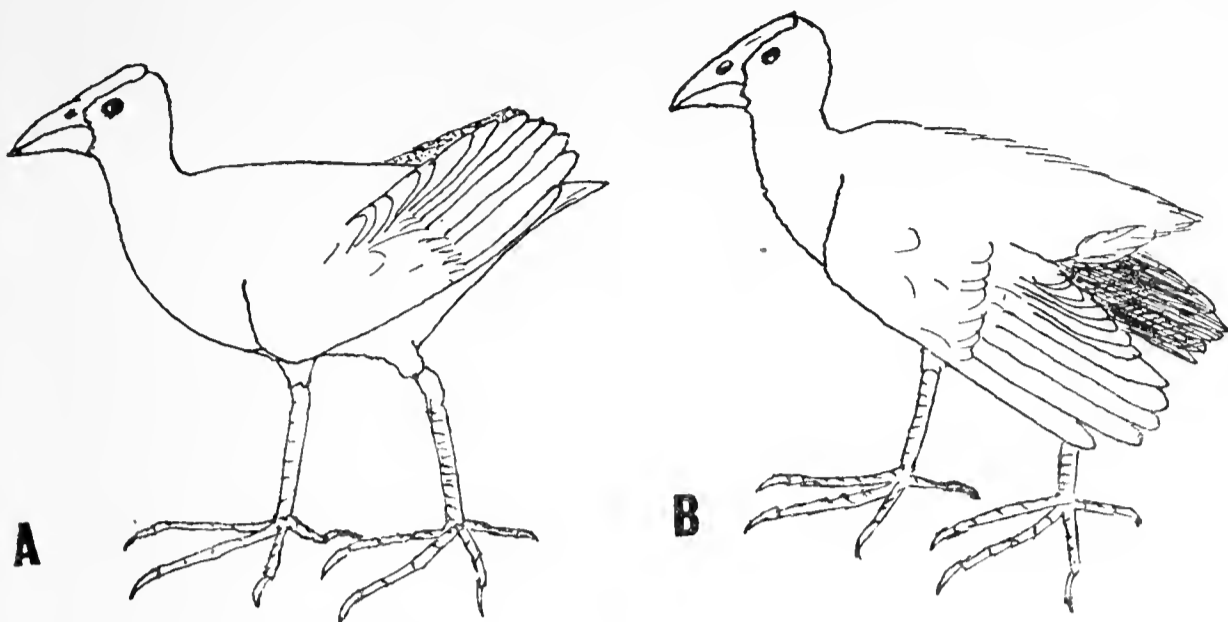


Fig. A. Anointing the insides of the primary feather tips with preen oil
(see text).

Fig. B. Sun-bathing posture, medium intensity.

bursts of flapping the part-opened wings. Coots (*Fulica atra*) and Moorhens (*Gallinula chloropus*) also bathe when standing with their feet on the bottom of breast-deep water, resembling the less aquatic Water Rail (*Rallus aquaticus*), African Black Crake (*Limnocorax flavirostris*) and Tasmanian Native Hen (*Tribonyx mortieri*) in this, but differing from ducks, grebes and other water birds.

After bathing they leave the water to preen and oil the plumage. Shaking movements are usually made first, then the bird nibbles its oil gland, often making rapid drinking movements in short series; then it systematically applies preen oil to the scapulars, mantle and body feathers, as it rearranges them. The tips of the part-opened wings are usually rubbed over the preen gland, apparently to oil these inaccessible parts of the body (Fig. A). The head is preened by scratching with the foot (lifted under the closed wing), only the claw of the middle toe being used. The feet are cleaned by nibbling with the bill, and the bill is wiped (sometimes rubbed) against projections, occasionally scratched with the foot as in head scratching.

Sun-bathing is commonly performed whenever the weather is at all bright, especially after bathing and the subsequent bout of oiling and preening. Sun-bathing Gallinules stand in a peculiar position with the wings extended, part-closed, on each side of the tail, or twisted downwards, or in positions intermediate between these (Fig. B). Ali and Ripley (*loc. cit.*) note that in India this species often clambers up reeds to sun-bathe in groups on misty mornings. Sun-bathing is often followed by preening and oiling of the plumage, even when bathing in water has not been carried out. Peculiar sun-bathing postures similar to those of Gallinules are also used by other rails, including Water Rail, Moorhen, Wood Rail *Aramides cajanea* and Tasmanian Native Hen (pers. obs. on captive individuals).

Occasionally I have seen Gallinules sun-bathing while sitting on the ground, with their legs projecting forwards under the body, all four toes held apart and pointing forwards, and the wings closed.

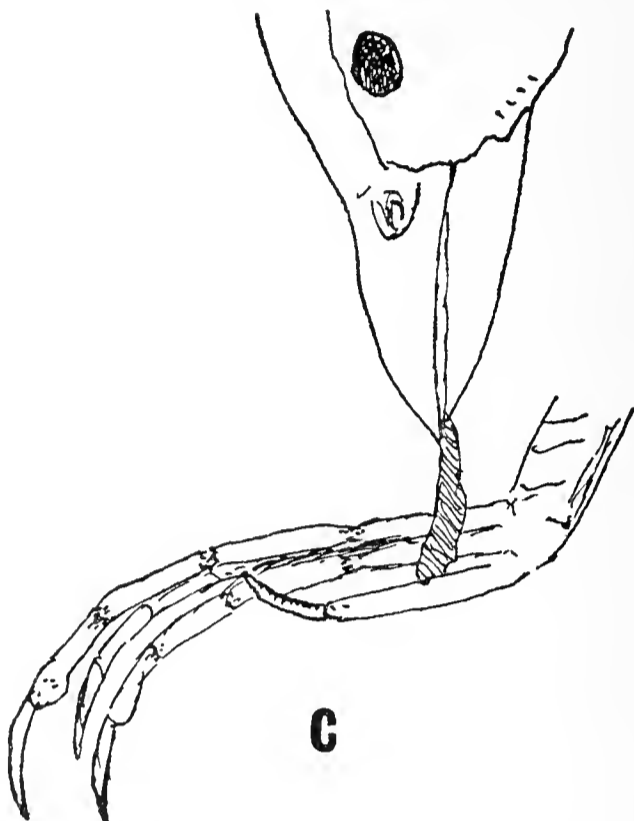


Fig. C. Use of the foot to hold food.

FEEDING BEHAVIOUR

The literature shows that Purple Gallinules are virtually omnivorous, eating leaves, stems, seeds, grain, flowers, insects, molluscs, leeches, fish, carrion, water snakes and a wide variety of other foods (Oliver 1955, Mountfort 1958, Ali and Ripley 1969, Falla *et al.* 1966, Dement'ev *et al.* 1969). Captive birds were seen to take vegetable matter by nibbling low plants, pulling trailing branches down with the bill, clambering in bushes, grubbing amongst soil and ground litter, and by lifting submerged water weed in the bill. After food has been picked up in the bill it is very often transferred to the feet and manipulated with them. Food is held in the feet by apposition of the hind toe with the three closed fore-toes (Fig. C), weed is combed with the fore-toes as it is held dangling from the bill, and the feet are sometimes used to hold down large food objects while they are pecked (e.g. fish and carrion meat).

Strijbos (1955) records a Gallinule eating the eggs in two egret nests in an African heronry, and I watched this species stealing the eggs from the nest of a pair of medium-sized captive babblers. The Gallinules clambered through the outer branches of a thick laurel bush to reach this nest, ignoring attacks and noisy threats from the parent babblers; eventually one Gallinule forced its way through the branches to reach the nest, and ate both of the two eggs which were in it.

Captive Gallinules persistently use the feet to hold food when they are nibbling it, often "wasting time" transferring food from the bill to the feet which could have been swallowed directly. Rowley (1968) records the use of the feet when feeding on small figs picked from the ground, but suggests that this is a special adaptation to fig eating.

However, use of the feet in feeding is probably of great importance to Gallinules feeding in their natural reed-swamp habitats, both in enabling them to feed from weed held above the surface of shallow water, and to feed on stems and seed heads pulled down with the bill. The behaviour has probably been retained in captivity only because it is an inherent part of their feeding behaviour, not because it is useful in these highly modified conditions. Young Gallinules attempt to hold food in their feet from when they are about two or three weeks old, and do so successfully when they are half to two-thirds grown.

These captive birds obtained flies and other small, winged insects by picking them from the surface of shallow water, and earthworms and snails by shovelling aside gravel with the closed bill, pushing stones aside using the frontal shield. Food of many kinds was often carried in the bill to water, and washed before it was swallowed.

TAIL-FLICKING

Purple Gallinules, like many other rails, have white under tail coverts which contrast strikingly with the darker plumage surrounding them. The patch formed in this way is used as a signal marking to warn other

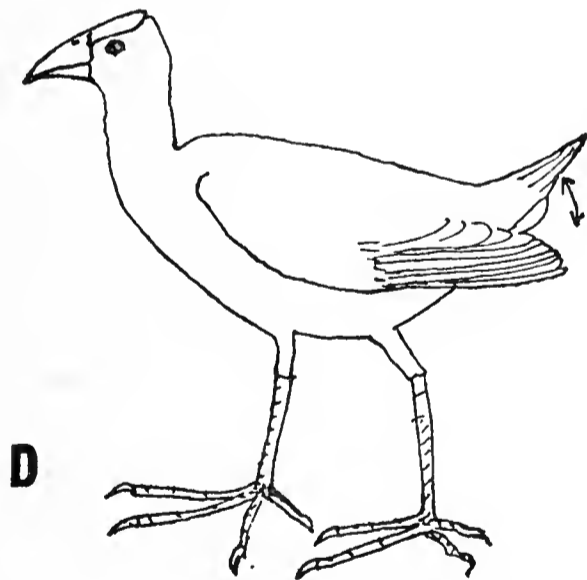


Fig. D. Tail-flicking of alarmed bird.

birds of the appearance of a potential predator, and it is emphasized by tail-flicking movements (Fig. D). Tail-flicking and other behaviour also functions in territorial (aggressive) display (as in the Moorhen, Howard 1940), and probably in providing a following signal for the young when the birds are moving through thick cover. Tail-flicking seems to be

performed as a response to anything which frightens the bird. It is performed indiscriminately whether it happens to be preening, incubating, bathing, sun-bathing, feeding or resting at the time. Tail-flicking was also seen from birds which were apparently giving self-assertive display to drive other birds away. The Moorhen spreads the (larger) white patch on its under tail coverts in territorial threat, but does not flick its tail. In this display of the Gallinule the tail-flicking seems likely to have been derived from the alarm tail-flicking, as fear, excitement, or anger, could produce this response in both situations.

CALLS

As mentioned above, the captive Gallinules studied seemed to be unusually quiet by comparison with the information given in standard books, probably because of the lack of cover in this artificial environment. Falla *et al.* (1966) list an ear-piercing screech—*kwee-ow*; a draw out, almost booming *poo-koo-koo-koo* call; a sighing *kwee-uk*; an anxious *pee-ewk*; a bleating *kwairk*, and an agitated *a-yik* or *k-yik* call. The first of these notes is given as the bird flicks its tail in the territorial calling posture, and various *ga-ga-ga* or *te-te-te-te* calls are given in threat behaviour (and apparently during sexual display, C. J. O. Harrison pers. comm.). The vocabulary of this species seems to be highly variable, and many of the different-sounding calls merge into each other, vary considerably, or are ambivalent. Thus a detailed study will be needed to work out their functions more precisely. This variability of the calls may have an important function in promoting individual recognition in this social species, where individuals are often out of each others' sight for long periods amongst vegetation.

From the evidence of sex-identity given by mating behaviour it is apparent that the calls of female Purple Gallinules are softer and less harsh than those of males. There is a similar sex difference in the voice of other rails including the Moorhen (Howard 1940), Tasmanian Native Hen (Ridpath 1964), Coot (Rüppell 1933, Grimeyer 1943) and American Coot (*Fulica americana*; Gullion 1952).

THREAT AND AGGRESSIVE BEHAVIOUR

As with calls, some of the behaviour postures of Gallinules are ambivalent, making it difficult to define their functions. However, unlike the calls, most of the behavioural postures show little tendency to merge into one another, so that they would appear to be worthy of record as a basis for future work. I have been able to distinguish three different postures used by Gallinules in agonistic encounters. The hunch-backed posture shown in Fig. E is commonly used in all kinds of aggressive encounters, especially when two birds meet while feeding. The posture is often only slightly indicated, but nonetheless sufficient to be noticed by the other bird and to cause it to respond. At higher intensities the neck is arched

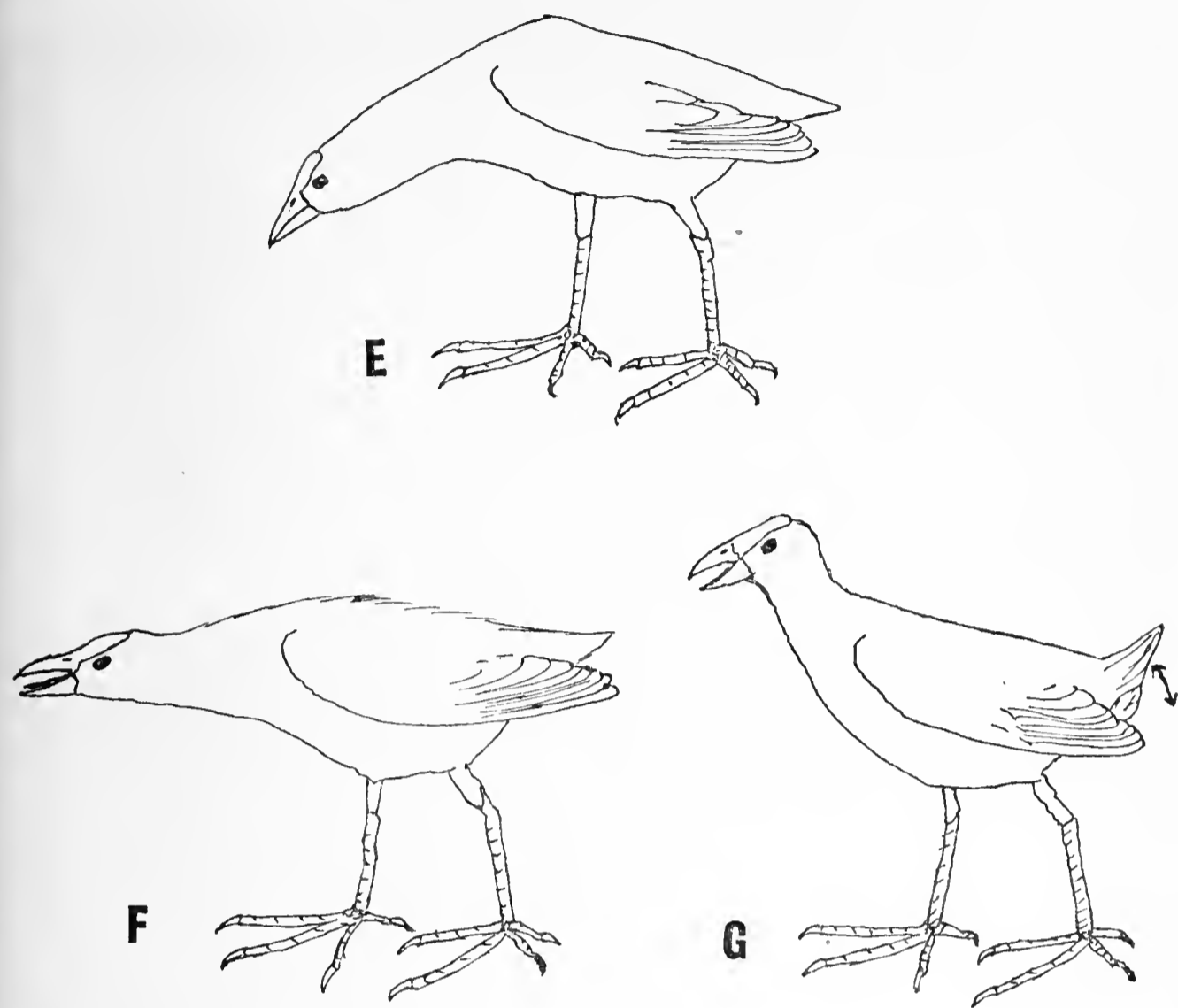


Fig. E. Hunched threat posture.

Fig. F. Gaping threat posture.

Fig. G. Threat posture with tail flicking used in defence of territory.

and the head thrust towards the opponent. If the opponent does not retreat then, it is usually pecked sharply on the neck or the back of the head, often in short bursts as the victim retreats and its aggressor makes short (two or three feet) runs after it. Several times I have seen an attacked bird twist its head away as if to appease when it was attacked in this way, but its aggressor pecked it regardless, causing the unfortunate bird to run away. More often when this appeasing behaviour was shown the threatened bird would be allopreened by the other, and sexual behaviour frequently followed this.

Another slightly different posture is also used in threat, apparently most often when the bird concerned is not feeding, but standing close to its young, mate, or some bird which it considers itself temporarily paired to. Here the threatening bird reaches forwards without arching the neck, and makes a more or less prolonged gaping movement at its adversary (Fig. F). The aggressor's plumage is usually sleeked when this action is used, and it is frequently aimed at birds of different species and frequently followed or accompanied by bouts of chasing, again often in bursts of a

few feet each time. I have watched captive birds persistently harrying a Crowned Crane (*Balearica pavonina*) in this way, as well as ducks, and smaller terrestrial birds.

A completely different agonistic posture appears to function mainly in territory defence. The bird stands upright and flicks its tail to emphasise the white under tail coverts, while giving loud *kree* or *kree-ik* calls (Fig. G). From their subsequent behaviour it was apparent that the birds giving this display were males on four occasions. When displaying in this way they will chase off any bird that closely approaches them on the ground, and this kind of behaviour seemed to cause periodic division of the Snowdon Aviary population into subgroups with scattered birds, those birds with the brightest plumage and reddest bills (? males) tending to be driven furthest.

A display corresponding to, and probably homologous with, the "swanning" described for the American Coot by Gullion (1952) is used in response to disturbances near the nest or chicks, or when another bird intrudes into the nest area. In this display the bird fluffs its plumage and raises the partly spread wings over the rump (Fig. H).

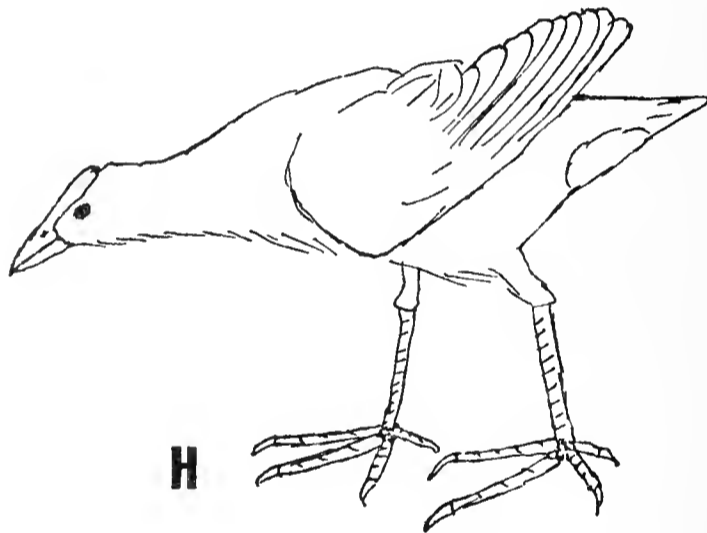


Fig. H. "Swanning" posture.

After aggressive behaviour, and sometimes interspersed with it, violent pecking at food objects (? redirected aggression), and bill-wiping (? an "irrelevant activity") are frequently performed.

COURTSHIP AND SEXUAL BEHAVIOUR

Aggressive behaviour often merges into sexual behaviour. Slight threat posturing and slight appeasement movements probably occur whenever two Gallinules approach each other closely away from a nest, and it is the subsequent behaviour of both birds which determines whether or not sexual behaviour follows. If courtship behaviour is to follow when two birds approach each other in this way, they usually either allopreen (male preens female) or less often pass a small food item between their bills.

Allopreening is of importance in the preliminary sexual displays, and probably in maintaining a pair bond when it has formed. In the displays preceding mating it is always (in my experience) the male bird which preens the head and neck of the female. The female often appears to solicit allopreening by turning her head away and fluffing the neck feathers, and in these circumstances there can be little doubt that the allopreening is a ritualised activity having little to do with plumage care. Harrison (1965) discusses the functions of allopreening in birds, and shows that it has considerable importance in sublimating aggression between birds when they approach each other closely.

In contrast, allopreening at the nest in the Purple Gallinule is most often mutual, and other parts of the plumage are *usually* preened in addition to the head and neck (except in the "nest changing ceremony", see below). It was not at all infrequent to see two captive Gallinules sitting head to tail on a clutch of eggs, each bird preening the back and rump feathers of the other. Allopreening of this kind often alternated with normal preening, and sometimes the oil gland of the other bird was preened, and preen oil wiped on the feathers of both birds (four separate series of observations, including more than three different birds). It was apparent that allopreening of this kind had a significant and definite function in the care of the plumage, as the movements used appeared identical (from ranges down to three feet) to those used in normal preening, and pieces of feather scale were frequently swallowed by the preening bird.

The passing of small food objects between the bills of birds which walked towards each other was seen on four different days, and each time the actions used were very similar to those of a Gallinule feeding a chick. I have seen this "courtship-feeding" in the pre-breeding period and during incubation, and C. J. O. Harrison (pers. comm.) has seen it performed by birds with well grown young. The infrequency of this behaviour and the small size of the food items suggests that they are only likely to be of ritual significance, and it is possible that the movements might be derived from nest building rather than true courtship feeding, as nest material is often passed from bird to bird at the nest site.

A typical behaviour pattern preceding copulation is that the two birds approach each other giving slight threat display, then the female "solicits" allopreening, and is preened on her head and neck by the male. At this stage either or both birds may start "walking time", a peculiar action where the bird walks on the spot, raising its feet without closing the toes as they usually do when the foot is lifted in walking (Fig. I). The allopreening "solicitation" posture of the female may then be exaggerated into the sexual solicitation posture (Fig. K), and the male may step or jump on to her back and copulate. The male remains on the hunched back of the female by clinging with its feet and balancing with flapping wings (Fig. J), and mating usually lasts for two or three seconds, though

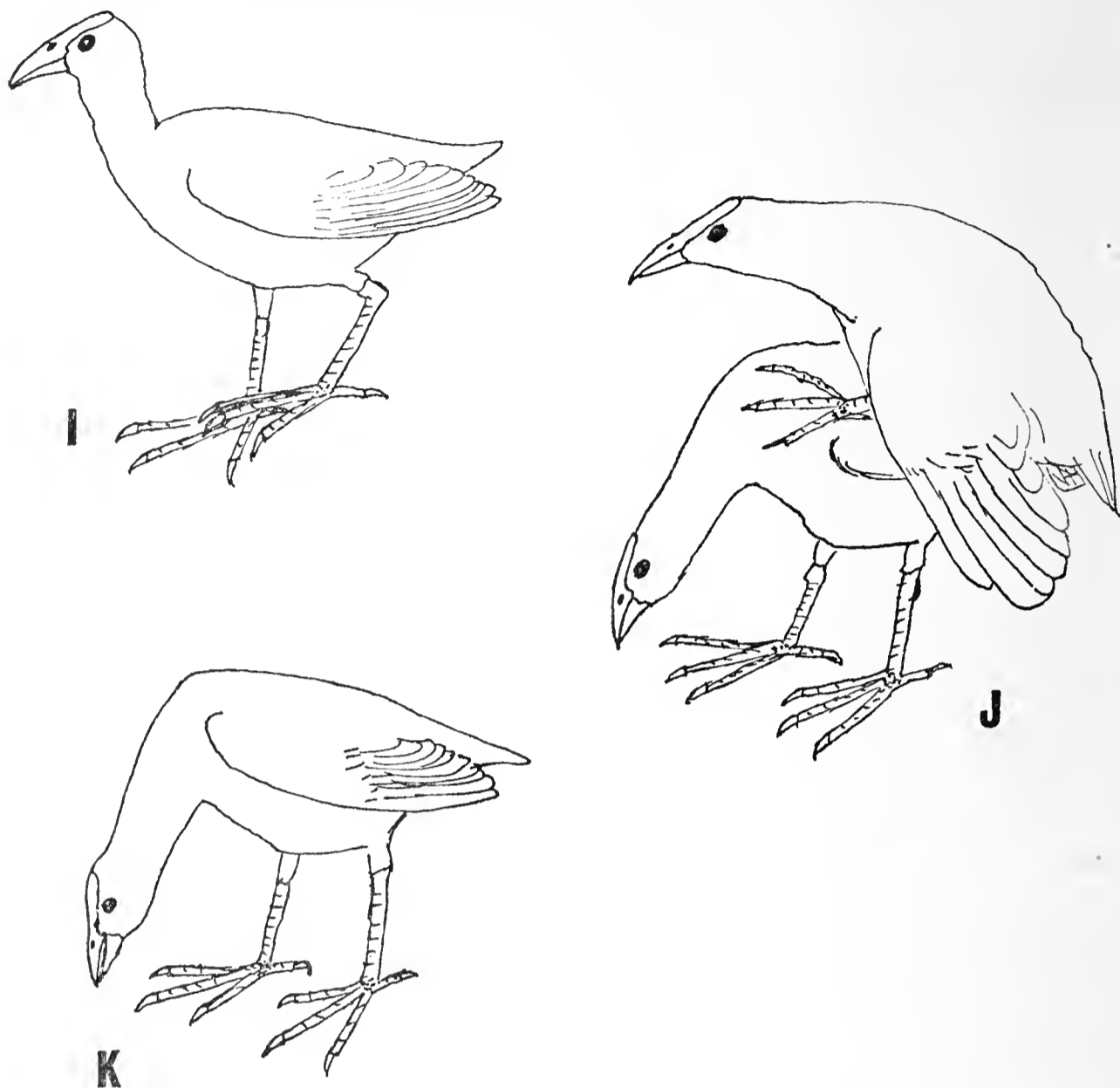


Fig. I. "Walking on the spot" in sexual display.

Fig. J. Copulation.

Fig. K. Solicitation posture of female.

the male often remains on the female's back for ten seconds or more, and may attempt to mate several times while standing there. The posture used by the female Gallinule when soliciting copulation is similar in many ways to those of the Tasmanian Native Hen (pers. obs.), Moorhen (Howard 1940), and American Coot (Gullion 1952).

While the female bird is being allopreened other Gallinules (presumed to be males) may join in and preen on the opposite side, or from near to the other preening bird. These other birds usually continue with their preening while the first bird actually copulates, and I have not seen them make mating attempts of their own. No call is given during copulation, and the male steps off the female's back and walks away from her, sometimes it then preens, but not always; the female bird usually preens after a mating attempt.

BREEDING

Purple Gallinules build bulky nests of vegetation in the wild, resembling large nests of the Coot. The nests are generally built in thick cover, and

usually just above shallow water, or up to a few feet above the water surface (Mountfort 1958, Falla *et al.* 1966, Ali and Ripley 1969). Both male and female birds share in bringing material to the nest site, but much of the material seems to be incorporated into the nest by a female bird, who receives it from the bill of a male, and perhaps other females.

The captive Gallinules at the London Zoo built nests of grass under or near such ground vegetation as was available to them, and nest building activities continue right through the incubation period. Harrison (1970) has commented on the social nesting of these Gallinules and mentions a group of four birds which co-operated in the raising of a single brood. The birds of this group all carried nest material to the sites which were used for successive breeding attempts, but only one (possibly sometimes two) of the birds actually incorporated material into the growing nest structure; the others collected material, then passed it to the bird which was on or near the nest. During incubation the bird which was sitting spent considerable amounts of time plucking material from within bill reach of the nest and incorporating this into the nest walls; it seems likely that other birds incorporated material into the nest structure in this way, besides the usual one.

In addition to the group of four birds mentioned by Harrison (1970) there was also another group of three in the aviary which acted as a social unit for several months during a nesting attempt, but which was less cohesive than the other group. At least three birds from the group of four, and two birds from the group of three helped with incubation, but I have the impression that the male bird which I most commonly saw mating did little if any sitting (observations on individually marked birds are needed to confirm this). All members of both groups took part in both feeding and brooding their respective groups of young (so far as I could tell), although the shares of different individuals differed considerably. From the rate at which eggs appeared in three different nests (one each day for total of six days) it would seem almost certain that each "clutch" was the product of a single female, as other rails lay one egg per day (Gullion 1954). Incubation periods of approximately 23 and 24 days (plus or minus one day with each clutch) were recorded for clutches of five and seven eggs from these birds. With each clutch all eggs which were going to hatch probably hatched within about a day of the first egg, despite the fact that incubation of both clutches probably started before laying was completed.

Two or sometimes three Gallinules from these groups would sometimes incubate simultaneously, although most often only a single bird would be in contact with the eggs at any one time. Changeovers at the nest often involved little or no ceremony, and they were usually gradual—often one bird would join the other on the nest, then after a while the first would walk away. Most often a bird approaching the nest would bring a piece of grass or other nest material and pass it to the sitting bird, then allopreen

the sitting bird in a very rough and stereotyped-looking way, before sitting down beside it and trying to move on to the eggs.

With several birds on the nest at once it was not surprising that eggs were sometimes pushed beyond the confines of the nest rim. When this happened the eggs were pulled back by deft-looking egg recovery movements. The bill would be hooked over the egg, often slightly shivered, and the egg would be drawn back towards the sitting bird (Fig. L). At one nest a single egg rolled down a slope away from the nest and was not recovered, and the same must frequently happen in nests built in reed beds.

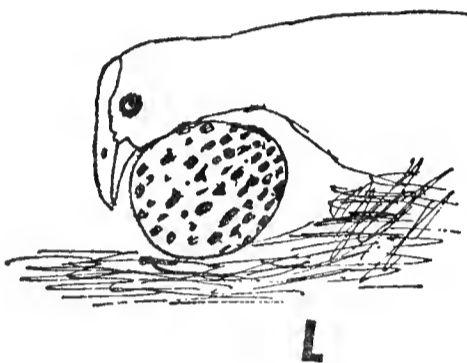


Fig. L. Egg recovery movement.

These captive Gallinules did not build substantial nest-like structures in addition to the nest which they used, but separate platforms are built in reed swamp habitats (Ali and Ripley 1969, Mountfort 1958). These platforms are used for feeding (Mountfort), and probably for roosting (as in the Moorhen, Howard 1940). Desultory platform-building attempts such as the one noted by Harrison (1970) carried out by these captive Gallinules probably represent expressions of the platform building behaviour which may be an important part of their activities in reed swamps. The captive birds were walking on firm terrain for much of the time, so that there was probably no need to build platforms.

For the first day or so after hatching the young Gallinule chick remains in the nest and receives little if any food, although it is brooded almost continually. After this the chicks wander away from the nest and are brooded and fed by other birds of their particular group. At first the food was almost invariably pieces of grass bitten off and passed to them in the bills of the old birds. Sometimes adults were seen to pass food from bill to bill among themselves (see above) before feeding the young, and often food would be successively given to and taken from the young. When the chicks grew larger they were often fed on the food which was provided in food trays for the adults, including pieces of meat and fruit. Harrison (1970) suggests that the passing to and fro of food between adult and chick may serve to break it up for the benefit of the chick. When young birds are accidentally separated from the adults which are tending

them they give a loud, high-pitched *peep-peep-peep* call which is incessantly repeated until they are given attention. Chicks two weeks old were beginning to take food for themselves, but young half the size of an adult were still being fed at times, a month or so later.

ACKNOWLEDGMENTS

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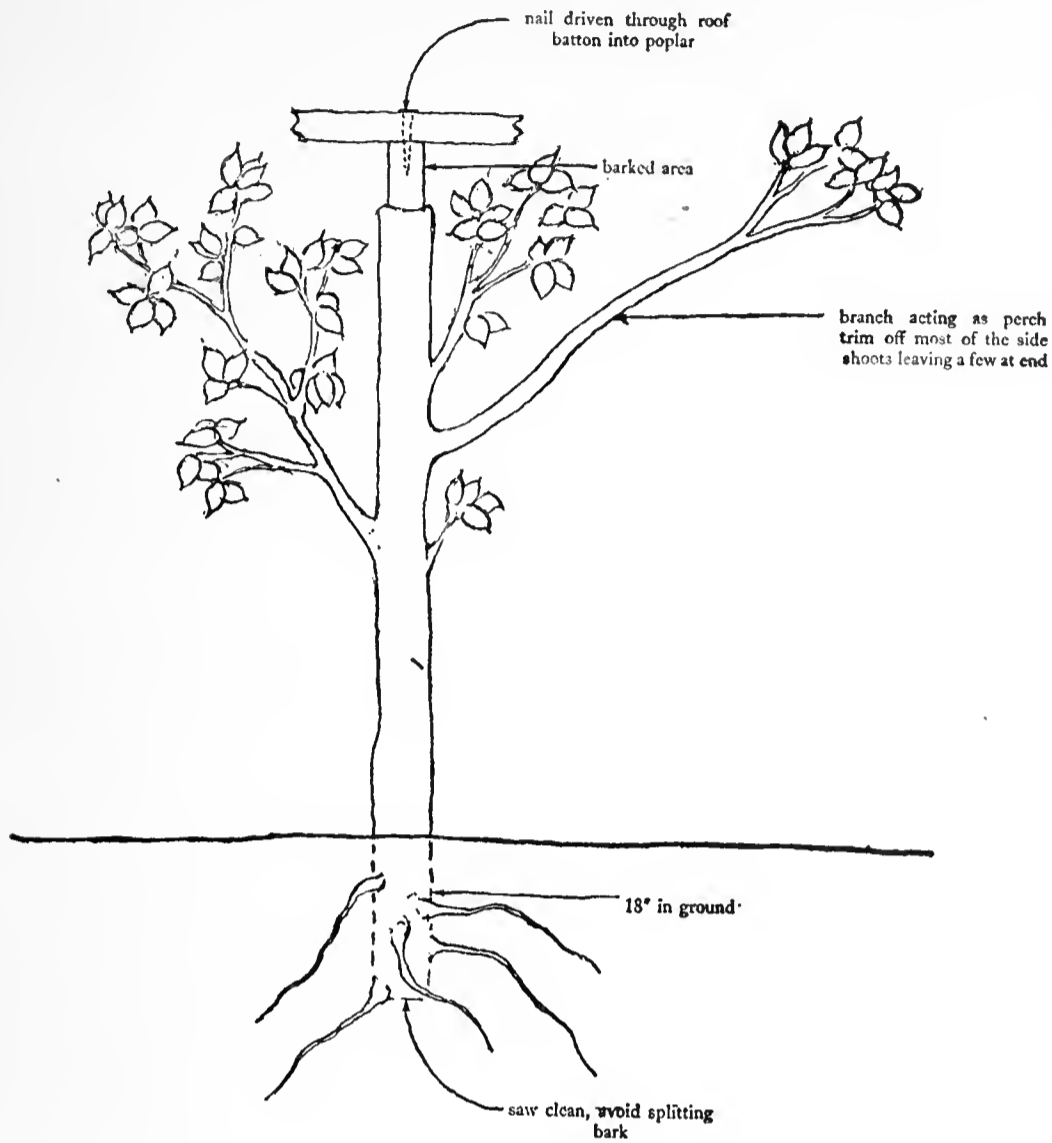
INSTANT PLANTED AVIARIES

By T. S. THOMSON (Hoole, Cheshire, England)

Growing vegetation is a desirable addition to any compound housing livestock. In addition to greatly enhancing the surroundings, natural nesting sites contribute to breeding success. Many plants and suitable shrubs are recommended in articles on the subject. However, with aviaries being frequently overpopulated, young plants frequently fail to become established. Very few bird keepers could tolerate aviaries kept empty while plants were allowed to make the necessary growth.

It was by chance that the use of Lombardy Poplar trees proved to be very satisfactory in furnishing planted aviaries. When aviaries were constructed after the end of the war, poplar trees provided posts to help overcome the shortage of timber. Four large poplars provided 7 ft. posts up to 5 in. in diameter. The branches were trimmed from the posts of poplar, but two or three were left on near the top to act as perches. The posts were inserted about 18 in. in the soil and supported the wooden battens on which the roof netting was fixed. A lengthy nail driven through the batten and into the post top held it in position. It was a pleasant surprise to find that the poplar posts burst into buds and leaf. Not only did the poplars act as uprights supporting the roof; they developed into a dense mass of growth. This required clipping back at least twice a season, depending on how near the roof netting the plants were pruned back to. It is most desirable to prevent any shoots from growing through the netting. After a few seasons with the plants well established, the task of clipping back the growth near the roof was greatly alleviated by ring-barking the poplars about 9 in. from the top. Ring-barking is the removal of a $\frac{1}{2}$ in. strip of bark round the circumference of the plant trunk down to the cambium layer. This results in the dying off of all the plant above the ring, the sap being cut off. In later years when new stumps of poplar were prepared for planting it was found much easier to remove all the bark from the top 9 in. thus preventing any growth. In addition most of the branches were left on, a bush being formed in the first season. The leaves are smaller in the first year being normal in size in the second season.

Even in aviaries housing bud-eating Bullfinches, 10 to 12 recently planted stumps of poplar became established. Where only one or two were planted they frequently failed to develop, the buds being constantly pecked by the birds. Roof spans up to 30 ft. were supported entirely by poplar cuttings. After a period of four to five years a few became ineffective as roof supports, the top 9 in. having deteriorated as a result of the barking action. Generally the greater the top circumference of a cutting the longer it acts as a roof support. Anything under 2 in. in circumference was not to be relied upon but 4 in. upwards frequently



lasted over 15 years. It is, of course, quite a simple matter to replace or supplement any plants which deteriorate.

Visitors have inquired about the cut off poplar posts pushing upwards as they grow. While there is an increase in the circumference, no upward growth of the trunk takes place. The top 9 in. of barked area does not develop in any way. Little harm, if any, is done by a few young shoots growing up through the roof netting. Usually the state of the nests in the shrubs dictates when they may be clipped back. On some occasions clipping takes place when birds are sitting without upsetting the breeding cycle. Where Bullfinches are kept the spring growth of foliage is retarded by up to a month, while the effect from Greenfinches is about a fortnight, the birds eating the earlier buds. The Poplar is so strong in growth that the buds taken by the birds are soon replaced. The only disadvantage of the retarding of the initial coming into leaf is the lateness of the provision of natural nesting sites, for the plants do not suffer any permanent damage. To offset this a few prefabricated nesting sites are provided in the shelter part of the aviaries, it being considered it is in the bird's interest to have the early nests under cover. A few evergreen cuttings, usually laurel because of its availability, are wired into the

leafless Poplar plants to provide cover for early nests. While laurel leaves hang for over a year in the dead state and provide cover, care must be taken to prevent leaves falling across a nest. I have records of losses resulting from a laurel leaf falling on eggs.

Poplar post cuttings inserted 3 ft. apart form a hedge. In one aviary a pair of Waterhens nested on the top and kept the growth partly under control by their continuous pecking of the leaves. The same effect was experienced when the same species nested on top of a privet hedge, the leaves being removed on top of the hedge several feet from the nest, resulting in it being unnecessary to clip the hedge all season. Privet leaves are also taken by members of the pheasant family without any apparent ill effect. However, any species which chew bark should not be enclosed in aviaries with privet.

Poplars can be trimmed to provide nesting sites from near ground level. Sometimes long grasses flourish at the base and being protected they grow into the poplar foliage thus providing ideal nesting sites for low nesters such as Yellowhammers.

When the Poplar cuttings have become established the trimming back results in a dense mass of foliage. When nesting is in progress it is sometimes necessary to view through the growth with the sun on the other side, in order to detect nests. While a twice a season clipping, plus an early Spring pruning, keeps the Poplars in good shape, it may be desirable to resort to more drastic action every 10 years or so. Branches with brush-like tops can be cut back. The oldest Poplars are over 20 years and present no trouble to keep them within bounds. Probably restricting the growth of the foliage effects the root action on the same principle as the Japanese dwarf culture of trees.

While a Poplar tree may only provide a few trunk-size cuttings suitable for the dual purpose of roof supports and aviary shrubs, all Poplars offer cuttings for striking. However, it takes several years for one to two-inch diameter cuttings to develop heads suitable for natural nesting sites.

The smallest flights here with growing Poplars are only 9 ft. \times 3 ft. Several flights 12 ft. \times 6 ft. have a single plant at one end. Probably many would not advocate any use of live plants in such small units. It is a question of the stocking density. Here only one pair of finches occupy such aviaries. In large units the Poplars planted 3 ft. apart in rows 9 ft. distant, form continuous hedges with lanes between. It is always desirable to provide the maximum flying space in aviaries and consideration should be given to the siting of the plants. While a long narrow aviary gives the inmates a fly-way back and forth the birds must stop at each end. An aviary which provides unlimited continuous flight would be of a circular shape, not very practical to construct. Here units 20 ft. \times 20 ft. provide finches with continuous flight and units 40 ft. \times 40 ft. serve large parrakeets. Such desirable conditions are most frequently used by the birds in the early Spring.

It is quite a simple matter to provide live perches from the poplars by leaving individual branches unpruned. Not only is there no fixing problem, there is no need to be constantly replacing perches of the conventional type, a task the average bird keeper frequently fails to carry out properly. In addition fixing perches in aviaries results in the deterioration of the structure. How often does one observe perches supported by the ends pushed through the wire netting? The constant action of the birds alighting wears off the galvanized coating, rust sets in and the wire fractures.

Where pheasants and other heavy types are kept, perches trained from poplars are most successful. Being free to yield they do not give sufficient support and the large birds are discouraged from using them. Branches cut for perches tend to become damp in wet weather and bone dry in dry weather, neither condition being normally desirable.

As stated earlier, most aviaries are generally over-stocked and a planted unit can act as a test. If plants fail to flourish the answer could be too many birds. In one large unit here there is an annual "battle" between the gardener and the bird keeper. The aviary in question contains matured standard fruit trees, mostly apples. It is used as a breeding unit, being rested during the winter. If the birds, mostly finches, are admitted before the blossom bursts there is a loss of a ton of fruit. On the other hand, keeping the birds out of this orchard aviary greatly affects the season's breeding results. While the actual time of commencing nesting is not really involved, the birds being accommodated in an adjacent 100 ft. x 30 ft. planted unit, the best results are obtained when the first round of young are fed on the fruit buds. The crops of the young finches are as green and fat as ripe peas in a pod. Fruit trees have two types of bud, fruit and growth. The fruit buds are plump and develop earlier. The fruit trees require an annual pruning mainly to prevent shoots from growing up through the roof netting, 14 ft. high. Poplar cuttings of the conventional type were inserted 18 in. apart to form a barrier hedge against visitors wandering through this orchard aviary, keeping them to the walk-around pathway.

Planted aviaries here are much dryer than unplanted ones, probably due to root action keeping the soil open. On the other hand planted aviaries encourage vermin. I will comment on this in a later article. While plants encourage insect life, it is considered a minimal fringe benefit in average-sized aviaries. Even in large units, rested in Winter, very little natural insect life is available. In one enclosure a full range of vegetables is grown, plus soft fruit. It has been found necessary to introduce blackfly on broad beans, the plants so treated being covered until the aphid had gained a hold. Three 60 ft. rows of broad and 120 ft. of runner beans are grown annually, and when infected by black and green fly give automatic success in breeding species such as Siskins.

In some seasons over 100 birds have been kept in this vegetable garden aviary, the results and effects providing interesting data.

Non-gardening aviculturists may be deterred from attempting to root post-sized poplars. The gardening experts advice on rooting poplar cuttings is somewhat contrary to the procedure which has been repeatedly proved successful here. The cuttings whether large stumps or small shoots are inserted in early Spring, not in October or November, although this latter period is recommended by the experts. The Lombardy Poplar used here is known as *Populus nigra italica*, there being 35 different species of Poplar listed in the Royal Horticultural Society's *Dictionary of Gardening*.

* * *

THE WINGED WORLD IN 1969

By CLIVE ROOTS (Heysham, Lancs., England)

Despite the usual frustrations and near-successes last year proved to be a fairly successful one at the Winged World, as we succeeded in breeding Southern Tree Pies, Brown-throated Barbets, Yellow-breasted Fruit Doves, Green Wood-hoopoes, Red-billed Hornbills, Fairy Bluebirds and Roulrouls. Many others got to the egg or fledgling stage only to be thwarted, usually by the attentions or close proximity of other birds. A pair of Little Bee-eaters tunnelled and were later seen taking live food in, but their tunnel collapsed and was then deserted. Spotted Morning Warblers made mud nests in several places, couldn't decide which to use and laid their pale blue eggs all over the place. Hoopoes, Mrs. Wilson's Tanagers, Andaman Grackles, Abyssinian Ground-Thrushes and Bleeding-heart Pigeons all got so very near to success also.

Many interesting acquisitions were made during the year. A group of five Carmine Bee-eaters imported early in June from West Africa are still thriving at the time of writing, and have been housed in the large landscaped compartment specially arranged for tunnellers, in which the Little Bee-eaters made their effort.

Groups of Ferruginous Wood Partridges, Van Den Bock's Pittas, Spur-winged Jacanas, African Jacanas, Spur-winged Plovers and White-faced Tree Duck were received, and pairs of Black-throated Wattle-Eyes, Steller's Jays, Toucan Barbets and Scimitar-bills have been added to the collection. Other interesting newcomers are Van Hasselt's Sunbirds, Ross's Touraco, and Grey-hooded Kingfisher.

* * *

ROTHSCHILD'S MYNAH

(*Leucopsar rothschildi*)

REGISTER AND REPORT ON 1969 CENSUS

By D. T. SPILSBURY (Malvern Links, Worcestershire, England)

Because Rothschild's Mynah has a limited distribution, being confined to certain habitat near the northern coast of the Indonesian island of Bali, the council of the Avicultural Society decided that an annual census and breeders report should be published in the AVICULTURAL MAGAZINE in the hope that this would stimulate interest in a captive conservation programme for the species.

It should be noted that an annual census both for young bred and numbers held, was, and is conducted by the International Zoo Yearbook but this is in respect of *L. rothschildi* held in zoos throughout the world and does not include the numbers held or bred by private aviculturists.

In 1968 the first census was conducted amongst our members, both private aviculturists and representatives of zoos, by the late Mr. W. R. Partridge, and the resulting information together with data assembled by the International Zoo Yearbook was published in the AVICULTURAL MAGAZINE, 75, 3, which was for May-June, 1969. It is to be regretted that Reg Partridge was not able to continue for many years the task he had set himself and for which his knowledge of this species made him eminently suitable.

The 1968 census revealed a total captive population for *L. rothschildi* of 171 specimens held in 55 separate collections.

In 1969 it was decided to write to all known owners informing them about the Avicultural Society's census and asking them to complete and return a census form which in addition to the essential numerical data sought information about the species in captivity and which when concluded may suggest the best means of persuading *L. rothschildi* to reproduce sufficiently to represent a self perpetuating captive population. This year owners were requested to send information about the age and origin of their birds, causes of death for both adult and young stock, longevity, dispersal of surplus stock and also if willing to co-operate in a ringing scheme. Breeders of *L. rothschildi* were also asked to answer questions concerning the housing of breeding pairs, the type of nest box and nesting material, the number of young reared in 1969 and the prior years, the success of each pair in terms of nests, eggs per nest and young hatched per nest, and were the young removed when independent. Within the register will be found the full details of this survey but perhaps a summary and some further thoughts and conclusions will be more acceptable to some readers.

There can be little doubt that *L. rothschildi* is an excellent choice for the aviculturist to attempt a captive breeding programme with for it is

apparent that adult wild caught stock and more important aviary-bred specimens, once independent, can and do live for a reasonably long time which, of course, does mean that breeding pairs can produce young for several years. The longevity record for the species possibly rests with the birds which Mr. Ezra obtained before the last war and which continued to live for four or five years after his death in 1956. The Zoological Society of London had a specimen for 12 years, and there are numerous examples within the register for both wild caught and captive-bred stock of specimens still living with seven, eight and nine years to their credit.

It is interesting to find that of the 178 specimens held in captivity 71 are captive-bred, 64 wild caught and the remainder are of uncertain origin. Of the breeding pairs only one pair that was bred in captivity have so far reproduced and reared their young to independence, and two other owners having pairs, of which the female is captive-bred, have produced young. Within the birds of uncertain origin is the Indonesian total of 21 specimens at Jogjakarta.

It would be impertinent of me, having no specialized veterinary knowledge, to draw any firm conclusions from the causes of death for both adult and immature Rothschild's Mynahs but one or two points I must make. It is clear that not sufficient owners do bother to have their dead birds examined by skilled avian pathologists, which is a great pity, particularly in the case of young for here we have the greatest mortality. The incidence of avian endoparasites is not surprising and deaths directly attributed to *Ascaridia* are noted in the register. It would perhaps be wise for owners to examine faecal samples regularly and take the necessary steps should ascarids be present. I imagine that in aviaries having a natural earth floor and particularly on new sites, the gapeworm could be a problem but so far no reports indicate that these parasites have caused death.

There are several instances of mortality due to fighting both amongst the species itself and from other birds. Incompatibility between a pair either seasonably or permanently must be watched for and if *L. rothschildi* is to be kept within a community no risk should be taken with this rare species by having more aggressive birds as companions.

The production of young that leave the nest or die within it having leg and other deformities is well known in both this and other insect rearing species and they are probably due to a calcium deficiency or to a functional disorder which prevents the absorption of calcium. The large number of captive-bred specimens that fail to breed and the number of infertile eggs might also be attributed to the incorrect balance between calcium and other essentials of the diet. Readers wishing to gain fuller appreciation of the problem would do well to consult the papers, "Cramps and fits in carnivorous birds" by J. D. Wallach and G. M. Flieg within Vol. 10, *International Zoo Yearbook*.

All owners were asked if they would be willing to co-operate in a ringing scheme which would make the permanent identification of all captive held stock possible. Such a system would be essential if a stud book for the species is started as indeed it is for any livestock that is to be perpetuated along prescribed lines over an extended period. In Great Britain, of the 34 specimens of *L. rothschildi* at least 12 were bred by Mrs. Scamell, mostly by one pair, and it would probably not be sensible to lose the opportunity of identifying these birds permanently before the knowledge of their origin is lost and unwitting inbreeding to a dangerous degree occurs. It was proposed that birds should be rung with split rings and young should be rung when independent of their parents.

Of the 50 owners who returned their census forms, 32 were in favour of ringing (Zurich, New York, Philadelphia and San Diego operate their own schemes), Harewood and Mrs. Scamell would ring young but not their breeding pairs, two owners would not ring and 14 owners did not complete the question.

In order to make the census as complete as the available information allows the following owners either have or recently had *L. rothschildi* in their collections and whilst most of them have been contacted none has made a return. I would be grateful if anyone can give details about these.

Brown, Alfred W., Ormmond Plantation, Destrehan, Louisiana. It is believed that Mr. Brown maintains the collection of birds that belonged to his late wife and a breeding pair of *L. rothschildi* and their young could still be there. Lenz, W. Lee, 1401 Guadalajara Pl., Claremont, California 91711. Mr. Lee Lenz has bred this species with success and at least two zoos have his young. Ontario Zoological Park, Upper Canada Zoological Society, Zoo Park Road and River Road, Wasaga Beach, Ontario, Canada. One male (Vol. 10). Tiergarten Heidelberg, Gemeinn. GmbH, 69 Heidelberg 1, Tiergartenstr 8, Germany. (Vol. 10, one male, one female, both captive-bred. Tiergarten Schonbrunn, 1131 Wien XIII, Austria. The Zurich Zoo sold two birds, presumed immature, to this zoo in September, 1969. (A.S.C.)

The dispersal of specimens occurred mostly as the result of selling young but it is good to find that owners having odd birds are attempting to place them with owners having odd specimens of the opposite sex on breeding terms, which, of course, is the only intelligent thing to do.

During 1969 Mrs. Scamell, Basle, Zurich, Milwaukee, have been able to hatch and rear to independence young Rothschild's Mynahs and seven other owners report egg laying by their pairs. Of these successes Zurich is surely the highlight for the second generation Rothschild's Mynah this zoo has produced in captivity. I am sure that all owners of this species will wish me to convey to Mr. C. R. Schmidt and the staff responsible our congratulations on this fine achievement.

Breeding seems to have been achieved under two separate housing systems, in small flights solely occupied by the breeding pair and in very large community aviaries where a breeding pair has been able to establish sufficient breeding territory and monopolize enough of the available live food to rear young. There seems to be a trend particularly in the U.S.A. towards the single pair to each aviary method, and I agree that greater control of the nesting and rearing requirements can be achieved this way. However, the breeding of insectivorous birds from pairs housed in this way, with no need to defend the nest and an unlimited supply of food easily gathered, might account to some extent to the eviction of young that is so prevalent. Whichever way of breeding is selected it does seem that the species resents interference when rearing—or at least needs to feel secure within the nesting area, and I would assume that a planted flight, perhaps with climbing plants masking the nest, would help to create the best environment.

It would seem that the species is reasonably catholic in its choice of nesting site and will utilize twigs, grasses, leaves and many other materials to line the nest cavity.

The clutch of eggs can number from two to five but three and four seems to be quite normal. Instances of nesting and egg-laying cycles occurring six times in a year have been noted, but it is doubtful if more than three separate successful broods of young could be regularly attained each year without resorting to fostering out eggs.

It is difficult to ascertain the percentage of hatching in *fertile* eggs but one breeder in 1969 found 90% did hatch and I should expect the average to be better than 50%.

I think on balance it is best to remove the young when independent, certainly from small breeding units it is essential and probably even in the large community flights breeding results would have been better had not young been present.

This year, as occurred in 1968, enthusiastic breeders and owners suggested that the Avicultural Society should establish an official studbook for *L. rothschildi*. Official in that the studbook would be endorsed by the International Union for the Conservation of Nature and Natural Resources, and the International Union of Directors of Zoological Gardens through the IUCN's Liaison Committee. It has always been my hope that this will be possible but I do not think that the time has yet come to embark on an official studbook for two reasons. There are still owners of *L. rothschildi*, particularly in Indonesia, who are not yet prepared to co-operate with us and it is essential that all owners do so, and it is by no means clear that the species is capable of becoming self-perpetuating under captive conditions. I must remind you that only four of the 50 owners that returned census forms managed to rear young. The council of the Avicultural Society will no doubt apply to the Secretary of the Zoo Liaison Committee to propose the establishment of an official studbook

when these two conditions indicate that the studbook could be maintained. Meanwhile the Avicultural Society will continue to conduct its own census and breeders report. In 1970 we shall attempt to establish the diet for the successful rearing of young and general feeding for the species, try to determine the best way of sexing Rothschild's Mynah and continue to seek information concerning mortality for the species.

I would like to express my gratitude to all who completed and returned their census forms; in this day of bureaucratic spying through form filling, it must come as a severe blow to find the practice has extended to one's pastime!

In extending the publicity for the census I wrote a number of articles and would like to thank the Editor of *Cage and Aviary Birds*, Mr. W. S. Page; the Editor of *Die Gefiederte Welt*, Dr. J. Steinbacher; the Editor of *Foreign Birds*, Mr. H. B. Wragg; the Editor of *Oryx*, Mrs. M. Fitter; and Dr. and Mrs. L. A. Swaenepoel who edit *Le Mond des Oiseaux* and *De Vogelwereld*, for kindly publishing them.

Mr. Joseph Lucas has again kindly given permission for material published within the *International Zoo Yearbook* to be used for this year's census.

CENSUS

(Abbreviations. "A.S.C." stands for Avicultural Society Census 1969. "Vol. 8," "Vol. 9" and "Vol. 10" refer to Extracts from *International Zoo Yearbooks*.)

Country	Name	Address and Notes	♂ Male	♀ Female	Sex Unknown
Belgium					
	Société Royale de Zoologie,	Antwerpen 1, 26, Koningin Astridplein. (A.S.C.)			2
		These birds were purchased from Copenhagen Zoo in December 1965 where they were bred and hand-reared.			
Ceylon					
	The Zoological Gardens of Ceylon,	Anagarika Dharma- mapla Mawatha, Dehiwala. (A.S.C.)	1	1	
		This pair is wild caught and purchased from a Thailand dealer in December 1959 and September 1967.			
Denmark					
	Zoologisk Have, København F.,	Den. Roskildevej 32. (A.S.C.)	1	1	
		This breeding pair is wild caught, the male obtained 1959 and the female in 1961. Dr. Holger Poulsen, Curator of Birds, reports that in 1969 this pair nested twice but without success. In 1963 one youngster was reared, in 1964 nine young in two broods were raised to independence. All young so far have been hand reared from an age of one week. Breeding Flight 3 × 2 × 3 m. inside, 4 × 2 × 3 m. outside. Some years this aviary was planted some not, also the pair shared this aviary with other species some years. The nest box was wooden, 40 × 20 × 20 cm., and materials were fine hay, feathers and small twigs.			

continued

Country	Name	Address and Notes	♂ Male	♀ Female	Sex Unknown
Denmark—continued					
	H. Christiansen,	4953 Vistuborg. (A.S.C.) This breeding pair are father and daughter. The original pair was purchased before 1965 and was wild caught. Young were hatched in 1965, 1966 and 1967, but were killed by the adult male between 6-13 days. In 1968 the male was removed from the flight after eggs were laid and kept out of sight and hearing of the female. The female reared one youngster to independence (two hatched but one died at ten days) and this was removed. The male was returned and the pair bred again but though young were hatched the female would not feed them. In the spring of 1969 the male killed the female and the young hen was placed in an adjoining flight. Later the young female was allowed to join the adult male. Two eggs were laid that contained young. The breeding flight was planted and had dimensions of 2 m. long, 1.20 m. wide and 2 m. high, the shelter was the same size. The nest box was 30 cm. wide, 18 cm. high, at the back, 15 cm. at the front and 15 cm. in depth. The diameter of the entrance placed at the end of the front was 10 cm.	I	I	
	E. Nørgaard-Olesen,	6851 Janderup Vestjylland. (A.S.C.) This pair was purchased in 1964 and was wild caught. These birds are housed in an unplanted flight with earth floor during the summer but are wintered in a cage 3 m. long, 1.5 m. wide and 2 m. high. The pair occupy their flight solely.	I	I	
France					
	Parc Zoologique de Clères,	Rouen, S.M. (A.S.C.) The origin of this bird is unknown and another of the same sex has recently been sent to the Washington Zoo. Menagerie-Museum National d'Histoire Naturelle 57, rue Cuvier, Paris 5eme. (A.S.C.)	I		I
		This bird was wild caught. A recorded death for the species at Paris was from Hepatitis (a female).			
Germany					
	Tierpark Berlin (East),	D.D.R.-1136 Berlin, Am Tierpark 41. (A.S.C.) One male obtained from Copenhagen Zoo in 1964 where it was bred and hand-reared the same year. The second male was wild caught and arrived in June 1967.	2		
	Aktien-Verein des Zoologischen Gartens zu Berlin,	1 Berlin 30, Hardenbergplatz 8. (A.S.C.) This bird, thought to be male, was purchased from Basle Zoo where it was bred in 1969.			I
	AG. Zoologischer Garten Koln,	5 Koln 60, Riehler Str., 173. (A.S.C.) This pair, which is wild caught, was obtained in June, 1964, and nested twice in 1969; each time two eggs were laid but no young was hatched. This pair is housed with six other birds (<i>Lamprotornus superbus</i> , <i>L. chalybus</i> , <i>Icterus icterus</i> , <i>Notiospar auraeus</i>) in a flight (within a Birdhouse) 2.80 × 2.70 × 3.00 (h) m. Central heating with a range 20-25°C. is present for this flight which has a sand floor but is unplanted. The nest box is described as a wooden starling box 23 × 23 × 23 cm. In 1967 one youngster was reared and it, together with its female parent, was sent to Pretoria Zoo.	I	I	

continued

Country	Name	Address and Notes	♂ Male	♀ Female	Sex Unknown
Germany—continued					
	Duisburger Tierpark	A.G., 41 Duisburg, Mulheimer Str. 273. (A.S.C.) One pair came from Zurich Zoo in 1961 and Dr. D. Poley believes that they were bred there. The male, of unknown origin, arrived in 1960. The birds are now housed in a flight (planted) 8 × 3 m. but no breeding behaviour has ever been noted.	2	1	
	Zoologischer Garten	6 Frankfurt a.M. 1, Alfred Brehm-Platz 16. (A.S.C.) One bird purchased from a dealer in October, 1963, probably wild caught, the other, bred at Zurich Zoo, was obtained in July, 1966. The cause of death of four adult birds in the years 1962 and 1963, and another in 1965, all shortly after arrival was from ascaridae and stomach parasites. In 1965 one adult died from acute catarrhal enteritis, and in 1967 an adult died from tuberculosis of the liver.	1		1
	Krefelder Tierpark	Krefeld, Uerdingerstr. 377. (A.S.C.) Two of these birds were bred at Basle Zoo and were obtained in 1965, and the other was wild caught and purchased in June, 1964.			3
	Wilhelma Zoologisch-Botanischer Garten	7000 Stuttgart, Postfach 1227. (A.S.C.) One bird, probably wild caught, obtained March, 1965, the other obtained from Basle Zoo in September, 1968. Cause of adult death Enteritis (Anthrakose ?).			2
Great Britain					
	Birdland Zoo Gardens	Bourton-on-the-Water. (A.S.C.) This pair is captive bred, the male by Mr. W. R. Partridge, the female by Mrs. K. M. Scamell, and both it is thought in 1966. For the last two years there has been nest inspection only.	1	1	
	Castle, D. F.	Southampton. (A.S.C.) These birds were purchased from Mr. Partridge in February, 1969, as a possible pair. One bird, the presumed male, is wild caught, the other bird was bred by Captain de Quincey in 1965 and has a leg deformity. The Zoological Society of London has kindly allowed their female to join these birds in the hope that another breeding pair can be established.			2
	Dudley Zoological Society	Worcs. (A.S.C.) These were purchased in April 1964, and are wild caught.			2
	Greater London Council	Parks Department. (A.S.C.) This bird was bred by Capt. de Quincey, possibly in 1965.	1		
	Hale, I. G.	Glamorgan. (A.S.C.) This pair was bred by Mrs. Scamell and purchased in September 1968. They solely occupy an aviary 12 × 10 ft., including a planted flight with earth floor. A nest box 16 × 9 × 9 in. with interior base covered by peat and decayed wood. No nesting activity as yet.	1	1	
	Harewood Bird Garden	Yorks. (A.S.C.) These two pairs were formerly in Mr. Partridge's collection and both have hatched young. Pair 1 reared one youngster in 1966 (in 1965 the male of this pair with another female reared two young). Pair 2 hatched young in 1968, as did pair 1, but these were not reared. Both pairs are wild caught (date of purchase unknown)	2	2	

continued

Country	Name	Address and Notes	♂ Male	♀ Female	Sex Unknown
Great Britain—continued					
		and each pair was housed separately in planted flights 20 × 8 ft. plus shelter 10 × 8 ft. Nest boxes 15 × 12 × 7½ in. with a square entrance hole 2½ × 2½ in. and an outside landing ledge. Nesting material mostly fine twigs and roots with some grass and feathers. Fresh green leaves were also found in the nesting cavity. The cause of death for young is the usual rejection by the parents. Within 24 hours of hatching the young would be thrown out the nest. From previous years it has been found this procedure would continue until late summer and the last nest of eggs would be hatched and the young more usually reared. Mr. Hall suggests that the success comes after the peak in breeding condition is over. Pair 1 nested three times and pair 2 three times, the clutch for each pair being usually four eggs but sometimes three or five. In 1969, whilst the two pairs were still with Mr. Partridge, an interesting experiment in the use of foster parents was tried. Three pairs of common Starlings, <i>Sturnus vulgaris</i> , were housed in a large flight and allowed to nest at the same time as the Rothschild's mynahs. Eggs were transferred from the mynahs to the starlings but rejection of the hatched young, of both species, took place from the starlings nests. A second attempt was made and eggs were again transferred. Just before hatching a panel in the aviary roof wire netting was removed to allow the starlings to forage for their own food but two pairs and one male promptly decamped. The remaining female hatched two young mynahs and reared them on her own but never leaving the aviary to do so. One youngster died just before it left the nest and the other died about a week after leaving the nest, dietary deficiencies probably accounting for these losses. In 1969 approximately 90% of the eggs hatched.			
		I am grateful to Mrs. A. B. Partridge and to Mr. A. E. Hall (Mr. Partridge's assistant) for most of this information.			
		King, G. J., Bury St. Edmunds, Suffolk. (A.S.C.)			I
		It is believed to be a male but its origin is unknown. The bird has been with Mr. King about six years.			
		Payne, C. M., Claverdon, Warwickshire. (Delves, Tony, Chapel End, Nuneaton—new owner since May.) (A.S.C.)	I	I	
		This pair did not nest during 1969. They were both bred by Mrs. Scamell so are not older than five years.			
		Marlow, E. N., Gedling, Notts. (A.S.C.)			I
		This female remains of a wild caught pair obtained four years ago. They were housed in a 10 × 8 ft. flight which was planted. They received no heat in winter. For the last two years this pair went to nest six times each year and the clutch was always of three eggs. The nest box Mr. Marlow describes as being of a small parrot type 20 × 12 × 10 in. and small twigs comprised the main nesting material. It was usual for the male to eat the eggs at about twelve days but he was removed prior to this period of incubation on the last occasion, the female did sit but no young hatched. The male later "went light" and died.			
		Kelling Park Aviaries, Holt, Norfolk. (A.S.C.)	I	I	I
		The male is wild caught, the female was bred by Mrs. Scamell in 1962, and the unsexed is immature also bred by Mrs. Scamell but from a different pair.			

continued

Country	Name	Address and Notes	♂ Male	♀ Female	Sex Unknown
Great Britain <i>continued</i>					
	Rosborough, S. J.,	Ballymena, Co. Antrim, N.I. (A.S.C.) This pair was bred by Mrs. Scamell in 1968. No nesting behaviour noted.	I	I	
	Sawyer, R. C. J.,	London. (A.S.C.) This bird was bred by Capt. de Quincey, possibly in 1965.	I		
	Scamell, Mrs. K. M.,	Newdigate, Surrey. (A.S.C.) Pair 1 wild caught male obtained in 1964, female in 1962. This breeding pair has reared three in 1965, two in 1966, three in 1967 and no less than eight in 1968. In 1969 this pair nested 11 times laying a total of 12 eggs in four of these. The adults threw out three, three and two young at varying stages of development from the three nests that had nestlings. Pair 2 wild caught. Male exchanged with Kelling Park Aviaries in early 1969 and was probably imported in 1965, the female was purchased in 1962. This breeding pair nested five times and hatched all five eggs in two nests 3 and 2. One youngster was thrown out but four left the nests and two survived. The breeding pairs are housed in identical flights 8 ft. × 3 ft. 6 in. × 7 ft. high leading from a bird room heated in winter to 40°F. Within the bird room is a shelter 4 × 4 × 6 ft. high, the flight and shelter being joined by a pop-hole. The nest box is described as a Cockatiel nest with an enlarged entry hole. Twigs are used to form the bulk of the nest but it is finished off with a cup of fine fibres or grasses. Mrs. Scamell attaches great importance to there being no disturbances whilst the female is incubating and whilst the pair are rearing and she advocates the prompt removal of young once they are independent.	2	2	2
	Stamps, D.,	Bilston, Staffs. (A.S.C.) This bird has been with Mr. Stamps since December 1968, and was bred by Mrs. Scamell.	I		
	Winged World,	Morecambe, Lancs. (A.S.C.) This male is the survivor of a pair, probably wild caught, that have been with Winged World since April 1967. In 1968 the pair hatched young which were thrown out of the nest at about four days.	I		
	Zoological Society of London.	(A.S.C.) This is the survivor of a pair bred and presented by the Surabaya Zoo, Indonesia (presentation February 1961). This bird is on loan to Mr. D. Castle for breeding purposes. The male died from Pneumonia and abscess of air-sac. The age of the longest lived specimen at Regents Park was 12 years.		I	
	Lewis, E. C.,	London. (A.S.C.) No return made but Mr. Lewis has exhibited a specimen during 1969.			I
	Manning, D.,	Ilkeston, Derby. (A.S.C.) No return made but Mr. Manning has exhibited a specimen during 1969.			I
Hong Kong					
	Botanic Gardens,	Hong Kong. (Vol. 10.) No return made.	I		

Country	Name	Address and Notes	♂ Male	♀ Female	Sex Unknown
Indonesia					
	Kebun Raja Dan Kebun Binstang (Gembira Loka), Jogjakarta, Java. (Vol. 8.)	No return made by this zoo either for the International Zoo Yearbook census or the Avicultural Society census since 1967. Indonesia, it must be remembered, contains the natural wild habitat for the species and we can expect to find that most, if not all, of the Indonesian zoos that keep birds to have some specimens of <i>L. rothschildi</i> . Apart from the zoo at Jogjakarta in Java, there are zoos at Bandung, Jogjakarta (being relocated at Ragunan), Surabaya (where Regents Park Zoo's specimens were bred), Semarang, Pematangsiantar, and Bukit Tinggi. Information concerning the population of captive held stock for Rothschild's Mynah at all of these zoos is totally lacking.	6	15	
Netherlands					
	Royal Zoological Society, Natura Artis Magistra (Artis Zoo), Amsterdam. (A.S.C.)	This pair were purchased from Basle Zoo in October 1964, where they were bred. There has been no breeding attempt.	1	1	
	Wassenaar Zoo. (A.S.C.)	These two pairs are described as breeding pairs and in 1967 one pair had young in three nests but they were not reared. Both pairs are wild caught and one specimen has been in the collection since 1961. The pairs are housed in single pairs in aviaries 2 × 2.5 × 2 m. which are planted. Wooden nest boxes are offered for breeding.	2	2	
South Africa					
	National Zoological Gardens of South Africa, Pretoria. (A.S.C.)	These two females were obtained from Koln Zoo in June 1965. In 1967 Koln sent to Pretoria a breeding female and her single youngster. These were killed by the two original birds when placed in their aviary. The two females have nested in 1967 and 1968 sharing the same box. Ten eggs were laid the first year and 12 in 1968.			2
Switzerland					
	Zoologischer Garten, Basel. (A.S.C.)	The breeding pair were wild caught in 1964 and have bred in 1969 and possibly in previous years because five of the total are captive bred at Basel. In 1969 the pair nested four times hatching three, four, one and two. Three young were reared and are thought to be females. Breeding took place in a flight within a Bird House which had access to an outside aviary which had a sand floor and was planted. The floor inside was covered with peat moss. The nest is described as a commercial starling box. A few other birds of mixed species shared the aviary. The young were removed after they had left the nest about two weeks for the parents could be dangerous. The oldest bird at Basel arrived in 1961.	2	3	3

continued

Country	Name	Address and Notes	♂ Male	♀ Female	Sex Unknown
Switzerland—continued					
	Zoo Park Daehelhoelzli, Berne.	(A.S.C.) Both these specimens were captive bred. One was purchased from Zurich zoo in April 1967, and the other from Basel zoo in September 1968. It is assumed that both are males.			2
	Voliere Arboretum, General-Guisan-Quai 45,	8002 Zurich. No <i>L. rothchildi</i> at this location A.S.C. 1970.			
	Zoo Zurich.	(A.S.C.) Mr. C. R. Schmidt sends very complete details about the Rothschild's Mynahs at Zurich. Pair 1 were wild caught, the male arrived in November 1963, and the female in May 1964. Prior to 1969 this pair reared 13 young. In 1969 pair 1 nested three times. Nest 1, number of eggs not given but two young hatched and reared. Nest 2, four eggs laid, three young hatched and two raised. Nest 3, three eggs laid and two young hatched and reared. This pair was housed in an open-fronted aviary 12 × 10 × 3 m. high, which is planted on natural ground. Some 60 other birds of 20 species share this flight. The nest box was of wood measuring inside 15 × 15 × 15 cm. with an opening 5 cm. Nesting material used; feathers and fine branches. The young were removed when independent. This pair have reared 19 young but the female died in July, 1969. Pair 2 were captive bred at Zurich, from it is assumed, pair 1. The male hatched in July 1966, the female in September the same year. This pair was housed during the summer in a planted aviary 4 × 3 × 3 m. high. This pair nested five times laying in each as follows: Nest 1, three eggs laid, 1 young hatched but not reared. Nest 2, number of eggs not given, two young were hatched but not reared. Nest 3, four eggs laid, two young were hatched and one fully reared. (This is second generation captive bred and is almost certainly a stage beyond any other owner outside Indonesia.) Nest 4, three eggs were laid and two young were hatched but not reared. Nest 5, three eggs were laid but the two hatched young again were not reared. The youngster was removed when independent. Recorded deaths for adults at Zurich list visceral gout, general septicaemia and parasitic worms as known causes. For young the main cause of death was their eviction from the nest by the parents between one and 10 days.	4	2	7
U.S.A.					
	Buffalo Zoological Gardens, New York.	(A.S.C.) This presumed pair were received as immature birds in November 1967, from Mr. W. Lee-Lenz who bred them.	1	1	
	Cheyenne Mountain Zoo, Colorado.	(A.S.C.) All birds at Cheyenne Mountain Zoo are wild caught and arrived in November 1963. The pair have bred to the extent of laying four eggs in April in the hollow trunk of a dead pine tree which is 12 ft. high and 10 in. in diameter and the actual nest is about 10 ft. from the ground. This nest had been placed in the aviary in December, 1968, and the Rothschild's Mynahs had immediately taken it over despite the presence of some 70 other birds of 30 species. In the past other types of	1	1	4

continued

Country	Name	Address and Notes	♂ Male	♀ Female	Sex Unknown
U.S.A.	—continued	nest boxes had been tried without any interest being shown in them. The mynahs enlarged the nest cavity to 10 in. deep and 5-6 in. inside diameter. The entrance is 3 in. in diameter. No nesting material was used but in enlarging the cavity the pair broke into a lower hole through the base of their own nest and the eggs were lost. The pair then covered the hole with feathers, string and bits of paper but no further eggs were laid. The aviary is described as a Free Flight Exhibit and is 24 × 18 × 14 ft. high with tinted glass top at the southern interior of a Bird House. The entire front of this flight is open so that the birds may fly into the public area. The flight has an earth floor covered with Vita-bark and is heavily planted with tropical plants. The temperature is regulated 70-75°F. and humidity increased by the presence of a large recirculating double pool.			
		Chicago Zoological Park, Illinois. (A.S.C.) These birds are believed to be wild caught and arrived at Brookfield between 1963-1966.			2
		Columbus Zoological Gardens, Ohio. (A.S.C.) These birds are believed to have been captive bred in California; both were received as immature, one in May 1966, and the other in July 1968.			2
		Conservatory-Aviary, Pittsburgh, Pennsylvania. (A.S.C.) This pair were obtained from Mr. Alex Isenberg of Portola Valley, California, in April, 1969, and are adult. Mr. Roland W. Hawkins, aviculturist to the Conservatory-Aviary, has written with the information that <i>L. rothschildi</i> has been bred in the past but the adults have been lost. The present pair have been placed in a small planted "habitat" which is shared with compatible species.	1	1	
		Lincoln Park Zoological Gardens, Illinois. (A.S.C.) This single bird was purchased in July 1964, and is thought to be wild caught.			1
		Los Angeles Zoo, California. (A.S.C.) These two birds were received from an aviculturist as adults in June 1966. It is not known if they are wild caught. They are housed in a large planted cage.			2
		Milwaukee County Zoo, Wisconsin. (A.S.C.) Mr. Joseph M. Iding, curator of birds, has sent these details about Milwaukee's success with this species. The group consisting of two breeding pairs, a non-breeding pair and four immature are housed in a 50 × 100 ft. planted, heated and air-conditioned community flight with some 200 other birds of mixed species. The two breeding pairs remain of six original birds purchased from Holland in April 1965. The non-breeding pair now about 2 and 2½ years old and were bred, one each, from the breeding pairs. The immature were bred from both pairs. In such a vast aviary close inspection is scarcely feasible but in 1969 several nestings by both pairs took place and pair 1 hatched three young, pair 2 hatched two young and four from both pairs were reared. Apart from 1968 when pair 1 laid four eggs in one nest no other details about clutch sizes are available. The nest boxes are described as Cockatiel type about 12 × 12 × 15 in. high. Recorded nesting material includes leaves from plants, small twigs, bamboo, and palm. Mr. Iding obviously feels he can better these	3	3	4

continued

Country	Name	Address and Notes	♂ Male	♀ Female	Sex Unknown
U.S.A.—continued					
		results for he is planning to build four small flights for the Rothschild's Mynahs to breed under more controlled conditions.			
		National Zoological Park, Smithsonian Institution, Washington, D.C. (A.S.C.)	I	I	
		The male was received from Clères, France in 1969 and its origin is unknown and the female's origin and date of arrival is unknown. The pair is housed in a large planted community aviary, and in 1969 several nests of eggs have been laid but no young have been reared to independence. The nest, 8 × 6 × 6 in. with a hole 2 in. in diameter, was in a rock wall. Causes of death recorded for adult stock are: One adult after eight years in the collection with pneumonia and one adult male died of trauma as a result of fighting.			
		New York Zoological Society, Bronx Zoo, New York City. (A.S.C.)	3	2	
		All five specimens were wild caught. Two males and one female were received in November 1967, one male in October 1961, and one female in December 1961. There has been no breeding success at the Bronx due to housing problems. Mr. Joseph Bell, Associate Curator of Birds, hopes that the building programme now under way (new planted aviaries and a really large building for Passeriformes are referred to) will improve matters.			
		Philadelphia Zoological Garden, Philadelphia. (A.S.C.)	I	I	
		This pair has bred for the last two years and four eggs are laid in each clutch (in 1969 two nestings) these so far have always been infertile. The pair is housed in a community flight with natural planting and dirt flooring. A hot air heating system in winter keeps the temperature between 60–70°F. This flight is 50 × 30 × 20 ft. high. The nest box is similar to a large parrakeet box and is located high in a ficus tree. Mr. John A. Griswold, curator of birds, writes that the female was purchased from an English dealer in February 1962, and the male exchanged for a female of the same species from the National Zoo in June 1967. The female is doubtless wild caught.			
		San Antonio Zoological Gardens, Texas. (A.S.C.)		I	I
		The female is the survivor of a breeding pair which in 1968 reared to independence four young. Three of these were killed by aggressive starlings and the other was accidentally killed by a keeper closing a door. The male died in a fight with a common starling. The female was captive bred in Los Angeles and was purchased 1967. The unsexed birds of unknown origin was purchased in November 1968. The successful breeding of 1968 took place in a community aviary containing 40 birds of 20 species. The aviary is described as being a planted diorama of 20 × 20 × 10 ft. with a glass front. The floor is sand covered which is kept moist with a sprinkler system. Systems of controlled heating and air cooling keep the desired temperature range. The next box had dimensions of 12 × 12 × 18 in. and nesting material included peat moss and dry leaves. The young when independent were allowed to remain in the aviary.			

continued

Country	Name	Address	and	Notes	♂ Male	♀ Female	Sex Unknown	
U.S.A.— <i>continued</i>								
	St. Louis Zoological Park,	Missouri.	(A.S.C.)				2	
	These two specimens were purchased from a dealer approximately 4-5 years ago and they were then immature. These birds are housed in well lit cage some 5 × 6 × 9 ft. with a sand covered floor. They have been given a plywood parrot-size nest box, and for nesting material have been offered cedar tow, alfalfa and timothy. There has been no nesting behaviour.							
	San Diego Zoological Garden,	California.	(A.S.C.)		4	3		
	There are three pairs of Rothschild's Mynah and one odd male at San Diego (the latter, the survivor of the pair, presumed wild caught, donated to San Diego by Dr. K. C. Searle in October 1969, and which previously were with Mr. W. R. Partridge). There have been no young reared at San Diego since June 1967, and all 11 have been reared by a wild caught pair imported from Surabaya in September 1961. In 1962 one reared, 1963 three reared, 1964 one reared, 1965 two reared, 1966 two reared, 1967 two reared. It is interesting to note that all these successes, except for July 1965 took place in June. In 1962 when this pair first reared, Mr. Kenton C. Lint, curator of birds, described the nesting behaviour in some detail, and from February to June the pair nested five times (twice eggs were laid but disappeared, twice young hatched but were deserted, and finally came the success of what is believed to be the first captive rearing of <i>L. rothschildi</i> in the U.S.A.). Mr. Lint believes that three eggs were laid each time but as the nest was located behind a rock crevice this is conjecture based on behavioural study. The nesting material used included grasses, wool, pieces of yarn and leaves. The young were not removed when independent and apart from the Searle bird the Rothschild's Mynahs at San Diego consist of original parents and their young. All breeding took place in the Rain Forest-Walk-Through Aviary. This vast structure contains some 200 species of birds and is 167 × 80 × 110 ft. high. San Diego plans to construct a special aviary for this species in 1970 as part of a special conservation programme. Deaths of adults at San Diego are attributed to Trauma (no information as to the nature of this but probably injury from other birds). The death of young is attributed to desertion by the parents and pulmonary congestion.							
	San Francisco Zoological Society,	California.	(A.S.C.)				2	
	No information offered about these birds.							
	Tacoma Zoological Society,	Washington.	(Vol. 10 and A.S.C.)		2	2		
	Three of these birds were bred by Mr. Lee Lenz some years ago; the origin of the other bird is unknown.							
	Tampa. Busch Gardens Zoological Park,	Tampa,	Florida.	(Vol. 10.)	1	1		
	Presumed wild caught.							
	Woodland Park Zoological Gardens,	Seattle,	Washington.	(Vol. 9.)	2	2		
	No recent information.							
					Total	60	61	52

I am grateful for the interest shown by the Embassy of the Republic of Indonesia in this project.

Mr. Robert L. Kondik, Curator of Birds at Columbus Zoological Gardens, and Mr. T. J. Riggs of Brooklyn, New York, helped in no small measure to track down owners unknown to me.

My final, but by no means least, thanks to Mr. Colin Harrison who helped me in so many ways to get this Register and 1969 Report back for his editing almost on time!

* * *

BREEDING RESULTS IN THE NORFOLK WILDLIFE PARK

By PHILIP WAYRE, Director (Great Witchingham, Norfolk, England)

The 1969 breeding season in the Norfolk Wildlife Park was reasonably successful with a total of 158 birds of 35 species reared to maturity. The most important event of the season was undoubtedly the successful breeding of three young Stone Curlews *Burhinus o. oedicnemus* apparently for the first time in captivity in this country and possibly in the world. An adult pair, one of which was originally presented by the R.S.P.C.A. having a damaged wing, are kept in the Wader enclosure. Last year (1968) they laid two eggs from which one chick was hatched but failed to survive the winter. The first egg this year was laid on 14th May and the second two days later; within a week both eggs were removed and incubated under a broody bantam. Two chicks hatched on 30th June and were reared without difficulty on a diet of maggots and mealworms. The adult laid again on 26th June, apparently only one egg, though a second egg could have been taken by Jackdaws. The egg was once again removed and incubated by a bantam. It hatched successfully and the chick was reared without trouble. All three young birds are alive and in good health at the time of writing.

A pair of Skylarks *Alauda arvensis* kept in a small planted aviary built a nest and laid two eggs on 25th May, but both eggs were subsequently eaten by field mice. The latter having been dealt with, the birds built a new nest which was found to contain two eggs on 20th June. Both eggs hatched on 30th June and one chick was reared to maturity the other dying when five days old. It is the first time this species has bred in the collection.

Other passerines to be bred include Wheatear *Oenanthe o. oenanthe* with one chick reared to maturity, Blackbird *Turdus m. merula* two, Song Thrush *Turdus ericetorum ericetorum* four, Greenfinch *Chloris c. chloris* three and Bullfinch *Pyrrhula pyrrhula pileata* two.

Both Azure-winged Magpies *Cyanopica cyanus cooki* and Alpine Choughs *Pyrrhocorax g. graculus* again nested but the eggs of the former proved

infertile. The Choughs hatched five young but one died at 14 days old. The remainder of the brood were then removed and an attempt was made to hand-rear them but this proved unsuccessful. The Azure-winged Magpie, which escaped at Easter 1968, managed to survive the winter at liberty and during the summer built a nest in a thorn bush a few yards from the aviary containing one of the captive pairs. This bird is still seen about the park from time to time.

Four young Red-breasted Geese *Branta ruficollis* were the first to be bred in the collection. Other waterfowl reared include Swan Goose *Anser cygnoides*, European White-fronted Goose *Anser a. albifrons*, Emperor Goose *Anser canagicus*, Greater Snow Goose *Anser coerulescens atlanticus*, Taverner's Canada Goose *Branta canadensis taverneri*, Barnacle Goose *Branta leucopsis*, Common Shelduck *Tadorna tadorna*, Ashy-headed Goose *Chloephaga poliocephala*, Cereopsis Goose *Cereopsis novae-hollandiae*, Red-billed Pintail *Anas erythrorhyncha*, Bahama Pintail *Anas bahamensis rubrirostris*, Falcated Teal *Anas falcata*, European Wigeon *Anas penelope*, Chiloe Wigeon *Anas sibilatrix*, Garganey *Anas querquedula*, Common Shoveler *Anas clypeata*, European Eider *Somateria mollissima mollissima*, Canvasback *Aythya vallisneria*, Ferruginous *Aythya nyroca*, Mandarin Duck *Aix galericulata*.

A young Kestrel *Falco tinnunculus*, sole survivor from a brood of three, was the first to be reared to maturity in the collection. This species is very rarely bred in captivity although a brood was successfully reared in 1969 at the Falconry Centre in Gloucestershire. Previous records include two definite and one doubtful breeding in captivity (Prestwich 1955).

Owls did well with five Barn Owls *Tyto a. alba*, nine European Eagle-Owls *Bubo b. bubo*, seven Little Owls *Athene noctua vidalii*, and four Tawny Owls *Strix a. aluco*, reared to maturity. Once again a young pair of Eagle-Owls was presented to the German Nature Protection Authorities for release in the Eifel area in an attempt to reintroduce the species there, while a further two pairs are awaiting shipment to the Conservation Authorities in Sweden for release in their forests. They will bring the total of young Eagle-Owls bred in the Wildlife Park and sent to Sweden for release to 18 since 1964.

Four of the young Barn Owls were released as soon as they were fully fledged, their parents being kept inside the aviary and the young fed every night outside on top of it. At the time of writing at least two of the youngsters are known to be living in the vicinity and are still returning nightly for their food six months after their release. Similarly five Little Owls were released and at least one is known to come back every night for the food left on top of its aviary.

REFERENCES

- PRESTWICH, A. A. 1955. *Records of birds of prey bred in captivity*. 2nd Edn., London.

COUNCIL MEETING

A Council Meeting was held on 20th March, 1970, at the Windsor Hotel, Lancaster Gate, London, W.2.

The following Members were present: Dr. Jean Delacour, Vice-President, in the Chair. Mr. J. J. Yealland, Vice-President. Miss P. Barclay-Smith, Mr. J. O. D'eath, Mr. M. D. England, Mr. C. J. O. Harrison, Mr. L. W. Hill, Mr. H. Horswell, Mr. K. A. Norris, Mrs. K. M. Scamell, Mr. D. T. Spilsbury, Mr. A. A. Prestwich, Hon. Secretary.

THE SOCIETY'S MEDAL

The Society's Medal was awarded to: Mrs. K. M. Scamell, for breeding the Spotted-winged Stare *Saroglossa spiloptera*, in 1969; Mrs. K. M. Scamell, for breeding the Indian Blue Chat *Luscinia brunnea brunnea*, in 1969; Mr. A. E. Hall, for breeding the Black-necked Starling *Sturnus nigricollis*, in 1969; Mr. G. R. Pryor, for breeding the Blackish Rail *Rallus nigricans*, in 1969.

CERTIFICATE OF MERIT

The Society's Certificate of Merit was awarded to: The Tropical Bird Gardens, Rode, for breeding the Scarlet Ibis *Eudocimus ruber*, in 1969; B. Bertram (Sub-Department of Animal Behaviour, Cambridge), for breeding the South Indian (Lesser) Hill Mynah *Gracula religiosa indica*, in 1968.

ELECTIONS

There were the following appointments: Vice-President: Miss P. Barclay-Smith, M.B.E. Hon. Fellows: Mr. C. K. Lucas, Mr. K. A. Norris and Mr. D. H. S. Risdon.

OBITUARY

Council has learned with profound regret of the deaths during the past year of the following Members: *Hon. Fellow*: Mr. Lee S. Crandall (1938). *Members*: Mr. Walter Bird (1952), Mr. Edward M. Boehm (1960), Mrs. Alene S. Erlanger (1942), Mr. Pieter W. Louwman (1951), The Duke of Palmella (1944), Mr. W. R. Partridge (1934), Mr. J. H. Reay (1947), Mr. Walter H. Turner (1930).

ARTHUR A. PRESTWICH,
Hon. Secretary.

* * *

BRITISH AVICULTURISTS' CLUB

The one hundred and third Meeting of the Club was held at the Windsor Hotel, Lancaster Gate, London, W.2, on Friday, 20th March, 1970, following a dinner at 7.30 p.m.

Chairman: Mr. K. A. Norris.

Members of the Club present: S. J. Allum, *Miss P. Barclay-Smith, A. W. Bolton, W. J. Bourne, R. A. Chester, F. Coombs-Goodfellow; R. G. Crowe, J. O. D'eath, M. F. Draper, Mrs. W. Duggan, Miss R. M. Ezra, R. H. Grantham, J. Hancock, R. T. Harvey, L. W. Hill, *Dr. E. Hindle, Dr. J. R. Hodges, H. Horswell, P. Howe, *H. J. Indge, H. Jordan, Dr. S. B. Kendall, H. G. Kenyon, Miss R. Low, *P. H. Maxwell, N. O'Connor, P. J. Olney, W. J. Page, *A. A. Prestwich, Mrs. M. Reay, D. M. Reid-Henry, K. M. Scamell, Mrs. K. M. Scamell, G. St. G. Schomberg, Mrs. C. H. Seth-Smith, D. T. Spilsbury, N. R. Steel.

* Denotes Founder Member.

Members of the Club present, 38; guests, 34.

Members were able to welcome Dr. Jean Delacour making one of his all too infrequent visits.

Mrs. K. M. Scamell showed the B.B.C. colour film "The Incredible Hummingbirds", with commentary by Peter Scott. L. W. Hill who, with Mrs. Scamell, appears in the film, acted as projectionist. The Club was very fortunate in that Len Hill brought as a guest Richard Brock, the producer and director of the film.

ARTHUR A. PRESTWICH,
Hon. Secretary.

* * *

NEWS AND VIEWS

David King has succeeded Lynn Hall, Jr., as President, Avicultural Society of America.

* * *

Philip Wayre is at present spending three months in India filming for a B.B.C.2 series.

* * *

The Bronze Medal of the Zoological Society of London has been awarded to P. B. Partridge, in recognition of forty years service to the Society.

* * *

Mrs. Brenda Rhodes reports that two young Black-tailed Conures *Pyrrhura melanura* have left the nest and have been removed from the aviary, as the parents show signs of again nesting.

* * *

The Association de la Presse Avicole et Horticole Belge has awarded its annual Grand Prix, 1969, to Madame Georgette Swaenepoel, principally in appreciation of her untiring administrative work in the production of *Le Monde des Oiseaux* and *De Vogelwereld*.

* * *

Dr. L. A. Swaenepoel, Lembeek, Belgium, reports that one of his Bronze-winged Parrot *Pionus chalcopterus* hens has laid two lovely infertile eggs which she is brooding diligently. He now has six pairs of Blue-bonnets, some of which are visiting the nests.

* * *

I usually report progress in the conservation of the Whooping Crane. The first accurate census was taken in 1941 and revealed that only 15 birds were to be seen wintering on the Aransas National Wildlife Refuge, in Texas. Last winter a record 55 wild Cranes returned.

* * *

R. T. Kyme reports that his Weber's Lorikeets *Trichoglossus haematod weberi* hatched two young ones on 25th February but, unfortunately, they lived only three days. The parents are again sitting on a clutch of two eggs. Latest arrivals are a pair of Perfect Lorikeets *T. euteles*.

* * *

The late Mrs. Alene Erlanger, formerly Treasurer, United States Section, International Council for Bird Preservation, established a Medal in honour of Dr. Jean Delacour, President Emeritus, I.C.B.P. The Medal is awarded for services to ornithology, bird preservation and aviculture. Miss P. Barclay-Smith was amongst the leading ornithologists that attended the dinner in the American Museum of Natural History on 20th January, 1970, when Dr. Dean Amadon, Vice-Chairman of the U.S. Section, presented the first award to Professor Konrad Lorenz.

* * *

Gleaned from the R.S.P.B. Report, 1969. White-tailed Eagle. The four young ones taken to Fair Isle in June, 1968, had all disappeared by September, 1969. One young bird was seen by fishermen on Fair Isle coated in oil.

Osprey. Three pairs in Scotland each produced two young and other pairs were prospecting.

Snowy Owl. The pair in the Fetlar Reserve, Shetland, again nested. Six eggs were laid but only three young fledged; subsequently two died from malnutrition and pneumonia.

* * *

John Wilson writes of his Pesquet's Parrot: "I have had my bird for almost three years. It was in rough feather on arrival but is now getting into first class condition, and is very tame. In the summer I keep it in a large outside flight, with a shelter. It has had no artificial heat during the winter when it is kept inside a frost-proof building in a good-sized flight. Temperatures have fallen to 1° C. at night, but it has thrived well. I feed

it on Nectorfeed, Farex, sweetened milk and honey, also a large variety of fruit and raw vegetables ”.

* * *

One of the most interesting rearings at Chester Zoo last year was two Red-masked Conures *Aratinga rubrolarvata*. The only previous successful breeder seems to have been W. Shore-Baily who was awarded the Society's Medal for rearing two young ones in 1925. He was again successful in the following year, number reared not recorded. Other birds reared include one Sclater's Curassow, one Louisiade Lorikeet, three Great Eagle-Owls, three Crimson-winged Parrakeets, three Derbyan Parrakeets, one Glossy Starling, and three Barnard's—Pennant's × Port Lincoln Parrakeets. The Kookaburras hatched two young but failed to rear them.

* * *

News from the Tropical Bird Gardens, Rode. Donald Risdon writes, 23rd March, 1970: “ We already have two couples of Peacock Pheasant chicks hatched and the full-winged Carolinas have full clutches which they are just starting to incubate. I think this is the earliest I have ever known for them. The full-winged Mandarins are not far behind.

I am glad to say that our two baby Scarlet Ibis have survived the winter and are now showing a few pink feathers.

The Eagle-Owls are calling and have made a scrape, but so far no eggs. The young pair of Cassowaries we bought last autumn have grown fantastically during the winter. The smaller of the two, which I hope is a male, is already turning black ”.

* * *

Paul Schneider, Riverside, California: “ Avicultural-wise 1969 was a fair year. My wife hand-reared three Leadbeater's Cockatoos; one Alba Cockatoo, the egg of which was placed under a bantam for 25 days, and for the remainder of the incubation period in an incubator. Two Grand Eclectus (males), the eggs of which were incubated by the female for two weeks, and the remainder in an incubator. The raising of two males from the same clutch has proved to me that nest mates are not necessarily true pairs. This also applies to doves and pigeons.

Two Indian Ring-necks and three African Greys were also hand-reared. Successes were obtained with the albino and pied Cockatiels, Many-coloured, Rock Peplars, lutino Ring-necks, Yellow-fronted Kakarikis (20 reared), Green Jungle Fowl and Satyr Tragopans. A Hawk-headed chick and a Port Lincoln chick were both lost at about seven days of age.

I lost my old Satyr Tragopan female on 25th November. I had her in my possession for some 12 years. The party from whom I purchased her had had her for some two or three years and she was an imported adult when he obtained her. She produced every year.

On 8th June while attending the Avicultural Society Meeting at the Los Angeles Zoo, thieves stole seven lutino, one blue and one split male Ring-necks. On 27th June the State served us with condemnation papers on

our home for highway construction. We are currently in an expensive litigation with the bureaucracy over their confiscating ridiculous offer. In the interim we have had to purchase another place and I spent eight weeks of my vacation and accumulated time constructing 79 flights (86 ft. \times 112 ft.), and they are a long way from completion. I hope that by the end of 1970 we will be living a normal life once more".

* * *

Ralph C. Small, Brookfield, Illinois: "After nine years as parrot keeper at the Chicago Zoological Park I have been transferred to the mammal department. During this time the following birds were raised to maturity in the parrot house—6 Crimson-winged Parrakeets, 64 Nyasa Lovebirds, 1 lutino Nyasa, 19 Swainson's Lorikeets, 2 Eastern Rosellas, 11 Red and Yellow \times Blue and Yellow Macaws, 13 Hawk-headed Caiques, 2 Cockatiels, 5 Roseate Cockatoos, 5 Plum-headed Parrakeets, 1 Jendaya \times Golden-headed Conure, and 3 Bourke Parrakeets.

My biggest thrill was in 1969 when the Hyacinthine Macaws hatched an egg, but the chick lived for only about 2½ days. I do not think the parents fed it. I was looking forward to the opportunity to try again this year. The remarkable thing about all these breedings is that they took place in the parrot house in cages 5 ft. \times 5 ft. \times 7 ft. high, except for the Macaws—they were in cages 5 ft. \times 8 ft. \times 9 ft. high. Even more remarkable the public could reach over the guard rail and feed the birds. This tends to make some very nervous and they would refuse to go to nest. Some would lay and hatch their eggs, and then either kill or throw out the babies or refuse to feed them. The abandoned babies were, with permission, hand-reared by my wife and myself. It was a very satisfying experience to watch the tiny babies grow into beautiful adult birds.

The temperature during the winter was kept between 65°–75° F., but in the summer it went up as high as 110° F. I always kept a night light on in the building to prevent injury in the dark. During the years other birds were brought into the building to be reared. To name a few, five Emus, one Darwin's Rhea, 18 Wild Turkeys, some pheasants, ducks, geese, swans, quail and peafowl. The past nine years have been quite rewarding for it is an experience too few are able to have. It is my hope that some time in the future I will again be able to care for a large collection of parrots".

A. A. P.

* * *

REVIEW

PATTERNS OF REPRODUCTIVE BEHAVIOUR. By DESMOND MORRIS. London: Jonathan Cape, 1970. Price 84s.

This is a collection of 14 articles which have appeared in various scientific journals, some out of print. Nine deal exclusively with reproductive patterns and the other five, although covering a wider field, are included because they have an important bearing on this subject.

Aviculturists will be specially interested in those chapters dealing with birds. The very complex reproductive behaviour of the Zebra Finch is described in detail based on the study of 23 individuals, nine of which were bred in the laboratory. In addition the occurrence of the same or similar markings in other Australian grass-finches is illustrated diagrammatically by a comparison of 22 related species. Whilst many of the component markings are shared between several species, each possesses a unique combination of markings.

The function and causation of courtship ceremonies contains a number of examples among birds as well as other groups of vertebrates. The feather postures of birds and the problem of the origin of social signals is of especial interest in the interpretation of the social behaviour of birds. "Typical intensity" and its relation to the problem of ritualization is followed by a long chapter on the reproductive behaviour of the Bronze Mannikin. Other chapters confined to the study of birds include one on the courtship of pheasants and a long account of the comparative ethology of grass-finches and mannikins. But most of the other chapters also contain references to birds in the discussions on the reproductive behaviour of vertebrate species. The response of animals to a restricted environment will be of especial interest to those concerned in the care of wild animals, many in laboratories and zoological gardens. E. H.

* * *

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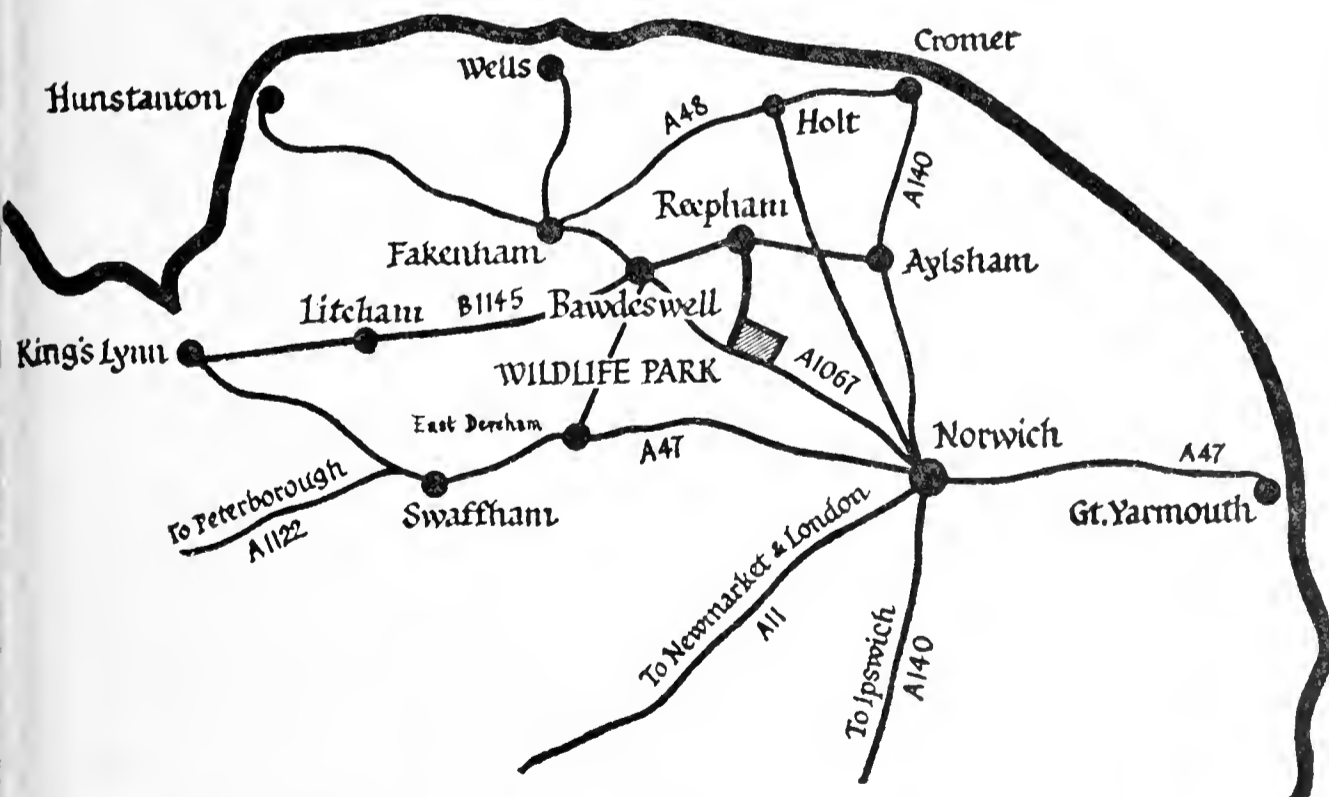
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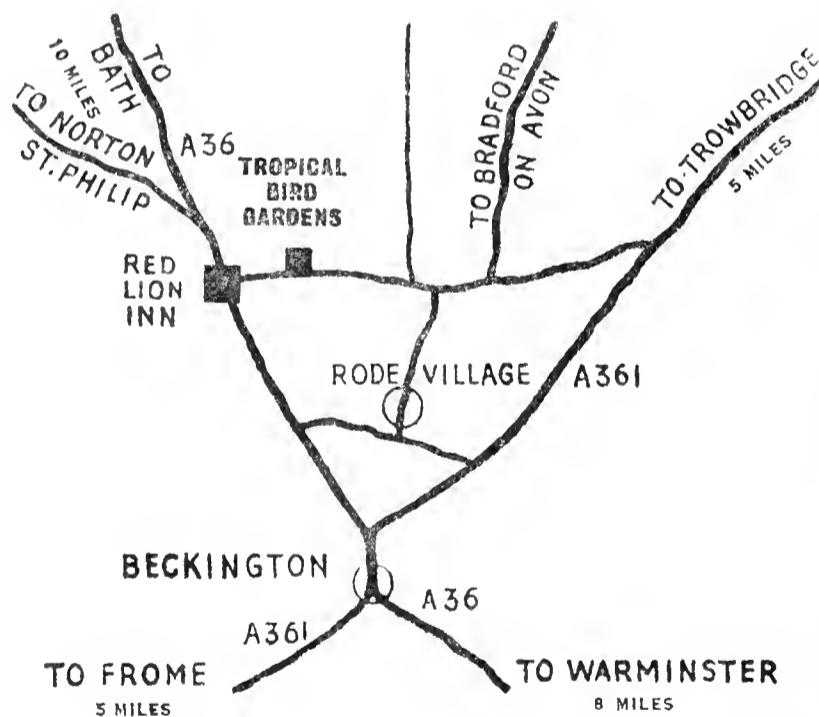
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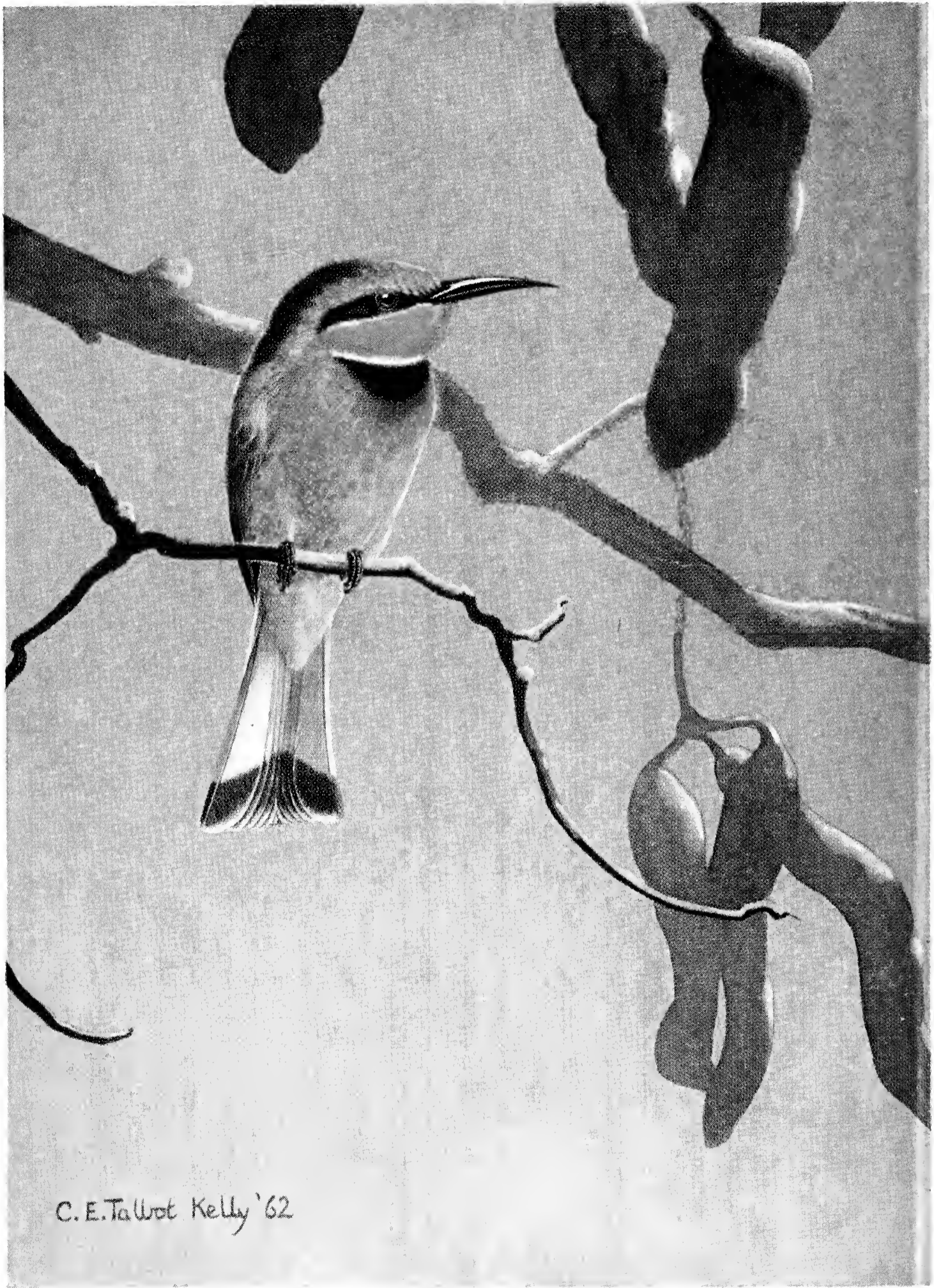
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LITTLE BEE-EATER.

AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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JULY—AUGUST 1970

ON THE LITTLE BEE-EATER

By DEREK GOODWIN (London, England)

My qualifications for writing about the Little or Least Bee-eater (*Merops pusillus*), are (as I have fully explained to our fair Editor, so blame her not me!) based on nostalgia rather than knowledge. I have seen the species only once, and long ago, but my memory of it is vivid.

In May 1941, as a young soldier, I spent a fortnight at Clairewood Camp, near Durban, South Africa. As Army life went it was a brief period of almost unimaginable luxury sandwiched between the rigours of six weeks on a troopship from England and the war in the Middle East. For me a very large fly in the otherwise temporarily soothing ointment was that I had no field glasses. As my readers are, no doubt, also bird-addicts, I need not enlarge on this misfortune for it to be appreciated by them!

At the first opportunity I was, of course, away into the surrounding countryside looking for birds and other creatures. Most of the birds kept at what was, for me in my binocular-less state, a tantalizing distance. Then, as I was wandering over some grassland dotted with scrubby bushes, a flash of bronze and green caught my eye. I saw the bird settle and, to my delight, it and its four companions stayed settled and allowed me to approach to within about 8 ft. and feast my eyes on them.

I can recall even now that I was trembling with excitement and, no doubt, with fear lest they should fly away before I had noted down their appearance. I had never in my life seen birds like them before, and although I realized that they were bee-eaters of some species I had no idea which, except for realizing that they were certainly not *the* Bee-eater (*Merops apiaster*) of my British bird books. Having hastily made rough sketches and "colour maps" of them I settled down to a pleasurable few minutes (till they flew further off) watching them. Later I saw Green, Blue-cheeked and European Bee-eaters (*M. viridis*, *M. superciliosus* and *M. apiaster*) in Egypt but, beautiful as they were, none of them made so clear and lasting an impression on me as those five Little Bee-eaters in Natal. The Little Bee-eater is not, perhaps, quite so striking as some of its relatives but, as the accompanying plate shows, it is a lovely bird and, of course, quite different from any species I had seen before.

The Little Bee-eater has a wide range in Africa, being found from just south of the Sahara in West Africa east to Ethiopia and Somaliland south to Natal. It is an inhabitant of savanna woodland and scrubby arid country. In South Africa it is fond of the vicinity of water (Roberts). Like other bee-eaters the nest is in a burrow of a bank, often quite a low one, and sometimes in the roof of an ant-bear hole. Bees, wasps and other insects, mostly caught on the wing are its food, as with most other bee-eaters.

A bee-eater that has captured a venomous bee or wasp takes it to a perch and prepares it by beating its head against the perch, then gripping it by the tip of the abdomen and rubbing it against the perch to express the venom from the sting. The bird then beats the bee's head one or more times again and then swallows it. Fry (1969a), from whose paper these feeding details are abstracted, found that the movements are innate but improve with practice. Non-venomous insects are given much less elaborate treatment. Fry's detailed experiments were made on the Red-throated Bee-eater (*M. bullocki*) but he mentions having seen the same behaviour from wild bee-eaters of several other species, including *M. pusillus*. There is, however, evidence that some of the larger bee-eaters sometimes take bees in continuous flight but it is not known how they then prepare them for swallowing (Fry, 1969a).

It has been claimed that the European Bee-eater is immune to bee and wasp stings, but Fry suggests that, at least in the Red-throated Bee-eater, this immunity is only partial, as a young bird that was, apparently, stung by the first few bees it ate, showed signs of distress.

At one time the bee-eaters were divided into several genera mainly on the differing shapes of their tails and the present species was put in the genus *Melittophagus*. Fry (1969b), however, puts the Little Bee-eater, along with most of the others, in the genus *Merops*. I conclude with references to papers which are recommended to those wishing to learn further about birds of this interesting and colourful genus.

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BREEDING THE LITTLE BEE-EATER AT THE
WINGED WORLD*(Merops pusillus)*

By CLIVE ROOTS (Morecamb, Heysham, Lancs.)

As so often happens these days, due to building delays, the very short period between the completion of an animal building and its opening to the public seldom allows time to provide the most suitable environment for the inmates. This was the case at the Winged World four years ago, and only after the building was open were we able to concentrate on providing more suitable quarters for birds with exacting requirements. One of the first jobs to be tackled was the construction of an artificial wall for tunnel-nesting birds, bee-eaters in particular, although few shared our optimism that these birds could be induced to breed in indoor community cages. This seemingly simple task of providing nesting sites for tunnellers involved the use of three tons of rock and seven tons of soil. This was carried piece by piece and sackful by sackful along a tortuous route at least one hundred yards from the nearest access point, up a slope, two flights of steps and through two narrow doorways. Some of the rocks weighed almost two hundredweight.

It was built into a wall in which gaps, approximately one foot square, were left. These were later covered with a wire-mesh screen in which small holes were left, and a weak plaster mixture, dyed the colour of the rocks, was trowelled over the screen. A retaining wall was then built about six feet behind this rock face, and the gap between filled with soil and planted. Vines were also planted in crevices left between the rocks. The soil soon became quite impacted and birds perching on the lip of the two-inch diameter entrance holes were confronted with a solid mass of soil into which they could tunnel.

Four Little Bee-eaters were housed in this exhibit, but far from being occasionally gregarious, as they apparently sometimes are in the wild state, the first pair to come into breeding condition would not tolerate the presence of the others. Their first nesting attempt, in the spring of 1969, was unsuccessful as they chose one of the holes nearest the top of the wall.

The depth of soil over their tunnel was therefore no more than a few inches, and as we feared, the front part of their tunnel collapsed soon after they started feeding their young. Shortly afterwards a group of five Carmine Bee-eaters were obtained from West Africa and placed in this exhibit, but in the spring of this year the Little Bee-eaters became so aggressive that it was necessary to remove the several times larger Carmine Bee-eaters for their own safety. Both Little Bee-eaters were observed excavating a new tunnel, once again near the top of the wall, in the middle of March. Towards the end of the month it became apparent that egg-laying and possibly incubation had commenced, because of the long period

of absence of one of the birds. As far as we could tell incubation started on 4th April, and on the 25th of the month the first of the many visits to the tunnel with food commenced. Both parents fed the nestlings with mealworms, mealworm pupae and blowflies. Crickets and locusts were also offered but were ignored. From entering the nest-hole with food to reappearing again no more than four seconds elapsed, and often only three, so we naturally assumed that the tunnel was short, possibly about eighteen inches long, but we never took the risk of inspecting the entrance hole or tunnel during incubation and rearing for fear of upsetting the birds.

The other species in their compartment—breeding pairs of Fairy Blue Birds and Yellow-breasted Fruit Pigeons—plus pairs of Van den Bocks Pittas and Scimitar Babblers, were never aggressive towards the Bee-eaters. The Babblers, however, were a nuisance because of their continual investigation of the tunnel entrance, no doubt out of curiosity as they had never molested the more vulnerable Pigeon and Blue Bird nestlings. On many occasions the Bee-eaters had to wait until the Babblers had moved away before they could enter the hole, so the latter were removed.

During the early days of rearing two dozen trips with food, on several occasions daily were observed, yet towards the latter part of the rearing period the food-carrying visits became less frequent, and we were concerned that some of the nestlings may have been lost. Even a few days before the young eventually emerged we witnessed no more than a handful of visits with food daily.

Obviously the bulk of the feeding was done in the many hours of daylight before and after our normal working hours. After a rearing period of exactly 28 days three nestlings appeared. One was a poor flier, another could manage reasonably well, although it could not perch, and both consequently spent most of the time on the floor. The third nestling was poorly feathered and replaced in the tunnel. The nestlings at this stage were green above, had a black eye streak, brownish white throat, and pale green underparts streaked with green on the breast. They were the same size as the adults, but their bills were short and straight. Two days later the most backward of the two still out of the tunnel disappeared, and we assumed it had returned to the nest. This proved to be correct, for the following day saw the reappearance of this and the third nestling. Neither could fly properly, and as it soon became obvious that the parents were ignoring them they were removed. One died within the hour, but the poorly feathered one was successfully hand reared. This breeding attempt therefore reached a successful conclusion as the other youngster was reared to independence by the parents.

As described above the Little Bee-eater (*Merops pusillus*) has been bred at the Winged World. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

BREEDING THE BLACK-TAILED CONURE

(Pyrrhura melanura)

By MRS. BRENDA RHODES (Sowerby, Yorkshire, England)

The size of these birds is about 10 in. They are a lovely dark green with a large white eye ring, beaks and feet are grey, a wide collar of creamy white tipped feathers, some maroon feathers on the abdomen, long flight feathers are dark bluish, underwings are scarlet, and the tail is dark maroon.

There is no apparent difference in the sexes; when I bought mine I sexed them by the pelvic bone method. Possibly the hen's head is very slightly flatter than the cock's, and my hen has more maroon feathers on her abdomen. There is no difference in the behaviour of my pair when not breeding.

They live in a flight in the bird hut next to a pair of Moustached Parrakeets. It is only a small flight about 3 ft. × 3 ft. 3 in. × 6 ft. high. Also in the hut there are cages of Lovebirds, Budgerigars, one pair of Aymara Parrakeets, one pair of Tovi Parrakeets and one pair of Plumhead Parrakeets in a flight at the other end of the hut. There are also Waxbills and Finches flying free in the work space of the hut.

The hut is heated and the temperature is about 58°F. They are nice quiet birds. Their normal diet is sunflower seed with apple, grated carrot and millet sprays. They were always given budgie seed but never touched it until they started to breed. As they like to chew wood they always have a supply of willow twigs to save their perches, etc.

I bought these birds in July 1968. They were given a nest box on 1st December 1968, size about 9 in. square, 18 in. deep with 2 in. peat in the bottom, but did not go near it for about three months when they started to sleep in it at night. At the end of October 1969 the hen started to go into the box during the day. They were seen mating on more than one occasion during January 1970. On 1st February I think she laid her first egg and started to sit. There was no chance of looking into the nest box unless I looked while she was sitting, so I did not take that risk and did not see her again until the babies were about 10 days old.

On 26th February I first heard faint squeakings coming from the nest box. Also at that time the cock started to be plucked till at the end of one week he was bald.

As soon as I heard the first squeaking I gave them extras, soaked sunflower seed, soaked millet sprays, and they started to eat a little budgie seed. I gave them soft food made of canary rearing food, P. Sluis S.L.O., grated carrot, grated cuttlefish bone (as the parents never touch the cuttlefish bone), all mixed with water, also extra apple. I always

put Cytacón and Abidec drops in the water of all my birds that are feeding young.

I heard the babies being fed at some time every day and at six weeks old could hear them trying their wings in the nest. Then at seven weeks old the first baby was out in the flight when I went into the hut. The hen stays in the nest box with the young most of the time.

The baby is just a bit smaller than the parents, with a shorter tail but like them in plumage except there is not as much scaly marking round the throat and this is much fainter. The beak is just a bit paler and has a small lump on each side of the top beak (I expect its just not hardened up yet). I am very pleased to say that they are not plucked at all and look perfect, the red in the wings and the rest of the colouring seems just as bright as that of the parents.

The babies went back into the nest often at first and they all sleep in the nest at night. Seeing just one baby for a few days and thinking it the only one, I looked into the nest box to find another baby and one egg, so with the egg found in the flight about two weeks before, it would seem she laid four eggs and hatched and reared two babies.

At eight weeks old, on the first day the youngest was out of the nest for a while, the parents were seen mating again. The babies continued to thrive for a few more days, but as I thought the parents wanted to go to nest again and the young ones seemed to be feeding themselves, I took them away and brought them into the house in a cage to keep my eye on them for a while. They have now been on their own and eating for themselves for four days and are still keeping fit and well. They are both inquisitive and lively, and I am very thrilled with them.

Mr. Clifford Smith of Denholm came to see my birds while the young were being reared in the nest, then he came again to see them when they had fledged and saw both babies in the flight with their parents. He is in agreement with me that they are beautiful youngsters.

As described above, Mrs. Brenda Rhodes has bred the Black-tailed Conure (*Pyrrhura melanura*). It is believed this may be a first success:

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

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BREEDING THE RUFOUS LAUGHING-THRUSH (*Garrulax caerulatus*)

By A. H. ISENBERG (Portola Valley, California, U.S.A.)

These handsome Rufous Laughing-thrushes (*Garrulax caerulatus*) come from Formosa. The head, back, wings and tail are a uniform brown, the throat paler and more beige, the belly greyish, and the under tail coverts white. The birds have blue skin around and behind the eye, and a black or very dark blue streak under the eye. The bill is yellow with a dark base. There are white tips on the two outermost tail feathers which can be revealed when the tail is flicked and partly expanded. Although the sexes are alike they can easily be sexed by separating the birds and listening to their call-notes. The female starts with one note and then five to seven higher notes which the male will usually answer immediately with varied musical notes.

I have had this pair for nearly five years and in the last three six young ones were reared, nine having been hatched. One I hand-reared and it was the most charming pet and loved having its feathers scratched; but unfortunately it succumbed to gapes at the age of 14 months. It twice recovered pretty well after I had swabbed its throat and trachea with Listerine and Vick's formula 44, but the third attack was fatal. The other five young were well-grown and had become independent when I found two drowned in their shallow pond, another hung itself, and the last one went through a hole in the wire-netting into the next aviary and was killed by a magpie.

The birds built on the first occasion a deep cup-shaped nest in a bamboo thicket at about five feet from the ground, using sticks, bamboo leaves, grass and horse-hair. Four blue eggs were laid each time, and the same nest was used for three sittings between April and July. A new nest was built in almost the same spot in the second year. Last year only one sitting occurred with three eggs and all hatched but none lived beyond eight days. The nest was built in their shelter in a thick Ficus vine.

Live crickets and mealworms were given; and also meat and hard-boiled egg with toasted wheat-germ, some fruit, and peanuts.

At the time of writing I have only the parents and can only hope they will nest again this year. I believe this to be a first breeding of these birds and would like to hear if anyone else has been this fortunate.

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BREEDING THE SOUTHERN TREE PIE AT THE WINGED WORLD

By CLIVE ROOTS (Heysham, Lancs., England)

We imported a pair of this attractive species from Bombay three years ago, but on several occasions were tempted to dispose of them due to their destructive habits. With the exception of the oropendolas and aracaris they are possibly the most destructive of all the many species of softbills that we have attempted to house in our exotically-planted aviaries. Eventually it became necessary to move them to a plantless aviary designated specifically for plant wreckers. The Southern Tree Pie (*Dendrocitta leucogaster*) is a splendid black, white and coffee coloured species with a tail almost 12 in. long. They are seldom available to aviculture even though they are apparently fairly common in the Southern part of India. I have never found them to be aggressive towards other birds, even species much smaller than themselves, and for once the frustrations experienced, before we eventually succeeded in breeding these birds in the summer of 1969, were not due to the close proximity of other birds. A small wire mesh basket was provided, into which twigs and other nest materials had been interwoven. All but the sturdiest outer twigs were removed by the birds and they were completely disinterested in the wide variety of other nesting materials which were offered. Eggs were eventually laid on the bare mesh and of course were soon cracked. A sod of turf solved the problem, as it withstood removal attempts and provided a relatively soft base for the eggs which were off-white and heavily streaked with black and brown.

Two chicks hatched after an incubation period of 19 days. Maggots, mealworms and crickets were provided, but the most acceptable form of food, from the day they hatched, were young mice, which the parents dismembered and gave to the chicks in minute pieces. Eighteen days were spent in the nest, and the youngsters at this stage resembled the adult birds minus their long tails. The over-zealous hen commenced plucking them soon afterwards, and it became a race against time whether they would be plucked bare before they were completely independent. Fourteen days after leaving the nest they were left with only their primary feathers and we had no alternative but to move them. By this time they had commenced to feed independently, however, and it was not necessary to hand feed them. After rearing these youngsters the parents became dissatisfied with their nesting facilities and on one occasion removed all nesting material when they had young in the nest. Once on the aviary floor these nestlings were regarded as a source of food and were soon killed by the Tree Pies themselves. Fortunately, the nesting problem has been solved once more by wiring hessian into the bottom of their basket and they have bred again.

As described above the Southern Tree Pie (*Dendrocitta leucogaster*) has been bred at the Winged World. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

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BREEDING THE BROWN-THROATED BARBET AT WINGED WORLD

By CLIVE ROOTS (Heysham, Lancs., England)

In any mixed collection of birds the tree-hole nesting species obviously stand a far better chance of successfully incubating their eggs and rearing their young than those which build exposed nests. This is particularly so where the smaller hole drillers are concerned, as the entrance hole to their nest cavity is small enough to provide a safe retreat from prospective egg stealers. The successful breeding of the small Brown-throated Barbet (*Tricholaema melanocephalum stigmatothorax*) provides ample proof of this fact, whereas the nesting attempts of the other birds in their planted compartment at the "Winged World" have been foiled by the continual jockeying for the choicest sites and nesting material. These Barbets, and the other arboreal nesting species prefer to drill their own holes into the semi-rotten tree trunks provided for this purpose, and only when these are unavailable do they resort to using nest boxes. Due to the nature of the nest-hole, which had an entrance no more than one inch in diameter and then appeared to drop vertically into the trunk, we were unable to ascertain how many eggs were laid, or exactly how long the incubation period was, although we consider it to have been about 12 days. Both sexes shared the incubation duties, and mealworms, maggots and house crickets were taken into the nest cavity. After eight days our prepared insectile and minced beef mixture was taken in, and a little fruit, too. Only a single nestling resulted from this breeding, and from a subsequent one also. Both adult birds fed the nestling, which appeared at the entrance of the nest hole approximately two weeks after hatching. They continued to feed it for several weeks, but would not tolerate its presence when they went to nest again.

As described above the Brown-throated Barbet (*Tricholaema melanocephalum stigmatothorax*) has been bred at the Winged World. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

BREEDING THE YELLOW-BREASTED FRUIT PIGEON AT THE WINGED WORLD

By CLIVE ROOTS (Heysham, Lancs., England)

A pair of Yellow-breasted Fruit Pigeons (*Ptilinopus occipitalis*) have been housed in the "Winged World" since we stocked the aviaries, three years ago. They attempted to nest on several occasions when we kept them in the free flight area, but were thwarted by the many Toucans, Jays and other omnivorous species there. They were eventually settled into a large planted compartment in company with numerous Bee-eaters, Pittas, Fairy Bluebirds and other non-aggressive species and soon made use of the flat-based plastic wire nest-basket which had been positioned at the highest point on the rear wall. Fine hay was placed in this and was used for nesting without the addition of any other material. Late in 1969 two eggs, typically pigeon shape and colour, were laid in the nest, and were incubated undisturbed by both birds for about 17 days, although the exact incubation period was difficult to ascertain as they both sat tightly, and changed over very quickly. When a chick was first seen in the nest it appeared to be two or three days old. Neither were the parent birds seen feeding the single chick which resulted from this first successful breeding, although this has been observed during the further two successful breedings which have occurred this year.

The other birds in the compartment were ignored by the adult pigeons however close they ventured to the nest. On one occasion several Carmine Bee-eaters were allowed to perch on the side of the nest containing the chick. When it eventually left the nest after 14 days and moved to nearby branches, it was about half the size of the parents, and had the same basic green colouration, but lacked their bright markings. Six months later, these markings, particularly the deep yellow patch on the breast, are beginning to show. The two subsequent breedings this year have also produced one youngster each.

At the "Winged World" Fruit Pigeons are treated as omnivorous birds, but we so often hear of instances of these birds receiving a diet of fruit alone. A check on the content of the cultivated fruits that are available to aviculturists will reveal that they are little more than expensive water. Their protein content is practically nil, and most are either devoid of, or very low in, vitamins and minerals. Our Fruit Pigeons receive a typical omnivorous softbill diet, comprising diced fruit liberally laced with vitamins and minerals and a good quality insectile mixture with which is mixed equal parts of raw minced beef. Maggots and mealworms are eaten with relish.

As described above the Yellow-breasted Fruit Pigeon (*Ptilinopus occipitalis*) has been bred at the Winged World. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

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BREEDING THE AFRICAN SONG SPARROW AND GREEN SINGING FINCH IN AUSTRALIA

By J. J. WALSH (Drouin, Victoria, Australia)

In 1968 I was offered a pair of African Song Sparrows (*Passer lutea*), both young birds; and as I was told that they were hardy enough to withstand the cold winter weather to which we are subjected in this district, I was all too eager to try them. Both birds were still in their juvenile plumage but moulted into adult plumage during the first winter. The female stayed grey-brown with horn-coloured bill and legs, but the male became quite different. Body, head and face became a pretty lemon yellow, wings and tail brown, bill black, and legs horn-coloured.

During the month of September I noticed that the birds were objecting to my presence in the aviary. The two chattered and complained every time I approached to feed. This caused me to wonder what was wrong, and on making a closer inspection of the sheltered section I found a large untidy nest erected in some Tea-tree hung in the shelter. The huge nest structure appeared to be camouflage for the small nest cavity in the centre reserved for the eggs. After about three weeks two chicks fledged from the nest, after loud chirping from the nest during the week which had preceded their flight. Both proved to be females. In the 1969 season a further five chicks fledged and are doing well.

African Green Singing Finches (*Serinus mozambicus*) also nested in the last season, but the first two nests proved failures, the parents sitting for ten days and then deserting the eggs. When the third clutch of three white eggs were laid I placed them under a canary which kindly agreed to take charge of them. All three chicks hatched and were reared by the canaries and are now fully coloured and beautiful birds. The Green Singers laid again and this time reared two chicks which fledged from the nest but only lived one week owing to a cold snap. The aviary is 40 ft. × 18 ft. × 9 ft. high with $\frac{3}{8}$ in. mouse-proof wire. It has permanent water in the form of a pond, but this is only shallow. The aviary is fully planted with mainly evergreen shrubs, affording great protection for all the inhabitants.

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HAND-REARING AND KEEPING BABY SWALLOWS

By JOHN MALLET (Jersey Zoo Park, Trinity, Jersey)

On 11th July 1967 a young Swallow (*Hirundo rustica*), about ten days old, was handed to me. I put it into a canary nest pan lined with cotton wool, and put this into a budgerigar nest-box. Feeding it presented no problem. It accepted bread and milk, hard-boiled egg and minced heart. Four mealworms were given with each feed. The first feed was given at 7 a.m. and then every three hours until dusk.

On 20th July it started sitting on the perch just below the hole of the nest-box, frequently exercising its wings. If anything frightened it, it flew back into the nest. By 22nd July it had learned to fly around the kitchen, and would come and sit on my finger to be fed. During the next two days I took it outside many times, but once it went off over the buildings, out of sight. I called and in less than a minute it was back on my finger. I gave it a few mealworms and it was off again and back on my finger in a very short time.

This went on for two days; the flights gradually lengthening, and it started to fly into the kitchen through a small open window only 9 in. square. For about two weeks it flew in and out of the window during the day. I hung a sack over the window each evening so that it was in for its first feed in the morning. When on the wing it caught insects and also went to one of the lakes for water, but still expected its mealworms when it returned. On 26th August at 9.30 a.m. it went off and was not seen again.

Another young swallow was handed to me during the second week of September 1968. This one had flown into a moving car and injured its wing. It was fed the same diet as the first but I had to force feed it. Because it was unable to fly I kept it in a box-type canary cage 18 in. × 12 in. × 15 in. with two natural perches and a dish of water. I also put in a dish of mealworms. After a few days it was feeding itself on mealworms so I put some Sluis Universal Food in with the mealworms and stopped force feeding it. I offered it bread and milk in a separate container but this was not touched. It did eat some of the Sluis mixture. When the injured wing was stronger it started to fly from perch to perch. I decided to leave the cage door open and to fix some twiggy branches around the room. Very soon the bird came out and flew around the room using the perches to rest on. It did not find any difficulty getting back to its cage for food. From then on the cage door was never shut.

The injured wing always stuck out slightly. I did not notice any migratory urge in my swallow, but perhaps the injured wing accounted for this. Since the wing was not strong enough for flight until late November it was not possible to release it in the autumn. By 1st January it was able to catch a few flies that it managed to find. The wild swallows

arrived in April so I opened a window and three days later my swallow had gone. I did not notice a swallow with a damaged wing among the residents so I do not know how it fared.

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BIRDS AT SEA

By ALAN BOOTH —(M.V. *Trecarrell*, at sea)

During the present voyage I have tried to keep a record of birds which came on board the ship, particularly after strong winds from the coast. On the crossing from England to the Gulf States of America, we did encounter such winds from the Bahamas. On the following morning the following birds were on the ship: a small blackbird with white underparts and orange-red wing and tail patches, this was later identified from R. Tory-Peterson's book, "A Field Guide to Birds", as the American Redstart. It was also accompanied by a female, both birds were very tame as they even entered the accommodation in search of food. The others, of which at least four were counted, were small, wren-sized, olive green above, white abdomen, bright yellow breast, black mask bordered posteriorly white, these were again identified from the above book as Yellow-throated Warblers.

The two species were new to me and I had an opportunity to watch them for at least four days before they left us at the Providence Channel, in the early morning, as they were not seen again. During these four days they were all seen looking for insects, and were seen to take very small cucs, which must have been blown out on the same winds, as well as those already on the ship.

On entering the Gulf of Mexico we again had strong winds from the north so we had more warblers and some herons. These were white, small sized with yellow bill and black legs, which were identified as American Egrets. Six were seen flying around the ship on the first day, four flew off but two remained and stayed until the following day. They were joined by a small, very dark heron with white abdomen, dark greenish upper parts and purplish breast. This was identified as the Louisiana Heron. They were all gone next day as we approached Galveston. The other bird was an adult Mangrove Cuckoo which was so tame we were able to approach within 2 ft. of it, before it moved away down the wire hanging from the ship's derrick, which were horizontal at the time. He, too, had disappeared on approach to land.

The river, from Galveston to Houston, was the most profitable as the following birds were seen with the aid of binoculars: Laughing Gulls, White Pelicans, Roseate Spoonbill, Large White Heron, Large Blue Heron, and Black-Crowned Night Heron. The Spoonbill, large blue,

and Night Heron were all seen at the same colony. A few Skimmers were seen to take fish from the river where they were feeding. In Houston the Common Nighthawks were seen flying both at night and day; as they were at all ports in this area we visited. The Boat-tailed Grackle was seen in great numbers at the mouth of the Mississippi.

The birds seen on the way down from New York to New Orleans were as follows: Cape May Warbler (male), Brown Thrasher, Cat Bird (male), and a female Towhee. These were all identified with the help of the Peterson book. Each only stayed for about a day since we were only just off the coast.

Since this was only the beginning of the voyage, I am hoping more birds will make their appearance on the ship during the remainder of it.

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“ESCAPES”

By DERRICK ENGLAND (Neatishead, Norfolk, England)

At some time or other most aviculturists have inadvertently allowed a bird to escape. Quite often it does not go very far and shows clearly that it wants to re-enter the aviary, especially if it has a mate there. Sometimes it may remain tantalizingly in the neighbourhood, every now and then flying over the house, but never coming close enough to be recaptured. For weeks and even months, neighbours telephone to say that it is in their garden and “do come and catch it”, though more often than not it has gone before the owner can arrive.

Some of these birds manage to find a living in the wild and to survive for considerable periods; many, one suspects, meet a comparatively quick death either because their period of captivity has blunted their awareness of the danger from predators or because they cannot find sufficient food. Even if suitable food exists, a bird which for years has fed from a dish or a hopper may not be able to find enough to keep it alive when free.

Escape may occur in a number of ways, from the all-too-easy “family pet through the sitting-room window” to the accidentally open door of a large aviary at a zoo. A very frequent source of curious birds in the wild is the bird-keeper who, although he knows that his birds are not all permanently pinioned, puts off the clipping of the wings of those which are not until it is too late.

Most “escapes” are sufficiently unlike native British birds for it to be obvious even to a casual observer that the bird which is visiting their bird-table is something unusual, leading to a telephone call to a more knowledgeable friend. Others attract less attention—even from ornithologists—either because they are natural “skulkers” or keep high in dense foliage, or because, immediately they escape, they fly far away to the nearest they can find to their natural habitat, woodland, broad open fields, marsh-land or estuaries.

It is unfortunately true to say that not all aviculturists are also field ornithologists and, however much they deplore it when they do accidentally lose a bird, many are unaware of the confusion—and indeed sheer hard work—which escapes may cause among those people who are responsible for recording wild birds, and especially among those who are concerned with the rare or unlikely visitors to this country.

A small body of ornithologists called the "Rarities Committee" was set up some years ago by the Editors of the monthly journal *British Birds* to consider each occurrence of a bird which is so rare that it has previously been acceptably recorded only a very few times. One of the chief objects was to achieve a uniformity of assessment of the evidence submitted in each case, in a way which was not possible when records were scrutinized only by local ornithologists. In the case of a bird which would be completely new to the British list, this committee does not publish the record until it has been considered and confirmed by a similar committee of the British Ornithologists Union.

The writer of these notes has the task of scrutinizing all records submitted and attending meetings of the Rarities Committee in order to advise on the likelihood or otherwise of a recorded rarity having escaped from captivity (ducks and geese excluded). Each year this becomes more difficult as an ever-widening variety of species becomes available to aviculturists; indeed, the stage is rapidly being reached where, given the knowledge and the money, it will be possible to obtain in Britain all but the remotest and little-known species. As an example of this, a Snow Finch spent the best part of 12 months in and around an airfield in East Anglia. Those who heard about it were so certain that it could not possibly be a wild bird that no-one troubled to report it formally to the Rarities Committee—the date of its arrival was wrong; its habitat was wrong; it was ridiculous to suppose that it had not escaped from captivity. It was not until the writer pointed out that he knew of no Snow Finches in captivity in this country and that they were most infrequently imported that it was taken seriously.

A Scops Owl recently reported in the west country gives an example of a different kind. The writer was aware that a very few are in captivity in this country—chiefly in zoological gardens—and that, therefore, one or two are occasionally imported. He admits that he would very much like a pair of those beautiful little owls in his own collection and, even more, a pair of Pygmy Owls. It is putting it very mildly, however, to say that he was horrified to find, on enquiring about their availability (and thus the corresponding likelihood of their escape) that one dealer alone was importing Scops Owls (of various species) in crates of 20 and that, the supply having temporarily run out, "*a hundred more are arriving next Wednesday*".

It is not within the terms of reference of this brief article to discuss either the ethical or the conservation aspects of this state of affairs, and the

writer would be the last to oppose the acquisition, by those people who know how to look after them, of a *very* few Scops Owls each year. It is, however, difficult to refrain from the comment that neither aviculturists nor field ornithologists will have the pleasure of seeing Scops Owls at all if this sort of thing is allowed to continue. Nor is it any consolation to reflect that many die before loading on the plane in their country of origin and that, of those which survive to reach a "pet-shop", the majority die a miserable death as a child's pet, fed on bread and milk. Quite certainly serious aviculturists in this country do not provide a market for numbers such as these.

The main object of this brief paper, having drawn attention to the increasing difficulties of deciding whether some birds are wild or have escaped, is to enlist the help of all readers, whether they be curators of zoological gardens or owners of a few pet birds. If they accidentally lose a bird which might be reported as being wild—ducks and geese excluded—will they *please* immediately notify the writer at the address below. If this address has been forgotten or mislaid the information would be forwarded if addressed to the Editor of this journal or to the secretary of the Avicultural Society, but the appropriate address should be used if possible.

Members should be selective in their reporting, because a high proportion of birds kept in captivity can be ruled out. Thus parrots and humming birds may obviously be excluded and a little imagination will suggest a great many more. Care should, however, be exercised in the case of birds which, although their country of origin is too far away for them to have arrived "unassisted", could be mistaken in the field for birds on the British list. For example, Indian Rollers, many of which are imported, could be confused with the European Roller and Bay-backed Shrikes might at a brief glance be thought to be Lesser Grey Shrikes. *All* thrush-like birds and "little brown jobs" should be reported, the latter including female and out-of-colour weavers and whydahs, and certainly *all* north American birds. Despite the fact that few species of storks, cranes or flamingoes are likely to occur wild in Britain, it would be helpful if all of them—and all pelicans—were reported too, and, of course, all birds of prey from falconets to vultures. If there is the slightest chance that an "escapee" could be thought to be a wild bird, it is better to report than to be reticent—quite certainly no information will be ridiculed and all will be gratefully received.

It is perhaps relevant to conclude by saying that this "information bureau" can work both ways—a number of escaped birds have been retrieved by their owners as a result of information given to and received from the Rarities Committee.

Please send information, including species, district and date, to M. D. England, Mashobra, Neatishead, Norfolk, NOR 37Z. Phone: Horning 561.

THE MASSENA'S PARROT

By ROSEMARY LOW (Sidcup, Kent, England)

The Massena's Parrot, or White-capped Parrot (*Pionus seniloides*) from the central and eastern Andes of Colombia and the Andes of Ecuador, is little known to aviculturists. I can only find one reference to this species in confinement. Contained in the AVICULTURAL MAGAZINE for September 1933, Walter Goodfellow described how, while collecting in Quito, Ecuador, he had in his possession two Massena's or Grey-headed Parrots, as he called them. They had the freedom of two or three rooms together with a number of Bronze-wing, Blue-headed and Coral-billed Parrots, Caiques, Amazons and conures. The Massena's had been hand-reared from the nest and used to sleep in a basket with a pair of Black-headed Caiques. Goodfellow had a high regard for the members of the genus *Pionus* as pets.

Unfortunately, the Duke of Bedford's description of the Massena's Parrot would not inspire enthusiasm in anyone. He described it as "untidy looking" with "the appearance of a bird making a half-hearted effort at albinism or suffering from weak feather growth." The scientific name "seniloides" meaning "resembling the aged" is equally uncomplimentary and unjustified.

I was fortunate enough to obtain a young bird of this species in December; it is, in my opinion, a most attractive little parrot and its pretty markings are invariably commented on.

It has no bright colours except for the pinkish-red of the under tail coverts and the area surrounding the vent. In common with most members of the genus, the head colouring is rather complicated and difficult to describe. The head feathers are a mixture of dark grey, pink and pinkish or buffish-white, the centres of the feathers being a light colour, edged usually with dark grey. The feathers of the ear coverts are dark grey with pink centres, the small feathers at the side of the beak having white centres. The forehead and crown feathers are a lighter grey with pinkish centres and white bases and the large feathers of the nape are pinkish white. The beak is pale yellow and the area of bare skin surrounding the eye is white. The iris is brown. The upper breast is dark vinous coloured with some of the feathers below the throat showing salmon-coloured centres. The lower breast is a more pinkish vinous colour. The wings, back, rump and the upper surface of the tail are a uniform dark green. There is a pinkish-vinous patch at the base of the tail. The length is 10 in.

On examination of a number of skins of this species, I found that the markings were very variable; the underparts, for example, varied from dark green with a vinous tinge to the upper breast only, to the whole of the

breast vinous-coloured. The depth of colour on the breast is probably an indication of age, the immature birds being greener in this area. Certainly, my own bird has developed more colour on the breast in the five months it has been in my possession.

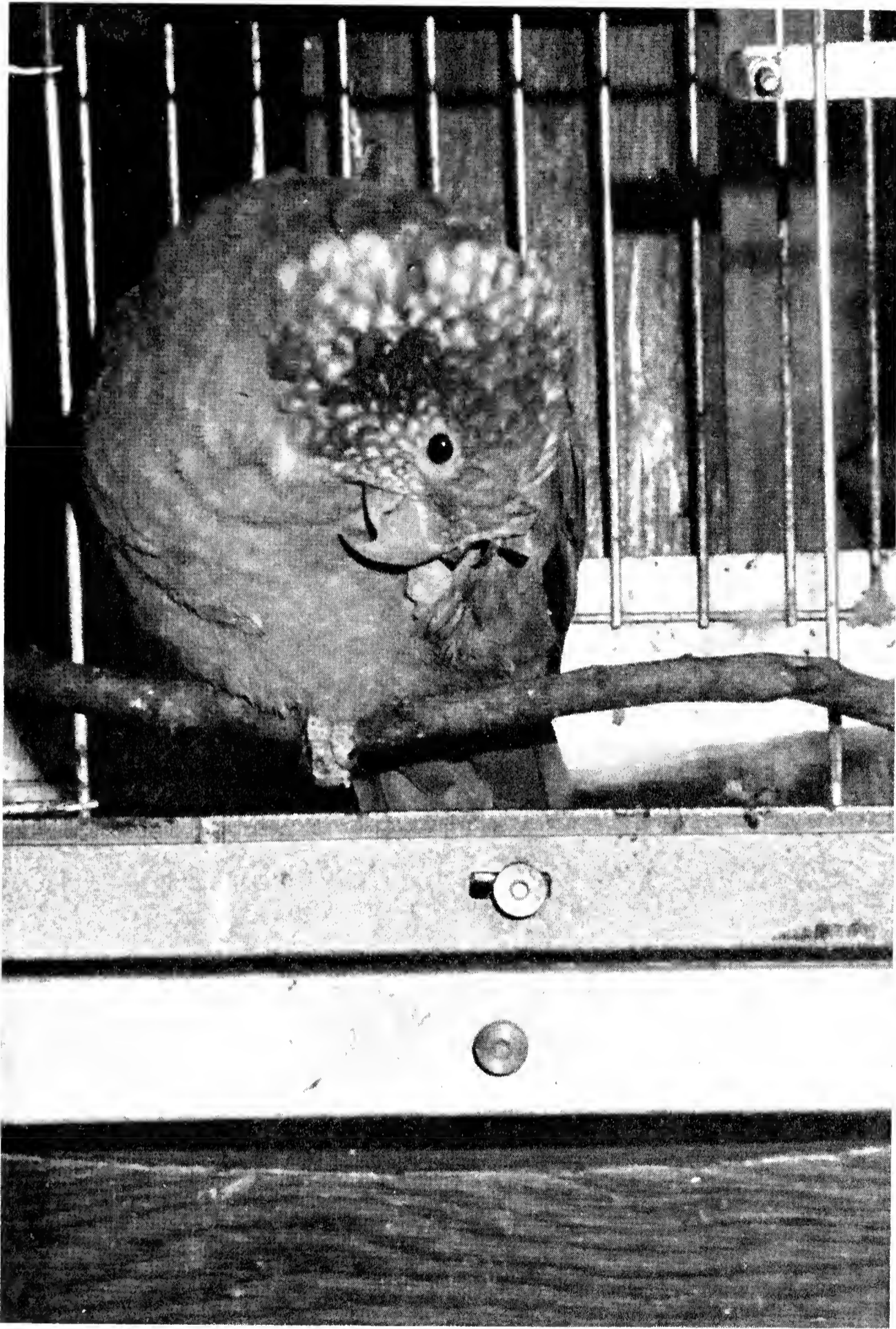
Soon after I bought it, it began to take grapes from my fingers and to nibble playfully at my hand. After about two months, I opened the cage door, but the open doorway was ignored until I placed a twig across it. This was immediately investigated and the Massena's was soon outside, climbing around the top of the cage. Some time was spent sitting there before it suddenly took wing and circled the room two or three times, flying with much confidence. After landing on the picture rail several times, it dropped almost vertically on to the cage and was soon back inside. The flight of this species is strong and direct; it is also able to hover.

This little parrot is absolutely ideal as a pet—it is intelligent, inquisitive and full of mischief. It delights in exploring different parts of the room and has never done any damage. This is just one aspect of the superiority, in my opinion, of this genus as pets, over Amazon Parrots. They are nowhere near as noisy as Amazons and except for a five minute session of shrieking every day, inspired by my Amazon and carried out in competition, the Massena's is not noisy. The greatest disadvantage of Amazons as pets is seldom mentioned: when adult and really fit their tempers can seldom be trusted; when in breeding condition they are, unfortunately, often dangerous and certainly not suitable as pets for children or for anyone who is nervous of a parrot's beak. *Pionus* are very gentle—they may nip playfully but seldom cause real harm. I doubt whether they would learn to speak more than a few words and have not the ability to whistle like Amazons but talking parrots have little attraction for me.

My Massena's is very fond of fruit and greenfood and, apart from spray millet, which is consumed with relish, shows little interest in sunflower, loose millet or canary seed. Any fruit or greenfood is eaten including grapes, apple, orange, tangerine, cabbage, spinach, dandelion leaves, seeding grasses and chickweed. When soft fruit is in season, especially cherries, I have no doubt that it will be eagerly eaten.

I feel sure that the bird will become very tame—it has flown on to my shoulder several times and comes to me to have its head rubbed as soon as it sees the twig which I use to scratch its head.

* * *



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[Rosemary Low

Massena's Parrot



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[Australian Information Services

Black Cockatoo

AUSTRALIAN PARROTS: PROBLEMS AND STUDIES

By HARRY FRAUCA (Australia)

Australian parrots present a fascinating challenge to the conservationist and the scientist.

With 53 species listed for continental Australia and some neighbouring islands, they form one of the most varied and numerous groups of the order Psittaciformes in the world. Aesthetically, they are amongst the most beautiful birds anywhere on earth; some of them have evolved a coloration which is so exquisite as to defy description.

While some species appear to have decreased partly as a result of European settlement, others have benefited and their numbers and their range extended greatly. Parrots are as much a part of the Australian bush scene as the gum trees and the kangaroos. One can hardly travel anywhere in this continent and in some islands, without encountering parrots of some species. And in certain areas, one may actually see clouds of these birds aloft. Recently, a Western Australian naturalist watched flocks of Budgerigars which he estimated to number some 20,000 birds. And I have often seen the sun-parched trees covered with little corellas, completely white birds so that it looked as though a snowfall had just blanketed the trees.

But the parrot situation in Australia has many facets. As I write this, one of the most common of our parrots, the Sulphur-crested Cockatoo, is protected in some states, but not protected in others. It is not protected, for instance, in Queensland, New South Wales and Victoria and in my Queensland country town an adult bird of this species sells for \$A10, a young one for \$A20. This explains the popularity of these birds even in their homeland. The Sulphur-crested Cockatoo or White Cockatoo is one of our finest "talkers" and hence a much coveted pet.

Budgerigars sell for \$A1 a pair, but other rarer species such as the turquoise parrot sells for \$A10 a pair. Exportation of parrots is forbidden but there is a lively—and quite legal—trade in these birds throughout Australia. Many Australians living in bush towns make considerable sums of money from trapping and selling parrots. A friend of mine who is a full-time fireman supplements his income with parrot trapping and receives regular orders for consignments of 100 or 200 birds at a time.

Trapping involves little expense but much patience and bush work. Usually, box traps are set in areas where parrots feed. "Callers" (aviary birds) are placed in the traps and these decoy the wild parrot to the traps. In a good day a trapper can catch 30 or 40 parrots.

The popularity of some species is, however, badly offset by the unpopularity of others. For instance, the galah, one of the better known Australian parrots, was declared a pest in certain Western Australian

districts after flocks of this bird played havoc in wheat fields causing serious losses to the growers. Similar stories come from other parts of Australia.

Certain rosellas, among which are some of the most beautiful species in this country, are also most unpopular. A farmer friend of mine and his two sons shot 235 Pale-headed Rosellas over a week as the birds pounced on the milo fields. Naturally, this species is not protected in Queensland.

By their status of abundance, Australian parrots fall into these categories: abundant, common, rare and very rare. Among the most abundant throughout a large section of eastern Australia, are some lorikeets such as the Rainbow Lorikeet, the Musk Lorikeet, the Scaly-breasted and the Little Lorikeet.

The Rainbow Lorikeet is one of the most colourful species and, like the other lorikeets, a vociferous bird which makes its presence felt by strident calls. Lorikeets feed largely on blossoms or on the nectar therein and the rainbow is no exception. A nomadic bird that travels in small flocks, it follows the blossoming gums and tea-tree (*Melaleuca*) and dozens of these birds can be heard and seen feeding on the blossom of these trees in many bush areas.

The feeding habits of our parrots are variable; most cockatoos feed on grain, seeds, and some take insects and their larvae. One of these, the glossy Black Cockatoo has rather specialized feeding habits. A glossy black bird with a rather funereal appearance, it occurs sparsely in mountain forests of eastern Australia usually in areas where Sheoaks or Casuarina trees are plentiful. Much of its food derives from these trees. It will eat mainly the seeds contained in the cones. I have often watched some eating; an interesting sight.

The bird bites the woody cone off the tree limb, then transfers the cone to one claw. Grasping the cone firmly, it proceeds to tear off the husk to expose the seeds which it then eats. While doing so, this cockatoo shows the efficacy of the foot structure as a "hand" for the manipulation of objects.

The Black Cockatoo is also another specialized feeder. In addition to eating seeds, blossoms, nectar, fruits, nuts and berries, this large beautiful species will also seek and eat the larvae of certain insects that are tree borers.

Landing on a tree, it proceeds to bite off pieces of bark until it reaches the tunnel underneath in which is the insect grub or larva. The bird seems to seek particularly the large grubs of some wood moths, Cossidae, and of some large longicorn beetles, Cerambycidae, known among Australians as "wicketty grubs". However, many of us would like to know how the black cockatoo manages to track down the trees where the larvae are, or perhaps it happens on to the right tree by accident.

History tells us that the first Australian parrot described by Europeans was probably the Little Corella which was mentioned by the English

adventurer, William Dampier, in his journals dating back to 22nd August 1699. He saw these white birds on islands of now the Dampier Archipelago in north-western Australia.

The Little Corella is one of the most abundant species. Recently, an observer in north-western Australia watched flocks which he estimated to number between 60 to 70,000 birds. An interesting point about this species is that it often mates with the Galah. Galah-Corella hybrids are trapped in the wild from time to time and they are also known to be produced in aviaries. The genetic combinations of these two species produce a bird that is usually like the Galah, complete with the Galah's grey, pink-rose plumage, but it has the characteristic bluish-purplish eye ring of the Corella.

Most Australian parrots breed in hollow trees or similar spots and the hens produce white eggs. There is one parrot, however, that appears to make a nest in the tree hollow, a habit that is not known for other Australian species. This is the turquoise parrot, a splendid bird that is no longer abundant, and which occurs in eastern Australia. One bird was seen recently stripping green leaves from a tree, placing them under the rump feathers and carrying them to the nesting site.

Another specialized nester is the Rock Parrot of the coastal regions of southern and western Australia which is known to lay the eggs in rock crevices; and the Ground Parrot, a relatively rare species which occurs in grasslands of Tasmania and eastern Australia, which makes a shallow scrape in the ground under grass cover and there lays her eggs.

The two rarest parrots in Australia are the Paradise Parrot and the Night Parrot. The Paradise Parrot occurred near my home in the Burnett-Mary river valleys of Queensland and in north-east New South Wales. The last and only photograph of this bird was taken in 1922 by naturalist C. H. Jerrard only a few miles from my home and shows the parrot standing at the foot of a termite mound.

The bird's association with termite mounds concerns nesting sites. That is, the Paradise Parrot breeds in hollows excavated into termite mounds where the eggs are laid. The bird was recorded in areas of savannah or scrubby grasslands with plenty of termite mounds. Although many expeditions in search of this bird have been carried out, none has met with success. The last record of this species dates back to 1926 when a party of five was seen near Casino, N.S.W.

But for all that many of my colleagues and I don't believe that the Paradise Parrot is extinct. This country is too big and too little known to come to rash conclusions on "extinct species."

A similar rare species is the Night Parrot which has only been recorded in the inland regions. It is a nocturnal bird, probably chiefly or entirely a ground feeder and ground dweller. The only specimen positively identified in this century was obtained in 1937 in the inland. All expeditions in search of this bird have failed but perhaps being a nocturnal bird and of highly cryptic habits, it is hard to discover.

But the future of most of our parrots seems to be bright enough. Most species are protected in some parts of their range, others are protected throughout the country. Many or all species are bred in aviaries so ensuring a steady supply of new individuals for, fortunately, most species breed well in captivity providing that the right quarters and food are supplied.

And the famous "budgie" which is now acclimatized as a cage pet in many countries, is still as plentiful as it ever was and still clouds of these beautiful little birds soar aloft in the bush sky proclaiming the hardiness of this species, which has become adapted to live and survive in some of the toughest environments on earth.

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BREEDING ROBINS

By FRANK MEADEN (Cheshunt, Hertfordshire, England)

In the MAGAZINE last year C. J. O. Harrison (Harrison, 1969 *a, b*) described an attempt to breed robins *Erithacus rubecula*, which was thwarted by the aggressiveness of the male parent which killed the young. When the opportunity arose this year it seemed worthwhile to try it again under different circumstances, and to compare the results.

The parents in this instance were hand-reared birds from separate nests which had come to grief in the wild the previous year. They were presumably unrelated, and were housed in adjoining aviaries in the garden from the time in 1969 when they became self-supporting to the 1970 breeding season. Each of the aviaries measured some $12 \times 6 \times 6\frac{1}{2}$ ft. high, and were partly sheltered and covered at the back. They contained a natural growth of rhododendron, redcurrant, reeds, iris, sedge, blackberry and honeysuckle, which rather gives the impression of densely overgrown aviaries; but this was not so for the vegetation was fairly low and confined to the perimeter of the aviary. The front of the aviaries was partly sheltered by an apple tree; and at the front, which butts on the garden path, a hollow log was fixed about four feet up in the female's aviary. This was placed horizontally with the entrance hole facing east.

The normal daily food consisted of Avi-vite softbill food and finely grated cheddar cheese, and a ration of maggots powdered with Casilan, together with whatever else they could find in their enclosures.

Towards the end of March the hen was seen to be frequenting the nest-log on numerous occasions throughout the day, but only remaining inside for a few moments during each visit. At this period a pair of wild robins were seen in the garden. These were believed to be nesting somewhere in the near vicinity. Constant fighting took place between the two males, our own bird challenging the wild bird upon each visit.

The challenge would be readily accepted and they would attack each other while hovering and fluttering vertically up and down the full height of the enclosure with just the wire between them.

Believing the 1st of April to be as good a day as any, the male was, on this day, placed in the female's enclosure. They were watched, but no squabbling was observed between them, merely the usual tail-flicking and an occasional chase with the male stopping a few inches short of the hen with a little bow and tail flip. By the 5th April a nest had been commenced, intervals between entering the nest-hole were now far shorter, and each time a billfull of nesting material, such as dead leaves or fine grass, was taken into the log. All nest building appeared to be by the hen at this stage, the male going no further than a quick settling on the threshold, a peep into the log, and back to his favourite singing perch.

The hen was sitting tight on five eggs by the 10th April, with the male singing almost from dawn to dusk in the farthest corner of their enclosure, only visiting the feeding shelf sited near the nest-log on rare occasions, and even then taking hardly any food. On 26th April when ASPEBA held a meeting at our house members were able to observe the newly deposited broken eggshells which were dropped in a further corner of the aviary. It was at this time that the male commenced taking food to the hen. He was in the log for so short a time, hardly disappearing before re-emerging with the bill empty, that he had too little time to feed the young.

European Flour-moth larvae in varying stages of growth were now included in the food, and a bucket of rotting fruit in their enclosure also attracted a certain amount of insect life, and since part of the enclosure covered a portion of the garden goldfish pond there may well have been other insect life taken but not recorded. With the knowledge that young now existed, we added Calcium Lactate as well to the maggots in an effort to obviate any deficiency and possible rickets, adding about five drops of Abidec to the maggots first, so giving them a slight film of the concentrated vitamin before adding this powder and the Casilan.

Once the crucial five-day stage was passed a daily ration of 20 or so mealworms were included in the diet. Unlike many other softbills the robins took most of these to the nest and did not eat them themselves, although they may have taken just a few. On the 10th May, when four other aviculturists were present, we slid aside the plastic flap which covered an observation hole in the log, and found the presence of four almost fully feathered nestlings. The wild robin was still visiting the aviary.

The young emerged from the nest on 12th May, leaving one unhatched egg. On 15th May one fully feathered but partly decomposed youngster was removed from the pond. On 17th May the hen was observed to be nesting again in the same site, the unhatched egg having disappeared and

an almost new nest was completed. No further checks were made on the new nest but the hen seemed reluctant to begin laying again, and since the three young were present I wondered if their presence in the nest area had inhibited the production of a second clutch.

The male wild robin which had continued to visit the garden ceased to do so after the 18th May. The male of the aviary pair appeared to ignore his offspring once they were feeding themselves and the hen showed increasing interest in the nest. On the 29th May, when by subsequent calculation the clutch must have been laid and incubation begun, and when the young were 17 days out of the nest, the male suddenly turned on the young ones. Within half an hour of an earlier check he had killed one young bird, stripping the top of the head and pecking out the eyes, and a second young one was being attacked. The remaining young were caught up and removed. The second young one had been pecked about the head and eyes, but no serious damage was visible and after it had been treated with an eyewash, and force-fed with five mealworms, it was back to normal behaviour within minutes, apparently sustaining no shock.

The 10th June saw eggshells once again carried from the nest and on 14th June E. Easter investigated the nest and found that three or four young had hatched. At the time of writing they are doing well and will be left with the parents in the enclosure to see if any set pattern is shown by the male in his reaction to the young.

This method of breeding this species has had greater success than that described by C. J. O. Harrison. Factors which might have assisted success are the introduction of the male to the female's aviary, which might reduce his initial dominance; and, more important still, the fact that for the greater part of the nesting cycle a wild male was present and enabled the aviary male to direct the greater part of his aggressive reaction towards this outside individual.

Man creates many problems when confining birds and animals in confined spaces. These should all breed under suitable conditions but the many barriers that we ourselves erect have to be overcome. When one listens to some bird breeders one could be excused for believing that they might have brooded and reared the clutch themselves; but in actual fact we do very little apart from reducing the difficulties that we have created for ourselves in the first place.

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BREEDING THE YELLOW-WATTLED BRUSH TURKEY IN NORTH AMERICA

By G. MICHAEL FLIEG (Brookfield, Illinois, U.S.A.)

Megapodes are a family of game birds restricted to Malaysia, the South-west Pacific, the Philippines, New Guinea and Australia. The family is unique in that it constitutes a group of birds which leave the incubation of their eggs to a natural heat source—solar heat, volcanic heat or the heat produced by decaying vegetation. Megapod means "big foot" and is quite appropriate for the 10 species which rely on their feet for excavation. Although many have been kept periodically, only the Yellow Wattled Talegallus or Brush Turkey (*Alectura lathamii*) of Eastern Australia has bred freely in Europe but until this year none were bred in the Western Hemisphere. In 1969 the first breeding was accomplished at St. Louis followed later by San Diego.

In late July 1968, the St. Louis Zoo obtained two pairs of 1967 hatch birds captive bred in Frankfurt, Germany. They were placed in a large outdoor exhibit approximately 30 ft. × 20 ft. The birds had access to a barn and they were always fed inside—their diet consisted of Purina Game Bird F & M in the fall. In winter, 50% of the above, 25% Trout Chow No. 4, and 25% small seed. As a breeder ration in the spring and summer 50% Trout Chow and 50% Game Bird F & M.

Although they had free choice access to the barn—they entered only to feed or to escape the badgering of the dominant male, although the outside temperature reached extremes of 10° F. Peat moss was supplied to the birds from the beginning. It was piled into a corner of the enclosure, but was immediately moved away from these obstacles by the male and a mound took form. No further material was supplied until breeding behaviour was noted in the summer. It was at this period when the subdominant male had to be removed as the colour of the head and wattles of the dominant bird intensified as he came into breeding condition. He simply would not let the other male alone and pursued him constantly. The male alone took care of the mound and he would not tolerate the presence of the hens on the mound, except for brief intervals. It was also at this time that all loose material went into the pile. Although we added more peat moss—feathers, droppings, debris from the yard and shavings from the barn were incorporated into the mound. The mound finally grew to 15 ft. in diameter and 3½ ft. high. It was at this time that we decided that the mound wasn't decomposing quickly enough to produce heat and three bushels of Bison dung were added to the core. Heat was produced almost immediately and the decomposition of the other organic material began. The male must keep a relatively constant temperature in the mound. His thermometer is his wattles or tongue, therefore, he must open the mound in the morning to let it cool off; as the sun warms the mound it is covered over to prevent excess heat from entering, but if it is a

cool day it is left open. At evening it is shovelled back together again to seal the heat in. This process also allows for any new collected materials to be fully incorporated into the mound. To the casual observer it appears as if he is tearing it apart and putting it back together. Although the Brush Turkey is considered monogamous, the presence of two hens had no effect and the trio lived in harmony, but I suspect from the total number of eggs that only one hen laid.

The hens' feathers were broken and frazzled indicating that the male either persecuted or copulated with them. Copulation was not witnessed, but I rather believe that it occurred in the early morning as the male worked all day on the mound. Although we searched religiously for eggs, we did not find any until 15th August when a clutch of 14 were found buried about 2 ft. below the surface, standing vertically on end and were spaced roughly 6 in. apart. Some eggs were found in a layer beneath the others. The earliest eggs were closest to the centre as ascertained by candling. They were laid in roughly a 30° wedge of the circumference of the mound. The interval between eggs in the species is approximately 5-7 days (Lack 1968) indicating the first egg may have been laid in late June. The incubation period is variable depending upon the heat of the mound, but is recorded at normally 47-52 days (Baltin and Faust 1965). This, of course, depends upon the actual heat of the mound. The eggs are very large in relation to other birds eggs, the egg weight being approximately 12% that of the hen. Of course, the birds hatch at a highly advanced stage in comparison to other birds. Upon candling the eggs, five were removed and placed into a still air incubator at 93° F. This temperature was selected after reading an account published by the Frankfurt Zoo (Baltin and Faust 1965).

The eggs were placed upright and covered with damp peat moss. The eggs are never turned in the mound when tended by the male and the unique egg, about the size of that of a Canada Goose, contains a moveable air bubble. The first egg was a heartbreak as the chick broke the paper thin shell, but couldn't break the damp membrane and died. The second hatched on 17th August and was placed into a game bird hatcher to dry—I believe the 99½° F. was too hot for it and it died after six hours. I believe that this is the first megapode to be hatched in a mechanical incubator although Frankfurt hatched birds in an aquarium with decaying leaves. It was interesting to note that the position of the chick within the egg as they have no egg tooth and simply use their feet to kick out of the egg, therefore, they are upside down in relation to other birds. After hatching in the mound the chick must dig his way to the surface which takes 24-30 hours. Artificially hatched chicks at Frankfurt as well as the St. Louis chicks were unable to right themselves until about 24 hours old, probably because they lie on their backs and kick to excavate out.

The first chick hatched from the mound appeared in the yard on 21st August. It was removed immediately and placed in a wire commercial

brooder with no heat. When a junglefowl chick was placed with the megapode chick, the latter became quite passive and did not appear comfortable. This was received as an indication that the chick did not feel at ease with a companion as he normally would take care of himself after hatching and lead a rather solitary existence. We removed the junglefowl and the Brush Turkey became very active, feeding on $\frac{3}{4}$ Game Purina Bird F & M and $\frac{1}{4}$ Purina Trout Chow with LIV sprinkled on top. Twice daily some crickets were offered and received with relish.

When hatched megapode chicks have fully developed remiges and are capable of flight; they are covered with grey coloured down with an orange tint on the head and neck. They are larger than peafowl at hatching. After the young hatch, the parents have no further contact with them although they apparently do not harm them. A statement that the cock digs the chicks into the pile for a few nights is unconfirmed, but chicks can dig themselves out again after leaving the pile if they are reburied. According to Frankfurt data, after hatching, chicks lose 35% of their egg weight, and 40% when they reach the top of the pile. After 3-4 weeks the other feathers grow and the weight triples—after four months the birds reach 60% of their weight and are full grown within a year.

By December 1969 the St. Louis bird was about $3\frac{1}{2}$ months old and was about 85% grown. This breeding was accomplished while I was Curator of Birds, St. Louis Zoological Gardens.

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* * *

BRITISH AVICULTURISTS' CLUB

Dinners and Meetings during the 1970-71 session have been arranged for the following dates:

The 1970-71 Session

- Friday, 4th September, 1970
 Friday, 20th November, 1970
 Friday, 12th March, 1971

The Dinners will be held at the Windsor Hotel, Lancaster Gate, London, W.2.

ARTHUR A. PRESTWICH,
Hon. Secretary.

NEWS AND VIEWS

John Bunker: "My pair of Ornate Lorikeets (*Trichoglossus ornatus*) are breeding and at the moment (26th May) seem to be rearing their two young successfully."

* * *

Pesquet or Pecquet. Lesson in 1831 named this parrot *Psittacus Pecquetii*, the account stating that he had received the specimen from M. Pecquet. Later in the same year he spelled the name *Psittacus Pesquetii*. We are, therefore, left wondering which is really the correct spelling. Pesquet is now generally accepted, although Pecquet, possibly incorrect, does, of course, have priority.

* * *

Why Quelea? C. J. Skead, *Bokmakierie*, March, 1970, 3, asks this very pertinent question.

In 1758 Carl Linnaeus named the Red-billed Weaver *Emberiza quelea*. It is generally supposed that *quelea* has its origin in some African language. But when would, or could, Linnaeus have got the name? Perhaps one of our more erudite members can elucidate.

* * *

Phillip Glasier, The Falconry Centre, writes (18th May): "We have had 10 clutches from nine different species so far this year. At the moment on eggs we have Lanners, Red-tailed Buzzards, Common Buzzards, Kestrels (we reared six last year), American Kestrels, Tawny Owls, Bay Owls and Merlins. Our Caracaras laid eggs but though fertile they failed to hatch."

* * *

Dr. L. A. Swaenepoel, Lembeek, Belgium (5th May): "The second nest of the Bronze-winged Parrots (*Pionus chalcopterus*) was also infertile. We were very unlucky with the three eggs of Ringnecks, by the parents of the albino. They were entrusted to a normal hen who left them while hatching. None of the chicks was red-eyed.

"We have a few Mulgas and Blue Bonnets, and we hope to raise a few Green Rosellas, as well as dilute Golden-mantled."

* * *

An item from PETERBOROUGH'S column, *Daily Telegraph*, 19th May 1970: "Thrush à la carte. How Italian ideas on sport differ from ours was apparent yesterday at a show of products from Pisa and Lucca at the Italian Trade Centre in Mayfair. On show was a clockwork gadget (a battery-operated version also is available) that imitates the calls of blackbirds and thrushes. One of a number of bird-ensnaring devices, it is said to work like magic, pulling in the victims as fast as they can be shot and skewered for roasting."

* * *

Down the years exhibitors have done very well with Choughs. The same cannot be said of aviculturists. The difficulty being, I imagine, that aviculturists have only very occasionally been able to obtain pairs. I am reminded of this by the fact that Choughs at the Riber Castle Fauna Reserve and Wildlife Park have recently produced five eggs. I do not think anyone has been completely successful in rearing this species, although Claude Payne came near to success in 1967, when one young one lived a fortnight or so.

* * *

Arthur and Catherine Tyler, Oakland, New Jersey, state that experience has shown them that Jendaya Conures will, if allowed, breed approximately every four months. They write: "We let them have three clutches, three eggs on each occasion. The first produced two young, the second three and the third but one, although all the eggs were fertile. The last was hand-fed from a few weeks old and so we have a very tame, sweet pet bird. Jendayas do, however, have a very lusty voice which some people might find unbearable."

* * *

George and Bessie Bray, San Francisco: "Last year we had two unusual breedings. An African Silverbill crossed with a female Bengalese (Society) Finch. There was only one young one, a male that looks like an overgrown African Silverbill, but with a darker beak and darker facial area. He in turn mated with an African Silverbill, but as far as we can tell without result. Maybe he is a mule! We also had a Green Singing Finch cross with a Yellow-rumped Grey Singing Finch hen. Two beautiful young ones which turned out quite rufous in colour."

* * *

It is reported in *Oryx*, May, 1970, 243, that Dr. Rodolfo E. Gonzales is of the opinion that the total population of the Monkey-eating Eagle of Mindanao Island, Philippines (the Eagles only home) is now only about 36 birds, certainly less than 50.

It is perhaps worth recalling that this Eagle (*Pithecophaga jefferi*) was named for a near relative of a former Vice-President of the Society, the late Edward Boosey. The type-specimen was obtained by John Whitehead during his successful expedition to the Philippines, 1894-97. At the collector's request it was named after his father, Jeffery Whitehead, grandfather to Edward Boosey.

* * *

Dr. Maurice Burton, *Daily Telegraph*, 7th March 1970, says it is very difficult to understand the way birds seem to enjoy smoke. He writes: "Before electrification, the steam train on Ryde pier, belching smoke, always had its attendant flock of gulls that accompanied it the length of the pier. Starlings, jackdaws and rooks are fond of perching on smoking chimney stacks, whether of private houses or factories, or did before oil-burning became so general.

“The worst addict recorded in my file was perhaps the hill mynah that flew at anyone smoking a cigarette, nipped off the glowing end and swallowed it.”

* * *

1969 was a very good year for Gentoo Penguins at the Edinburgh Zoo; 18 young were reared from 24 eggs hatched; on the other hand only one King was successfully reared

One of the most interesting events was the rearing to maturity of three young from four eggs hatched by the pair of American Kestrels (*Falco sparverius*).

The Cassowaries have laid eggs annually since 1965; on four occasions eggs have been hatched. Last year three eggs were laid; one proved infertile but the other two produced healthy chicks. One young one unaccountably disappeared, so only one was reared. This makes a total of five reared during the last three years.

* * *

Mrs. K. M. Scamell (28th May): “Our Quaker Babblers *Alcippe horocephala* have hatched two young, probably two days ago. I cannot trace that this species has been bred before. The late spring has resulted in late nesting everywhere, except the hen Cock-of-the-Rock *Rupicola peruviana sanguinolenta*, which started building last February and laid an egg about a week ago. She incubated about a week and then either she or the male knocked it out of the nest.

“Lemon-rumped Tanagers *Ramphocelus icteronotus* and Rothschild's Mynas are incubating two and three eggs respectively, and the Indian Blue Chats have one egg. Other softbills are building, so it is rather early to say whether it is going to be a good season or not.”

* * *

Mrs. Leila Leitch: “This year I have been very successful with Pygmy Cardinals *Lophospingus pusillus* and have reared five, one by hand. The Zosterops are incubating eggs for the fifth time. On the first three occasions the cock destroyed the eggs after a few days. At the fourth sitting five young ones were hatched and both parents fed the chicks at frequent intervals with fruit flies, bread and milk, honey-sponge and finally chopped mealworms. This parental care and enthusiasm continued for four days, but on the fifth morning I found all the young had been tossed from the nest. The hen appeared somewhat distressed for a short while that day but soon recovered, and within a week was relining the same nest and is at present (11th May) incubating four eggs which are due to hatch this weekend. Both are taking turns in incubating the eggs. We shall keep the birds under close observation and may remove the male when the eggs are hatched.”

* * *

G. A. Smith writes: "Two or three years ago a small consignment of Malayan Long-tailed Parrakeets *Psittacula longicauda* were imported, and a few more last year. As with all the 'Psittaculines' cock birds seem to have preponderated. My own 'hen' moulted out to become such another. This young bird I exchanged for the only hen—despite my advertisements—I could muster. And then she, on receipt, seemed strongly to favour one foot—always standing on the other. Needless to add this resolved itself to be severe frost bite. They seem to be just as hardy as other members of their genus: Bedford found them otherwise. When frightened, and they are most suspiciously nervous birds, they sleek their feathers very close to the body. Consequently, the otherwise unnoticed (because such movements take place under cover of the feathers) abdominal respiratory movements become most pronounced. And if particularly scared the increased respiratory rate then becomes audible and may, to the uninitiated, seem 'pneumonic'. I had hoped to try to get them to breed. Unfortunately, they are supposed to nest in January or February in the wild. At present the cock is in a profound moult.

"At the moment (28th April) I have New Zealands on eggs, and three other pairs, I hope, thinking about it. My Many-colours have only laid three eggs, one of which is infertile. So I've fostered them off with Redrumps and hope that they will have a more 'generous' forced second round. Lutino Cockatiels, all four pairs, have eggs. If only, in bird breeding, one could count chicks before they hatch!"

A. A. P.

* * *

REVIEW

A GUIDE TO PHEASANTS OF THE WORLD. By PHILIP WAYRE.
London: The Hamlyn Group, 1970. Price 63s.

This is an up-to-date account of our present knowledge of these beautiful and interesting birds written by the Honorary Director of the Pheasant Trust in Norfolk, where the most comprehensive collection of pheasants in the world is being maintained. The so-called progress of civilization resulting in the destruction of tropical and sub-tropical forest has brought extinction, or the threat of it, to many of these birds and at the present time of the 48 species of pheasants at least 16 are considered to be in danger of disappearing from the world. Fortunately the Pheasant Trust, at Great Witchingham near Norwich, has been successful in breeding many of these species and recently has re-introduced a number of Swinhoe's Pheasants into Taiwan where the species is close to extinction. A similar project is in hand with regard to the Mikado Pheasant.

Details are given of housing and management of breeding birds and there are chapters on incubation and rearing and a useful account of the

diseases of pheasants. The genera are then described in detail illustrated with a series of excellent coloured plates, and a detailed check list of pheasants of the world.

The three appendices deal respectively with the work of the Pheasant Trust, the Eley Game Advisory Service and the Game Research Association.

Aviculturists will find this book a most useful guide and source of information.

E. H.

* * *

NOTES

NOTES ON PARAKEETS AND SEEDEATERS

Last autumn, owing to the impossibility of obtaining labour to help with the glasshouses I had to cut down considerably on my collection of birds. In parakeets my interest in the main has now been concentrated on my favourites, the Kings, and Princess of Wales. Both species have confounded all my expectations, because of the spartan diet to which I was forced to subject them during last winter and spring, by producing large broods. In the past I have been able to practice what I consider good animal husbandry by giving all sorts of foods, and supplements, to bring them into breeding condition. This year they had a bare dry seed diet from November to April. Nest-boxes were only put in the flight in the second week of May, at which time I also put in large quantities of chickweed. The breeding results were the best ever.

The seedeaters in my planted aviaries have brought pleasure and sorrow. The Red-faced Crimson-wing *Cryptospiza reichenowi*, of which I wintered two males and a female in an unheated aviary, early in May (to my great surprise as I had no idea young were in the nest) had three young fly when A. V. Griffiths, who was down on holiday, put his finger in the nest. One young one, a male, is still very much alive but the other two died. Also, I am sorry to say, the only hen, the mother, was also lost. She and one of her young were picked up from the aviary floor badly mutilated about the head, by, I suspect, a Magpie which later took all of a brood of Blackbirds which had nested in the honeysuckle which covers these aviaries. These Crimson-wings must be very hardy.

Members of the African Serins, of which I have several species, have nested. The St. Helena Seedeater, *Serinus flaviventris*, produced one young after three nests, all of which collapsed. White-bellied Seedeaters, *S. f. dorsostriatus*, have two young flying. Also, at the moment, two races of Yellow-rumped Serins, *S. atrogularis xanthopygius* from Eritrea, and *S. a. reichenowi* from East Africa are both nesting. Two races of the more typical type of *S. atrogularis* from South Africa have made no attempt at nesting as yet. Only one of the four races has the black throat. The Eritrean bird is placed with *atrogularis* in the books but I feel that this must be a mistake. Song and behaviour is so different. All these are delightful little birds, no trouble, and industrious charming songsters, among which great confusion is caused by the various dealers names.

While some live food might have been obtained in the aviaries I was in no position to find the time to give them the attention as to feeding that the various experts expound. I found the *Cryptospiza* need, like the Twinspot with which they have a great affinity, lots of live food to get them going when newly imported; so it is surprising that my birds brought off a normal nest of three young with the only greenfly and the chickweed supplied by A. V. Griffiths during the short time that he was here.

I am aware that the St. Helena Seedeaters have been bred on several occasions but have come across no reports of breeding of the Red-faced Crimson-wing, White-bellied Seedeater or Eritrean Yellow-rumped Series in this country.

PETER PARIS.

* * *

CORRESPONDENCE

RARE AND VANISHING AMAZONA PARROTS

To the November–December, 1969, number of the AVICULTURAL MAGAZINE I contributed a short note with the above title. Unfortunately though, I omitted an important sentence, which made for ambiguity. The figure of half a million birds referred to all species of Amazon basin parrots, not only to the genus *Amazona*. Despite this lapse I was more than a little surprised that anyone should interpret it to mean that half a million birds of all species were imported into *this* country annually. The figure was intended to apply to the U.S.A. only, and not to this country. A widely-read weekly publication suggested that the estimate was a “fantastic exaggeration”, and asked “Can anyone honestly think that 500,000 Amazons were taken?” An answer is half a million Amazona Parrots, NO: half a million South American parrots and parrakeets, YES.

I cannot claim any great knowledge of the bird trade as operated at present, but I have vivid recollections of several large consignments of parrots, mainly Roseate Cockatoos, Lovebirds and Ring-necked Parrakeets arriving in a deplorable state, many of the birds being either dead or dying shortly after arrival in England. Perhaps I am prejudiced but I, for one, can well-believe that for every live South American parrot sold in an American pet shop 50 have died, for one reason or another.

Christopher Weathersbee, after a close study of what he describes as the “Amazon Parrot Raid,” has made known some of his findings in *Science News*, 4th January 1969, and *Peruvian Times*, 21st November 1969. The following are extracts. Since the lifting of the Parrot Ban in the U.S.A. in 1967 it has been quite a fad to own a parrot of some kind. Pet shops have been selling them as a “novelty” as fast as they can obtain them. A buyer for F. W. Woolworth, a chain that does a significant portion of the nation’s pet selling, says the demand is such that birds cannot be captured fast enough to satisfy it. The prices range up to \$50.00 each, and average between \$30.00 and \$20.00. Weathersbee says: “The South American parrots are collected in the forests by Indians, who bring them to the nearest riverbank. There they are purchased for a few cents by buyers who cruise up and down the river until they have a boatload. The survivors of the boatload are sold to the Bogotá centre or abroad.”

“One of the things that has conservationists upset about the parrot trade is that there may be very few such survivors. It has been estimated that for every live bird sold in an American pet shop, 50 have died. Many are killed during collection, either by rough handling or in order to reach the coveted young. Many more die in cages waiting for the buyer at the river, and the toll continues after the entrepreneur has acquired his charges. Thus to satisfy a demand for 10,000 pet parrots (in the neighborhood of the number imported in the past year) as many as half a million birds may have been destroyed.”

Dr. Maria Buchinger, Head of the Latin America Desk of the Nature Conservancy, says a side effect of the animal trade is the subversion of the backwoods Indians’ economy. What happens, she says, is that the buyers will patronize a particular section of the river while the parrots are plentiful there. For a few months or a couple of years some of the Indians will earn a tiny amount which they nevertheless consider good, easy money. In the meanwhile they will neglect to maintain their farms and other traditional means of living, so marginal as a rule that they can stand little neglect. Then the birds become scarce from the over-hunting and the buyers move on, leaving the Indians with neither crop, cash income, savings nor any long-term benefit from their collecting.

Robert Neeley, a former hunting guide in Colombia who now refuses to take anything but photographic parties, says such disruption of tribal affairs, plus the consciousness that foreigners are hunting out vital native game supplies, has made many Indian chieftains ardent conservationists. There are still enough Indians who fall prey to temptations, however, to keep the animals coming out of the jungle.

WALLEY’S WOOD,
EDENBRIDGE, KENT.

A. A. PRESTWICH.

* * *

FEEDING PARROTS

I was interested in the correspondence in the AVICULTURAL MAGAZINE about feeding parrots. As you may know I have kept a small collection of cockatoos for about 20 years and have bred a few most years. One citron-crest hen has reared almost every year for about 15 years and roseates have performed similarly. My birds receive adequate attention but not as much as I could sometimes wish.

As your correspondents indicate very little if any controlled experimentation has been carried out on the diets of cage-birds—such work is extremely expensive apart from anything else—but one can assume a few general principles, e.g. that a bird can't produce protein from carbohydrate without nitrogen, and as a consequence a diet of low-protein grain is not likely to be sufficient for breeding birds—and there is, of course a very great amount of information about the diet of domestic poultry. Pheasant breeders have cashed in directly on this information and, as many appreciate, turkey starter crumbs supply an excellent supplementary diet for many species of birds.

I have always supplied my cockatoos with supplements to a basic grain diet and these include hard-boiled egg, bread and milk and a variety of household scraps including cooked meat scraps and bones including ham bones. It is fairly certain that a breeding pair feels the need for meat and I believe that many years ago I reported in the MAGAZINE how a citron-crest hen used to catch and eat sparrows. Feather plucking is a terrible thing and it is quite certain that nobody knows how to cure it. Of the four species I have kept, Leadbeaters and roseates have never plucked, citrons occasionally and the Timor race of the Lesser sulphur-crest, badly. It must be appreciated that like most others I am speaking of what in a statistical sense is a very small number of birds. Plucking seems to be of two kinds, the mild (particularly breast) plucking which I am inclined to associate with some sort of frustration in the breeding cycle and I have had a breeding pair suddenly and for no apparent reason wreck themselves in a day, subsequently recover and never do it again and the chronic type which I am inclined to believe starts in a caged bird from boredom but subsequently fails to respond to anything including liberty or freedom in an aviary with a breeding partner.

There may be cases where plucking is associated with ecto-parasites or with diet but I believe the major cause is psychological. By analogy some of the worst of this type of behaviour is seen in the intensive poultry and pig units (tail biting) and it is extremely difficult to believe that diet is involved here.

I was delighted to see the notes about feeding lorries and lorikeets. My experience is limited to Swainson's which is reputed to be the easiest, but with them I certainly have had no trouble at all. I have two breeding pairs that produce one or two young with unfailing regularity and I have a colony (eight birds) which has its first baby ready to fledge. Essentially they get a basic diet of a pint of full-cream milk between them with a home made nectar addition of equal parts of Farex, runny honey and sweetened condensed milk with a liberal addition of ordinary white sugar. Sunflower seed is supplied *ad lib.* and the milk-nectar mixture has a large piece of bread put in it which the birds eat or waste. They get very little fruit except in the apple season. Grapes are by repute such an indifferent food that it seems hardly worthwhile. During the winter I occasionally give cod-liver oil or some of the household orange concentrate with a reputed vitamin A and C content. I give them bits of meat and bones at times and would think it a good idea: I have given egg on occasion. Presumably they get most of their protein from the milk. The historical difficulty of keeping the group alive is interesting because it seemed to apply to Swainson's as well as the other species that I would fully accept as being much more difficult. I have never seen the condition described as "fits" but Tom Spence told me he had been called in to attend to a Swainson's Lorikeet so suffering and that it had responded miraculously to an injection with vitamin B-12 (if I am misquoting him he will, I'm sure, let us know). The bird may, of course, have reacted to having a needle stuck in it.

Having had some association with Tom's big collection of lorries in Scotland which included such exotic things as the Black Lory I developed a mistrust of their capacity for survival which is only now mildly fading with my experience of my Swainson's. Mr. Murray's experiences with the Yellow-backs is encouraging and there must be many who during the last two or three years have had numerou

species. Several breeding reports have been published. Have these birds continued in good health and have there been any second generation breedings? I need a little encouragement to have a go with another species.

S. B. KENDALL.

WEIR COTTAGE,
BRIDGE ROAD, CHERTSEY,
SURREY, ENGLAND.

* * *

TOOL-USING BY BIRDS

I don't know as to whether tool-using has been described in birds other than the Galapagos Woodpecker Finch (*Camarhynchus pallidus*) which many of us may have seen on a Television film. The bird uses a beak-held twig to give an extension of its bill to probe insects from cracks and crannies. And certain Bower-birds, for example the Satin Bower-bird (*Ptilonorhynchus violacea*), use deeply-staining, burst berries as paint brushes to decorate their bowers. Recently I have seen a Bare-eyed Cockatoo (*Cacatua sanguinea*) which when offered a dead matchstick would hold it in the claw and quite deliberately, though admittedly with little facility, use it to scratch (poke might be the more descriptive word) the throat area immediately under and posterior to the base of the lower mandible. It did this in a dreamy sort of ecstatic way as would be expected if it gave the bird the same sort of physical satisfaction as stroking or mutual preening would. Not every proffered matchstick was so treated for if the bird was lively or excited it would chew them up. I suppose that Mr. Sidney Porter's account of his Keas which would, if given a tin, use it to bale out any container of water, is an even better illustration of the use of a tool by a parrot.

158 BROADWAY,
PETERBOROUGH, PE1 4DG,
ENGLAND.

G. A. SMITH.

* * *

AVICULTURISTS

On page 77 of the section, "News and Views" of Volume 76 of your AVICULTURAL MAGAZINE, is an excerpt from the *Los Angeles Times* implying that I was insulted at being classed as an aviculturist and that I said "An aviculturist is a zoo keeper". The paragraph also contained an admonition to me to bear in mind the past contributions of aviculturists.

For the record, I should like to categorically deny having made the remarks attributed to me, or any other comments that might be even remotely construed to imply disparagement of aviculture or zoo keeping. During the interview on which this article was based, I was somewhat concerned that the reporter took very few written notes and persistently asked leading questions obviously intended to evoke controversy. The same technique apparently was followed in interviewing another individual mentioned in the article, resulting in a tart letter from him denying several assertions contained in the story. I, too, prepared a letter intended to correct the record, but was asked by higher authority not to send it because (1) my objections were likely to be considered trivial by the editor of the publication in which the story first appeared, (2) the corrections would not reach the several other newspapers in which it was reprinted, and (3) the story, on the whole, was favorable to our program.

The zoo personnel and private aviculturists with whom we work, many of whom are close friends, know my high respect for their contributions to the art of animal-keeping and breeding. We have borrowed extensively from their literature, as well as from their undocumented stores of knowledge. Our veterinarian was a member of the Lincoln Park Zoo before joining our program, and two of our technicians formerly were with the National Zoological Park. We have utilized the counsel of aviculturists in propagation building design and the services of others in the breeding of certain species for which we have no facilities. My

staff and I are in frequent contact with them for mutually valuable exchanges of other information, and we have provided stock of rare and endangered species to a number of them on indefinite loan. As active participants, we attend several meetings each year that are devoted exclusively or in part to the care of wildlife species in captivity, and our Station is visited annually by dozens of aviculturists, zoo administrators, and technicians from this and other countries, including England.

Happily, the great preponderance of newspaper and magazine story coverage of our project has been objectively, understandably, and quite accurately written, and since staff and facility limitations do not allow us to encourage public visitation, we appreciate this means of informing the many interested individuals and organizations of our activities. However, working as we do with a most interesting and emotionally charged subject, our disappearing wildlife species, we will predict with reasonable certainty that additional misinterpretations of our objectives and remarks will take place in the coming months and years. Whenever events of that nature again raise questions or doubts regarding this program or the reported utterances of its staff, we would welcome the opportunity to reply to the situation before a judgment is reported in your magazine.

Unfortunately, quotations in the press sometimes are used extremely loosely or even erroneously by some writers, and anyone who has had even infrequent exposure to interviewing is chagrined at liberties that are taken in "reproducing" the spoken word. A very good friend who also is a zoo director, when I called to comment upon the article mentioned above, may have summed up the situation best by saying the following (or words to that effect): "Your friends know the remarks were inaccurate, but count your blessings. At least they spelled your name correctly!"

RAY C. ERICKSON,

*Assistant Director for
Endangered Wildlife Research.*

U.S. DEPARTMENT OF INTERIOR FISH AND
WILDLIFE SERVICE,
BUREAU OF SPORT FISHERIES AND WILDLIFE,
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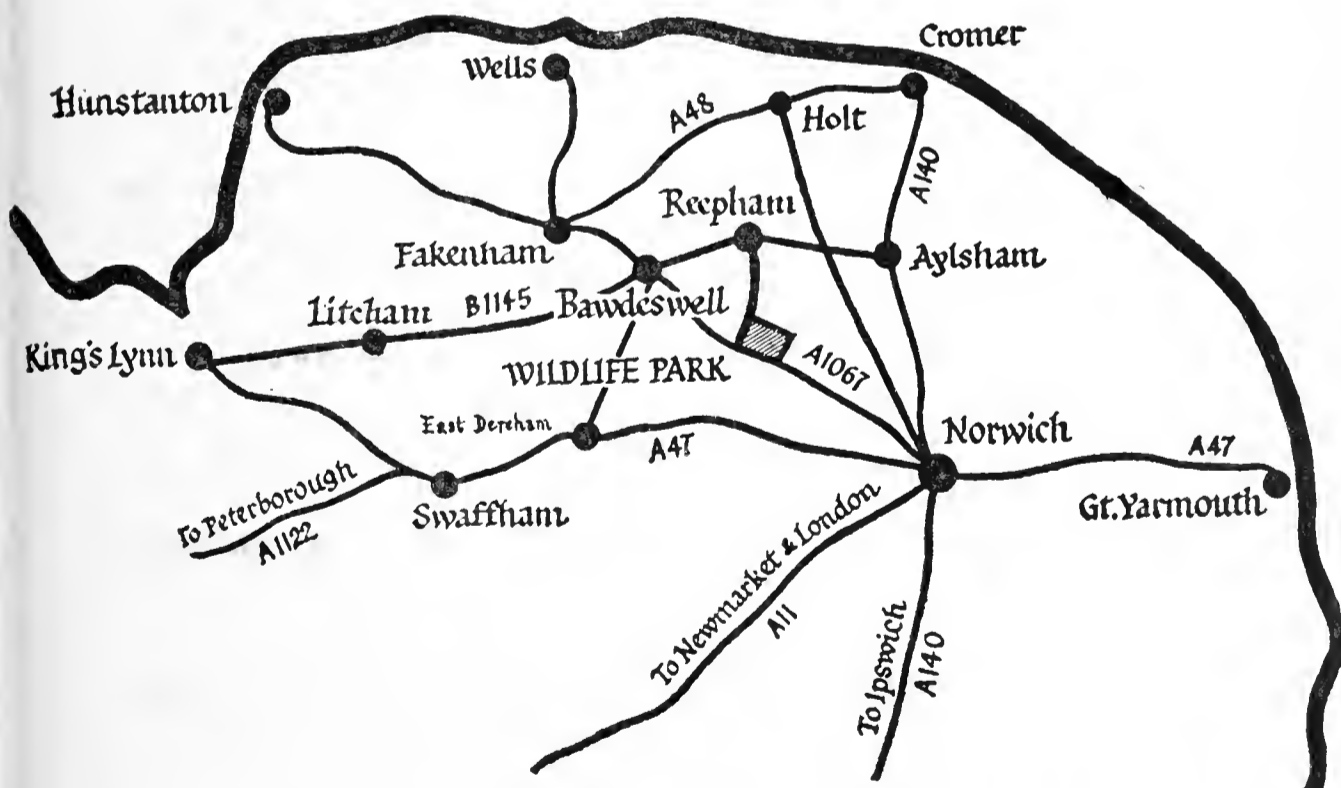
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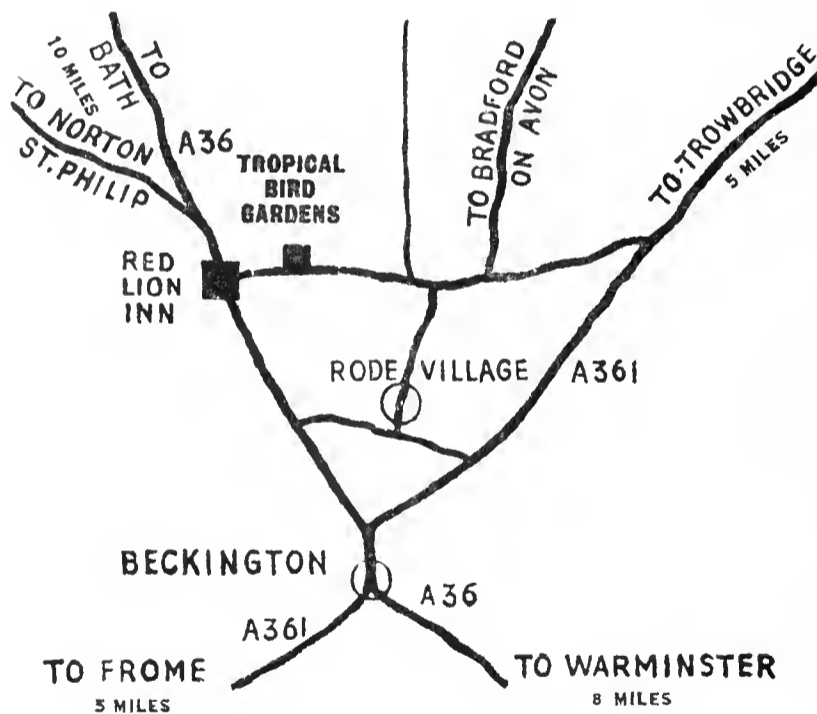
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THE AVICULTURAL SOCIETY

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SEPTEMBER—OCTOBER 1970

THE BLACK-HEADED BUSH SHRIKE

(*Tchagra senegala*)

By JEAN DELACOUR (Clères, France)

Shrikes consist of three sub-families of the family Laniidae. To the average European or North American interested in birds, the true shrikes of the genus *Lanius* are the best known. They extend in range over Europe, Asia, Indonesia, Africa and North America and are familiar to many in the wild state. They look like miniature birds of prey, although true passerine birds. Few aviculturists keep them in captivity as they cannot be associated with other birds on account of their murderous instincts. They are, however, handsome and interesting, and some have a pretty song. They are fed mostly on meat and do not present special problems.

The other two families inhabit Africa only. The Helmeted Shrikes (*Prionopinae*) are completely insectivorous, and harmless to other birds. Some beautiful species have been kept successfully in aviaries. The Bush Shrikes (*Malaconotinae*) are represented throughout Africa by numerous species of several genera. A number of them are very beautiful and fairly often kept in zoos and private aviaries, particularly the brightly coloured ones, such as certain species of *Laniarius* with much crimson in their plumage. Several genera are composed of insectivorous birds which are not too dangerous to other birds. Such is the case of the Black-headed Bush Shrike depicted on the accompanying plate. It is not gaudily coloured, but its sombre pattern is elegant. This species is the only one of the whole sub-family represented in Mediterranean Africa, as one sub-species (*culcullata*) is found locally in thick bush in the coastal districts of Morocco, Algeria and Tunisia. Numerous others are found throughout Africa. It is a shy bird, difficult to detect in the thickets, except when, in the spring, it comes out in a nuptial flight. It feeds almost entirely on beetles.

This Bush Shrike sings very well. It has, however, seldom been kept in captivity.

* * *

BREEDING BLACK-CRESTED FINCHES OR PIGMY CARDINALS

(*Lophospingus pusillus*)

By LEILA LEITCH
(Stratford-upon-Avon, Warwickshire)

My pair of imported Pigmy Cardinals was purchased from a friend who is a dealer, and introduced into a small planted aviary with heated shelter, where they settled happily with a collection of mixed small foreign seed-eaters.

At the time, midsummer 1968, I was inexperienced in aviculture and did not know of the difficulties experienced by some breeders in successfully rearing the young of this species. Consequently I was gravely concerned that only one from each of the first two broods in 1969 survived, and became independent. Having followed all available information to the letter, I was particularly strict in the rationing of mealworms, but only in this season have I had true success having six healthy and hardy youngsters in the aviary.

The breeding notes which I have made are as follows:

1. NESTING SITE.

The pair chose a site well screened, where there was a hand-made basket of finch-basket size but with two entrances. The site was in the inside flight where light, heat and a reasonable humidity prevailed. In the basket the hen constructed a very small fragile nest of hemp and sheeps' wool. Here she laid her two eggs, grey/green and brownish spotted, and these she incubated for exactly twelve days while the cock sang sweetly. After the first nesting a replica of the first nest was built in the same basket beside the other; these have been used alternately throughout the season and are still in a spotless condition.

2. NESTING BEHAVIOUR.

The hen did all the incubating but the cock was ever attentive, bringing her morsels from time to time and conducting her to and from the feeding station in the short periods she spent off the nest. Only when the hen was off the nest did he show aggression towards other birds, apart from normal defence of the site.

3. THE NESTLINGS.

The young when hatched, showed downy growth very quickly with a distinctive "top-knot" feathering. As they gained in strength they became active and noisy in their demands for food.

This demanding nature led me to question whether early losses were due to strict rationing of high-protein mealworms. A more generous supply produced healthy vital growth.

4. DIET.

For the first day the hen took to her brood crumbled hard-boiled egg and soft cheese mixed with Abidec. Thereafter both parents brought food to the nest. The diet offered was as follows:

(i) Mealworms: The parents fed the contents of two mealworms per nestling every hour on days two, three, four and five. The quantity was then increased and the chicks were given the entire worm. By the time they were fledged and left the nest on the twelfth day, they were fed ten mealworms each several times a day. This assessment is accurate as both parents preferred to take mealworms from my hand direct to the chicks rather than collect the food from the feeding station.

I hesitated and doubted the prudence of my generosity, but I can only comment that when mealworms were rationed the young died, the parents giving all available food to one chick only.

(ii) Gentles: These were always available as alternative live food, but the parents gave them sparingly, although once independent the young took them readily.

(iii) Proprietary soft foods, insectivorous mixtures etc.: The parents used these but rarely although they were observed to feed upon them themselves while saving the live food for the young.

(iv) Fruit flies: A culture of fruit flies was maintained but these were not taken to the nestlings. When independent the young birds enjoyed the fruit flies.

(v) Sponge, mixed with honey, beef extract, rose-hip syrup, Cytaccon, and water: This has proved an excellent food factor in the healthy development of all my young birds, not least the Pigmy Cardinals. The parents took the mixture to the nestlings at regular intervals, it was the first food the fledglings took for themselves, and I hand reared one ailing baby Pigmy Cardinal with this mixture and other diet mentioned here.

This chick learned to feed from forceps and grew to be quite vigorous, but it had a poor sense of balance and unhappily drowned in the aviary bath after five months of independent living.

(vi) Soft cheese "salad": This was used by the parents, and in the hand rearing. It comprises cottage cheese, finely-chopped egg, grated apple, Bemax, and finely-chopped lettuce or water-cress. I may add that this is popular with other parent birds, and with all birds in the aviary. For hand-rearing purposes it was dipped in pounded seed and helped to teach the young bird to take seed.

(vii) Soaked millet spray: Once the hen went to nest again the cock bird took over the rearing of the young. Although he fed them mealworms

almost exclusively at first, he also taught them to eat the sponge mixture, and trained them to eat softened millet spray and to pick up grit.

Incidentally, as I had read, he showed a preference for one chick each time and was grudging in his maintenance of the other. In a brood of three he killed the strongest of the chicks before I could come to the rescue. I understand that he is supposed to favour the young cocks; certainly one chick in each pair tends to sit beside mother while she incubates her eggs, the other goes exploring with the cock. Once independent the young develop at an equal rate and it is impossible to determine whether "father's favourite" was the young cock.

5. GENERAL OBSERVATION.

Only once have I seen evidence of the young being plucked in readiness for a new nest to be lined. On this occasion a plentiful supply of sheep's wool distracted parental attention from the downy breast feathers of the young.

When the newest nestlings became more demanding the cock drove the independent youngsters out into the flight. He was never over-aggressive, but the youngsters were disturbed by the behaviour and were removed from the flight to the independent existence of a separate flight. This rejection is at four to five weeks after they leave the nest.

The young birds I have in my collection live together quite happily and although they show true Pigmy Cardinal self assertion in establishing themselves high in the pecking order, they only evolve their order among themselves according to age. This process has yet to be observed when they come into breeding condition. This I believe is at about nine to twelve months.

Unfortunately my aviary conditions are so limited that I will be unable to keep all my young Pigmy Cardinals, although I shall make every effort to develop a strain of aviary bred birds, by retaining some of my own young birds and introducing new stock from time to time.

* * *

NOTES ON THE BREEDING AND BEHAVIOUR OF JAPANESE QUAILS

(*Coturnix japonica*)

By R. UNWIN LAMBERT (Reigate, Surrey, England)

In March of this year I purchased a pair of three-week-old Japanese Quail, *Coturnix japonica*, and placed them in a small aviary having a ground measurement of 6 ft. 6 in. \times 4 ft., in company with a pair of Chinese Painted Quail, *Excalfactoria chinensis*. The aviary has an earth floor and although it was planted with a selection of herbaceous plants the majority of these were stripped as soon as they started to grow. Although the aviary has a small hut in which the birds can shelter they have not yet used it—preferring to sit-out in the rain. As the aviary is, however, well drained the birds have not come to any harm; but no doubt other arrangements will have to be made later in the year.

The quail (both species) are fed on a mixture of high protein turkey starter crumbs, pannicum and white millet. At first this mixture was given in a ratio of 50% starter crumbs, 30% pannicum and 20% white millet. This mixture has now, however, been changed, for reasons given later, to a ratio of 30% starter crumbs, 40% pannicum and 30% white millet. In addition a plentiful supply of grit and greenfoods are given; the Japanese Quail preferring greenfoods more than the Chinese Painted Quail, and in both species the hen has a higher preference for it than the cock bird.

When they were approximately seven weeks old the Japanese Quail laid their first egg in a small scrape in one corner of the aviary, the scrape being about six inches in diameter and an inch deep in the centre. Subsequent eggs being laid at a rate of one per day. At no time, however, have the cock or hen showed any inclination to incubate the eggs; on the contrary the eggs were often rolled out of the scrape to a distance of a few feet away and then abandoned. At this stage I decided to purchase a small incubator into which were placed eight eggs. At the same time two eggs were placed under a Barbary Dove, *Streptopelia roseogrisea* "*risoria*", her own eggs being removed. Although my pair of Barbary Doves, which are kept in another aviary, lay and incubate their own eggs regularly no eggs have yet been hatched.

The incubator proved unreliable from the start as it was very difficult to maintain the correct temperature and it was not surprising therefore that after the incubation period (approx. 18 days) no eggs were hatched. On inspection fifty per cent of the eggs showed some development of the embryo. However the two eggs being incubated by the Barbary Doves hatched successfully; the first egg after 19 days, the second a day later. The chicks were immediately removed and placed in a small box which

was heated by a 60 watt electric light bulb placed inside an earthenware flower pot. At nights the top of the box was covered with a piece of underfelt.

As soon as they had dried out the chicks began to feed on finely ground turkey starter crumbs and by the end of the first week their size had more than trebled. Over the following two weeks I gradually reduced the amount of heat given until I judged that the chicks were big and fit enough to go into the outside quail aviary. A certain amount of bullying was shown towards them by the adults, but after a few days they were ignored except for the occasional chasing.

I now depend solely on the Barbary Doves for hatching the quails eggs and at the time of writing these notes in July two more Japanese Quails and one Chinese Painted Quail have been hatched (the C.P.Q. having the same tendency to abandon their eggs), and are at present being reared before being placed outside.

Obviously there are drawbacks to hatching quail's eggs in this way, the main one being that the doves cannot or will not incubate more than two Japanese and two Chinese Painted Quails eggs at the same time. Also of course the doves may lose interest and abandon the eggs before they are hatched.

In order to help reduce the number of eggs being laid, which were beginning to show signs of being thin-shelled, I changed the food mixture as outlined earlier in these notes, hoping that the reduction of the high protein starter crumbs would help reduce the number of eggs being laid, but this has not yet proved successful. Apart from this food mixture I have found that the Japanese Quails have a passion for mealworms, and I am now able to hand feed the original pair of birds purchased. I have found however that the female eats a larger proportion of the mealworms than

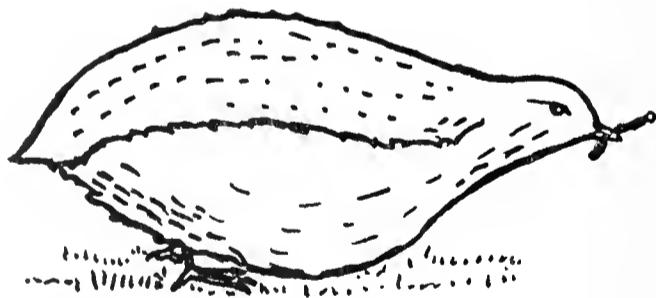


Fig. 1

the male. When the male is given a worm he holds it, with lowered head, in his beak uttering soft "croaking" noises (see Fig. 1). The female then immediately dashes up and accepts or takes the mealworm from the male, who then copulates or attempts to copulate with the female. Copulation takes place by the male jumping onto the female's back, his legs on the rear of the back and holding, with his beak onto the nape of the female's

neck, and pulling hard (see Fig. 2). Mating usually lasts for two or three seconds. If however, there are still some mealworms left uneaten the female will attempt to reach them with the male clinging to her. This



Fig. 2

usually results in the loss of a few feathers from the female's neck, and the courtship-feeding again taking place.

Courtship-feeding happens every time the male is given a mealworm, and it follows therefore that if the male is given for example five mealworms (not of course all at the same time) he will "courtship-feed" the female and mate or attempt to mate five times. The same applies to a lesser extent with the Chinese Painted Quails, although in their case copulation is less frequent—the male merely "giving" the mealworms to the female.

* * *

NOTES ON A PAIR OF LONGTAILED PARRAKEETS

(*Psittacula longicaudata*)

By G. A. SMITH (Peterborough, England)

The Longtailed Parrakeet is generally held to be the anomalous member of its genus. For whereas the others usually prove good aviary birds Long-tails are supposed to be unduly sensitive to cold. The Marquis of Tavistock (1927), for example, wrote that "they feel the cold more than any other parrakeet. Requiring a temperature of not less than 70° F. and are likely to die should it fall below 60° F.: for which reason we cannot hope to keep and rear them". More recently Rutgers (1969) voices the same opinion.

Last summer my attention was caught by an advertisement in "Cage and Aviary Birds" for an acclimatised pair of Malayan Longtailed Parrakeets. These had been kept in a small outside aviary for the previous eighteen months. The unheated shed, to which the flight was attached also served as a bird-room—having cages around the walls—and in one

of these the Longtails roosted for the night, gaining entry through a permanently open bob-hole. They were being disposed of because they proved too noisy, in the early morning, for the tolerance of the surrounding householders. As they had been sold I eventually acquired them, third hand, from a dealer.

By now it was autumn and the cock was a rather dishevelled individual with the long centre rectrices, from which the species gets its name, broken off short. The hen, was an equally ragged, dowdy, almost uniformly khaki-coloured bird. In late October/early November I noticed that the supposed hen was moulting out into a cock bird. However my fear about "changing sex" was mistaken. She gained orange cheek patches and assumed a greener cap but otherwise remained her normal drab self. She soon proved to be no exception to the *Psittacula* rule of hen birds being aggressive towards the males out of the breeding season. For although extremely timid her antipathy towards her mate was so strong that she would pursue and snap at him even when I stood but a few feet off, her aggression towards him being far stronger than her fear of myself. Therefore the cock was removed and brought inside for the winter which he spent in a metal box-cage standing close to the window of an extremely cold, disused bedroom; so cold that the water pot often froze solid during the night. The belligerent hen was left with my dealer friend, housed in a wooden shed roofed over, for illumination, with transparent plastic sheeting; giving an internal environment, except for wind and rain, almost identical to that out of doors. I assume that it was because she had to clamber down the netting of her inside flight to get her food, which was placed on the floor, that she suffered from frost-bitten feet, for, after the winter, she had lost the terminal phalanges of all save three of her toes. It was definitely not caused by having snow or hoar-frost gathering on the perches—often stated to be the cause of this injury. The cock remained unaffected.

Over the winter both partly moulted: mostly those feathers used in sex-recognition and display, the hen moulting her head and some central tail feathers, the cock regained his glorious filamentous tail, a few primaries and all of his head feathering. In February I collected the hen and put her in the cage with the cock. Up till now all that they seemed to eat was sunflower and apple. Only seldom would they take a little canary seed. What was most pronounced was the extraordinary large amount of both food and water consumed, resulting in the most copious quantities of moist faeces. As moulds will grow even at very low air temperatures they required cleaning out at very frequent intervals to avoid the risk of contracting Aspergillosis. When offered fresh unshelled peanuts they immediately stopped eating the sunflower and lived solely on these for almost a fortnight. Then, appetite sated, restricted themselves to just a few peanuts a day. It was as if the previous monotonous diet had deprived them of some essential dietary need which, once satisfied, could



Fig. 1. ♂

be taken at a less liberal rate. Now they would eat grapes and orange. They proved themselves to be exceptions to the general rule with parrots in that they would not eat the exposed pips in a slice of apple before the fruit. Indeed they left these delicacies entirely alone.

On the fifteenth of March they were put into a small outside aviary, which they had to themselves; ten ft. long, six ft. high and three ft. wide, with a small shelter for roosting in. Flying Longtailed Parrakeets remind me much of Starlings. They whirr heavily weighted on short wings. The thrust backwards given to the spar as they launch themselves into the air, and the momentum of each landing impact, caused all the perches to work loose, or to fall, within a few days of having them outside. Only moderate woodchewers, their destructive attention was directed to removing bark from branches, leaving the shelter alone. The short toenails are hooked in shape and once they flew, or blundered, onto the wire they could clamber up and down but remained ensnared and fastened firm when they tried to fly off—caught by their own nails. Like Starlings, which also give the impression of awkwardness when flying in a confined space, they are said when in the wild to perform mass aerial displays before finally roosting for the night.

Both sexes are rather stolid-looking characters, and the beauty that they undoubtedly possess is to a large degree over-ruled by their stern and forbidding-looking heads. When conscious of being watched both remain perfectly still and unmoving. The cock, in contrast to the hen, and irrespective of whichever direction his body faces, twists his head away from the observer, such that he looks back, literally out of the corner of his eye. For all the world as if he were frightfully shy and couldn't bear to face one head on (Fig. 1). The head is also bunched onto the shoulders and the adoption of this backwards facing posture of the head keeps the red beak and much of the lovely Victoria-Plum-coloured cheeks hidden. The only break in the green of the body and head is the dull mauve nape of the neck. However, should an alarming movement be made by the onlooker, to see the better the bird brings his head completely round and then, if satisfied that no offence is intended, swivels it back to its almost totally hidden viewpoint. While this may be characteristic of the cock bird the hen (her head is less strikingly tinted and has a blackish beak) will gaze full face or laterally with none of his "coyness". The voice has the most mechanical of tones. The call-note made to starlings flying over the aviary sounds identical to the peeping of a child's cheap toy trumpet. However, unlike the neighbours of the original owners, I have not found them noisy birds. And despite the tinnyness of all their utterances they are not loud and certainly not irritating or unnecessarily prolonged. They are most vociferous after, or before, heavy rain which falls to interrupt an otherwise dry spell. The more usual incessant English rain does not seem to have this power to "lubricate" their "vocal chords". They do not sunbathe; though the hen would sometimes spend the hotter part of the day roosting in full sun—whereas she could have, and mostly did, seek shade in the shelter along with her mate. Likewise they made no attempt to bathe in the bath provided or in the rain. However, after summer showers they were often seen rubbing themselves on the damp netting of the flight in an attempt to foliage bathe. Food items larger than a seed and small enough to lift are raised in the foot to the head. Seeding heads of sow-thistle and dandelion may be bitten off and then lifted up in the foot instead of being eaten directly off the plant as would most parrakeets. Out of the breeding season this pair are rather timid; though less so than my aviary-bred Ringnecks. Too close observation of them makes them sleek the plumage and shiver the body with nervous tension. Coupled with this shivering the respiratory movements become exaggerated and quite audible and to the uninitiated might seem as if they were suffering from pneumonia.

BREEDING BEHAVIOUR

In the wild they are said to lay in February or March (Ali and Ripley 1969) and I therefore held out no real hope of getting them to breed, the cock still continued a desultory moult and I gave them no box. In early

May the Longtails became unusually energetic. (Or probably, more correctly, less prone to "freeze" when they saw me.) The cock vigorously flapped his wings and called whenever birds larger than a sparrow flew over. A week of spare time was wasted trying to saw a length of hollow Ash log into a nesting chamber and then, thoroughly exhausted by the effort, they were given a rather hastily-built box fabricated from inch thick chip-board and with a plywood lid. Suspicious as the birds were to anything new I was pleasantly surprised, two days later, to see the cock peering into the nest hole. All courtship took place on the top of the box, or in its very close proximity. They would start very early at sunrise till perhaps 9 a.m., recommencing again in the late afternoon—following the usual parrot siesta—for a further hour or so. Almost all observations were taken from a twenty yard distant window and because of this and also the hours they kept (they always roost full two hours before any other birds in my small collection) my notes are a little sporadic. Nevertheless though I was not fortunate enough to have them breed they may prove of some slight interest.

In the breeding season the hen's attitude towards the cock entirely changed. She would sit inert for much of the time, as if entirely oblivious of him and his antics. However—although she looked as if she was just about to doze off—any slight movement or sound proceeding from a source other than the male would immediately alert her into her normal

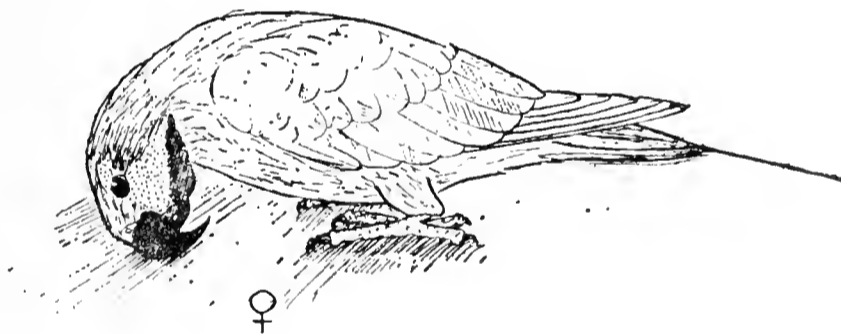


Fig. 2.

wide-awake self. Many of the early days were spent by both sexes pushing the culmen, like a child with a sledge, along the top of the box (Fig. 2). This method of progression is especially interesting for I have noticed that very young parrots similarly trundle their beaks along the ground when they push themselves under the feathers of a brooding parent bird. As soon as the male became more dominant he gave up this subservient method of progression; but the hen used this as her normal means of moving about the surface of the box until a few days before she started to enter the nest. She would raise her head slightly with the back horizontal and squeakily cawing, like a fledgling Rook, plead to be trod. This I never saw him do. My impression was that he still remained uncertain of himself when in too close contact with her. She first entered the box in the last week of June and from then on spent much of each day

mysteriously inside. The male had entered the box several times during the first two weeks, long before the hen, and was never seen to do so subsequently.

Once courtship had started the cock became an entirely different animal. He "walked tall". In the winter months she seemed to be larger than he. Now the position was reversed. His head was extended well off the shoulders and seemed bulkier. His early display took place in the absence of the hen and consisted of marching (the steps more pronounced than in normal walking) to and fro on the top of the box. After every two or three steps he would give a jump in the air. So far as I could see this was a silent display. When doing this promenading alone he would break off and excitedly call to Starlings flying over as if he wished to draw attention to himself and his nest box. When the hen ultimately joined him (she was a few weeks more retarded reproductive wise than he) he became oblivious of other birds. He fed the hen not by regurgitating in the usual parrot-pumping head up and down manner, but instead the head was swung round and round three or four times as if relying on centrifugal force to get the bolus up. She would sit quite unmoved by these gyrations and take the proffered food without any discernible movement on her part. Both indulged, in the early part of courtship, in much displacement preening. Whereas she would attend to almost any part of her person he mostly preened his upper chest which coincidentally showed off his broad cheek-stripes. This was distinct from the swaying part of later stage courtship when he would sway the body slowly from side to side turning the head to give her a broad lateral view of his cheeks and of the contracting pupil of the eye. As well as this lateral swaying of the body he also had a bowing display which usually terminated in him feeding the hen. In this the head was bowed very low. The beak was then raised off the ground, lifted quite high and then placed on the ground on her opposite side.

Another pattern of courtship was for him to advance, swaying the body, towards the hen—and as usual jumping every few steps—then when six or seven inches away sidle round to take the next few steps crabwise and finally to completely reverse and "back-in" next to the hen with the last few steps. So that he stood slightly in front of and yet to one side of her. Her beak lying on his back and her field of vision almost entirely obstructed by his wonderful collar. They looked not unlike a couple riding a tandem bicycle with him, unchivalrously, sitting in front. If she moved away from him, and this slightly ludicrous coupling, he would waddle after her, forgetfully omitting to jump and then back-in again. He—and until I saw this I wondered at what use he had for his whip-long tail—swished the tail from side to side, in wide arcs each time he changed his direction and backed-in.

Although the hen spent long periods in the box until the end of July she never laid.

Longtailed Parrakeets are far from rare in the wild. Yet, rather oddly (for Singapore—a major bird market—lies practically at the centre of their distribution) they are seldom imported. The few that do get brought in seem, as is usual with Ringnecks and other “Psittaculas” to have a very large disproportion of male birds. The pair that I have cannot be very aberrant examples of hardiness for often acclimatised single cocks are advertised for sale. So something other than a suspected intolerance towards cold may be to blame for the recorded losses.

My impression would be that: (a) they require large amounts of food—and will not eat if watched. Newly imported parrots, in my opinion, often die of sheer starvation, even when in the midst of plenty. (b) Psychological stress, they certainly shiver continually with fear when they are kept close to disturbing factors—which is the usual lot of newly captured birds. (c) Diet: whatever they do eat in the wild it almost certainly is not fed to them in captivity. As they may partake of very few forms of food once they do settle down this may predispose towards deficiency disease. (d) Parasitism. Most wild birds—parrots included, harbour various “worms”. The stresses of captivity may tend to upset the normal “balance” between host and parasite in favour of the latter. The cock of my pair has, or had, microfilaria (larval bloodborne worms). And popular belief has it that these birds die from a “worm in the heart”. The worm probably lives in the peritoneal cavity or air sacs of the bird “pushing” its infective larvae—microfilaria—into the blood. Thromboses or “clots” of microfilaria may feasibly cause death through, say, Coronary thrombosis; but the adult worm is not involved.

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BREEDING IN CAPTIVITY OF THE EUROPEAN BEE-EATER, THE CARMINE BEE-EATER, AND OF A HYBRID BETWEEN THE TWO

By E. CALLEGARI (Ravenna, Italy)

Some years ago, during a safari in East Africa, near Mombasa, I caught an adult Carmine Bee-eater, *Merops nubicus*. This species is a lovely carmine-red with blue-green on head, rump and upper tail-coverts. I took it with me while on a visit to some national parks, and it arrived in Italy all skin and bones, yet healthy enough to recover within a few days. It proved to adapt itself to captivity so well that it displayed to a female of the European Bee-eater, *Merops apiaster*, with which it shared an aviary.

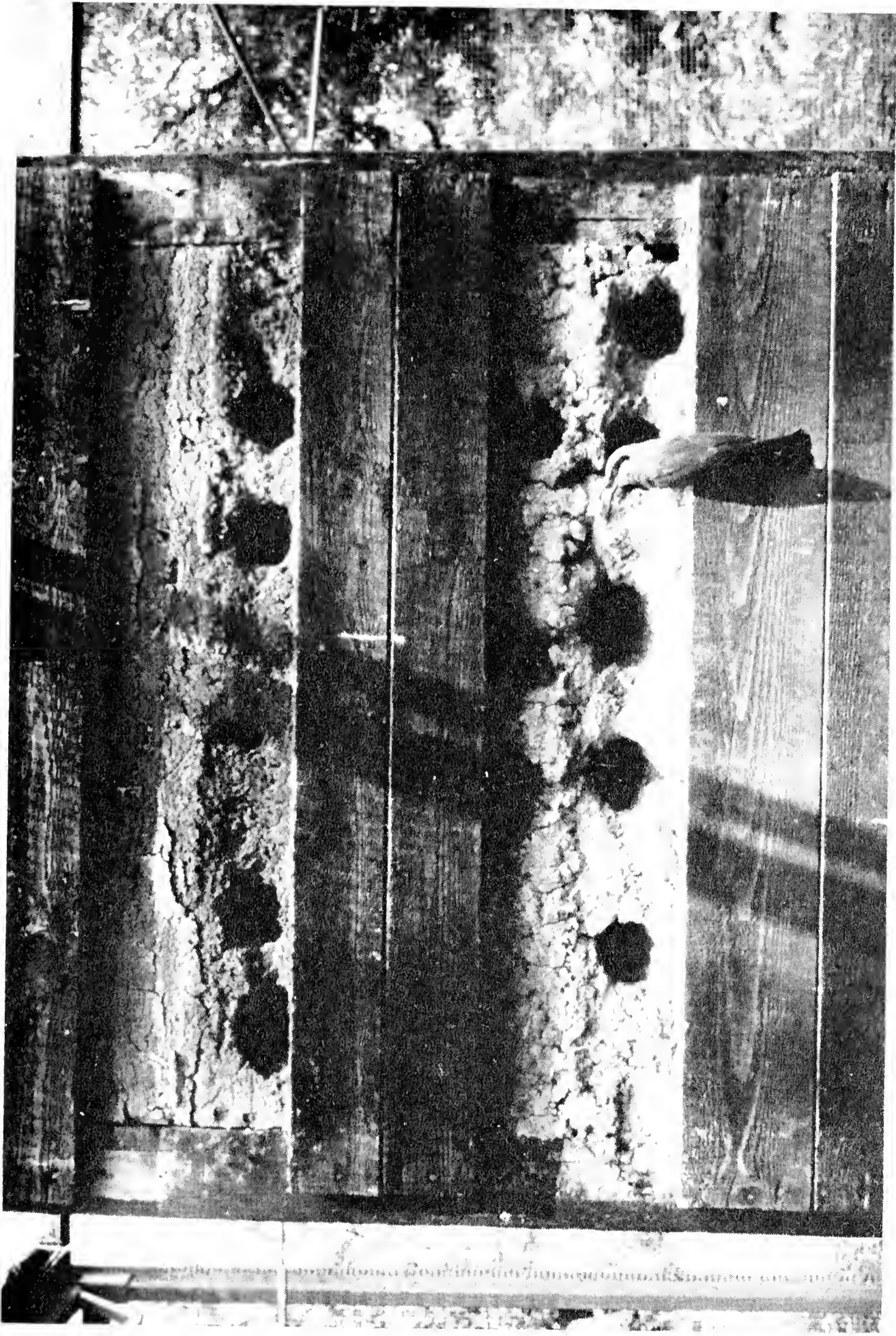
Since then I have always been trying to obtain Carmine Bee-eaters, but I had never been able to get any. After an unsuccessful journey to Timbuctoo I went to the Uebi Scebeli, having been told of the existence of a colony of these birds there. When I arrived at the banks of the river, at the foot of the slope where the birds nested, four monitor lizards were present; and I was told by the guide that when he first arrived at the spot one of the monitors was clinging to the slope with a nestling in its mouth.

I returned home with eight of these nestlings. They grew healthy and strong, and as early as the month of January the males began to display to the females. I hoped to breed them but was faced with the old problem of how to provide a suitable artificial nest. Taking the advice of Mr. Peter Scott, I went to Professor Otto Köenig in Vienna to copy the artificial nest he used. By the time that both the aviary and the nest were ready the birds had already laid their eggs from the perches. In that year only one pair of European Bee-eaters succeeded in rearing two nestlings.

Things went better the following year. When Spring came the birds began to display, make nests and lay eggs. There were fights, and several of the eggs as well as a few day-old nestlings were thrown out of the nests, but two pairs of Carmine Bee-eaters were able to hatch four nestlings in all. What surprised me most was the nest of one pair of European Bee-eaters. They were feeding two young in the nest but once these emerged I realised that they were, in fact, two hybrids from a Carmine Bee-eater and a European Bee-eater. They look beautiful, and what is strange is that they have a pink chin and throat and a thin blue-grey collar between throat and breast.

When I sent the above information to the AVICULTURAL MAGAZINE I was asked if I would give further details of the feeding of the birds and the making of the nest. I willingly describe all this and I hope it will be clear.

First of all you must bear in mind that Bee-eaters do not drink. For this reason the birds must retain the water from the food which they eat, and therefore the insects which you give them must not be dehydrated.



Copyright)

Artificial Nest-site for Bee-Eaters

[E. Callegari

THE UNIVERSITY OF CHICAGO

Another point of great importance is that they need frequent changes in the kind of insects given. To make this point clearer I want to quote what I wrote several years ago with reference to the feeding of three White-fronted Bee-eaters kept in captivity. "They seemed to prefer every new insect which I gave them." If my statement is not absolutely accurate it does, however, indicate the birds' preference for variety in the matter of food. They readily accept a vast range of the harder chitinous insects in varying quantities; but refuse the softer insects such as caterpillars, wasp-larvae and larvae of lamellicorn and longicorn beetles. According to the insects available, I feed my group of European, Carmine and White-fronted Bee-eaters on a mixture of 60% mealworms, 20% bees, and the remaining 20% of wasps, hornets, cockchafers, rose-beetles, flies, cockroaches, fresh-water shrimps, grasshoppers, dragonflies, butterflies, big ants, cicadas, etc.

Of course it was much easier to find more varied and numerous insects some fifteen years ago, when I made the first mixtures for three European Bee-eaters. Today I have a wider experience in collecting these insects, but it is more difficult to find them; for a lot of these species have almost disappeared. While once I could collect these insects in the neighbourhood of Ravenna, I now must go many kilometers from the town to be able to find some. I keep the insects in cold store and feed the refrigerated insects to the birds, with the exception of the meal worms, which I supply alive. This is fed to the species already mentioned, but another group consisting of Little Bee-eaters and Cinnamon-chested Bee-eaters get only 4% of bees, with no fresh-water shrimps at all.

This was the most satisfactory way I could find of feeding these birds and keeping them alive and healthy without giving them an excess of any particular kind of insect. I am sure, however, that they would eat mealworms in greater quantities and for longer periods; but fear they might ultimately get tired of them. They enjoy spiders, scorpions, scolopenders and small lizards too. They eat small quantities of cut lettuce as well, and during the moult they even swallow a few feathers. They can tell their prey by sight as well as taste. Thus they catch all the flying insects which happen to get into the aviary, crying out with excitement for the insects they mainly enjoy and discarding rather disgustedly those they do not like—Arctiidae, Tenthredinidae, Chrysomelidae, Coccinellidae, Cantharidae, Lampyridae, *Metoecus*, etc. I am surprised to observe that they will accept a very small percentage of both Zygaenidae and *Lytta pescicaria*.

The artificial nest is made of a wooden box filled with a mixture of earth and sand until compact. You must place it in the sunniest spot you can find. Remove one or two boards on the side you deem more suitable for the digging of the nests (see plate). In doing this the soil will be left exposed, and in this the birds may dig their holes without any danger of landslips.

If you provide the birds with adequate heating during the winter months, and feed them as described above, the birds will survive well with only a slight death-rate. But even here you may come across the disappointments well known to all aviculturists. Last year, in fact, I lost the mother and one daughter of the Carmine Bee-eaters, and two specimens of the young European Bee-eaters, one of which had nearly developed a ruby-red iris. I believe that this is the first time that the Carmine Bee-eater has been kept in captivity, the first time that it has been bred, and the first time that hybrids have been obtained in this family.

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BREEDING THE BLUE-CROWNED MOTMOT AT THE WINGED WORLD

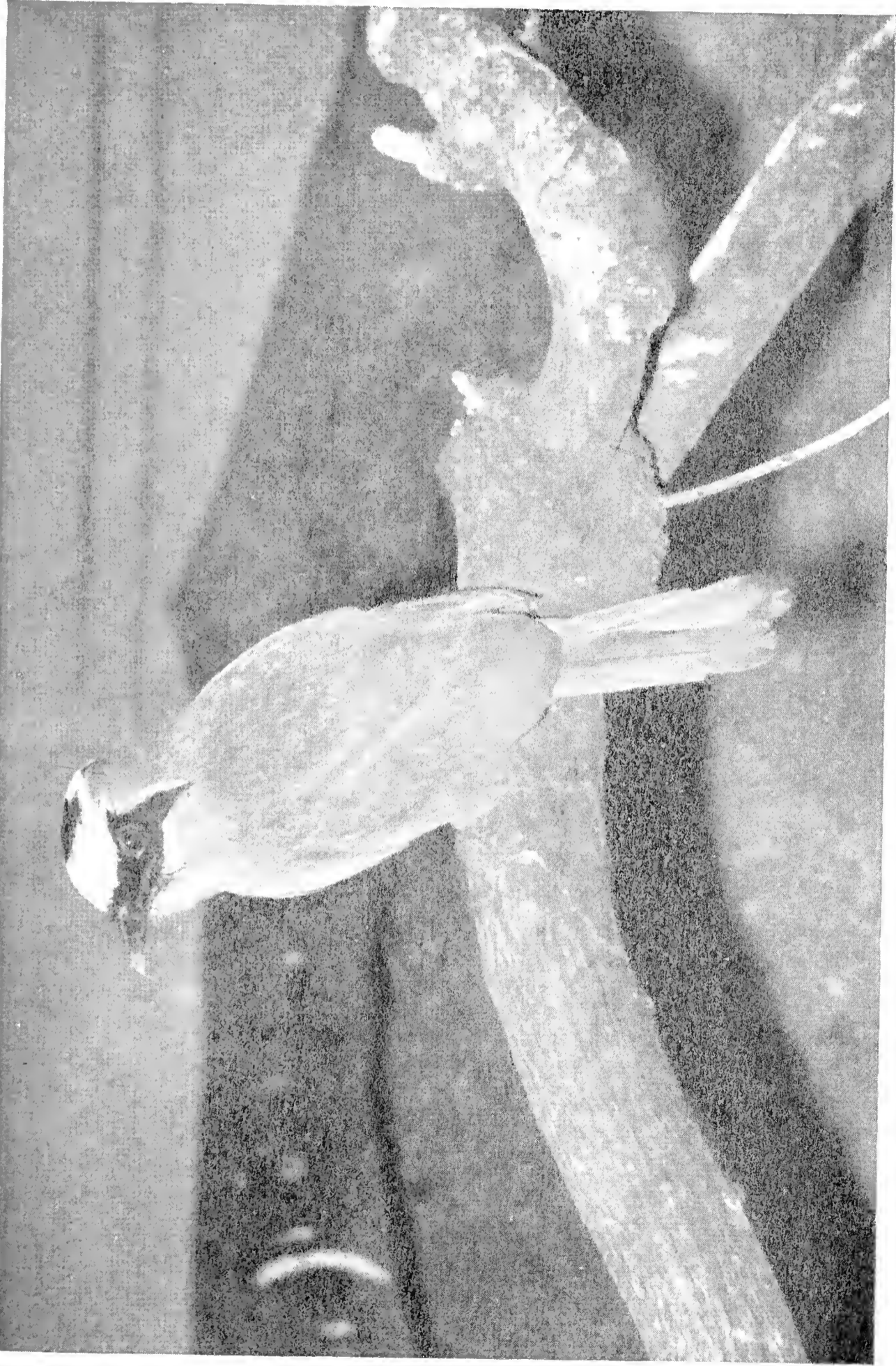
(*Momotus momota*)

By CLIVE ROOTS (Heysham, Lancs., England)

A pair of Blue-crowned Motmots, belonging to Bill Ranson, a member of our staff, has been housed at the Winged World since 1966. On several occasions they tunnelled into the earth floor of the aviaries we have exhibited them in. Normally these tunnels have been used for roosting in, although on at least two occasions last year we optimistically hoped for youngsters as the adults were observed taking food into the tunnel. On each occasion however they stopped after a few days. Eventually they were housed in one of our largest glass-fronted compartments together with many Thrushes, Starlings, Wood Hoopoes, Bulbuls, Orioles, Barbets, a Cock of the Rock and a Ground Cuckoo. The competition for live food can be imagined and it is a wonder they managed to commandeer sufficient to rear their young when they finally bred successfully.

Their earlier breeding attempts were no doubt thwarted by the collapse of their tunnels, as they burrowed diagonally into almost level soil, and then levelled out into their nest cavity. Consequently there was a not great deal of soil over their tunnels, and it was loose, due to being hoed daily. I am certain that they were finally successful because they tunnelled beneath a large concrete pool, which incidentally later broke its back as a consequence. No cave-ins were experienced as the bottom of the pool obviously acted as a roof for their tunnel and nest cavity, and the surrounding damp soil no doubt aided egg incubation also.

We have no idea how long the incubation period was, as the adults were extremely secretive in their movements. There was no doubt however about their many visits to the tunnel with live food, which commenced of April 13th. Maggots were left in the aviary *ad lib*, to the delight of the other birds. Competition was also keen for the mealworms, crickets, locusts, young mice and earthworms which were thrown to the Motmots repeatedly throughout the day. Ten days later the calls of the youngsters could be quite clearly heard some yards away. Strips of meat supple-



[Clive Roots]

Young Blue-crowned Motmot, two days after leaving the nest-tunnel at the Winged World.

1850

mented the live food from 14 days onwards, and after a nestling period of exactly 28 days one youngster appeared on 12th May. A second nestling left the tunnel two days later. In between the appearance of the nestlings the parents were observed mating again.

We were amazed at the size of the young Motmots, which were as large as the adults. They had short tails of course, but resembled the adults in colour also, although they lacked the breast spot.

Within one week of leaving the tunnel both youngsters were observed feeding themselves, and three weeks later their tails were as long as their parents', although not raquet-tipped. By this time the adults had young in the nest again.

* * *

As described above the Blue-crowned Motmot, *Momotus momota* has been bred at the Winged World. It is believed this may be a first success. Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

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BREEDING THE THAILAND HOOPOE AT THE WINGED WORLD

(*Upupa epops longirostris*)

By CLIVE ROOTS (Heysham, Lancs., England)

Our pair of Thailand Hoopoes, purchased in 1966, produced infertile eggs on many occasions, so we eagerly took the opportunity last year to acquire four hand-reared youngsters. The original hen mated with one of these birds and fertile eggs were laid early this year. Before this happened however her behaviour was peculiar to say the least. For many weeks she spent practically all day in the nest box and it was a rare occurrence to see her at all. The nest-box was suspended from the highest point of their indoor aviary, which was shared with a group of Carmine Bee-eaters, a breeding pair of Brown-throated Barbets, Minivets, Sunbirds and several other species. The male Hoopoe fed her untiringly and we occasionally checked to see if eggs had been laid. After two months, and no eggs, we were naturally concerned that such a steady, established bird should hide away for so long. The nest inspections became less frequent, and we eventually decided to fill the box with rotten wood to keep the hen out for a while and provide her with much-needed exercise if she really did intend to lay. A last minute check however revealed that she had a nestful of healthy fledglings, apparently about two days old. Egg laying and incubation had occurred since our last check, just over three weeks previously, so we cannot provide any information on the incubation period of these birds. The male Hoopoe continued to feed the hen and nestlings for several days before she emerged to assist him.

Maggots and earthworms were preferred, which eased the live food situation as there was a great deal of competition from the Bee-eaters for mealworms.

Two fledglings were seen at the entrance of the box twenty days after we assumed they had hatched, but not until five days later did the first one venture out, followed after two days by the other. The next day two more youngsters appeared. They were exact replicas of the adults, except for their shorter bills. Within three weeks however these were equally as long as their parents' beaks and had it not been for the latter's leg rings it would have been difficult to indentify them. These young Hoopoes were splendid birds. Their feathering was perfect, their bills strong and their legs and feet well developed. They were by far the finest youngsters of any species reared at the Winged World. The adults were seen mating while their young were still in the box, and they have nested again.

Our success with insectivorous birds is naturally attributed primarily to the provision of a suitable high protein diet. The Thailand Hoopoes, like all the other insect eaters, receive the standard softbill fare comprising our own insectile mixture with raw minced beef. A fresh mixture with finely diced apple replacing the meat is given late in the afternoon and is left in overnight. A few maggots daily, and mealworms occasionally, complete their basic diet. This is supplemented however by the earthworms, crickets and the not-so-welcome cockroaches which are now thriving in their aviary, and they are continually probing the earth floor and crevices for these and other invertebrates.

* * *

The breeding of the Thailand Hoopoe brings to five the number of species of the order Coraciiformes which have reproduced at the Winged World in the past twelve months.

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SUBSPECIES AND AVICULTURE: SOME NOTES ON RECENT DIFFICULTIES

By C. J. O. HARRISON (Perivale, Middlesex, England)

There is usually little reason for aviculturists to bother about subspecies, or races as they are sometimes called, of the different species of birds. They are likely to pay little attention to them unless two forms that were regarded as species are combined as two subspecies within a single species. In some cases, particularly where populations of a single species are separated on islands the populations may be very different in appearance. In such instances there has been a feeling that separate awards should be made for first breedings of birds from these distinct populations. This has been done in the past by the Avicultural Society for subspecies of some parrots; but since this has recently led to doubts being expressed concerning the subspecific identity of such birds, it seems necessary to try to explain the difficulties involved where named subspecies are concerned.

The naming of subspecies began mainly at the beginning of this century. It was intended for the use of museum systematists and many of the differences involved between subspecies are so slight that they are only useful if the user has a series of skins of birds from both populations in front of him when he is considering them. Many of the differences are those of populations, not of all individuals. Names were given not only to separate populations such as those on islands, but also to various local parts of continuous populations of widely distributed species. Names were often given after an examination of only one or two individuals from widely separated localities and further collecting may often have revealed that such subspecies intergrade with no definite division between them.

In addition it has been the practice to assign names to populations when 75% of one sample differ in a particular character from all of the other sample; but this also means that one in four of a named subspecies might be indistinguishable from the next subspecies. The characters that separate subspecies may be very fine distinctions in colour, shape, or size sometimes only distinguishable in certain plumages and one sex. Since overall measurements cannot be taken from a stuffed skin, parts such as the bill, tarsus, wings, and tail are measured. Variation in the size of such parts may not mirror overall changes in size. In some instances the critical size differences separating the range of measurements identifying different subspecies may be as little as a millimeter.

These named subspecies were intended for use in discussing the variations apparent in samples of populations available as museum specimens. In 1949 Bernard Tucker pointed out that in the majority of cases subspecies were not relevant to field studies of live birds, and discontinued the general use of subspecific names in the journal "British

Birds". We should recognise that such subdivisions are not usually relevant in aviculture either; and that an individual bird, or pair, for which the precise locality of origin is unknown cannot be confidently assigned to a subspecies unless the latter is one in which all individuals are strikingly different from all other individuals in other subspecies of the species concerned.

The attempt to apply these subdivisions to live birds in aviaries has led to some difficulties. A Swedish member of the society, Mr. T. R. M. Brosset, who is very interested in Parrots, visited the aviaries of a number of British aviculturists and in doing so formed the opinion that a number of birds had been wrongly attributed to particular subspecies. He sent me some excellent colour transparencies of the birds concerned, together with tentative identifications, and encouraged me to take a further look at the matter. The two principal species involved are the Eclectus Parrot, *Eclectus roratus*, and the Lorikeet, *Trichoglossus haematodus*.

The Eclectus Parrot illustrates the problem very well. There are eleven named geographical subspecies. Only about five of these can normally be identified by the amateur, and two of these intergrade. The males of all are very similar. In *E. r. pectoralis*, the female is red, maroon above, and dark blue on the breast. The male usually shows a little yellow on the tail tip. Individuals of the subspecies *biaki*, *aruensis*, *macgillivrayi*, *goodsoni*, *solomonensis*, and *maforensis* cannot be distinguished from *pectoralis* for ordinary avicultural purposes. This group inhabits the area from New Guinea to the Solomons and Northern Australia. The birds originally described as *Ceram eclectus*, the breeding of which was described in an earlier number of the AVICULTURAL MAGAZINE, appear, in fact, to have belonged to this group.

E. r. vosmaeri of the Northern Moluccas, and *E. r. roratus* of the Southern Moluccas have violet on the upper mantle, neck and underside of the females. On the former the underside of the female tail and under-tail coverts may be yellow, while on the latter only the tail tip is normally yellow, but this character is variable and the two intergrade. *E. r. cornelia* of Sumba and *E. r. riedeli* of Tenimber both lack blue on the neck, breast and belly of the female, and the second has about an inch of yellow on the underside of the tail while the first has virtually none.

The picture is more complex in the case of the Lorikeet. It was analysed by Cain (1955). The New Guinea region is inhabited by a group of subspecies centred around *Trichoglossus h. haematodus*. These birds have a red breast barred with black, a tendency towards black on the belly, a greenish-yellow collar, blue on the head and brown on the nape. These characters may vary independently within the population formed by this group. Birds tend to be more heavily barred in the west, bluer-headed and blacker below in the south, and so on. Various parts of this population showing various combinations of these characters have been given the names *berauensis*, *intermedius*, *flavicans*, *massena*, *micropteryx*,

nesophilus, *deplanchii*, *caeruleiceps*, and *nigrogularis*. The variations are not absolutely clear-cut and unless a bird can be compared with an extensive range of museum skins it would seem inadvisable or impossible to assign one of these names to it, and even then the identification would not be certain, and I would suggest that for avicultural purposes these forms are best regarded as a single population.

A form with a plain red breast occurs on Bali, Lombok, Sumbawa and Djampea, and has the names *forsteni*, *mitchellii* and *djampeanus*. A greenish or yellow-breasted form occurs on the Lesser Sundas and has the names *capistratus*, *fortis*, *flavotectus* and *weberi*; and between the two *stresemanni* on Kalao tua is intermediate in its characters.

The Australian group have bluer heads and unbarred breasts with more orange and yellow mixed with the red; the other plain-breasted forms having dark heads. *T. h. moluccanus* and *septentrionalis* have greenish collars, *rubitorquis* has a reddish collar.

In addition to the above there is one individual form. *T. h. rosenbergii* of Biak is like the first group but has very heavy blue-black breast bars, more extensive red on flanks and wings and a very large yellow collar.

The general picture within this group is therefore like that of the Eclectus Parrot, but in this case only six groups can be recognised with 22 names. Some idea of the difficulties that might be involved in identifying odd birds of the first group can be gained from the following comments. When Mr. Brosset sent his colour transparencies, D. T. Holyoak and I examined them independently in comparison with material in the collection of the British Museum (Natural History). A pair of Lorikeets at Chester Zoo had been described as the Louisade Lorikeet, *T. h. aberrans*. Brosset pointed out that *aberrans* was now a synonym of *flavicans* and since the bird was not yellowish suggested that it might be *T. h. micropteryx*, or *massena* or *intermedius*. Holyoak agreed they might be any of these, or possibly *caeruleiceps* or *deplanchii*, and I was not sure that *nigrogularis* could be ruled out. The birds which bred at Kelling Pines had been described as the Blue-headed Lorikeet, *T. h. caeruleiceps*. Brosset thought that they were *haematodus* but was not wholly sure. Holyoak suggested *caeruleiceps* or *nigrogularis*, but felt certain that many of the other forms listed above could not be completely ruled out. My own view was that *haematodus* was a possibility but that *caeruleiceps* could not be entirely dismissed.

In view of this I would repeat my opinion that as far as records and awards for breeding are concerned it would be better to recognise the larger and more distinct natural groups and not to assume that every name must separate a distinct and identifiable population of individuals which are recognisable even when the precise locality of origin is not known. I think too that zoological gardens and public collections should display more caution in using subspecific names, and also that we should recognise that dealers often have access only to rather limited sources

of information and may be a little incautious in their identifications.

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THE IDENTIFICATION OF THE KANSU BABBLER AND GREY-HEADED BABBLER

By C. J. O. HARRISON (Perivale, Middlesex, England).

While reading an account of the breeding of one of these species by A. H. Isenberg I had occasion to examine some museum skins and came to the conclusion that most, perhaps all, the birds which have in recent years appeared in collections of live birds as the Kansu Babbler, *Garrulax sukatschewi*, are in fact individuals of the Grey-headed Babbler, *G. cineraceus*.

The last has a resemblance to the Rufous-chinned Babbler, *G. rufogularis*, to which it is closely related, but lacks the elaborate pattern. It is mainly a warm slightly rufous buff, with a vinous tint on breast and throat, and orange-buff on tail coverts and hind-flanks. The crown of the head is dark grey-black, there is a white spot on the lores between eye and bill and the white continues under the eye to another small patch just below and behind the eye. The ear-coverts are rufous. The lower edge of the ear-coverts has an irregular blackish stripe breaking down into spots. The bill is fairly stout. The edges of primary wing feathers are ash-grey, greater primary coverts are black, and tertials and secondaries on the closed wing are warm buff with a broad black band at the end and a narrow white bar across the squarish tip. The central tail feathers are similar with a broad black band, narrow white terminal bar and square tips.

The Kansu Babbler has very subdued colouring and lacks black on wings and tail. It is soft vinous pink below and mainly pinkish grey on mantle and head. The lores are dark with a dull blackish line through the eye, another bordering the lower edge of the ear-coverts, and the entire ear-coverts are white. The bill is more slender, tapering and very slightly decurved. Primary feather edges are ash-grey, and tertials and secondaries olive, the tertials having rounded terminal white spots, the secondaries tiny triangular white tips. The central tail feathers are olive brown with faint greyish fringes and tip. The tail is relatively long and the tips of feathers taper a little. Tail coverts and flanks are light orange-buff. This would appear to be a rare species of limited distribution. The Grey-headed Babbler has a wider distribution from Assam, through northern Burma to adjacent parts of China.

* * *

AN EXPEDITION TO ALASKA IN SEARCH OF GROUSE AND PTARMIGAN AND ON THE WAY BACK A VISIT TO THE WESTERN DISTRICT OF AMERICA

By YUKIO NAKATA (Osaka, Japan)

The grouse and ptarmigan occur as 11 different species on the Eurasian Continent, and seven in North America. They are almost circumpolar, but their total number is gradually decreasing.

The dispatch of a group to Alaska for the purpose of taking some of them for breeding in captivity was proposed by an American named Mr. Ray Carr of the Western Game Breeder's Society, U.S.A. The present writer had the pleasure of joining the group.

The American members participating were unanimous in welcoming the opportunity as a rare chance probably never to be enjoyed again in their lifetime. This feeling was shared equally by me, and I found the visit to Alaska to be the most rewarding and memorable experience.

Alaska is the most beautiful region in the entire North America. Its southern part, when the group visited it, was in the midst of autumn, and the long lines of birches with their leaves turned yellow, were seen literally forming an endless vista. Actually, they extended over a distance of 1,000 km., dotted at places by glacier ice falls, beautiful placid lakes and rivulets, each suggesting the most attractive spots for camping or angling.

Moreover, volcanoes Iliamna and Redoubt, and Mt. Spurr, all 3,000 m. high, were snow-capped, towering high and majestic in the sky; while Mt. McKinley, towering over 6,000 m. high, is said to be the highest mountain in North America. It is now a National Park.

During the present expedition, I drove by car over a distance of about 3,000 km. To me, the visit to Alaska seemed to have been a visit to a giant natural zoo. On both sides of the road on which I drove along, a variety of such wild animals, big and small, as moose, caribous, brown bears, foxes, coyotes, porcupines, marmots, squirrels, grouse and ptarmigan came out to greet me. At times, they were seen crossing the road in front of my car. Almost at 10 min. intervals, as the car sped along, the carcasses of porcupines were found left lying on the ground, suggesting that they had had the misfortune of being collided with or run over by cars because of the very slow speed at which they could run.

In the shoals of the limpid rivulets, groups of crimson salmon were seen swimming up against the stream.

On the mid-slopes of the mountains sloping steeply high up into the sky abruptly from the roadside were seen dots of white, which, on the closer examination through a telescope, were found to be the mountain sheep. Their existence so high up struck the writer as something extremely mystic.

In the sky, I saw many V-shaped formations of wild geese in flight.

The brief descriptions above will suffice to give a rough idea of Alaska's natural scenery.

Once you step into such modern cities as Anchorage or Fairbanks a totally different picture is presented, for here the fruits of human civilization glitter. The hotels are brilliant, both inside and outside, and to dine in the dining-room of a gorgeous hotel leaves an impression of great luxury. But as a matter of fact our accommodation during travel through Alaska consisted entirely of bivouacs, using eiderdowns and sleeping bags.

When I reached Alaska it was just September. In the southern part of Alaska, the temperature then was 7°C at the lowest, and 18°C at the highest, while, in the central part, it dropped to -4°C at the lowest and it rose just to $5-6^{\circ}\text{C}$ even at the highest.

The biting polar cold had not yet set in, but the present writer was told that, on a certain day, Fairbanks recorded as low a temperature as 54°C below zero!

In the central part of Alaska, the visitor will see more snow-capped and sharp-tapered peaks, and more spruces than birches. The number of tall trees will decrease; in the Eagle Creek Ptarmigan Research Area, a whole expanse of Tundra will greet him. There will now be no tall tree to be seen there. The whole view is nothing but a vast expanse of Tundra or wildly sloping hills with bushes, dotted with left over snow.

The grouse and ptarmigan are captured when they are on the ground by means of a hand net, a mist net or a copper wire loop; while, when they are perched on twigs, the use of a loop formed into a noose, made of a thick vinyl thread, fixed at the tip of a telescopic and long angling rod (over 5 m. in length), placed over the neck and shoulder of a grouse or ptarmigan, was found highly effective.

At times, the cry of a baby grouse or ptarmigan may be mimicked to attract its parents; when they come sufficiently near they may be caught with a hand net.

On the Kenai Peninsula in the south, the grouse were captured under the guidance of Dr. Larry Ellison, who has for several years been engaged in the research of the spruce grouse, living in a cabin erected especially for the purpose deep in the forests of Sterling H.W. But for his guidance, indeed, it would have been utterly out of question to capture grouse in these forests, which are so thick and dense that in winter it would be impossible to get out of them without help.

Dr. Ellison is an official researcher attached to the Alaskan Department of Fish and Game who obtained his degree for his study of grouse, and he was good enough to present me with a copy of his four-part treatise, which was of tremendous interest.

I had the pleasure of staying at his cabin over two nights. It was not supplied with electricity. Cooking was by propane gas and lighting was provided from the same source. Water had to be drawn from East Finger Lake, 100 m. distant, and the mountain wood had to be cut by



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Willow-Ptarmigan at Mrs. Kubek's Farm.

[Yokio Nakata

1850

means of a saw operated by petroleum as fuel for heating.

Normally Dr. Ellison would be engrossed in study, all alone in the forests, but accompanied by two dogs, white and black.

In the central part of Fairbanks I had an opportunity of calling at Alaska University, where I was taken to its research laboratory, and at the breeding area outside the campus I inspected the reindeer, brown bears, foxes, willow ptarmigan, etc. Many willow ptarmigan had already grown to the size of adult birds. The rearing room was divided into two, the one virtually being an ultra-red ray lamp-lighted warm room while the other was a wire-floored pen with no shelter. They were fed with Purina pellets. Apparently, no complicated feeds were given.

In connection with this visit the present writer feels himself much indebted to another authority on the study of ptarmigan—Dr. Robert Weeden, for his thoroughgoing encouragement and assistance; and also to Dr. Ellison and Mr. and Mrs. J. Kubek for generous assistance and advice.

After travelling through Alaska for ten days I boarded a plane from Anchorage to San Francisco, then flew to Utah in order to attend the annual convention of the American Game-Bird breeders Cooperative Federation, which was to be held at Salt Lake City.

At San Francisco I was welcomed very kindly by Mr. Ronald Reuther, the Director, and had the pleasure of making a round trip of the spacious zoo ground with Mr. C. Rawlins of the London Zoo, who was also on a visit.

I was greatly impressed by the beautiful sight of the zoo, which had lovely plantations and green lawns, dotted with yellow and red flowers. It was far more beautiful than its counterparts in Japan.

The San Diego zoo, which I had visited last fall, was extremely spacious, where natural environments with gorges, etc., especially designed and well suited for wild animals to live in, were most impressive, and I was struck, in particular, at the sight of numberless galapagos tortoises, iguanas, humming birds, and the large collection of reptiles kept there. On the occasion of my visit to this zoo, I was a grateful recipient of the kindest hospitality provided by Kenton Lint, the Curator of Birds.

Among other game-bird breeders, I met Fitzsimmons-Denton who has the most elaborate and scientific facilities for breeding of birds, and appeared to be especially proud of such rare birds as Peacock Pheasants, Jungle-fowls, etc., which he owned. In particular, I noted with much interest such Japanese species as Ijima Copper Pheasants and long-tailed fowls kept there in quite a large number.

I was able to attend an annual meeting of the American Game-Bird Breeders Cooperative Federation, where the speakers included Wesley Batterson, lecturing on the "Propagation of Waterfowl and Grouse", Prof. Allen Stokes on the "Behaviour Studies of Various Gallinaceous Birds", and Glen Christensen on "Breeding the Himalayan Snow

Partridge and the Crested Tinamou", all of which I found exceedingly interesting and instructive.

* * *

EXTINCT, VANISHING, AND HYPOTHETICAL PARROTS

By A. A. PRESTWICH (Edenbridge, Kent, England)

Since 1600, the date accepted by the Survival Service Commission, International Union for Conservation of Nature and Natural Resources, as the reckoning date for modern extinction, 167 species of birds have certainly become extinct, and at least 340 are considered to be endangered species. Needless to say, a number of parrot species are included in both groups.

Some species have vanished, or are vanishing, through natural causes, but man is responsible for the status of the great majority—destruction of habitat by cultivation, felling of forests, draining of swamps, shooting and trapping, and persecution by introduced predators.

An attempt has been made to list all the parrot species that are now certainly extinct. Just a few "probables" are included. It is not known for certain that they are extinct but it is feared so. It is to be hoped that they have vanished only temporarily.

EXTINCT

NORFOLK ISLAND, PHILIP ISLAND, OR LONG-BILLED PARROT.

Nestor productus (Gould), 1836. Norfolk and Philip Islands, Western Pacific.

While the other *Nestor* spp. are on the verge of extinction it is believed that this is the only one that is definitely extinct. The last specimen is said to have died in a cage in London, sometime after 1851. It was a large bird, total length about 15 in., somewhat like the Kaka *Nestor meridionalis*, but with a yellow breast. There are specimens in 14 museums.

NEW CALEDONIAN DIADEMED LORIKEET.

Charmosyna diadema (J. Verreaux and Des Murs), 1860. New Caledonia, West Pacific.

Only the type, a female, is known to exist. It is believed to have been collected before 1860, and it is now preserved in the Musée Nationale d'Histoire Naturelle, Paris.

MAURITIAN BROAD-BILLED OR CRESTED PARROT.

Lophopsittacus mauritianus (Owen), 1866. Mauritius, Indian Ocean.

In the Library of Utrecht there is a manuscript journal kept during the voyage to Mauritius of Wolphart Harmanszoon, 1601-1602, in which there is a sketch of this parrot. Sir Thomas Herbert sketched this large, probably flightless, blue-grey parrot, with its enormous bill and distinct crest, in 1638. Otherwise it is known only by rather unsatisfactory accounts of travellers, and bones preserved in London, Tring, Cambridge and Mauritius museums.

CUBAN RED OR TRI-COLOURED MACAW.

Ara tricolor Bechstein, 1811. Cuba and Isle of Pines, West Indies.

This was a comparatively small macaw, length about 18 in., predominantly red and yellow. It is believed that a few birds were still living until about 1885, but the last-recorded specimen was one shot at La Vega, near Ciénaga de Zapata, on the south coast, in 1864. There are 15 skins in 11 museums.

ST. CROIX MACAW.

Ara autochthones Wetmore, 1937. St. Croix, Virgin Islands, West Indies.

Known only from osseous remains. Nothing appears to have been recorded concerning this rather primitive macaw.

MAUGÉ'S CONURE.

Aratinga chloroptera maugei (Souancé), 1856. Puerto Rico and Mona Island, West Indies.

This conure differs from all allied principally in having the whole of the under wing-coverts red. The last specimen was taken on Mona Island, by W. W. Brown, a collector, in 1892. Only three specimens are known to exist, in Paris, Leyden and Chicago.

CAROLINA PARRAKEET.

Conuropsis carolinensis carolinensis (Linnaeus), 1758. South-eastern United States of America, from southern Virginia to Florida.

This parrakeet was bred in captivity on several occasions: first by Dr. Karl Russ in Germany, in 1879. The greatest success was obtained in the Cincinnati Zoological Garden, where the last known example died in September, 1914. There are specimens in most of the principal museums.

LOUISIANA PARRAKEET.

Conuropsis carolinensis ludovicianus (Gmelin), 1788. Central United States of America.

Differed from the preceding by being somewhat paler generally. The date of extinction is doubtful. Three of a flock of 11 were shot in Louisiana, in 1881; one was reported shot in Kansas, 1904; and one is said to have been seen in Jackson County, Missouri, in 1912 (possibly an escaped cage bird). No museum specimens have been recorded.

NEBRASKA PARRAKEET.

Conuropsis fratercula Wetmore, 1926. Nebraska, United States of America.

A "little brother" of the Carolina Parrakeet. Known only from a fossil humerus found in Snake Creek Quarries, Sioux County, Nebraska.

CULEBRA AMAZONA PARROT.

Amazona vittata graciliceps Ridgway, 1915. Culebra Island, West Indies.

Described as smaller than the Red-fronted or Puerto Rico Amazona Parrot *Amazona vittata vittata*. None has been found since 1899. Only three specimens are preserved: they are in the United States National Museum.

RÉUNION OR MASCARENE PARROT.

Mascarinus mascarinus (Linnaeus), 1771. Island of Réunion, Indian Ocean.

Père du Bois described this parrot very accurately in 1674. In 1834 Carl Hahn figured an example then living in the Menagerie of the King of Bavaria. Unfortunately all trace of this bird, probably the last of its kind, was lost. Only two specimens have been preserved, in the Museums of Paris and Vienna.

RODRIGUEZ PARROT.

Necropsittacus rodericanus (Milne-Edwards), 1867. Rodriguez, Indian Ocean.

Known from bones and the description of an anonymous, contemporary observer. Last seen about 1760. It was apparently approximately the size of a large cockatoo, completely uniform green, with a huge bill. The bones are at Cambridge.

SEYCHELLES ALEXANDRINE PARRAKEET.

Psittacula eupatria wardi (E. Newton), 1867. Seychelles, Indian Ocean.

Still present in 1870, when a few skins were collected for Cambridge University, but there is no later record. This race differs from the Ceylon *P. e. eupatria* and allies in wanting the rose collar. There are skins in only five museums—Cambridge, England; Cambridge, Mass.; London; Paris; and New York.

MAURITIAN RING-NECKED PARRAKEET.

Psittacula krameri echo (A. and E. Newton), 1876. Mauritius, Indian Ocean.

Now very scarce, even if not actually extinct. Last sighted in April, 1911, when Colonel R. Meinertzhagen saw an adult pair. Differs from the Ring-necked of Africa and India in being larger, darker green in colour, and in having broader tail-feathers.

RÉUNION RING-NECKED PARRAKEET.

Psittacula krameri eques (Boddaert), 1783. Island of Réunion, Indian Ocean.

Known only from Daubenton's plate, 1783, and from a statement by Père Dubois that he saw them, about 1670. How it may have differed from *echo* of Mauritius is not known.

EXILED or RODRIGUEZ RING-NECKED PARRAKEET.

Psittacula exsul (A. Newton), 1872. Rodriguez, Indian Ocean.

No information has been forthcoming since 1875, when an immature male was killed by Vandorous, on 14th August. It must be considered extinct. It was a medium-sized parrakeet, total length 16 in., of a pale greyish-glaucous colour. Only two specimens are known, both in Cambridge.

CEBU or GOLDEN-BACKED HANGING PARROT.

Loriculus philippensis chrysonotus Sclater, 1872. Cebu, Philippine Islands.

This hanging parrot was gradually exterminated by the destruction of forests on Cebu, about 1906.

PARADISE or GOULD'S BEAUTIFUL PARRAKEET.

Psephotus pulcherrimus (Gould), 1845. South-eastern Queensland to northern New South Wales, Australia.

At one time believed to be extinct it was rediscovered by C. H. Jerrard, in 1921. The following year he photographed a pair at the nest. The last authentic sighting appears to be that of Jerrard on 14th November 1927. There is little evidence to suggest that it still exists.

LORD HOWE ISLAND GREEN PARRAKEET.

Cyanoramphus novaeseelandiae subflavescens Salvadori, 1891. Lord Howe Island, South-west Pacific.

The last pair was seen by a Mr. Hall, in 1869. This subspecies was about the size of the Norfolk Island Parrakeet *C. n. cookii*, and rather like it in colour, but of a more yellowish tinge. There are specimens in London, but no others have been recorded. There are fortunately still seven races of *C. novaeseelandiae* living, although several are very reduced in number.

MACQUARIE ISLAND RED-FRONTED PARRAKEET.

Cyanoramphus novaeseelandiae erythrotis (Wagler), 1832. Macquarie Island, south-east of Tasmania.

The last examples were seen about 1913. This subspecies was larger and paler than the New Zealand Red-fronted *C. n. novaeseelandiae*. There are specimens in London. As there are no trees on Macquarie Island this parrakeet nested amongst tussocks on the ground, and so was an easy victim to abandoned house cats, etc.

TAHITI PARRAKEET.

Cyanoramphus zealandicus (Latham), 1790. Tahiti, French Oceania. This Tahitian species disappeared about the middle of the nineteenth

century. The last authentic specimen was taken in 1844 by Lieutenant Marolles, and is now in Paris. Other specimens are in London and Liverpool. The species differed mainly in that it had a brown-black frontal band (crown green).

NEW ZEALAND ORANGE-FRONTED PARRAKEET.

Cyanorhamphus malherbi Souancé, 1857. Hen Island, Little Barrier Island, South Island, New Zealand.

There have been only five reports during the past 80 years, most of them unconfirmed. If not actually extinct it must be extremely rare.

ULIETEA (NOW RAIATEA) ISLAND OR SOCIETY ISLANDS PARRAKEET.

Cyanorhamphus ulietanus (Gmelin), 1788. Raiatea Island, Society Islands, French Oceania.

This very distinct species, olive-brown with brown-red rump, is known only from two specimens collected by G. R. Forster in 1773 or 1774, during Captain Cook's second voyage. There are skins in London and Vienna.

NIGHT PARROT.

Geopsittacus occidentalis Gould, 1861. South and Western Australia.

Only one specimen has been collected this century but there have been unconfirmed sightings as recent as 1960. It must be considered a vanished species. There are specimens in eight museums. Dr. Karl Russ is credited with breeding this parrot in Germany, in 1877: but Dr. Russ never made any claim to have done so. There must surely have been a confusion of common names.

HYPOTHETICAL

The parrots listed as hypothetical are birds known only from the descriptions of travellers and explorers of long ago. It must be remembered that the majority had little or no training as naturalists, consequently their descriptions leave much to be desired. They are sometimes of the sketchiest and it is perhaps remarkable that since 1900 authors should have seen fit to bestow scientific names on about a dozen supposed species or races, including seven macaws. It is, however, only fair to say that they are listed merely as "hearsay species".

GUADELOUPE VIOLET MACAW.

Anodorhynchus (? *Ara*) *purpurascens* Rothschild, 1905. Guadeloupe, French West Indies.

Don de Navaret, 1640, described a macaw of entirely deep violet. Probably the description should not be taken too seriously.

YELLOW-HEADED OR JAMAICAN RED MACAW.

Ara gossei Rothschild, 1905. Jamaica, British West Indies.

Based on a macaw described by a Dr. Robinson who saw an incomplete, stuffed specimen. It was said to have been shot, probably about 1765, by Mr. Odell, about 10 miles east of Lucea. The specimen appears to have been lost.

JAMAICAN GREEN AND YELLOW MACAW.

Ara erythrocephala Rothschild, 1905. Jamaica, British West Indies. Based on poor hearsay evidence. It must have been extinct by early in the nineteenth century.

GUADELOUPE RED MACAW.

Ara guadeloupensis Clark, 1905. Guadeloupe, French West Indies. Extinct since early eighteenth century (? 1722). Based on a good description, but no specimen. It appears to have resembled the Red and Yellow Macaw *A. macao*, but was smaller and the tail was all red.

DOMINICAN GREEN AND YELLOW MACAW.

Ara atwoodi Clark, 1908. Dominica, British West Indies. Based on a rather doubtful description by Thomas Atwood, published in 1791.

YELLOW AND BLUE OR MARTINIQUE MACAW.

Ara martinica Rothschild, 1905. Martinique, West Indies. Based solely on the unconfirmed description of Père Bouton, published in 1640.

MYSTERIOUS MACAW.

Ara erythrura Rothschild, 1907. "One of the West Indian Islands". Based on a description by De Rochefort, published in 1658.

GUADELOUPE CONURE.

Conurus labati Rothschild, 1905. Guadeloupe, French West Indies. Based on the writings of J. B. Labat, 1722. It is said to have been about the size of a Blackbird, entirely green except a few, small red feathers on the head. No specimens exist.

GUADELOUPE PARROT.

Psittacus violacea Gmelin, 1788. Guadeloupe, French West Indies. Known by descriptions of naturalists and travellers—Du Tertre, 1667, Labat, 1722. Probably extinct since early eighteenth century. No specimens exist.

MARTINIQUE PARROT.

Amazona martinica Clark, 1905. Martinique, West Indies. The only description is that of Labat, 1722. No later report. The parrots of Guadeloupe and Martinique may possibly have been races of the same species, or even the same species, as there is no indication of how they differed.

BOURBON PARROT.

Necropsittacus borbonicus Rothschild, 1905. Island of Réunion, Indian Ocean.

Known only from the short description of Père Dubois, 1669: "Body the size of a large pigeon, green; head, tail and upper part of wings the colour of fire".

MAURITIAN PARROT.

Necropsittacus francicus Rothschild, 1905. Mauritius, Indian Ocean.

Known only from the contemporary authors of Mauritius in the seventeenth and eighteenth centuries: "head and tail fiery red, rest of body and wings green".

In order to reduce duplication to the minimum the numerous references are not given. The majority are to be found in the very extensive Bibliography in James C. Greenway, Jr., *Extinct and Vanishing Birds of the World*, 1958, to which anyone sufficiently interested should refer.

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BERLIN ZOO NEWS

By DR. HEINZ-GEORG KLÖS

In 1966, we obtained a pair of Black-headed Ibises (*Threskiornis melanocephala*) which successfully bred and raised two young in 1967 and three in 1968. At that time we put a pair of Straw-necked Ibises (*Threskiornis spinicollis*) into the same aviary with the result that very soon the male Black-headed and the female Straw-necked Ibis formed a pair. They have bred in 1969, and a hybrid was reared. In 1970, their first two eggs were put into an incubator. After 28 days, the young hatched and were raised artificially. At first they were fed with a mixture of predigested fresh water fish, meat and chicken meal. Later on they got small pieces of fish and meat, salad, cooked rice, and in addition calcium and vitamins. This diet proved to be satisfactory because the young developed very well and as rapidly as the two others which a little later were raised by their parents.

All five hybrids are similar in coloration: they look very much like Black-headed Ibises although their neck is covered with white feathers and there is more black on the wings and back than in *Threskiornis melanocephala*. Due to the good breeding results, our aviary has become so overcrowded that we were forced to pinion all our young ibises. They now live among geese and ducks on one of our lakes where they make a beautiful exhibit.

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LONDON ZOO NOTES

By P. J. S. OLNEY

Since the last London Zoo Notes we have had a particularly active period compounded of the usual hopes and frustrations, rearrangements, exchanges and purchases.

Some of the more interesting adult arrivals have been Hooded Mergansers, Scarlet Ibises, Bateleur Eagles, Mikado Pheasants, Allen's Gallinule, Pygmy Kingfishers, Wood Hoopoes, Striated Thrushes and Thick-billed Weavers. A small collection of southeast Asian Pigeons and Doves was presented and included four species or subspecies not seen in the Gardens before; the Mountain Imperial Pigeon *Ducula badia badia* and *Ducula badia griseicapilla*, the Little Cuckoo Dove *Macropygia ruficeps* and the Little Green Pigeon *Treron olax*.

There have been a number of notable deaths including a male Ne-ne, female Golden Eagle, our adult male Princess Stephanie's Bird of Paradise, and the Naked-throated Bell Bird. The latter's strident call will be missed, especially as the bird had been in the collection for 18 years. Fortunately we have managed to replace the Ne-ne and Golden Eagle, though in both cases as yet there has been no obvious permanent pair bonding.

Pursuing the policy of providing where possible mates for our birds, we have obtained a number of prospective husbands or wives. These have included a Chough, Little Owl, and a number of ducks and geese.

It is too early to say how successful this year has been for breeding, though it is satisfying to record another Spectacled Owl and 3 Black-footed Penguins, including twins.

The building of the new Ape and Monkey houses has resulted in the loss of the Great Aviary and the consequent rehousing of a number of birds. The opportunity was taken to rearrange a number of exhibits. For example, the Scarlet Ibis are now housed outside alongside the Cariamias and Kookaburras.

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NEWS AND VIEWS

Dr. S. B. Kendall has two Citron-crested and three Roseate Cockatoos in the nest. He has also had a minor invasion by predatory boys.

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The Ospreys arrived back at Loch Garten for the twelfth successive season, a pair of Snowy Owls on Fetlar have laid, and a pair of Golden Eagles have successfully nested and reared a young one in the Lake District. This is probably the first to be bred in England since the late eighteenth century.

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E. Nørgaard-Olesen, Janderup, Denmark, 25th July: "We have had a warm spell for the last four weeks and the birds are doing well. I have one well-grown young Blue-necked Mousebird in the nest, and two pairs of Philippine Hanging Parrakeets are brooding for the first time, after being in my possession for three years."

* * *

The Great Indian Hornbill in the Curraghs Wildlife Park, Isle of Man, had the misfortune to break off a piece of its large, curved beak and was in danger of starving. A local dentist, however, took an impression for a plastic replacement. The bird was given an anaesthetic and the plate was then successfully screwed into position. It is apparently now doing well again.

* * *

A note in *Chester Zoo News*, April, 1970, 6, states: "For a second year we have bred Louisiade Lorikeets *Trichoglossus haematod aberrans*. A single chick has emerged from the nest box and is being fed by the parents. We bred this species we believe for the first time in the British Isles last year and are especially pleased as this is an early chick and the pair may nest again."

* * *

Bernard Roer, Phoenix, Arizona: "My birds are not doing very well this season. The weather was cold and extra dry until about the first of May when it turned hot—it was 110° yesterday (21st May). The Australian birds are doing fairly well: Cape Barren Geese, nine; Black Swans, seven, and more eggs; Leadbeater's Cockatoos, five, and more eggs; Crimson-winged Parrakeets, six; and Bourkes, Scarlet-chested and Turquoisines have young."

* * *

Dr. L. A. Swaenepoel (22nd July, 1970): "We have been doing quite well with Green Rosellas; twelve from two pairs. The third pair, the hen of which is badly crippled, had ten infertile eggs. We expect to put up five new pairs as we seem to have five hens amongst the youngsters. Of Blue Bonnets there were only six good birds from seven pairs, but six of

them were 1969 birds. Unhappily, we lost nearly a score of this year's youngsters, mostly when just hatched. We thought we had played safe (?) by transferring the eggs under trustworthy (!) Redrumps, but a lot of mishaps occurred."

* * *

George and Bessie Bray, San Francisco: "We have found that feeding tomato to our Cock of the Rocks can keep them a deep scarlet colour. We had not previously fed tomato and it was quite a trick to get them to take it. We withheld all food and buried some Avocado (mouth-sized cubes) under cubed tomato. They finally ate the tomato to get the Avocado. Now we feed it freely and separately and they clear it up. Both of our birds are males but we have two females in quarantine in Bogota, Colombia, and if all goes well we should have them in six weeks!"

* * *

Mrs. K. M. Scamell (1st July): "The White-eyed Quaker Babblers did not rear to independence. A second round disappeared and a third attempt is now in progress. We have, however, bred Lemon-rumped Tanagers *Ramphocelus icteronotus*. Three eggs were laid, one fell from the nest and was broken. Incubation of the remaining two eggs commenced on 21st May; two young birds hatched on 3rd June, and left the nest on 15th June. We separated them from their parents yesterday (30th June) and caged them. They are feeding themselves. Rothschild's Grackles deserted their three chicks when three days old, and although hand-rearing was attempted it was not successful. They are incubating once again. The Tacazze Sunbirds lost their youngster, we believe, to a shrew, as did the Festive Tanagers."

* * *

T. R. M. Brosset, Gothenburg, takes me to task for calling the Red-masked Conure *Aratinga rubrolarvata* (p. 134). In this he is, of course, academically correct. Peters, *Check-list of Birds of the World*, vol. III, p. 187, in a footnote says: "As long as *Conurus* was employed as the generic name for the paroquets now placed in *Aratinga*, *Psittacara erythrogenys* Lesson was unavailable as the name of this species by reason of *Conurus erythrogenys* Lesson 1831 given to a Malayan bird; *Conurus rubrolarvatus* Massena and Souancá 1854, was used as the first available name. The use of *Aratinga* in place of *Conurus* now permits the use of *erythrogenys* Lesson 1844."

The Society's Medal was awarded to W. Shore-Baily in 1925, under the name Red-headed Conure *Conurus rubrolarvatus*. Thomas Brosset reports that last year Hans H. Hansen, Vejen, Denmark, was successful with this species: "I think four young were reared."

I have ample opportunity of studying the behaviour of several pairs of Moorhens. But a point puzzles me, as it has many reputable ornithologists in the past. When disturbed on land a Moorhen runs for cover, but when suddenly disturbed on open water it sometimes dives and swims under water. The point is mentioned by Witherby (v. 198, 305): "Birds which have dived when startled frequently remain almost submerged, preferably under cover of bank or amongst plants or surface debris, often exposing first beak only, and sometimes little more, or gradually showing head or head and surface of back, and remaining thus till danger appears to have passed." A footnote deals with this problem and in fact says: "The means by which this is effected has been disputed. Some have maintained that it is incredible that the buoyant bird—whatever may be the case where submergence is only partial—could maintain itself almost completely under water without artificial aid, and it has been emphatically asserted that it does in fact hold on to the stems of water-plants with its feet. . . It seems clear, however, that the bird is capable of submerging at least the whole trunk without such assistance, and Dr. C. B. Ticehurst has pronounced himself satisfied that a bird which showed no more than the beak and fore-head above water did not hold on to anything with its feet."

* * *

G. A. Smith, 20th July, 1970: "This year's breeding has been marred (is there such an event as a good season?) by infertility. Carelessness coupled with a heavy, and most unexpected fall of late snow, lost me my mature lutino (albino) Cockatiels—the roof of a holding aviary collapsed with the weight. Therefore I had to rely on their progeny. Unfortunately young male Cockatiels are often infertile. Usually, I feel sure because they lack a sense of "physiological direction"—when the hen is trod they, as like as not, try to copulate with the head of the hen rather than the tail. Or, and just as uselessly, sit like an avian jockey on the hen's back. Sometimes they may slowly spin around as if through moving they might "remember" what to do next; but even this is beyond many and once mounted they do little but admire the view from the higher advantage point. My New Zealands are most disappointing. The Yellow-fronted first pair had eleven eggs, none of which hatched—though all were fertile—the chicks dying a few days before each should have hatched, despite the excellent mothering of the hen. Next time she laid thirteen. After seven had hatched the cock—the most charming and suave of birds—died after an illness of less than a night's duration. Acute congestion of the lungs, the heart muscle literally ruptured trying to force blood through the useless respiratory system. This was my twelfth post-mortem on a New Zealand, and apart from five with psittacosis, all the rest have died from totally disconnected illness, as if they wished to sample all known diseases during their short life on this earth. The hen is masterfully rearing—the seven chicks are now three weeks old. The other eggs I gave to a hybrid pair.

And the cock bird, I think it was him, decapitated the lot after a week or so. The other pair of Yellow-fronted had seven eggs, three of which were fertile and hatched. Two young died in the nest of aspergillosis (I have decided never to use rotten wood for nest furniture, replacing this now with inverted sods). The sole survivor is a hen. The next round of seven eggs had only two fertile. The hen has never hatched more than three, and I've given these to a pair of Red-fronted. I was hoping that she'd nest again. Instead of which she is only brooding the "memory". New Zealands are most odd birds—they will moult and breed pell-mell all at the same time. They do not stand a chance when disease strikes to "test" them.

After much searching I managed to get a fine pair of Red-fronted from our member David Castle. She has laid twice but unfortunately on both occasions seven totally infertile eggs. The cock is too afraid of his spouse to more than feed her. So apart from a few Norwich canaries, some few Cockatiels and some, I hope, New Zealands success is bad. I did hold out hope of getting the Longtails to nest, and though she sits inside the nest most days, even now, I feel that it will have to be "next year". I know that it is a sign of desperation but I am positively looking forward to next year. It would be impossible for it to duplicate this year's literally dozens of eggs and barely a chick."

* * *

Tailpiece. During recent months several pairs of Red-rumped Parakeets have been sighted in the heart of Adelaide. L. R. Comport, *Bird Keeping in Australia*, April 1970, reports that an unexpected sighting from his office window prompted him to interrupt a telephone call to a business friend with the comment "Good heavens—Red-rumps." The friend's rejoinder was somewhat confused but was to the effect that mini skirts must be particularly short in that part of Adelaide!

A. A. P.

* * *

REVIEWS

BIRDS OF THE LEBANON AND THE JORDAN AREA. By S. VERE BENSON. International Council for Bird Preservation, 1970. London and New York: distributed by F. Warne and Co. 6os.

Nowadays most regional bird books are the work of a group of authors, and Miss Benson is to be commended for producing this admirable work as a one-woman effort, both text and illustrations being her own. We have become so used to the well-illustrated field-guides to birds, available for Europe and North America, that when we find ourselves in regions for which no such work is available, most of us are at a loss to identify what we see. The Middle East has always represented a gap of this kind in the regional coverage of field-guides, and the present work provides just what is needed for the Western part of this area.

In the introduction the author sets the scene with her comments on the varied habitats and the birds to be found there, and on the impressive autumn raptor migration. She also makes a strong plea for conservation in this region. A checklist of species with indication of status is included. For each species notes are given on range, identification in the field, voice, and habitat. Each is illustrated, 94 in colours and 258 in black and white. The colour plates illustrate in particular those species occurring in these regions and not found in the European field-guides, which most people are likely to use in conjunction with the present volume. Species only occasionally recorded are listed at the end of the main text. Many of these are illustrated, and where this is not done a brief indication of the salient points of recognition is given. An appendix illustrates and comments on the recognition of difficult birds of prey in flight and describes plumage variations of the Pied Wheatear and Persian Robin. A second appendix gives brief descriptions and some illustrations of the additional species likely to be encountered in Jordan.

A primary aim of the authoress in writing this book has been to make the people of the Lebanon aware of their heritage of bird-life and to try and awaken a desire to conserve it before it is too late. The International Council for Bird Preservation has lent its support by publishing the book and by planning for the production of an Arabic edition. The book is to be recommended as a valuable addition to anyone's books on bird identification; all profits from its sale will be given to the work of the I.C.B.P.

C. J. O. H.

* * *

KRANKHEITEN DER VÖGEL (Diseases of Birds). By H-S. RAETHEL. Stuttgart: W. Keller & Co., 1966. Price DM. 5.80.

This excellent little book on bird illnesses can be recommended to all who read German. It deals with bird diseases of all kinds, both those due to infection and those due to malnutrition; accidental injuries; and infestation by parasites. There are interesting discussions of various aspects of bird behaviour and bird-keeping where these are relevant to the main theme.

I fear that in Britain, where the private citizen is sometimes considered unfit to have free access to modern medicines, some of the recommended remedies may not be readily available to the rank and file of bird keepers.

The author points out that very many differently-caused illnesses may give rise to the same or similar symptoms. Like most who have written on this subject he recommends the use of small, heated cages for sick birds. Another very experienced German aviculturist, Dr. Jürgen Nicolai, has, however, argued cogently that it is much better to put the sick bird in a large cage heated at *one* end only so that it can choose what degrees of warmth it feels in need of.

The book is illustrated with a large number of very good drawings. It is to be hoped it will be translated into English. D. G.

* * *

BIRDS OF THE PACIFIC NORTH-WEST (with special reference to Oregon). By I. N. GARIELSON and S. G. JEWETT. New York: Dover Publications. London: Constable and Company Ltd. 1970. Price 47s. 6d.

A strong and handsome reprint of an important textbook (formerly titled *Birds of Oregon*) including one- to two-page descriptions and biographies of each species and race recorded in the area, a short description of the local life-zones and the progress of ornithological exploration there, and a 29-page bibliography.

It seems debatable whether attempts should be made to bring this type of textbook up to date as it seems pointless without a very thorough revision, yet if this is attempted it is no longer the same book and arguable that it were better to write a new one.

Meanwhile everyone seriously interested in the birds and the development of knowledge about them in an important area like this remains anxious to have the original version on their shelves and must welcome good reprints such as this. We should have more of them in the United Kingdom as well. W.R.P.B.

* * *

NOTES

COCKATIELS—THEIR VERSATILITY AS FOSTER PARENTS

During 1969, a pair of Lutino Cockatiels produced a fourth clutch of eggs, and as they had reared three rounds I did not want them to suffer the strain of a fourth. Having no normal cockatiels laying at the time, I decided to experiment with a pair consisting of an old cock and a very immature hen. They had spent some weeks in the box without laying, and I put in a single egg. This was accepted promptly, and the following day the remainder of the clutch was added. In due course, four chicks hatched and fledged—without the foster hen ever having laid!

This year, another pair of Lutinos deserted their three eggs, which I offered to a similar foster pair (1967 cock, late 1969 hen). Again these were accepted, and two duly hatched. After they had been close ringed, three more close-ringed chicks were added from a pair (split Lutino cock/normal hen) which had hatched eight of their 10 eggs, thus levelling off both pairs with five chicks each. These have all fledged, and are independent.

Obviously one cannot draw definite conclusions from only two examples, but I think it can be taken as indicative of possibilities. I shall certainly retain two or three third round hens this year for similar use next season.

Finally, the first night that one of my hen Bourke's stopped brooding, there was a sharp frost, and the following morning one chick was dead, one nearly so (it died 24 hours later) and the third was revived. After being warmed and hand fed, this was put into a nest of newly hatched and hatching normal cockatiels. I was quite astonished at the way it thrived, and duly fledged. The sight of a comparatively huge cockatiel pumping partly digested food into a tiny Bourke's, nearly beheading it and knocking it off the perch in the process, is the most comic I have beheld. Incidentally, I wonder if this is unique? Unfortunately the photographs I took of this have not come out well enough for reproduction, although the prints are quite reasonable.

D. G. MARRIOTT.

* * *

CORRIGENDUM

INDIAN RINGNECKED PARROTS—THE COLOURS OF
VARIANT BIRDS

Dr. Swaenepoel has written to point out that in his article on Indian Ringnecked Parrots (May-June issue, pp. 92-94), he had made a momentary error and written that an albino male might be expected to have a red and black collar. He points out that since the blue form lacks the red of the collar, and the lutino lacks the black, he would, of course, expect the albino to show no collar at all.

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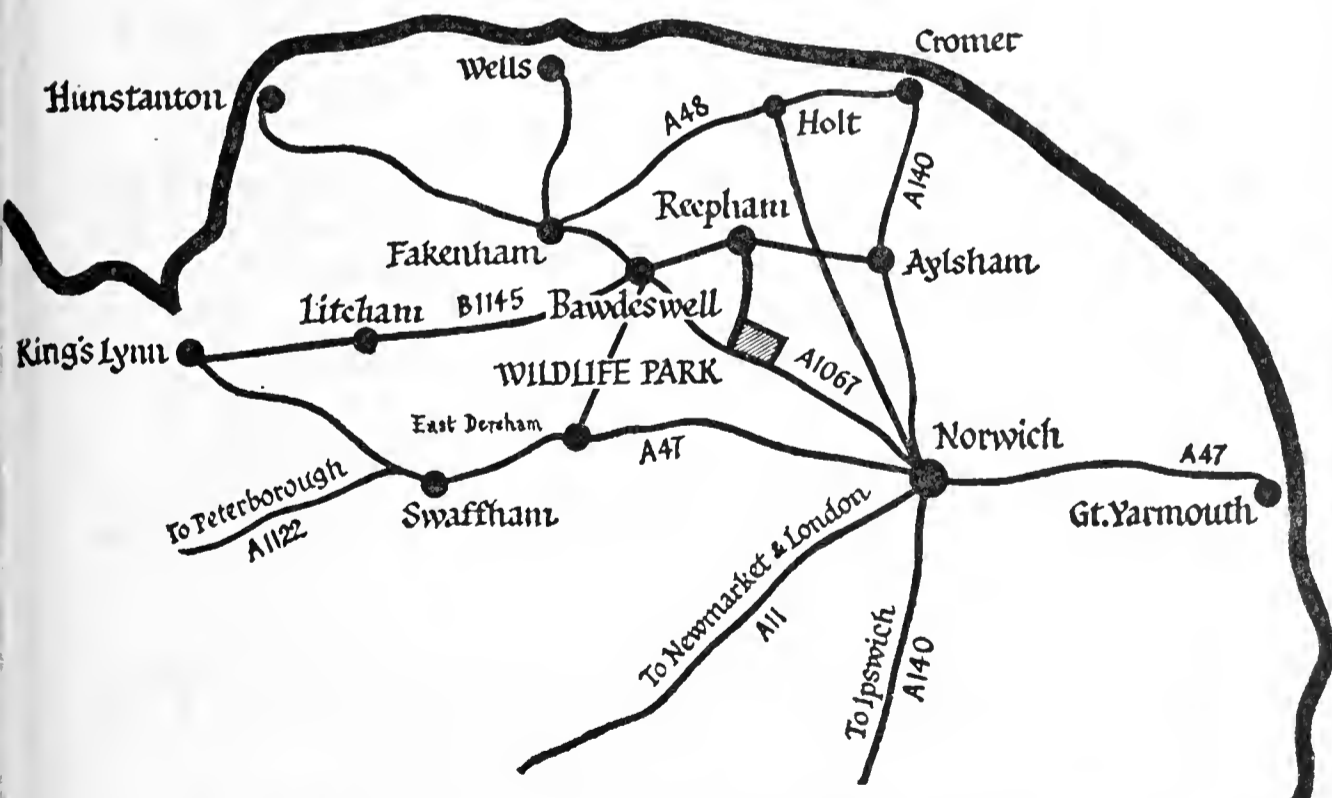
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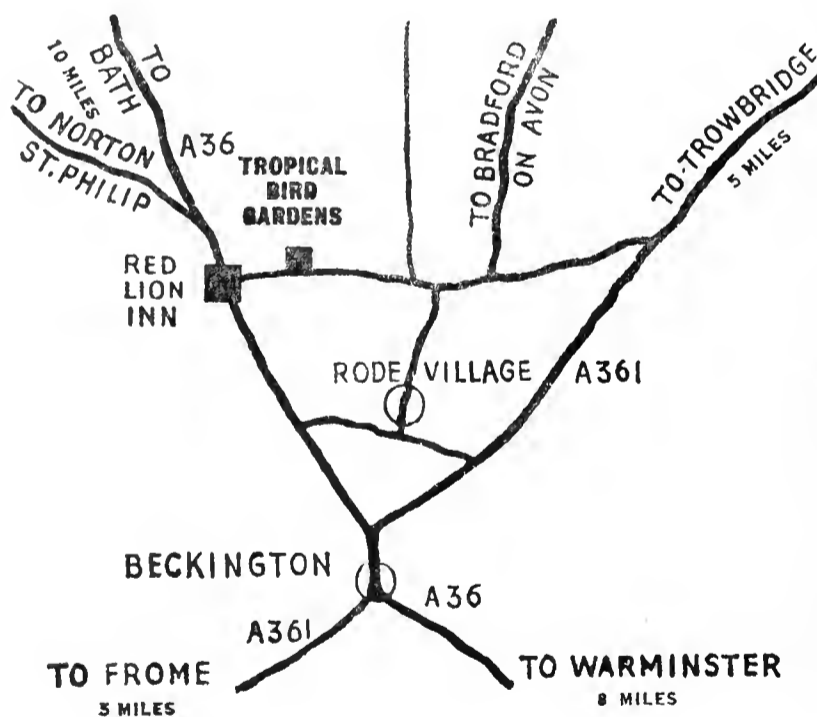
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NEW MEMBERS

The twenty Candidates for Membership in the July-August 1970, number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

CORRECTED NAME

For THOMAS L. WILKINSON, read THOMAS L. WILKERSON.

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P. H. HASTINGS, to "Woodville", Little Hyden Lane, Clanfield, Nr. Petersfield, Hants.

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CLIVE G. ROOTS, to Assiniboine Park Zoo, Winnipeg 20, Manitoba, Canada.

MANFRED F. SCHWEIGER, to 7501 Reichenbach über Karlsruhe, Tulpenstrasse 8,
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DANIEL P. SHEARING, to 34 Sydenham Avenue, Liverpool, 17.

KENNETH EDWIN LAWRENCE SIMMONS, to Dept. Psychology, The University,
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MISS GILLIAN WATSON, to Le Nier Cheva, Les Platons, Trinity, Jersey, Channel
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THOMAS LEE WILKERSON, to Route 1, Box 68, Riley, Kansas 66531, U.S.A.

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Seewiesen, West Germany. Proposed by Dr. J. Nicolai.

ANTHONY J. AYER, Richards & Ayer, P.O. Box 754, 12 Strand Street, Frederiksted,
St. Croix, Virgin Islands 00840, U.S.A. Proposed by John W. Livermore.

C. J. BERTS, Cherry Orchard, Wyre Forest, Nr. Kidderminster, Worcs. Proposed
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THE AVICULTURAL SOCIETY

Founded 1894

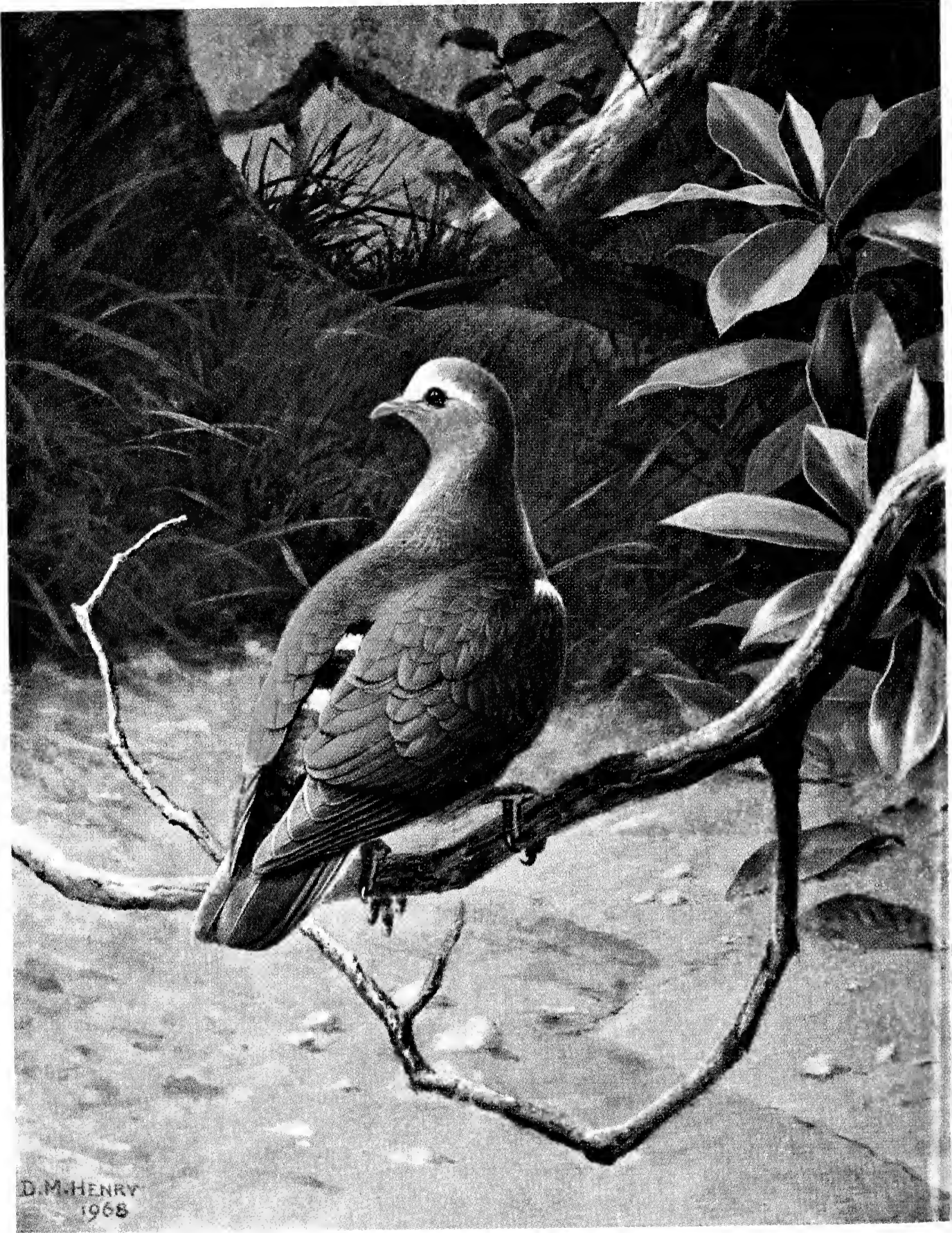
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BRONZE-WINGED DOVE

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NOVEMBER-DECEMBER 1970

“MR. BARNES-WINGDOVE”

AN OBITUARY

By D. M. REID-HENRY (Woodford Green, Essex, England)

When I was very small, about three years old I think, I found myself spending a holiday on a tea-estate known as “Woodside” in the hills of Ceylon. The planter was my grandfather, and a large percentage of his largish family were, if I remember well, also there. Certainly there were three aunts present and an uncle or two in addition to my own parents.

Life was very good in the eyes of a small boy and I particularly appreciated the attentions of the youngest of my aunts because she was clever at making birds' nests out of plasticine with eggs to go in them and a separate mother-bird to sit on top. She was also good at chasing butterflies for me to examine and admire, and was not repelled by frogs.

However, one day a new interest came into the adult conversation which was led by my father, and it concerned the fact that a gentleman by the name of Barnes-Wingdove was in the neighbourhood, and that my father had in fact seen him. Apparently he was a very splendid person, and altogether of great interest. Secretly I wanted to see him, but dared to confide this desire only to my favoured aunt. Time, of course, has removed all the details of how the meeting was to be arranged, but everyone decided upon an evening walk with that end in view. I remember the walk not so much on account of Mr. Barnes-Wingdove, but because in that part of the island the jungle harboured a plentiful leech population, and I was initiated into the ready methods of getting rid of them when they had collected for a feast upon my person. (Happily I was unaware of the presence of these parasites until after the party returned home and I was being prepared for the tub!)

During the walk, quite suddenly I heard someone say in a hoarse whisper, “There he is! Quick!! There!, Going through the trees!” My aunt had grabbed my arm and was urgently pointing into the gloomy forest nave. “There; did you see him?” Alas, I had not; and I wondered about the strange ability of adults to see someone “there” when he was obviously *not* there!

Fortunately for children, disappointments can be short-lived and I soon ceased to worry about Mr. Barnes-Wingdove because a troop of

Grey Wanderoo monkeys paid us a visit; and there were plenty of dancing dragon-flies over the hill stream to interest me. A large blue-black Carpenter-bee had a nest in one of the verandah beams and I daily was able to watch her come and go. My brother had found an elegant web-spider who had netted the passage between the trellis on the wall and a hibiscus bush, and she was busy executing capital punishment on insect trespassers who essayed to pass on their varying occupations. Once the Carpenter-bee was indiscreet enough to get herself tied up in the spider's web, and I well remember her annoyance. The change in her drone from a dignified bass to the strident "eeeeee . . . e . . . z" of extreme petulance, was enough to frighten me!—and the spider too was hesitant when she came out from her rest-room beneath a hibiscus leaf to investigate her victim. She decided not to press her toll-charge and retired, no doubt complaining to herself, about vandalism and asking herself "who is to repair the depredations?" This question was purely rhetorical, because as a matter of course she consumed her web every night and spun a new one by breakfast time! The bee disentangled herself and flew away to get rid of the sticky strands and clean up.

So Mr. Barnes-Wingdove passed out of my interest for two years, but he was never forgotten. His death came somewhat suddenly when I discovered that he had an alias which quite altered my imagined impression of him. For some time previous to my better understanding I had entertained misgivings about his character because in answer to my questions about him I had been told that he had green wings, a scarlet beak and flew very fast! This information I had filed away in my mind labelled, "for future comprehension", because I was not brought up to doubt the words of my seniors, and to solicit too much information was not in my make-up.

But one day I was bothering the taxidermist at the Colombo Museum whilst he was in the process of setting up a specimen of a very attractive bird. I was told in answer to my query that the bird was a Bronze-winged Dove!! The penny dropped at last and the ghost that had hovered periodically over my head for what had seemed a long time was exorcised and finally laid. The mysterious and puzzling gentleman was dead; and with him I buried the childish notion that people say what they mean and say it clearly to be understood aright. Another lesson—that small boys should not eavesdrop on adult conversation—I only learned when myself became adult!

Chalcophaps indica, or Bronze-winged Dove, is perhaps better known to aviculturists as the Emerald Dove. I will not enlarge on the suitability of this English name because a whole essay could be written about the patent absurdity of many vernacular names given to birds and animals. It is in this case enough to identify the species which is a well-known bird anyway, although not as commonly kept as many other, less attractive subjects.

I will not bore the reader with a description because I hope and trust the accompanying colour plate will serve adequately to convey a fair idea of the cock bird's appearance. The hen is duller, and lacks most of the grey and white top to her head, but it must be pointed out to those who do not know this dove, that the green of the wings and back is all metallic, and in a different light it can appear just like burnished bronze. Hence the name. It bears no resemblance to an emerald whatever.

In its jungle home, this bird is rather to be heard more than seen, but it has the habit of alighting on jungle tracks and cart roads to pick about for scraps of food. As one walks down such a path a pair of these doves may be flushed when they are engaged upon the elevating job of examining buffalo or other manure for any edible matter. They will fly further along and alight again not very far away, but if persistently disturbed they make off into the forest with rapid flight whither it is useless to try and follow.

They are not rare birds and are not very particular about altitude up to about 8,000 ft. but they are not to be found in very dry places or where the forest is too thin, for they seem to have a distinct preference for cover.

The only one I ever possessed myself I bought from a Calcutta dealer out of humanitarian motive. The bird was very timid and wild and would not settle down in my mixed aviary at all, so I sent him with a friend who was going up to the Burma front to be released *en route*.

Wild doves in sudden confinement are not an edifying sight: they batter themselves in distressing fashion and are better off released unless one has the time to devote to taming. But this dove can do very well in a suitable enclosure and they have been successfully bred on quite a number of occasions. A friend of mine in Ceylon regularly kept pairs in an aviary with suitable companions. He fed them all on a mixed diet of bird-seeds, berries and a daily dish of succulent termites. A small natural stream ran through the enclosure and all things were ideally arranged with the least trouble and inconvenience to the owner. In English conditions matters are not quite so simple; but a few of the Society's members have succeeded well in their treatment of Bronze-winged Doves and it is to be hoped that a good strain of aviary-bred birds will be established. However, I would hate to see them "improved" by line-breeding and other means which have produced such disasters as "Pouters".

The nest is said to be a more substantial structure than that of most pigeons; but although I spent some time in areas where these doves were not rare, both in India and Ceylon, I was never able to find a nest myself.

All accounts of the Bronze-wing pay some tribute to the bird's very rapid flight, and I can endorse these reports from my knowledge of the bird in the wild. It is however tragic that this attribute of speedy movement is frequently the cause of death. As it flies low generally, and dodges through the trees it often mistakes the wall of a native house for a space and dashes itself to death.

BREEDING THE LEMON-RUMPED TANAGER

(*Ramphocelus icteronotus*)

By MRS. K. M. SCAMELL (Newdigate, Surrey, England)

The Lemon-rumped Tanager is one of the eight species of velvet Tanagers found in South America and Mexico. Its range is Panama, West Colombia, Western Ecuador and N.W. Peru. It is said to interbreed with the Flame-rumped Tanager (*Ramphocelus flammigerus*) on the western slopes of the Andes in Colombia where males with orange rumps and females with the chest tinged orange-scarlet are found.

The adult male Lemon-rumped Tanager is a deep glossy velvety-black with the lower back, rump and upper tail coverts brilliant lemon-yellow. The female is greyish-brown above, tinged olive; the lower back, rump, upper tail coverts and underparts are a lighter lemon yellow and the throat and sides of the head whitish.

We obtained a pair of Lemon-rumped Tanagers in the winter of 1965/6 in exchange for other Tanagers. The previous owner stated that the pair had attempted to breed in a mixed aviary, but were unsuccessful due to the competition for the limited live food supplied. After caging for a while we turned the pair out into a lightly planted aviary measuring 6 ft. × 3 ft. × 6 ft. 3 in. high. This flight led into a small compartment within a birdroom. The compartment measured 2 ft. × 2 ft. × 6 ft. 3 in. high. The birdroom has an electric heater thermostatically controlled to give a minimum temperature of about 40/45°F. On the 26th April 1966 a broken egg was found in the flight. Various half-open nest-boxes had been placed in the flight and also a small nest-basket near the roof of the flight. It was in this basket the hen built a cup of grasses. It was poorly constructed and seemed too small for the bird. Here she laid one egg and incubated it from the 29th April until the 23rd May when it was removed. It was fertile but "dead in shell". She again laid and commenced incubation on the 28th June, one chick was seen on the 15th July but this disappeared the next day. No further breeding attempt was made that year. The hen appeared to be an old bird so that when an opportunity came in September to acquire another but younger pair, we did so. The new cock died that night and the old cock some months later, so we were left with two "hens". However, during the summer of 1967 the new "hen" developed male plumage and on 19th September 1967 we saw the old hen once again building a flimsy nest in her nest-basket. Nothing came of the breeding attempt.

On 22nd April 1968 the old hen started carrying grasses to the basket she had used before. This continued until 12th May when a soft shelled egg was found in the shelter. Nest building continued and on the 22nd May when she was in the shelter feeding, I checked the nest to find one

egg only. It was light blue with black flecks at the large end. Incubation continued until 4th June when she abandoned the nest. The one egg was found to have a hole in it. A search in the flight revealed some eggshells so it looked as if three eggs had been laid in total. I replaced the small basket with a slightly larger one, but she did not take to it and no further breeding attempts were made in 1968. In 1969 no breeding was attempted even though the new basket was replaced by the original one.

Both birds came through the following winter very well, outside in all weathers except frosts, so about the middle of April 1970 when both birds were in breeding condition they were moved to another and much larger aviary. The flight measured 15 ft. × 3 ft. × 6 ft. high and also led into a compartment within a birdroom. The compartment measures 4 ft. × 3 ft. × 6 ft. high. The adjacent aviary houses a pair of Rothchild's Mynahs. This time three nest-baskets were placed about 5 ft. 3 in. high on the north wall of the shelter, and no baskets were placed in the flight. By the 8th May the floor of the shelter was littered with nesting material (hay and twigs) which had fallen from two of the baskets, her old original one and the slightly larger one which she had ignored the previous two years. The third basket was larger still but she showed no interest in it. Finally she chose the smallest basket and by the evening of the 21st May the nest was complete but this time the nesting material was higher and the cup much deeper than ever before; one egg had been laid that day and a second one was laid on the 23rd May and she was seen to be incubating. We did not see the male bird take any part in the nesting activities but the pair are very nervous, so much so that the door of the birdroom had to be kept closed. Once it was opened the hen came off the nest. However, on 1st and 2nd June she stayed on her nest whilst the food pot was being changed. Two chicks hatched on the 3rd June, 14 days after the first egg was laid. The weather was very hot and the temperature in the birdroom was in the 80°sF during this part of June. The next two weeks were uneventful, the chicks feathered up and large quantities of mealworms and maggots were supplied together with the normal diced fruit mixed with insectivorous food. The heads of both young birds could be seen above the nest on the 14th June and at 6.45 a.m. next morning one bird had left the nest and was on the floor and the other was perched on the edge of the nest. They were quite small compared with their parents and coloured like the hen but paler. The compartment slide was shut with the parents inside and we thus made sure that no bird could get into the flight. We just could not risk the young birds getting drowned in the first thunderstorm. This so often happens with aviary bred birds during the first few days out of the nest. The second young bird finally left the nest 3½ hours later. The weather was much cooler, around 60°F in the daytime with the night temperature down to 48°F but we were back to 80°F by the 18th June. The smaller of the two young birds which measured about 3 in. in length, was perching well

but the larger was always on the floor or on a log which had been placed there. A closer look from a few feet away showed one leg dangling as if broken. Whenever one approached the compartment both parents uttered loud warning calls but the young birds themselves were very placid. The adult birds seem to have no song at any time, only a loud chirping when alarmed.

By the 22nd June the smaller of the two birds was making short flights and perching high up and two days later the one with the broken leg had followed, so we opened the slide and let all four birds enter the flight at will, but shut them inside at night. By the 29th June it was difficult to tell at a glance the young birds from their mother—they were so alike in colouration and size. The next day the hen was seen to repair her nest and spar with one of the young birds so we felt the time had come to separate them from their parents. We caught them up and caged them well away from their aviary. It was some hours before droppings showed they were feeding themselves but at dusk both birds were at the feeding pot. The fractured leg of the first bird out of the nest seemed to have healed but it had been a bad break just above the joint and the bird had difficulty in perching. On the 21st July we took it to a local veterinary surgeon who successfully amputated the leg above the break. The bird was soon perching and feeding well and seemed to have made a complete recovery. However, on 16th August when in an aviary and after a heavy rainstorm, it was found wet through on the grass and unable to fly. It was picked up and placed on the floor of its shelter but when we returned within the hour it was dead. It had apparently injured the stump remaining from the amputation and died from loss of blood—a sad ending.

In the meantime the parents had been supplied with more nesting material and the nest was rebuilt by the hen, anyway we never saw the male carrying any nesting material. The first egg of a clutch of two was laid on 6th July and one day later she was incubating with the temperature at 88°F. Two chicks hatched on the 19th July—again on the 14th day since the first egg was laid. Both young birds left the nest on the 1st August, the 14th day since they were hatched. This time no legs were broken. I measured them next day, just 3 in. from the tip of the beak to their $\frac{1}{4}$ in. long tails! The parents measure approximately 8 in. Again the parents were shut in the compartment and successfully reared the two birds until we separated them on the 20th August, 20 days after leaving the nest. They could feed themselves and after a few days in a cage we put them in an aviary with the one survivor of the first clutch. Very little live food is taken and this makes me wonder how much live food was fed by the parents who are very insectivorous, particularly when they are offered mealworms. However, on reflection I can recall occasions during the nestling stage when a whole pot of mealworms and gentles would be consumed in a few hours and as gentles have never been

particularly relished by the adult birds, I am sure these have been fed to the youngsters. The three young birds are almost indistinguishable from each other (1st September 1970) either in colouring or in size, being almost fully grown. There are patches of lemon amongst the whitish underparts, but we can see no sexual differences. The parents show no signs of nesting again though as yet they have not commenced to moult.

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As described above, Mrs. K. M. Scamell has bred the Lemon-rumped Tanager (*Ramphocelus icteronotus*). It is believed this may be a first success.

Any member knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

BEHAVIOUR NOTES ON THE BARRED AND ANDALUSIAN HEMIPODES

(*Turnix suscitator* and *Turnix sylvatica*)

By JEFFREY TROLLOPE (Hounslow, Middlesex, England)

INTRODUCTION

The reproductive behaviour of the genus *Turnix* is accepted as being polyandrous. Ali (1964) writes of the larger and more brightly-coloured hens of *T. suscitator* fighting rival females for possession of a cock, laying a clutch of eggs and leaving the cock to incubate and rear the chicks after hatching. Whistler (1963) selects *T. sylvatica* as representative of the genus with the same reproductive behaviour.

Sutter (1964) in an article on the genus, states that, although the cock incubates and rears the chicks, the hen may occasionally assist during a few days after hatching. He suggests that there is evidence from field observations that the hen lays several sets of eggs to be attended by different cocks.

This paper is based on two seasons observations on captive *T. suscitator* the Barred Hemipode or Bustard Quail. Some preliminary notes have also been made on *T. sylvatica*, the Andalusian Hemipode, also known as the Little Buttonquail or Striped Buttonquail. From the examination of skins, it would appear that the birds are of the sub-species *T. suscitator taigoor* and *T. sylvatica dussumier*.

BIRDS OBSERVED AND METHODS

The information on *T. suscitator* consisted of notes on three adults and four broods of chicks, some of which were watched at the adult stage. All observations were made from a shed which acted as an efficient "hide". The birds were housed in a planted aviary 12 ft. × 8 ft. × 8 ft.

The notes on *T. sylvatica* were limited, as these birds did not breed, although eggs were laid at random. Two pairs were observed for one season, one pair housed in the aviary mentioned above, the other in a smaller planted aviary 7 ft. × 5 ft. × 6 ft. The shed acting as a hide for the birds in the large aviary only. Their behaviour was recorded during observation and later, transcribed into a log-book.

BEHAVIOUR AND REPRODUCTION

As previously described in Trollope (1967), when *T. suscitator* were first bred, I removed the hen when the chicks were seven days old, as the hen showed no signs of interacting with the chicks or cock. The pair bond had been strong between the adult birds until the chicks hatched. After the chicks were fully grown and removed from the cock, I replaced hen "A" with hen "B". As stated I was perhaps too hasty in removing the original hen, but the literature available indicated the possibility of the dominant hen causing trouble.

On breeding *Turnix tanki*, the Yellow-legged Buttonquail, Seth-Smith (1903) observed that the hen did not help with the rearing of the chicks. However, he separated the hen, as she was eating the food meant for the chicks. The date of separation was not given, but one chick died at three days, presumably after removal of the hen.

In his paper on *Turnix varia*, the "Painted Quail" (1905) the hen was also removed after the chicks hatched, no date was given. However, it is interesting to note that courtship feeding, or "tit-biting" was observed, the hen feeding the cock, or rather offering food, as I have noted with *T. suscitator*.

As shown in the table after the first brood was reared, with the three succeeding broods, the hen was left with the cock and chicks.

Contrary to my impressions, gained from the brief time that the hen was left with the first brood, and limited reference to the literature, the hen fed the chicks and retained a strong pair bond with the cock. At night they would roost together in the clumped position, the chicks covered by cock and hen up to the age of about 14 days. From this age a lateral-to-lateral clumping position was usually adopted, but sometimes the hen would still try to cover one or two chicks, the cock struggling to cover the remaining chick or chicks.

During daylight, the hen would feed all the chicks, but as they grew older a pattern of the hen "adopting" one or two chicks seemed to develop.

SYNOPSIS OF REPRODUCTION, *Turnix suscitator*

Brood No.	*Hen	Number of Eggs and Date Laid	No. Hatched and Date	Hen Removed and Date	Chicks Reared and Date Removed	Hen Seen to Feed Chicks	Hen Brooding Chicks
1	A	4 10th-13th June, 1967	3 26th June	† 2nd July	2 27th July	—	—
2	B	4 31st Aug.-3rd Sept., 1967	2 17th Sept.	—	2 29th Oct.	+	+
3	B	3† 23rd-25th June, 1968	3 7th July	—	3 10th Aug.	+	+
4	B	4† 12th-15th Aug., 1968	4 28th Aug.	—	4 19th Oct.	+	+

* Same cock was used for each brood.

† Clutches laid before and after successful breeding.

The whole family would dust-bathe and sun-bathe together, allo-preening occurred between the adult pair, both adults preening the chicks. Dharmakumarsinji (1945) reports that the hen fed the young and clumped with the chicks and cock in captivity. He also saw hen, cock and young together in the wild. The birds concerned were *Turnix suscitator taigoor*.

INTRODUCTION OF HEN TO TWO COCKS (*T. suscitator*)

Although the value of an attempt to establish a "polyandrous group" in a small aviary 12 ft. × 8 ft. × 8 ft. was in doubt, I thought the observations might prove interesting. Two cocks were therefore released into the aviary on the 25th June, 1968. During the day they showed a good deal of social interaction clumping together and allo-preening. The next day hen "B" was released, she followed each cock alternately, with the normal locomotion, a rapid "pigeon-like" walk; she would break into a run, chasing a cock with her dorsal and lateral feathers erect. She pecked at their tails, sometimes holding the tail in her bill and pulling the cock up short. When he pulled free the chase would be resumed.

During the chasing the pursued cock would give a sharp "tuk-tuk" but the hen was silent. That evening, the hen roosted in the clumped position with one cock, the other cock roosting on the other side of the aviary. The cocks were fighting the following morning and although no damage was visible, I removed the cock that she had roosted with the previous evening.

INTRODUCTION OF A SECOND COCK (*T. sylvatica*)

With this species, I decided to try to introduce a cock in the same aviary as an established pair. The pair concerned were released in the aviary mentioned above on 31st March 1969 and a second cock was released on the 31st May 1969. He was immediately attacked by the hen, who rushed at him, giving jabs at his head and nape. He laid flat on the ground, the posture like that of the alarm crouch described by Harrison (1965) for *Excalfactoria chinensis*. This posture apparently acted as an efficient "cut-off" or inhibitor for aggression, as the hen walked away. The cock laid perfectly still for about one minute but when he began to walk he was attacked by the mated cock, and again by the hen. Both these attacks had the same pattern as the first, a rush, followed by jabs at the head and nape. I then removed the introduced cock to prevent injury.

VOICE

Turnix suscitator

The major vocalization for this species (or perhaps the most significant vocal signal) is the "purring" call, written as "Krrrrrrrrr" by Henry (1955). Both adult hens observed would give this call at frequent intervals. When walking they would suddenly freeze in an upright

posture, stretch the neck, then slowly lower the head, the bill nearly touching the ground, and as the head is lowered the "purring" call is given. Ali (1964) gives the function of this call as a challenge to other hens and to announce herself to a cock.

During the first breeding hen "A" developed a pendulous swelling from the throat, which I thought might be due to the inflatable bulb of the oesophagus and tracheal enlargement mentioned by Sutter (1964). However, this swelling proved to be an enlargement of the crop.

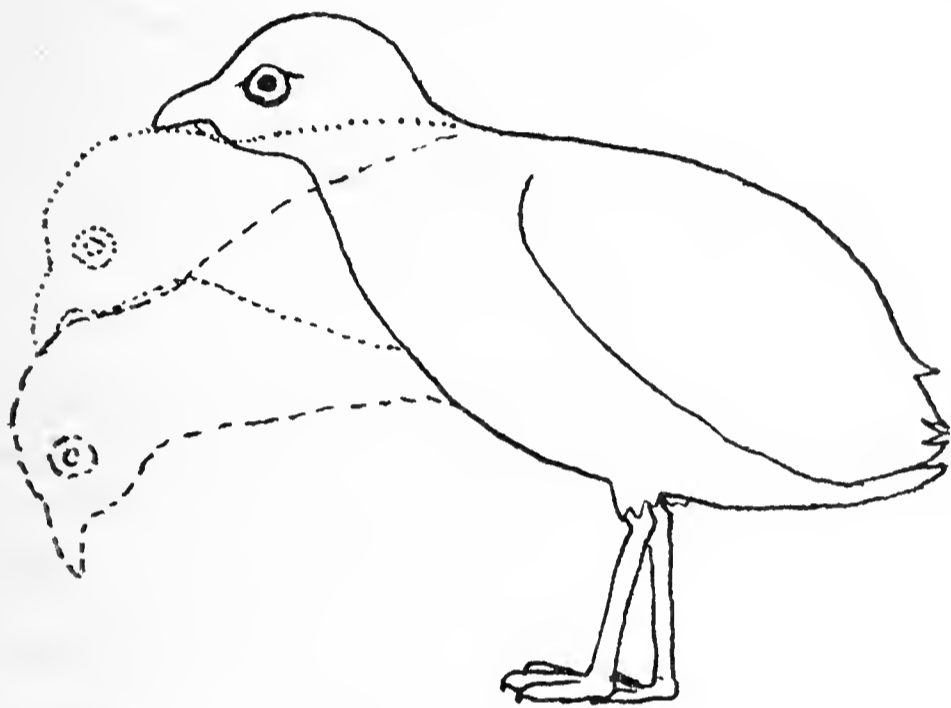


FIG. 1. Posture and Movement—"Purring" Call.
Turnix suscitator

A harsh "chook-chook" was given by the cocks during fighting, or when I entered the aviary after the chicks had hatched. The cock would always threaten and rush in my direction, sometimes pecking at my feet. Other vocalizations for *T. suscitator* are given in Trollope (1967).

Turnix sylvatica

With this species, the "major" vocal signal is a deep "hoo-hoo-hoo-hoo-hoo" given only by the hen. The posture is also different from that of *T. suscitator*, it would appear that the call is given when the hen is still, the posture upright, the neck stretched and arched, the throat moving and swelling with each note, the bill pointing towards the ground, but neck and head are not lowered as with *T. suscitator*.

The function of this call is said to attract the cock (Whistler, 1963). With the two pairs of *T. sylvatica* I watched, the hen would give this call facing the direction of the cock's position in the aviary. The cock would answer with a sharp "tuc-tuc-tuc", walk rapidly towards the hen, and a lateral-lateral clumping position would be adopted, and often allopreening would take place. The hens would also respond to the cock's call with the "hoo-hoo" note, the cocks walking towards the hens.

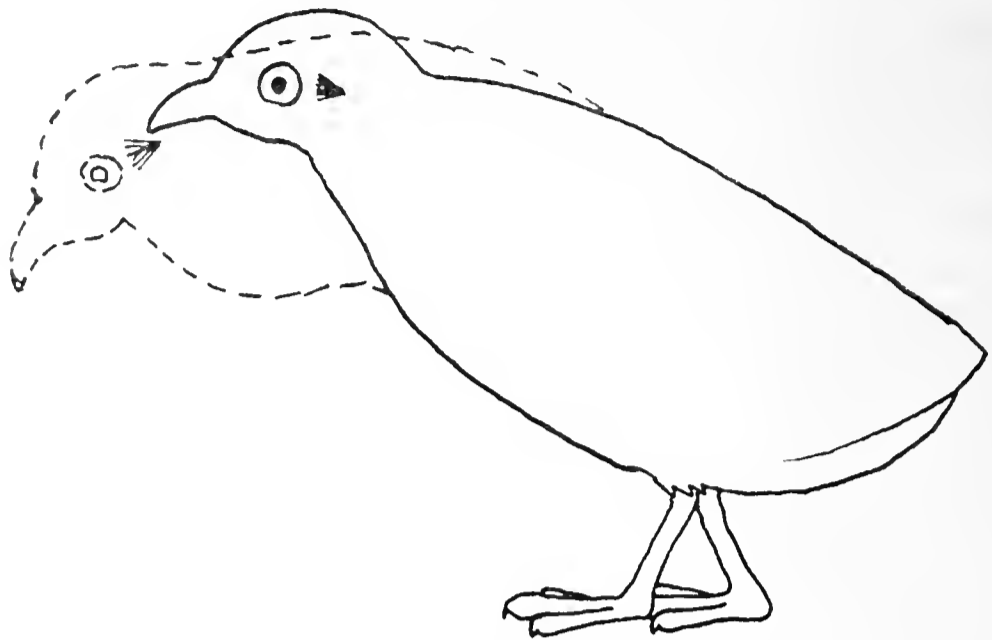


FIG. 2. Posture and Movement—"Booming" Call.
Turnix sylvatica

Although in adjoining aviaries when a hen gave a call, this was not taken up by the neighbouring hen, or at least only after such a time lag that would suggest there was no "challenge" response. Other calls are a kestrel-like high-pitched "kee-kee-kee-kee" given only by the cocks, the situations in which this call has occurred suggesting it is an alarm note. A low-pitched "cree-cree-cree" is given by both birds when in cover and often in the lateral-lateral clumped position.

To summarize these notes on vocalizations, the most obvious point is the great difference between the "purring note" of the hen *T. suscitator* and the "booming" note of the hen *T. sylvatica*, together with the difference in posture. The hen's call note in *T. tanki* is similar to that of *T. suscitator* (Ali, 1964). It would be interesting to see if they also have the same posture, as sexual dimorphism in the female plumage of *T. suscitator* and *T. tanki*, is more marked than in *T. sylvatica*.

NESTING

T. suscitator

Nests are usually a fairly well-made cup of whatever material was available. Bits of dead weed, dried grass, green stems, dead *convolvulus*, fine twigs, green and dead bits of irises and pine needles were all used at times. On two occasions a canopy of stems were pulled out from a weed pile, almost obscuring the sitting cock.

Both sexes took part in nest-building which was rapidly completed. Material was pulled to the site with sharp jerks over the "shoulder", the partner in the nest pulling stems around with this same sharp jerk. The cock spending more time in the nest than the hen. The pair would also make stem-jerking movements without stems, this always happened when one partner was in the nest pulling with real stems.

EGG-ROLLING BEHAVIOUR

This has been described for *T. suscitator* in Trollope (1967) and has been seen on other occasions, always performed by the hen.

DUST- AND SUN-BATHING

T. suscitator and *T. sylvatica*

Dust-bathing was a "social" affair for both species, a hurried scuffling with the feathers fluffed out, alternate sides of the head and body being rubbed on the ground. Sometimes a back kick with one leg would turn the body round in a "fixed pivot".

Sun-bathing was also social, usually a lateral-lateral clumping position would be adopted, and then one bird would move a few inches away, fully opening both wings simultaneously, so that the dorsal surfaces were exposed to the sun. One-wing exposure was also seen, the bird lying on its side.

DISPLAY OF HEN

Turnix suscitator

Only once has a form of display been observed and this was brief. The hen ran to the cock who was facing her and she then made a few rapid steps to one side, then to the other, whilst the cock squatted. These brief "rushes" were interspersed with the "pivot turn" also seen in dust-bathing.

BODY SWAY

Turnix suscitator

This is a curious movement, the bird will be walking in a "normal" manner, and suddenly stop, with the legs "frozen" in a stride. The body is then swayed forwards and back, about three or four times, then locomotion proceeds.

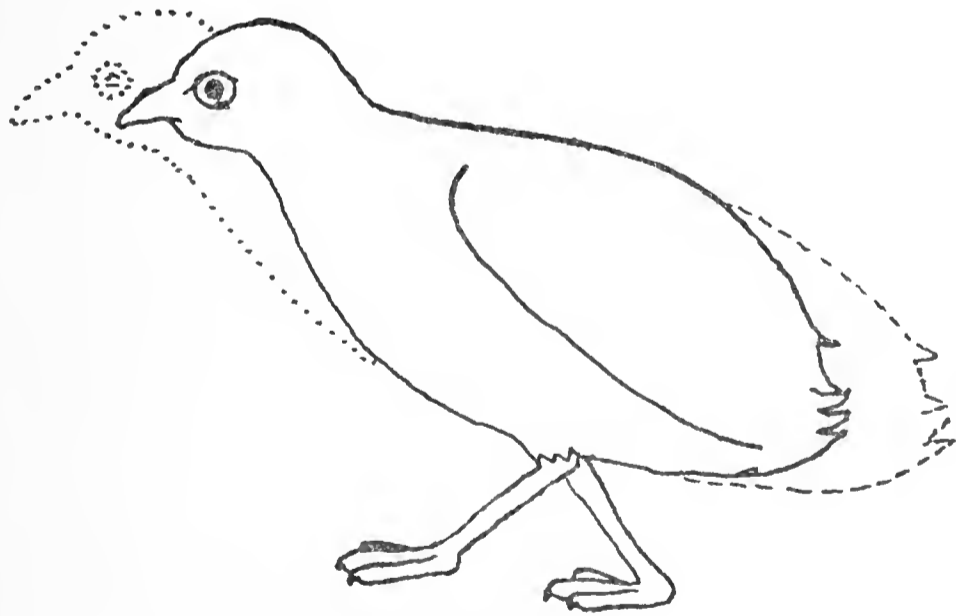


FIG. 3. Body Sway.
Turnix suscitator

I have only seen hens make this movement. Dharmakumarsinji (1945) mentions it and thinks it may be a leaf movement simulation, acting as camouflage for the bird.

DISCUSSION

The difficulties involved in carrying out field studies of birds such as Hemipodes must be formidable. Studies in captivity also have the problems of providing a suitable environment and sufficient space for "natural" reproductive behaviour to occur. However, the fact that three broods of *T. suscitator* were reared with the hen retaining a strong pair bond with the cock, and tending the chicks, suggests that this may happen in the wild.

The habitats of the genus are varied, Sutter (1964) lists arid or marshy grass and brush country, savannas, and more open woodland. Whistler (1963) records the habitat of *T. sylvatica dussumier* as cornfields and stretches of grassy plain; although it can be found in any type of low herbage and open scrub jungle.

T. sylvatica has a range extending from South-Western Europe, Africa and Asia. *T. suscitator* has an extensive range in India and Eastern Asia.

With such varied habitats, it is possible that in some species of *Turnix* the evolution of polyandry is such that the hen will fulfil a further role in the reproductive pattern other than establishing a territory and laying the eggs. This would occur if environmental pressures demand her additional care for the chicks, to ensure their survival in "borderline" conditions. Instead of following the "normal" pattern of a brief association with a number of cocks, which terminates after a clutch of eggs are laid, under "optimum" conditions.

In support of this theory of continued association by the hen with the cock and chicks, we have the observations of Dharmakumarsinhji (1945). It is interesting to note that when I described the first breeding and early removal of the hen, as she had no interaction with the chicks, he was kind enough to show interest, and wrote to me, remarking that the contrast in the behaviour of *T. suscitator* in the wild and as then observed by me in captivity was noteworthy.

SUMMARY

The reproductive behaviour of captive *T. suscitator* is described, also some preliminary observations on the behaviour of captive *T. sylvatica*. The behaviour of *T. suscitator* in captivity suggests the possibility that the female in the wild may help to rear chicks and retain a pair bond with the male.

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* * *

BREEDING THE STONECHAT, 1970 (*Saxicola torquata*)

By J. DOUGHTY (Cannock, Staffordshire, England)

(This data was sent to ASPEBA by a member but in view of its detail was felt to be of interest to a wider range of aviculturists.)

A pair of Stonechats, *Saxicola torquata*, was overwintered in an aviary 24 ft. x 7 ft. and 6 ft. 6 in. high. The birds were fed on maggots and pupae and adult blowflies, and a mixture of Haith's insectile food and hard-boiled egg to which was added Vit-min mineral powder. As spring wore on the diet was supplemented by insects which entered the aviary.

By February the cock began to display to the hen, which at times was decidedly aggressive. The display consisted of sudden dashes at the hen with out-stretched head, open beak, quivering wings and a display of the white secondaries. The hen tended to dodge these onslaughts, but on many occasions she stood her ground, whereupon the cock seemed to dance around her uttering a series of squeaky notes. In all of this courtship display the hen played a passive role, and only responded in a high-spirited manner with jerking tail and flipping wings so typical of the species. In between these ardent displays the cock sang from a high position in the aviary; his song growing stronger as the spring progressed.

On the 10th April a bank was covered with grass clods and depressions in the vegetation were made. Immediately these preparations had been completed the cock entered and inspected at least four potential nesting sites. Before entering he held his wings high in a quivering fashion uttering an "eurring" noise very similar to that of the cock Bullfinch when encouraging the hen to nest. When inside the hollow the cock made a high-pitched warble. The hen often followed him down and entered the sites chosen. It was noticed that in the nesting area the roles were reversed and it was the hen who became dominant; the cock always giving way to her in this area of their territory.

The hen eventually chose one of the sites inspected by the cock, which was at the base of the slope and under a particular heavy clod. She enlarged the chosen position and on the 11th April she began the foundations of the nest; mainly using dead leaves, together with grass bents, both fine and coarse rootlets, hair and other soft fibrous material. She completed the nest on the 15th April.

During the nest-building operations the cock sang from his favourite high perch above the nest; but if the hen stayed in the nest for some time he invariably flew down to investigate. Sometimes he would follow the hen to the nest and seemed to stand watch on a bramble slightly above the nest. It was also noticed that if the hen accidentally dropped a piece of material near to the site the cock removed it to the extremities of the aviary. This tidying up operation on the part of the cock would seem to be a protection measure against enemies, who might use such clues to locate the nest. At times he also encouraged the hen to continue building by flying by her in quick direct flight, carrying a piece of material, usually dead bracken.

Throughout this period the birds showed no fear or resentment at my presence; the hen often picking up nesting material from near my feet. On my inspecting the nest no alarm was shown by either bird.

On the 17th April she began laying, and then on consecutive days until April 22nd when a clutch of six was completed. However, she did not begin incubation, and it was subsequently discovered that a cat had been seen on top of the aviary, which may account for her desertion. Six days later, when it was obvious that she had deserted the eggs, these and the nest were removed.

On the 30th April she began building a second nest, but this time in a depression near the top of the slope and by the 10th May she had completed a clutch of five eggs. She began incubation on laying the fifth egg. The only problem to arise during incubation was that of cats. On noticing a cat, no matter the distance, the cock invariably called the hen off the nest by using a high-pitched "whibbing" note and flying across the nest-site in fast direct flight. On 23rd May, between 2.00 and 6.00 p.m. four eggs hatched and the fifth some time later.

For the first two days the cock fed the hen on the nest, who transferred the food to the young; she at no time for these days took food to the nest, although when she came off to feed the cock would feed the young directly. His favourite food at that time was the newly-emerged greenbottle fly, which being soft and small seemed ideal. He also fed hard-boiled egg to the hen and young, but for the most part rejected the fully developed greenbottle and bluebottle, which he appeared to test for softness before rejecting them. However, it was noticed that if more suitable foods were not available he would then break up a bluebottle and feed the dismembered parts to the young.

On the third day the hen would often leave the nest after receiving

food from the cock, fly around the aviary, kill the offering and often add to it herself and then return to the nest to feed the nestlings. This went on until the eighth day although by now the hen was feeding the young without any encouragement from the cock. The main food taken to the nest from the fourth day consisted of bluebottles, but only those newly emerged which were soft; maggots which they seemed to prefer rolled, which softened their structure; hard-boiled egg, and pieces of grit and cuttlefish bone. Both birds, but more especially the cock, would often take a mixture of these foods to the chicks. By the 6th day large quantities of these foods were being fed and the nestlings were encouraged to gape by the adult birds making a "clucking" sound. They seemed to know when the young birds had had enough, since on making this noise and receiving no response the birds would eat the food themselves. I had found that placing little piles of egg around the aviary and scattering the "rolled" maggots about the aviary encouraged the birds to feed since to find food they had to be more peripatetic and this was more akin to conditions in the wild. However, by the eighth day large quantities of the fully developed bluebottle were being fed, which was fortunate since I had large numbers of these which were only allowed to escape from the tin, one or two at a time, through a small aperture I had made—surprisingly, however, they still refused the fully-grown greenbottle.

On the 14th day the young birds began to stand outside the nest and on the 16th day they left the nest and became dispersed in the vegetation. It was now found there were four cocks and a hen; three of which were large and vigorous, and two small and stunted, which died two days later despite constant attention by both parents. When the birds were twenty-three days old, although still being fed by the adults, they were taken from the aviary, because by that time the hen had completed her third nest and had laid two eggs of the clutch and it was felt that the cock would soon decide his offspring were ready for independence, and his attempts to demonstrate this to the young might have resulted in death or injury to the young in the confines of an aviary. The young birds were placed in a four-foot box-cage and were soon eating the soft food and maggots which I had placed in one container.

By the 19th June the hen had laid her sixth egg (seventeenth in all) and had begun incubation the day before. This third nest had been built within nine inches of a Yellow Wagtail's nest containing five eggs, and this later presented an unlooked-for problem.

Two days before his own young hatched the cock Stonechat had become frustrated by the delay in hatching of his own young, and had transferred his affections to the yellow wagtails, whose large gapes poking out of the vegetation he could not resist. Thus by the time his six young hatched on the 2nd July he was spending all his time feeding the Yellow Wagtails, and it was rather an amusing sight to see both wagtails and a Stonechat feeding the young of the former; the hen Wagtail and Stonechat often

being at the nest at the same time. Because of this strange turn of events it was decided to transfer the young Wagtails (10 days old) and their parents to a cage. Unfortunately in the confines of a cage the adults fought viciously; they had even tended to be quarrelsome in the aviary. The hen bird was removed, since it had been noticed in the aviary that the cock Wagtail was more willing to feed soft food, and thus the cock finished the task of rearing. Five beautiful young Wagtails left the nest bowl on 7th July and began to feed themselves between 10th and 11th July.

Meanwhile the cock Stonechat, now the distraction had been removed, returned to his paternal duties. However, on the 5th July the six young Stonechats died. This may have been due to the cock's earlier confusion but I believe the main reason was due to the absence of soft-bodied flies, which had been available at the time of the successful rearing. This was bad management on my part in not having a "hatch" of flies prepared for this third nest. The Wagtails had been reared basically on the last "hatch" of greenbottles I had prepared.

At the time of writing this report the cock Stonechat is still displaying to the hen and encouraging her to nest. However, I hope that she resists, as I believe she has done more than enough for one year.

* * *

BREEDING THE ALPINE CHOUGH AT THE NORFOLK WILDLIFE PARK

(*Pyrrhocorax g. graculus*)

By PHILIP WAYRE, Director (Great Witchingham, Norfolk, England)

Two pairs of Alpine Chough were purchased from a Continental dealer in 1965. Both pairs were subsequently released in the larger of the two walk-through aviaries in the Park. In the spring of 1968 one pair constructed a substantial nest of sticks on top of a nest-box which had been placed inside a large cavity in an artificial rock-work cliff. Unfortunately the eggs were stolen by some Azure-winged Magpies *Cyanopica cyanus cooki* (Bonaparte) kept in the same aviary. Early in 1969 the Magpies were removed and the two pairs of Choughs divided—one pair remaining in the walk-through aviary and one pair being removed to a large planted pheasant pen measuring 54 ft. in length and 27 ft. in width. This pen has a wooden hut in it measuring 9 ft. × 6 ft. in floor area, and the Choughs could enter it through a small hole at the top giving access to an inside ledge. An open nest-box 12 in. square was placed in one corner of the hut 6 ft. above the ground. The birds nested in the box and hatched five chicks, one of which died after 14 days. The other four

chicks were removed and an attempt was made to hand-rear them, but this failed. The pair remaining in the walk-through aviary did not attempt to breed in 1969.

This year (1970) the pair in the pheasant aviary again built a nest of twigs in the open nest-box and on 15th April it contained four eggs which hatched on 1st May. Three young Choughs fledged on 23rd May, but a month later one of them succumbed to gapes. The remaining two are, at the time of writing (August), quite independent and their bills have changed from dull greyish-brown to bright yellow. Their legs are also beginning to acquire the reddish colour of the adult.

It was noticed that the parent birds became extremely selective in their feeding when rearing young, and would take virtually nothing but mealworms. These were fed *ad lib.* and at one stage were being consumed at the rate of nearly half a pound daily. A high protein supplement in the form of Casilan (Glaxo) was sprinkled over the mealworms every day. The pair in the walk-through aviary nested twice during the spring of 1970; on the first occasion the eggs appeared to be infertile, but the birds laid again and had four eggs on 15th June from which three young hatched on 29th June. Two of the young died, possibly because the adults were constantly disturbed by people passing through the aviary. One young survived to fledge and has since become independent despite the fact that it has one deformed toe.

As described above, the Alpine Chough, *Pyrrhocorax g. graculus*, has been bred at the Norfolk Wildlife Park. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

BREEDING THE GREY TOURACO AT THE JERSEY ZOOLOGICAL PARK

(*Corythainoides concolor concolor*)

By GRENVILLE ROLES (Deputy Curator of Birds)

Alternatively known as "Go-Away Birds", Grey Touracos inhabit the dry thornbush country of Angola, stretching eastwards to Tanzania and south to Cape Province. The birds in our collection came from the vicinity of Luanda in Angola, being presented to the Zoo in May 1967.

Large grey birds with delicate hair-like crests, black bill and legs, our Touracos are fed upon a mixed diet of all available fruits, offered chopped and whole, and our basic bread, milk, multivitamin mixture together with minced boiled egg, minced meat and meal worms. Fresh green branches of Hawthorn are always available and the birds quickly strip these of young leaves and buds. *Convolvulus* and *Hebe* (*Scrophulariaceae*) foliage are also readily taken.

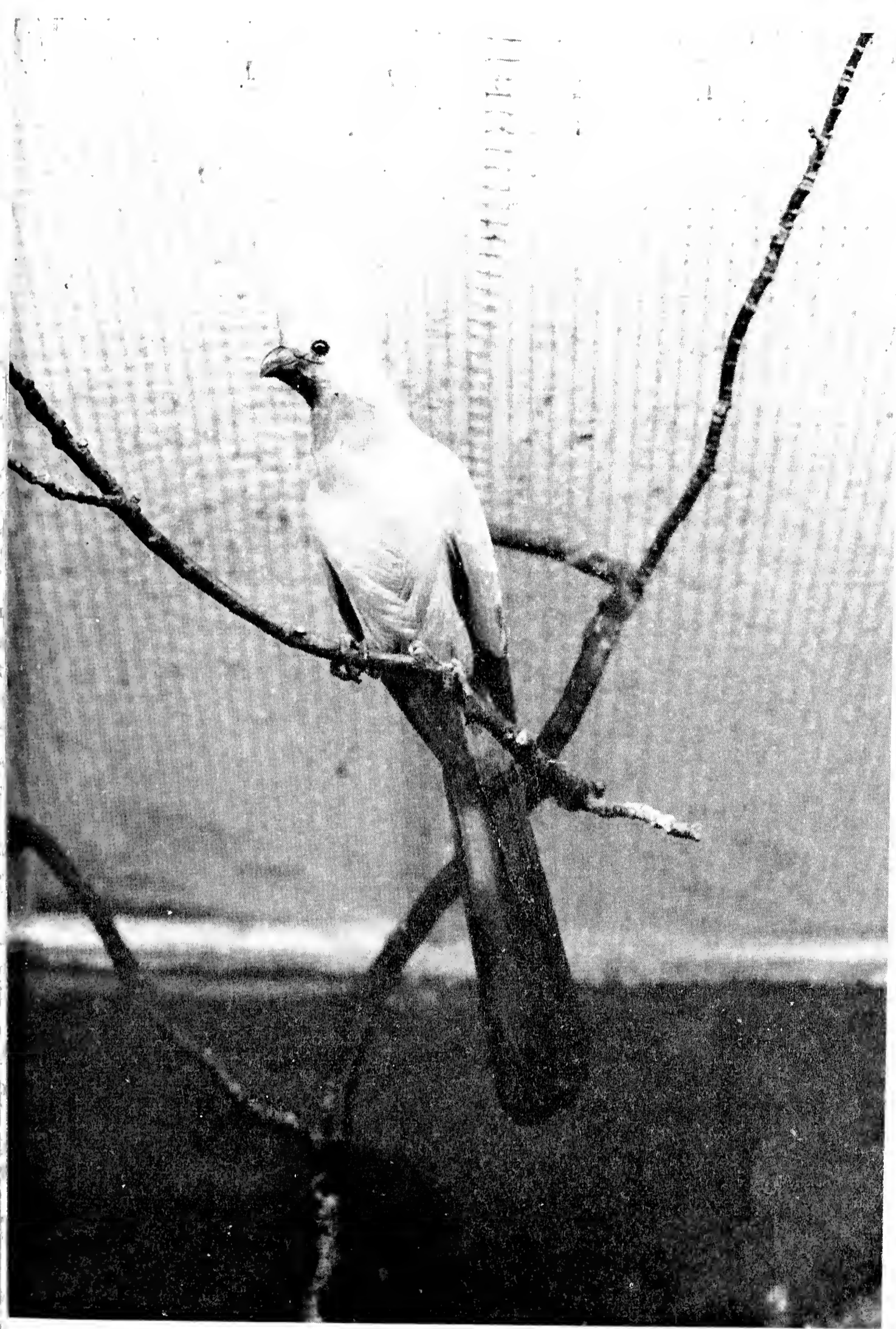
The first signs of courtship activity took place in August 1969 after the birds had been moved from their flight in the Tropical Bird House to a very large outside aviary. Two pairs of birds were seen feeding each other at this time and twigs were carried, though it seems with no definite purpose. By the 9th August one of the pairs had become very aggressive, chasing the other birds continuously. The chased birds were quickly removed but beyond further twig-carrying no other breeding behaviour was observed.

In the autumn all the birds were reunited in the Birdroom without any aggression being shown. All were ringed at this time with differently coloured celluloid rings.

On the 29th March this year one of the birds was seen tugging at small twigs which had been left attached to their perches. A large quantity of fine (thornless) Hawthorn and Oak twigs were scattered about over the flight floor and a close watch maintained. Very quickly the female (as it turned out to be) flew down to investigate and selected a Hawthorn twig, which she carried up to a wire nesting platform about 7 ft. high, resting upon the fork of a branch, and almost entirely hidden from view by a conifer branch. The nest which she and her mate proceeded to build was made entirely out of Hawthorn twigs, the Oak and various other bits and pieces lying about were completely ignored.

The pair again became aggressive and started to chase the other Touracos, which necessitated the latter's removal from the aviary.

At 11.30 on the 9th April mating was observed for the first time and again on the 18th and 28th April. Though the brooding pattern was started on the 27th April, the female usually brooding overnight, with



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Grey Touraco (*Corythaixoides concolor concolor*)
Parent Bird, 1970

[J. J. C. Mallinson



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Grey Touraco, 13 days old. Born 31 May, 1970

[J. J. C. Mallinson

very irregular "change-overs" in the day. The first egg was not laid until the 1st May, the second and third following on alternate days.

A changeover ritual was frequently observed during the incubation period of 28 days. The non-brooding bird on approaching the nest, would shake its head vigorously, the brooding bird responding immediately by shaking its head briefly and leaving the nest. Feeding of the brooding bird by its mate sometimes took place at this time, the visitor quickly taking the place of its mate upon the nest.

On the 29th May two chicks were observed in the nest, the third egg hatching two days later on 31st May. The last chick was removed from the nest and examined. Its pink flesh was well covered with charcoal grey down, the bill pink with a dark grey tip and the legs were greyish-pink with grey feet. The inside of the mouth was bright pink, eyes were opaque blue-grey with a white egg tooth and tiny white claws on the alula were also seen. The chicks weight was $14\frac{1}{2}$ gms., its overall length 3 in.

For the first few days it appeared that the only food given to the young was regurgitated greenfood, but when the smallest chick was 10 days old, it was again removed and re-examined at which time it regurgitated three large pellets (2 in. long weighing 4-6 gms.), which upon examination revealed that the birds were being fed on greenfood, boiled egg and raisins. At this time the chick weighed 71 gms. (before regurgitating the pellets), had a tail about 1 in. long and was pretty well covered by sprouting pin feathers.

At eighteen days old regurgitated banana was being fed to the young and at 21 days old they left the nest (19th June) though they had been climbing around the branches next to it for four days.

On 3rd July the chicks were seen eating Hawthorn leaves and two days later were seen pecking at a whole (skinned) orange.

On 17th July the chicks were seen eating from the feed dishes and were then considered to be self-supporting; though they continued to beg food from their parents until 27th July when they were moved to another aviary.

At the time of writing the adults are again incubating a clutch of three, the first egg being laid two days after the young were removed, 29th July.

As described above the Grey Touraco (*Corythaixoides concolor concolor*) has been bred at the Jersey Zoological Park. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

BREEDING THE DOUBLE YELLOW-HEADED AMAZON

(*Amazona ochrocephala oratrix*)

By CLIFFORD SMITH (Denholme, Nr. Bradford, Yorkshire, England)

These two birds were purchased in 1966, newly imported and obviously young birds as they had only a small amount of yellow on the front of the head. Each year the amount of yellow on the head has increased so that by 1970 the whole of the head and nape is completely yellow and they are very handsome birds, the most colourful of the Amazons, in my opinion. There is no difference in the colouring of the male and female, each having red and yellow feathers on the wing butts. The difference in head size has become more pronounced over the years and there is now no difficulty in recognizing the cock by his broader beak and wider and flatter head.

As it was summer when these birds arrived they were kept in the birdroom for about a fortnight and then released into a 12 ft. long × 6 ft. wide × 7 ft. high flight with a 6 ft. × 4 ft. shelter in the birdroom.

For the first winter they were encouraged to sleep in the shelter but after that they preferred to roost outside, only using the shelter for feeding and the afternoon siesta.

The flight is wooden framed and wired with 1 in. × 1 in. × 16 gauge Twilweld but they have made no attempt to chew the woodwork or the wire.

They are no more noisy than the Yellow Fronts and the Blue Fronts, their outbursts being confined to probably 15 minutes morning and evening.

The nest-box was introduced in 1969 and as a grandfather clock nest box had proved successful with the Yellow Fronted Amazons in 1967 (AVICULTURAL MAGAZINE, November 1969), a similar type box seemed to be the best approach.

Early in June the hen began to show interest in the box and soon a small pile of excavated filling was seen on the floor of the flight below the entrance hole. The hen then disappeared into the box and was only occasionally seen for a short period in the evenings. She sat two eggs very conscientiously for five weeks, when they were removed and proved to be clear. Reference to previous breeding reports of my Yellow Fronted Amazons and African Greys showed exactly the same results, a trial run before the successful year.

So when the Double Yellows began preparing their nest in early May, hopes were high that 1970 would confirm my observations.

The first egg was laid on 7th May, followed by another three within the week. Incubation commenced with the first egg and after two weeks

a quick inspection, while the hen was in the shelter feeding, showed that the eggs appeared fertile although they were not handled at that stage.

The sound of the young being fed was first heard on the 5th June but no opportunity to inspect presented itself until the 14th June, when two chicks and two eggs were seen.

The young were covered with grey down. Very little was heard from the log after the first week. The birds were inspected each week as conditions allowed; and each time saw quick growth and the appearance of feathers, the yellow on the forehead soon becoming visible. They left the nest on the 5th August within an hour of each other and are now feeding on their own.

The young are perfectly feathered and strong on the wing.

Their colouring is all green with a patch of yellow about the size of a shilling on the forehead; no colouring to the wing butts or wings; a white beak and white feet, and dark brown eyes.

They were fed the same diet as the Yellow Fronts, normal dry seed of sunflower, safflower, hemp, wheat and oats in the shelter, but soaked seed as above thrown on the floor of the flight. A shortage of chickweed due to dry conditions was balanced by extra dandelion, groundsel and later by *persicaria* and sow-thistle.

Apple, grapes and peanuts were offered; but only taken after the soaked seed and green food had been cleared. All the Amazons love a slice of orange but this is fed very sparingly.

Each end of the flight is covered for a distance of 3 ft. and the adults and young all roost together at one end; and as the young Yellow Fronts have slept out through the winters in previous years, unless they show any signs of discomfort the Double Yellows will be allowed to do the same. The above dates would suggest an incubation period of 21 to 24 days with approximately 70 days in the nest-box after hatching and three to four weeks to independence. The longer the period the young are left with the parents the greater seems to be the advantage, as they appear to make quicker progress.

As described above, Mr. Clifford Smith has bred the Double Yellow-headed Amazon, *Amazona ochrocephala oratrix*. It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

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THE BREEDING OF THE CORELLA (LONG-BILLED OR SLENDER-BILLED COCKATOO)

(*Cacatua (Licmetis) tenuirostris*)

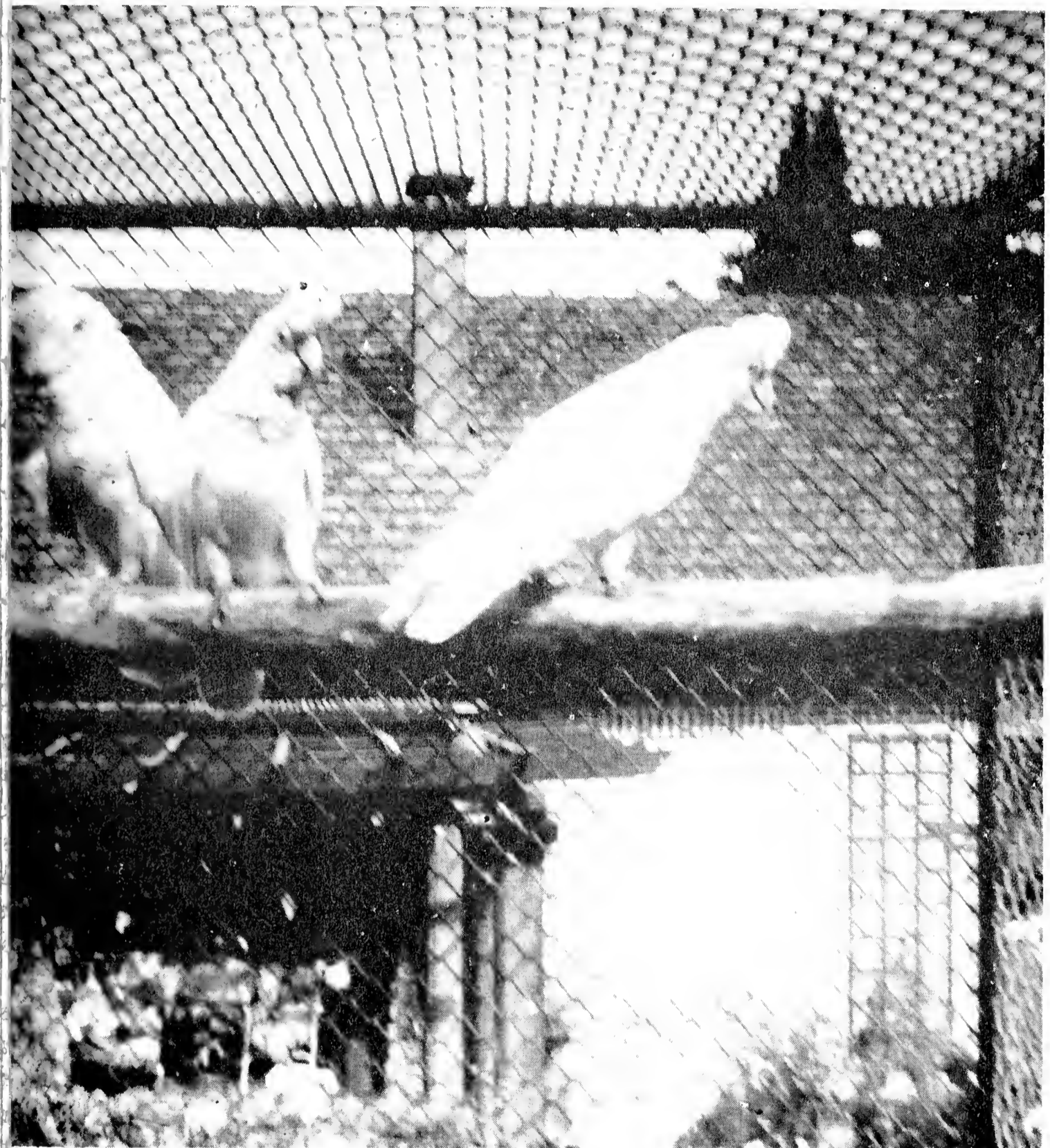
By ALAN LENDON (Adelaide, Australia)

The true Corella is a cockatoo with a moderately restricted habitat which may well be contracting in the face of pastoral development. Its present stronghold is the western district of the State of Victoria, from the vicinity of Port Phillip Bay (on rare occasions nowadays) to the South Australian border, which it transgresses for a short distance, especially in the vicinity of Naracoorte and Penola. The range in New South Wales has never been precisely defined but it is known to occur, somewhat sparsely, in the Riverina district and along the course of the Lachlan and Murrumbidgee Rivers. In my youth, the Sydney birdshops invariably had nestling Corellas for sale at the appropriate season, presumably obtained within the State, but the source was never reliably disclosed.

The Corella, with its elongated upper mandible which is an adaptation for digging up bulbs, is obviously closely related to the much commoner and more widespread Little Corella or Bare-eyed Cockatoo (*C. sanguinea*) but, as far as I have been able to ascertain, the two species do not make contact. In Western Australia, the form known as *pastinator*, which lacks the red crescent on the throat, was originally considered a valid species and was later regarded as a subspecies of *tenuirostris* and has more recently still been treated as a subspecies of *sanguinea*. This bird is sparsely distributed nowadays in the south-west corner of the State and is more plentiful north of Perth along the coastal strip, coming in contact with *sanguinea* at the northern extremity of its range, in the vicinity of Geraldton, and reputedly interbreeding.

I had always been attracted to this somewhat grotesque looking species but had never possessed a specimen, although it is not uncommon as a cagebird and reputedly an excellent talker. In December 1967, my elder son arrived home with a pair of these birds which he had obtained from a mixed collection of parrots and cockatoos exhibited at a service station, with the story that they had attempted to breed and had actually laid eggs during the previous season. A less likely breeding pair at first acquaintance could hardly be imagined; the cock being very timid and unable to fly on account of a damaged wing and the hen being obviously hand-reared, tame and with a strong tendency to human fixation and a repertoire consisting of a monotonously repeated "Hello Cocky". However, they appeared to be well-mated and frequently indulged in mutual preening.

They were released in an aviary with a flight $12\frac{1}{2}$ ft. \times $3\frac{1}{2}$ ft. \times 7 ft. covered with one-inch mesh chain wire and with a shelter at the rear



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[Alan Lendon

Slender-billed Cockatoo



measuring $5\frac{1}{2}$ ft. \times $3\frac{1}{2}$ ft. \times 8 ft.; the cock being provided with a perch which enabled him to clamber into the shelter.

In August 1968, they were supplied with a hollow log about five feet long with an internal diameter of about six inches and an inspection hole near the lower end. This was suspended obliquely in the shelter and in close proximity to a perch to enable easy access on the part of the cock.

An immediate interest was evinced and the hen spent a considerable amount of time in it from the start. From this time onward, mating was frequently observed and the first egg was seen on 22nd September and the second on the following day; it was not until four days later that a further opportunity to inspect the nest occurred and revealed a third egg; it is to be presumed that they were laid with either two or three day intervals between each. Incubation appeared to commence with the second egg and as is the case with most cockatoos (excluding the "blacks") the cock carried out the task for most of the day and the hen in the early morning, late afternoon and at night. Two of the eggs were fertile and the first hatched on 16th October and the second the following day, after an incubation period of approximately 24 days. One of the chicks, presumably the younger, died after about a week but the other flourished and ultimately left the nest on 10th December, approximately seven weeks after hatching. It flew well from the start but was appreciably smaller than the parents, with a considerably shorter upper mandible and a slightly less obvious red crescent on the upper chest. Although both parents fed the young bird whilst it was in the nest, after it emerged the hen rarely did so but the cock continued to do so on demand for several weeks, although the youngster fed itself and was deemed independent after about three weeks. Soon after this the cock developed an aversion to the hen and pursued her relentlessly around the aviary; fortunately for her he was unable to catch up with her on account of his flightlessness.

The food supplied consisted of a seed mixture of sunflower seed, hulled oats and canary seed. In addition, a plentiful supply of nutweed (*Romulea rosea*) was given, together with thistle and seeding grasses. An occasional peanut was relished.

The young bird soon became quite tame and would take a peanut from the fingers, as the hen had always done. At about the same stage it became very noisy and the parents, who had always indulged in a pre-roosting screeching session, somewhat increased their vocal propensities, so I presented them to the Adelaide Zoo, where they were satisfactorily housed and it is to be hoped that they will continue to breed and add to that institution's already long list of psittacine successes. However, although eggs were laid in 1969, no results were obtained.

At about the same time, I borrowed a tame bird, of unknown sex, as a companion for the young bird but it proved ill at ease in an aviary and unwilling to fly, in addition to appearing terrified of the youngster. This condition lessened somewhat after a time but they never really became

friendly and after several weeks, the young bird still being very noisy, I sent them both to the owner of the tame bird, and they now occupy an aviary with several others of the species.

I was quite unable to sex the young bird with any certainty in the early stages although I had a feeling that it was probably a hen; later I was not so sure but looking at it again when it was about a year old I felt that the original opinion was correct. This species is one of the cockatoos which does not exhibit any difference in the colour of the iris and although the sexes can be picked in a mated pair, I think it is pure guesswork in the case of a single bird.

I had not been able to find any convincing record of the previous breeding of this species in captivity other than those in the San Diego Zoo in 1959 and 1960 and I had suspected that the young might have been partly hand-reared, as is often the case there; however, Mr. K. C. Lint informs me that this was not so. Following publication of a brief account of my success in *Bird Keeping in Australia* a correspondent reported the outstanding achievement of Mrs. C. Pullan of Wellington, New Zealand, whose birds successively reared one, two, two and three young in the years 1965 to 1968.

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BREEDING THE LESSER SULPHUR-CRESTED COCKATOO

By CLIFFORD SMITH (Denholme, Yorkshire, England).

My Lesser Sulphur-crested Cockatoos, *Cacatua sulphurea sulphurea*, were purchased in 1962, the cock having been a pet bird which had become too playful with its beak, hence the reason for selling. A few months elapsed after I bought him before a hen was obtained, for cockatoos were not too plentiful at this time. The male has jet black eyes and the hen's are reddish-brown. Apart from the eye colour there is no other obvious difference either in colour or size.

Over the years the birds were kept in the same aviary, 12 × 5 × 7 ft. high, and various nest-boxes were introduced, but although they visited the boxes occasionally they never made any attempt to breed. However, in 1969 after the young Citron-crested Cockatoos which were in the next flight to the Lesser Sulphur-crested Cockatoos left the nest, there appeared to be more than the usual amount of bickering and so it was decided to give them a move.

A 20 × 4 ft. flight was made available and early in 1970 a natural log 2 feet in diameter and only 2 ft. 6 ins. high, resting on a concrete paving slab supported on a 4 foot post was fixed in the flight with no overhead cover. The log was an open cylinder resting on the concrete slab, with a layer of

peat and rotted wood in the bottom, a slab of wood on the top, and a square entrance hole near the top with a projecting perch just below it. Owing to various factors such as fixing the log, and its shape, there was no alternative but to have it with the entrance facing east.

The birds soon settled down in the new aviary but it was not until 1st June that the hen disappeared into the box; although she had been making numerous visits for a month before that. She was not seen for a week, so it was assumed that she was incubating. The cock visited the nest-box to feed her, and although she was seen out for short periods during the second week, no chance was given to make an inspection. As the walls of the log were nearly 6 inches thick it had been impossible to make an inspection door, so that when the absence of the hen allowed a quick look to be taken, it had to be through the entrance hole. This revealed eggs, but only a quick glance was possible since the cock was attacking fiercely, and any further disturbance seemed pointless.

At the end of June, although no sound of feeding had been heard, the cock was continually in and out of the log and his breast feathers were matted and wet after each visit, which is usually a sign that young are being fed. As well as the usual supply of dry seed in the shelter, large quantities of soaked sunflower, safflower, wheat and oats were thrown onto the floor of the flight. In addition what chickweed was available, together with dandelion roots, leaves and seeding heads were fed twice each day. The birds showed no interest in fruit or nuts but took some stale bread soaked in honey.

A youngster left the nest on 30th August but it was another week before the second one appeared. They were exact replicas of their parents and only slightly smaller, and were able to fly the full length of the aviary within minutes. They are now completely independent but will remain with their parents as long as possible.

Five pairs of cockatoos have reared young this year, along with two pairs of Amazons and two pairs of Grey Parrots, making it a very satisfactory season. There appear to have been only two things different from in previous years; firstly a very hot dry summer which does not seem to have favoured parakeet breeding up and down the country, and secondly my introduction of natural logs as nest-boxes, standing on concrete slabs and raised well above the ground. As concrete does retain moisture has this helped to keep the interiors at the right humidity to help with the hatching? The cockatoos have had a choice of various nest-boxes, but all have chosen the natural logs.

As described, Mr. C. Smith has bred the Lesser Sulphur-crested Cockatoo *Cacatua sulphurea sulphurea*. It is believed this may be a first success. Any member or reader knowing of a precious breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

BREEDING THE AZURE-WINGED MAGPIE AT THE NORFOLK WILDLIFE PARK

(*Cyanopica cyanus cooki*)

By PHILIP WAYRE, Director (Great Witchingham, Norfolk, England)

Six Azure-winged Magpies were received from a Continental Zoo as part of an exchange agreement in 1966. Some difficulty was experienced in determining the sexes of the birds, but an attempt was made to divide them into three pairs. This was successful in at least one case, since one pair kept in a large planted pheasant aviary built a nest and laid eggs, which proved to be infertile, in 1968. The second pair built a nest but no eggs were laid. What was believed to be a male of the third pair escaped at Easter of that year and has remained at liberty in the Park ever since. It seems to have a comparatively small territory and during the winter it is often seen feeding from the wild boars' feeding-trough in their enclosure not far away and it has also been observed to feed its mate with grubs through the wire-netting of the aviary. Various attempts have been made to re-capture this bird but so far none has proved successful, as it is not only intelligent, but extremely suspicious of any form of trap.

In 1969 both pairs nested again, the same pair producing eggs which once again proved to be infertile. The second pair did not lay.

Early in 1970 it was decided to split the birds and the hen which had laid was mated with the larger of the two birds in the other pair. This re-shuffle was successful in that the pair built a nest amongst the fir boughs attached to a support post 7 ft. above the ground in the aviary. The nest contained four eggs on 24th May and they hatched on 8th June. The four young fledged and were seen flying around the aviary on 2nd July. Unfortunately one was subsequently killed by a weasel, but the remaining three have survived and are now quite independent of their parents.

These birds are normally fed a mixture of pheasant starter crumbs and insectivorous food with a liberal supply of maggots and mealworms. When rearing young they appeared to feed them exclusively on mealworms which were sprinkled daily with Casilan (Glaxo) to supply additional protein.

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BREEDING THE ORNATE LORIKEET

(Trichoglossus ornatus)

By JOHN BUNKER (Ettington, Warwickshire, England)

In July 1969 I obtained a pair of Ornate Lorikeets which had been imported some twelve months previously, the birds were very active although one of them had only stumps of flight feathers in one wing and, as they were in an aviary and were very wild, this bird had damaged the extremity of the clipped wing through heavy landings. The plumage of both birds was not in the best condition, but they looked a pair and so they found their way into my collection.

They were released in a flight 8 ft. \times 2 ft. \times 6 ft. where they spent the summer and autumn. A parrakeet-type nest-box was installed and the birds took immediate possession, the hen roosting inside the box with the cock at the entrance hole; however, nothing of any note happened except that, with the assistance of a varied diet and constant bathing facilities, the birds' plumage improved tremendously and by October both birds were in splendid condition and could fly normally.

At the end of November they were transferred to winter quarters and were housed in an all-wire flight-cage 4 ft. long \times 2 ft. wide \times 3 ft. high. In February of this year a nest-box was placed on the floor of the cage with a view to getting the birds accustomed to it prior to their transference to an outdoor aviary, its dimensions were 15 in. high \times 9 in. \times 9 in. with a 2½ in. diameter entrance hole and a perch. The base was covered to a depth of 3 in. with a mixture of peat, soil and wood chippings, dampened and rammed down tightly. The box was investigated almost immediately and from then on both birds roosted in it.

Some three weeks later the birds were seen mating and the cock was feeding the hen regularly, the box was examined about a week later, but the only sign of any nesting activity was a minor excavation in one corner.

During the third week of April the hen was conspicuous by her absence and as soon as anyone approached the cage the cock dived into the box. This was examined much to the birds' consternation and was found to contain two white eggs, roughly the size and shape of those of the Eastern Rosella. They had assumed the chalky-white appearance of fertile eggs and hopes were high for a successful hatching. As the atmosphere was very dry the floor of the cage was moistened daily.

The hen was observed out of the box more regularly during early May, but as the birds were still highly nervous and suspicious of any interference in their domestic routine the box was not examined again until young were heard clamouring for food. Upon examining the box on the 28th May two young were found and were estimated to be about two weeks old, at this stage they had only a sparse covering of white down. They were

not examined closely but, perhaps surprisingly, the nest-box was quite dry and sweet and still contained the egg shells.

Increasing amounts of food were being consumed, the staple diet being a mixture of sugar, Farlene, Complian, honey, condensed milk, Bovril and Abidec, this being diluted with boiling water. It was supplemented with sweet apple, ripe banana, stale sponge cake, green ears of wheat and gentles, all of these were taken with equal avidity. The birds had continued through this period to make full use of the bathing facilities, sometimes bathing several times daily. Both birds spent long periods in the nest-box and both took all of the above-mentioned foods. The cock was not seen to feed the hen after the young had hatched.

The box was subsequently examined on the 6th June when the young were seen to have grown considerably and were clothed in dense white down. On the 14th June they were still down-covered but pin feathers were very noticeable on their heads and backs. The young clamoured regularly for food at this period, even late at night, and the parents were naturally consuming large quantities of food.

The young were again examined on the 26th June and their growth was very noticeable, their plumage had also developed considerably. Due to my being absent from the 27th June to the 10th July the young were not examined again until the latter date when they were found to be fully feathered, with tails as long as those of the adults and with only minimal vestiges of down.

The only really noticeable difference between the young and the adult birds was that the plumage of the young was slightly duller, their irises were black instead of the orange of the adults, and their bills were almost black as against the orange-yellow bills of their parents. I was quite surprised to find the young still in the nest-box at this late date.

The elder of the young left the box for the first time on the 18th July, being followed by the younger on the 21st July. Even after they had left the box both the young and the adults spent a lot of time in it and would retreat to it with the minimal provocation.

The young were seen to be feeding themselves on the 30th July, and were independent of the parents by the 2nd August.

As described above, Mr. John Bunker has bred the Ornate Lorikeet (*Trichoglossus ornatus*). It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

BREEDING THE FAWN-NAPED TANAGER

By H. MURRAY (Brentwood, Essex, England)

I have bred the Fawn-naped Tanager, *Tangara ruficervix leucotis*, this summer, and the young birds are now moulting into adult plumage.

These birds, which were imported from Equador last year, are mainly blue in colour with a fawn patch at the back of the head. They are roughly the size of a sparrow.

As usual with Tanagers, they became extremely belligerent when pairing, and as there is no sexual difference in colour it is very difficult to see which bird is paired to which, and the first definite sign that one usually has, unless you happen to be there at the crucial moment, is a badly battered bird if there are more than a pair of the same tanager in the aviary. This fighting does not seem to extend much beyond their own variety, but should a battle take place it is short and deadly. The trouble is that Tanagers are so quick in their movements. Out of the breeding season they are reasonably peaceful.

The nest, built in an angle of a wood frame was about the flimsiest I have known, and the usual Tanager clutch—two eggs—was laid. Like most birds that have had little contact with man in the wild, they are fearless sitters, but as the weather was warm at the time the hen left the nest for so long that I was very surprised that the eggs hatched. I cannot give much information on length of incubation, but it was about 14 days. The young were in the nest for nearly three weeks.

I have always been interested to try to find out if these small tanagers feed by regurgitation or not, and I feel reasonably sure that these birds did so in part. Certainly such flies as were caught were fed whole, but I think that some food was fed by regurgitation—fruit and sucked-out mealworms.

The plumage of the young birds was dull blue, dark on the head, lighter on the back, with a greyish-blue breast. No trace of the fawn nape was apparent.

As described above Mr. H. Murray has bred the Fawn-naped Tanager (*Tangara ruficervix leucotis*). It is believed this may be a first success.

Any member knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

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BREEDING SEASON 1970 AT THE NORFOLK WILDLIFE PARK

By PHILIP WAYRE, Director (Great Witchingham, Norfolk, England)

Two hundred and eighty-four birds of 41 species have been bred in the Park this season. Apart from the commoner European forms, waterfowl bred include 17 Emperor, seven Red-breasted, four Ashy-headed, four Ruddy-headed and six Cereopsis Geese. Ducks include seven Baikal Teal, seven Canvasback and five European Eider reared.

The Baikal Teal were hatched from eggs laid by a pair bred in the Park in 1966. They are kept on the largest pool which has an area of more than three-quarters of an acre of water.

The following is a list of birds, other than waterfowl, bred and surviving to independence.

Kestrel	5	Pied Wagtail	4
Stone Curlew	4	Azure-winged Magpie	4
Collared Dove	2	Alpine Chough	4
Barn Owl	4	Blackbird	2
Snowy Owl	1	Song Thrush	3
Eagle Owl	9	Mistle Thrush	8
Little Owl	6	Chaffinch	1
Skylark	2	Greenfinch	3
		Goldfinch	7

The five young Kestrels were produced by the pair which reared one youngster last year.

The Stone Curlews, all of which are pinioned and kept in the wader pool produced no less than 11 eggs. Of these, four proved to be infertile, two contained dead-in-shell chicks, and five hatched. One youngster died from an unhealed navel and the remaining four were successfully reared.

It is not possible to leave the eggs under the parent Stone Curlews since they are nearly always stolen by Jackdaws. The procedure has been to remove the eggs after they have been incubated for seven or eight days and hatch them under broody bantams. Immediately after hatching the young chicks are placed without the bantam in an electrically-heated coop and for the first two or three days they are force-fed with maggots and meal worms every two hours. After this period they learn to pick up food for themselves, though they will still take it from the hand whenever it is offered to them.

The nine young Eagle Owls brings the total to be bred in the Park to 47 since 1960. Of these, 18 have been presented to the Swedish Conservation Authorities at Skansen to help their scheme to re-establish this species in the wild in Sweden, while a further four birds have been

[Philip Wayre

Stone Curlew Chick

[Copyright





Copyright]

[Philip Wayre

Two young Stone Curlews

presented to the German Conservation Authorities who are responsible for a similar reintroduction project in the Eifel area of Germany.

The one Snowy Owl to be bred was the sole survivor of four chicks hatched by a female Eagle Owl. This bird has no mate but is a prolific egg-producer and since our female Snowy Owl refuses to rear her own chicks, it was decided to substitute the Eagle Owl's eggs with those of the Snowy Owl. The Eagle Owl is a much earlier breeder, but by removing her eggs this particular bird was induced to go on laying until she produced a clutch at the same time as the Snowy Owl. Two of the four chicks survived for more than a fortnight, then the smaller was discovered headless, and as a safety measure the remaining chick was removed and reared by hand. It is now fully fledged and very tame.

Both the Alpine Chough and the Azure-winged Magpie may be the first of their species bred in captivity in Britain, and separate accounts of their breeding occur elsewhere.

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SOME AVIARY NOTES, 1970

By K. A. NORRIS (Purley, Surrey, England)

For the second year running my Flame-headed Barbets, *Capito bourcierii*, raised my hopes and may yet add to my "firsts" this season. Last year they drilled a perfect nesting hole in a rotten tree-stump and the hen became rather 'puffy' and obviously on the point of laying. Then they suddenly deserted the tree-stump and I found that mice had taken over. Later they returned to the nesting-hole and worked on it with such enthusiasm that they went straight through the bottom, having excavated to a depth of over two feet. Incidentally they did not leave a single wood-chip in the vicinity of the stump. They took it in turns to excavate, each working for between five to ten minutes and then emerging with a beak and throat full of chips which they carried to the far end of the house and there dumped it from a high perch.

This spring I supplied them with a partly rotten tree-trunk about eight inches in diameter and four feet high, which I stood upright in the centre of a small pool where I hope mice will not reach it. Recently they have taken to this new stump and starting at a point where a branch had broken off, drilled inwards and then downwards in the exact centre. They have worked on this continuously for nearly a week (it is still hard wood in the centre) and have reached a depth of about eighteen inches; at which depth they have enlarged the shaft, which is little more than an inch in diameter, into a circular chamber about three inches in diameter. The hen again looks to be on the point of laying and the cock is constantly fussing round her and feeding her with mealworms and apple; "tuk, tuk, tuk", tukiing to her just like a bantam hen calling chicks to food she has found for them. I am keeping my fingers crossed.

Black-spotted Barbets, *Capito niger*, also gave promising signs. They have a partly hollow tree-trunk which they have used as a roosting place for the past two years and this summer the cock became very attentive until the hen was obviously about to lay, which she eventually did—from a perch!!

A pair of Orange-headed Ground Thrushes, *Geokichla citrina*, which reared three nice youngsters, two cocks and a hen, last year, have hatched five successive nests of three each this season but went to nest so soon after rearing the first three that the second and third rounds were hatched before the first were independent. I am certain that the oldest youngsters were responsible for picking their younger brothers and sisters out of the nest when they were still quite small, and while the hen had left the nest to feed, for I found them scattered about the aviary one by one, all very dead. The same nest was used for each brood and by the time that the fourth clutch was laid had become very delapidated, tipped partly on its side and so much flattened that it was little more than a platform with a slight depression in the centre. The fourth set of chicks were reared until they began to move about in the nest, whereupon one after another went overboard. I then tried to prop up the nest with a wad of grass pushed under it, but I could not remould it or make the depression any deeper. The hen actually laid the first egg of her fifth clutch whilst I was collecting more material for temporary repairs; so I had to leave the job unfinished. However, what work I had managed to do seemed to be effective, and the fifth brood were progressing well and had reached the stage where they could stand on the edge of the nest and I really thought they would be fully reared. Came a heavy rain-storm during the night and the nest finally collapsed, I found three miserable and saturated little corpses on the ground next morning.

As if the old birds had deliberately held back their moult and could now wait no longer, they literally fell to bits—to such an extent that for some time they were completely unable to fly, having dropped all their primaries at once. They are recovering equally fast, but it is sad to think of so much wasted effort—only three reared out of a possible fifteen. Incidentally this pair have been in my possession since 1965 and I had never heard the cock sing until this spring, when he had competition from the two young cocks reared last year, which were in a nearby aviary. During the early spring the chorus of these three birds was so magnificent that I could not resist spending some time each evening just listening to their evensong.

My young Rufous-bellied Bulbul, *Hypsipetes mccllellandii*, is now assuming full adult plumage and although he takes his fill at the food table each morning he is still ready to accept the odd tit-bit offered by the parents occasionally. These birds also laid a second clutch very soon after the first youngster left the nest, and incubated long beyond the normal period of fourteen days, but the eggs were infertile. During the

whole of this long period the first-nest youngster was allowed to sit on the edge of the nest, the old cock bringing food to it and the sitting hen at the same time. The results of the 1970 breedings are not very impressive, but it has its points of interest—and there is still the possibility that the barbets may lay. They are in my small tropical house, so they will not suffer from the deteriorating weather conditions at this late time of year.

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COUNCIL MEETING

A Council Meeting was held on 4th September, 1970, at the Windsor Hotel, Lancaster Gate, London, W.2.

The following Members were present: Mr. J. J. Yealland, Vice-President, in the Chair. Mr. J. O. D'eath, Mr. D. Goodwin, Mr. H. Horswell, Mr. K. A. Norris, Mr. C. M. Payne, Mr. D. H. S. Risdon, Mrs. K. M. Scamell, Mr. D. T. Spilsbury and Mr. A. A. Prestwich, Hon. Secretary.

THE SOCIETY'S MEDAL

The Society's Medal was awarded to Mrs. Brenda Rhodes, for breeding the Black-tailed Conure *Pyrrhura melanura*, in 1970.

CERTIFICATE OF MERIT

The Society's Certificate of Merit was awarded to:

The Winged World, for breeding the Little Bee-eater *Merops pusillus*, in 1970.

The Winged World, for breeding the Southern Tree Pie *Dendrocitta leucogaster*, in 1969.

The Winged World, for breeding the Brown-throated Barbet *Tricholaema melanocephalum stigmatothorax*, in 1969.

The Winged World, for breeding the Yellow-breasted Fruit Pigeon *Ptilinopus occipitalis*, in 1969.

ELECTION OF COUNCIL MEMBERS

There were the following retirements and appointments:

Mrs. K. M. Scamell, Mr. A. V. Marques and Mr. P. L. Wayre retired according to rule. Mr. D. T. Spilsbury retired at his own request.

Professor J. R. Hodges, Mr. S. T. Johnstone, and Dr. S. B. Kendall were elected to fill the vacancies.

HON. LIFE MEMBERS

Mr. T. T. Barnard and Dr. Satya Churn Law were elected Hon. Life Members, in recognition of their long association with the Society.

ARTHUR A. PRESTWICH,
Hon. Secretary.

BRITISH AVICULTURISTS' CLUB

The one hundred and fourth Meeting of the Club was held at the Windsor Hotel, Lancaster Gate, London, W.2, on Friday, 4th September, 1970, following a Dinner at 7.30 p.m.

Chairman: Mr. K. A. Norris.

Members of the Club present: Mrs. D. E. Balcon, A. W. Bolton, R. A. Chester, J. O. D'eath, Mrs. W. Duggan, R. T. Harvey, H. Horswell, P. Howe, *H. J. Indge, Dr. S. B. Kendall, H. G. Kenyon, J. Kuttner, R. T. Kyme, C. Marler, C. M. Payne, *A. A. Prestwich, Mrs. M. Reay, D. M. Reid-Henry, K. M. Scamell, Mrs. K. M. Scamell, W. M. H. Williams, J. J. Yealland.

* Denotes Founder Member.

Members of the Club present, 23; guests, 10.

The Dinner was followed by a *Conversazione*.

The date of the next Meeting is FRIDAY, 20TH NOVEMBER, 1970.

ARTHUR A. PRESTWICH,
Hon. Secretary.

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NEWS AND VIEWS

Members will be pleased to hear that Dr. Jean Delacour celebrated his 80th birthday on 26th September, 1970.

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Professor J. R. Hodges, 1970, successfully reared 19 Blue-winged Grass Parrakeets from seven pairs, and 13 Splendids from eight pairs.

* * *

Peter Scott has been awarded the Albert Gold Medal of the Royal Society of Arts for 1970, for his outstanding work in conserving wildlife.

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David Spilsbury reports: " My total number of parrakeets bred during 1970 was 42. The species reared were Barraband's, Pennant's, Golden-mantled Rosella, Turquoise, Splendid and Blue-winged Grass Parrakeet.

At the close of the XV World Conference of the International Council for Bird Preservation, held in the Netherlands in September, 1970, Miss P. Barclay-Smith was presented with the Delacour Medal "for services to conservation, aviculture and ornithology". In October Miss Barclay-Smith was awarded the Gold Medal of the *Svenska Kvinnors Djurskyddsforening* (Swedish Women's Society for the Prevention of Cruelty to Animals) "for her wonderful work, during a long period of years, for the prevention of oil pollution of the sea".

* * *

On Easter Sunday Rae Anderson was bitten on the hand by a 4½ ft. Red Rattle Snake. It is good to hear that he is making a slow but sure recovery. We certainly wish him well.

* * *

T. Driver reports the Loriinae breeding results, 1970, in the Kelling Park Aviaries: 2 Mitchell's Lorikeets, 2 Edwards's, 2 Forsten's and 4 Blue-headed *Trichoglossus haematod caeruleiceps*. The Purple-capped Lories failed to rear their young. Unmated Black-capped Lory and Mrs. Johnstone's Lorikeet laid.

* * *

The new bird house at the Tracy Aviary, Salt Lake City, Utah, costing some \$150,000, has been named the "Calvin Wilson Bird Pavilion", in honour of our Life Member who has been Director of the Tracy Aviary since its beginning in 1939.

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Last year two young Red-masked Conures *Aratinga erythrogenys* were reared in the Chester Zoological Gardens. The parents have this year reared a nest of three. The young are now about the same size as the parents but have not yet fully developed the characteristic red markings.

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Professor Dr. B. Grzimek reports a possible first success in the Zoologischen Garten, Frankfurt am Main. He writes: "This summer, we were successful in breeding *Creatophora cinerea* (African Wattled Starling). Three young ones from one brood left the nest and have grown up so far without any difficulty".

E. Nørgaard-Olesen, Janderup, Denmark: "My breeding results this year are one Philippine Hanging Parrakeet, just out of the nest; two Vernal Hanging Parrakeets ready to leave the nest; one Blue-naped Mousebird, and three Rain Quail. The Blue-crowned Hanging Parrakeets nested on the ground, one young living for three days".

* * *

Clifford Smith's breeding successes with his parrots and cockatoos, 1970: Leadbeater's Cockatoo, five young (three from one pair, two from another); Citron-crested, one young; Lesser Sulphur-crested, two; White-crested, one; Yellow-fronted Amazon, one; Double Yellow-headed Amazon, two; African Grey, four (three from one nest, one from another).

* * *

Jeffrey Trollope: "I have had two broods (three in each brood) of Barn Owls, fully reared. Last year was a disaster, the only creatures breeding were dozens of healthy, sleek mice. This spoilt my chances of breeding the Button Quail *Turnix sylvatica* and everything else! Since having the owls I have not seen a mouse, which happy state of affairs, I hope will continue".

* * *

An important breeding result in the Los Angeles Zoo. A pair of Crimson-rumped Toucanets *Aulacorhynchus haematopygius* took over a cavity excavated in a palm trunk by a pair of Lineated Barbets; three eggs were laid and duly hatched. Upon leaving the nest the three chicks, resembling miniature adults but considerably darker with the rump chestnut rather than crimson, were removed from the flight cage to ensure their survival.

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The Committee of the Avicultural Society of South Australia has compiled a Bird Price List. The prices quoted are to be regarded as a guide only and refer to true, adult pairs, aviary-bred and of good quality. Amongst the parrots listed are Crimson-winged at (roughly) £8 15s. od. Rock Peblers, £6 os. od., and Kings, £8 os. od. Export and import prohibitions taken into consideration, the £500 recently asked in England for a pair of the last named would seem to offer a great temptation for the breaking of such.

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David Spilsbury says of the 1970 Census for Rothschild's Mynah: "All owners known to keep this species have been sent a census form and it is hoped that these will be returned promptly. The recent influx of wild-caught specimens through the trade will have resulted in some new owners and I would be glad if these aviculturists would contact me at Withersfield, 5 Lambourne Avenue, Malvern Link, Worcs.

The census form this year seeks information on the feeding of breeding and non-breeding stock, the sexing for the species and causes of death. Also we seek to find out how many have been exported from Bali and, of course, maintain our interest in the breeding of this fine mynah".

* * *

Mr. and Mrs. K. M. Scamell have just moved to Cornwall. During the years they lived in Surrey, Mrs. Scamell notched up a long list of first successes—Blue-Headed Rock Thrush, Daurian Redstart, Rubythroat, Himalayan Rubythroat, Pied Bush Chat, Malachite Sunbird, Shelley's Starling, White-capped Tanager, Black Bulbul, Violet-eared Hummingbird, Indian Black Redstart, Spotted-winged Stare, Indian Blue Chat, amongst others. But Mrs. Scamell has just been deprived of what might perhaps be described as the "Crowning glory". A young Cock of the Rock *Rupicola peruviana* died on the 23rd day after it was hatched. Mrs. Scamell writes: "It was a great disappointment. I thought it was doing quite well. The hen seemed to want to nest again. She was sitting on the nest just after she had thrown out the chick".

* * *

Gerald Durrell, Hon. Director, Jersey Wildlife Preservation Trust: "This year we have bred 11 more White Eared Pheasants (which are still too young to sex) from the original pair: and the six pairs from last year continue to flourish. They laid a number of eggs this year but, naturally, all of them were infertile, but we hope next year to have a sort of Ford production belt in operation.

We were nearly successful in breeding the Thick-billed Parrots I brought back from the Mexican expedition two years ago. Unfortunately, one young one was crushed by its parents at the age of ten days, and the other one died shortly afterwards. We have not yet received a post-mortem report on it, but since our three pairs of birds are rather young specimens, it was rather surprising that they bred at all."

A. A. P.

* * *

NOTES

"WHITE-CAPPED" AMERICAN PARROTS

When editing an article in the July-August number of the Magazine by Miss Rosemary Low I found that the name "Massena's Parrot" was not used in books on South American birds, and therefore inserted the additional name "White-capped Parrot", which is the name given to *Pionus seneloides* by de Schauensee in his several recent books on the birds of the South American region, and is the name by which it is now likely to be recognised. Miss Low has since pointed out that the name "White-capped Parrot" is also used for *P. senilis*, and is more appropriate for the latter species since it does have a white crown and forehead. This does not, however, alter the fact that *P. seneloides* has also been given this name and has appeared, and is likely to appear, as the White-capped Parrot in books and articles on South American birds. Once such names are used in standard regional avifaunas it is extremely difficult to change them; and we can probably only remain aware that in present day writings on birds we may encounter both a Central American White-capped Parrot, *P. senilis*, and a South American White-capped Parrot, *P. seniloides*.

C. J. O. HARRISON.

* * *

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The Pheasant Trust

and

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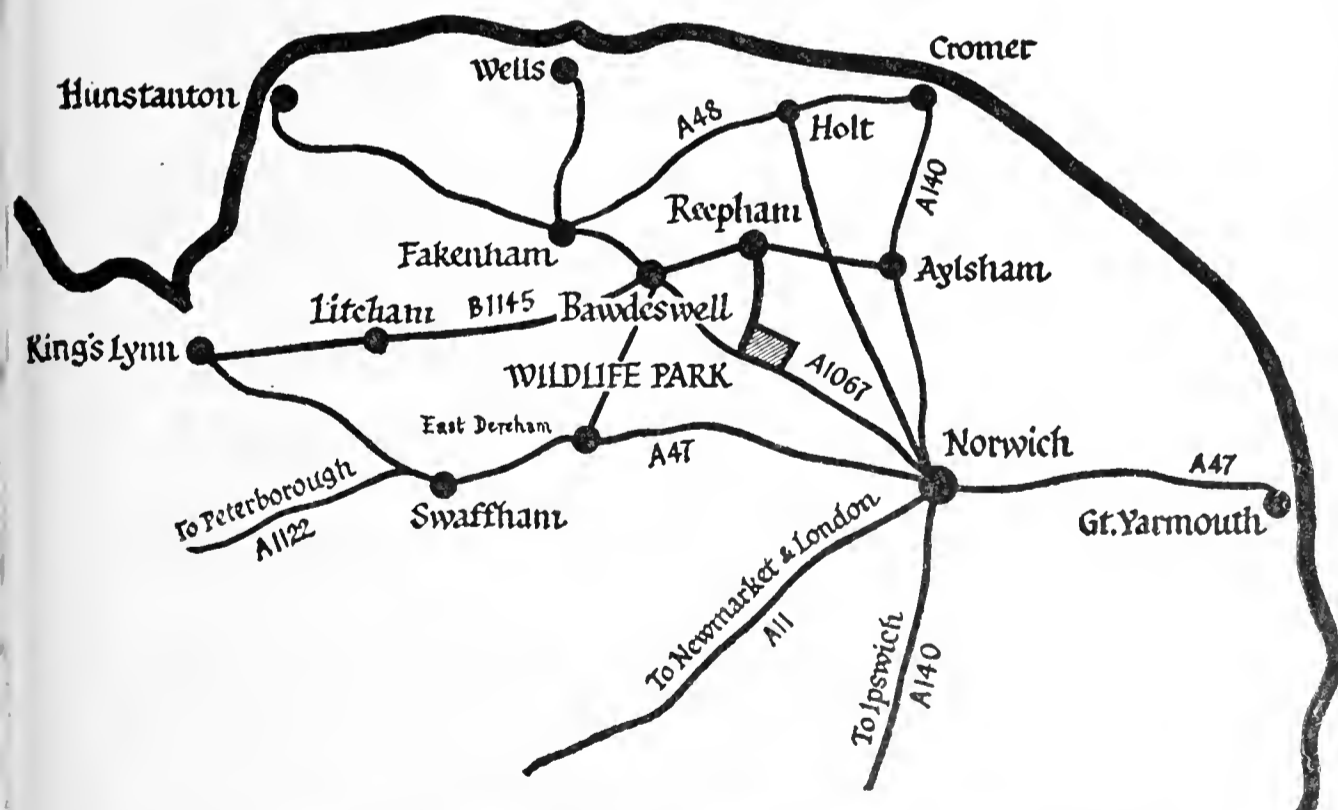
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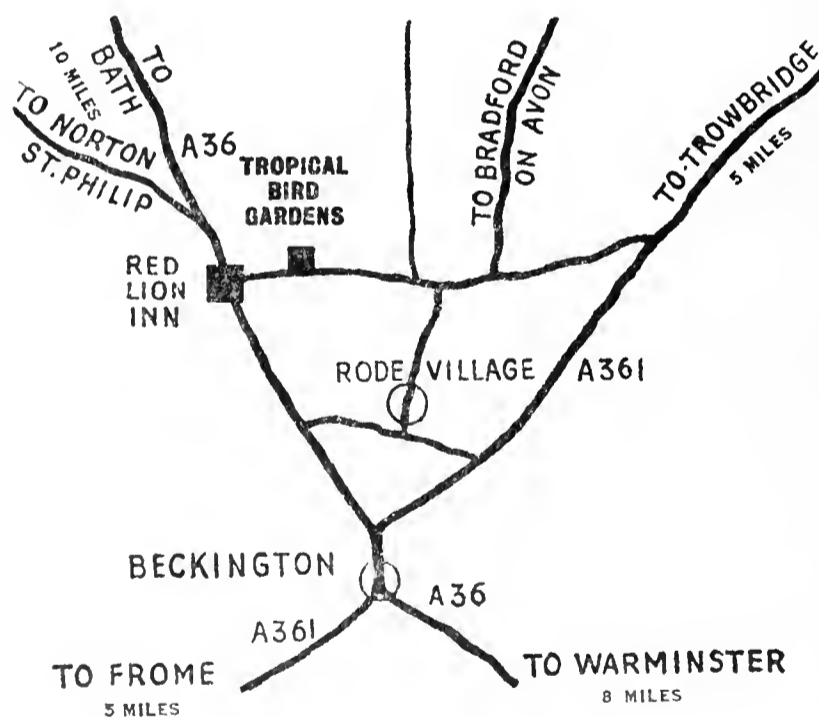
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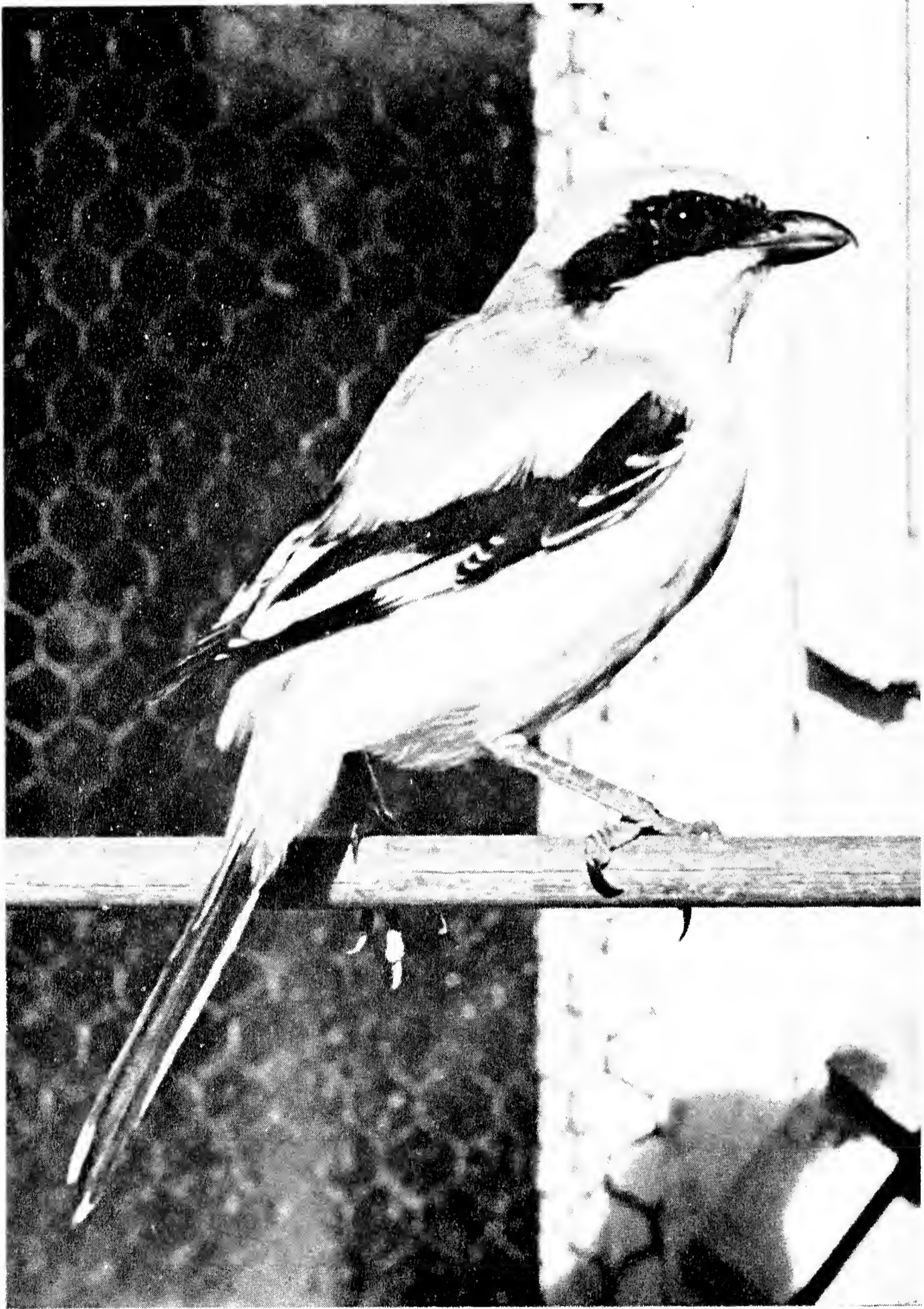
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Young Great Grey Shrike six months old.

[M. D. England

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BREEDING THE GREAT GREY SHRIKE

(*Lanius excubitor*)

By DERRICK ENGLAND (Neatishead, Norfolk, England)

I imported my pair of Great Grey Shrikes from India at the beginning of 1969. On arrival they were placed in separate cages—approximately 1 ft. × 1 ft. × 1 ft. 8 in.—to settle down and to learn to eat substitute foods. The room was controlled at 60°F, later reduced to 50°F. Although the birds differed slightly in plumage—one had faint traces of brown among the breast and flank feathers—I was not over-optimistic about their being a pair since the brown one might have been in immature plumage, as indeed it turned out to be, because within a few months the two were indistinguishable so far as colouration was concerned.

One was steady and ate well; the other—in immature plumage—was desperately wild while in a cage and was a difficult feeder. They were started on mealworms, maggots and small pieces of ox-heart. When they were taking the heart well, it was rolled in a mixture of soft-food, Vitonate, baby-food, powdered egg-yolk and yeast. They were not fond of the last three and these were discontinued, although the yeast has recently been acceptably re-introduced. From early April through the breeding season finely powdered cuttle was added. Surprisingly, they both seem quite unable to assimilate maggots, bringing them up shortly after swallowing in a large undigested mass. Also surprisingly, although all my other soft-bills from nuthatches to rollers prefer locusts in various sizes to almost all other food, these Great Grey Shrikes were until recently not enthusiastic and would only take adults, even these being allowed to fly around their aviary unless the shrikes were really hungry; the only way of getting them to eat them was to impale them on their favourite worm. They have, however, recently acquired a taste for them. Live sparrows were ignored when released into the aviary as food, although Great Grey Shrikes reputedly include many birds in their diet. (Witherby *al.* 1938). I was interested to note that some items of food, for example full-grown locusts, are frequently carried considerable distances—up to one foot as is the habit of most large birds of prey. This is especially so in the case of the oldest surviving youngster, which is a particularly strong, active bird.

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In April, with much misgiving because of their murderous reputation, they were put out together in an aviary 45 ft. long \times 4 ft. wide and 8 ft. high, with heated shelter approximately 5 ft. \times 3 ft. \times 8 ft. high. Initially the thermostat was set at 50°F, but throughout the quite cold winter of 1969/70 it was set to do no more than prevent actual freezing. I have no doubt at all from this and other evidence that, difficult though they may be to keep in health from some other points of view, they are hardy in the extreme as far as cold is concerned.

The expected fighting did not materialize, although they immediately divided the long narrow aviary into two territories, the bird which subsequently proved to be a female occupying the part remote from the shelter. She therefore has to pass through the male's territory to reach the food, with the result that I suspect that he usually gets the tit-bits. Although he has never been seen to attack her when in his territory, she obviously goes in some fear of him out of the breeding season and this part of her approach to the shelter is achieved in a hasty dash. The shelter itself seems to be regarded as neutral ground. This holding of territory was not entirely abandoned during nesting (the only nesting site was in the female's section), the birds continuing to use their chosen individual perches, though this may have been mainly a matter of habit.

Shortly after being put out of doors one bird was seen carrying nesting material. An "artificial bush" was put high up in one cover, consisting of suitably forked branches surrounded by screening evergreens, and a very good deep nest was immediately built of twigs and dried grasses, lined with finer grasses, feathers, small pieces of paper and glass wool, the material used for roof insulation. I supplied this as a substitute for the wool often used in the wild, as being less likely to become tangled round the birds' toes and because the weather was very cold. No courtship was seen and, although the female continually begged for food and solicited copulation, the other bird appeared to take no interest whatsoever. He must, however, have had something to do with things since four of the five eggs were fertile. Later he once or twice unbent so far as to feed the female when she left the nest. Subsequent experience with these and Rufous-backed Shrikes gives me the impression that sexual activity, both in and out of the breeding season, is most often initiated by the female.

I did my best to leave well alone and so did not at first know the number of eggs in the nest, although it was fairly obvious when incubation, even if only intermittent, began, since the female had by now lost most of her nervousness and would allow one to watch her on the nest from a short distance away. The male's apparent lack of interest had not led me to expect much and I was therefore not altogether surprised when there were still eggs on the seventeenth day. (Incubation period 15 days—Witherby, H. F., *et al.* 1938.) Expectations had in fact been lowered still further by the female staying off the nest for long periods during the first few days of incubation. (Experience with these and other shrikes has

since shown that this is normal—if rather alarming—behaviour, because this year five nests of two different species have appeared to be deserted soon after incubation began, but have hatched satisfactorily.) However, on the eighteenth day the male was seen to carry food to the female on the nest and she in turn to pass it to something beneath her.

All seemed to go well for about four days, after which the dreaded corpses began to be delivered to a spot just inside the aviary door. (It is interesting how many birds in captivity not only place empty egg-shells in a chosen spot but also use it as a last resting-place for the bodies of their offspring.)

Dr. Ian Keymer happened to be staying with us at the time and so an expert post-mortem examination was possible immediately. Each contained an impacted mass of the cases of blowfly pupae. It is one of the shrikes' less-endearing habits that, unless absolutely desperate efforts are made to prevent it, they will persist in feeding their young on one item of food only—usually the least suitable—however many alternatives are provided. So four nice youngsters perished, together with my hopes.

Several inactive weeks went by and then they began again. The old nest was relined, eggs were laid and incubated. They were fertile but did not hatch—she probably carried the business of “temporary desertion” in the early stages too far, in very mixed weather.

During the winter they had to be driven into the shelter each night—my wife valiantly carrying on this rather exacting exercise when I was absent—until it was discovered that they do not normally go to roost until it is nearly dark: when left alone they always put themselves to bed long after we have abandoned hope and in fact after we could see properly.

We had a lot of snow and frosts in Norfolk last winter and so I was not prepared for nest-building to commence on 5th January. I felt that it really was asking for disaster to allow them to continue at that time of year and so took down the nest-site and re-erected it in the shelter, where it was ignored. From then on, every time there was the slightest hint of spring in the weather, the birds made desperate attempts to build a nest in the spot in the air where the bush had been. This year the male was taking a bigger share, even if only by encouraging his mate, and the efforts of the two to beat impossible circumstances were quite heart-rending. Week after week I was tempted to give way against my better judgement, but I hardened my heart until 16th March, when the male was seen feeding his mate, and I erected an improved version of the previous year's bush in the same spot. But frustration had killed desire—I had put them off too long. Nothing at all happened until 22nd March, when a nest was very hastily built in which six eggs were laid.

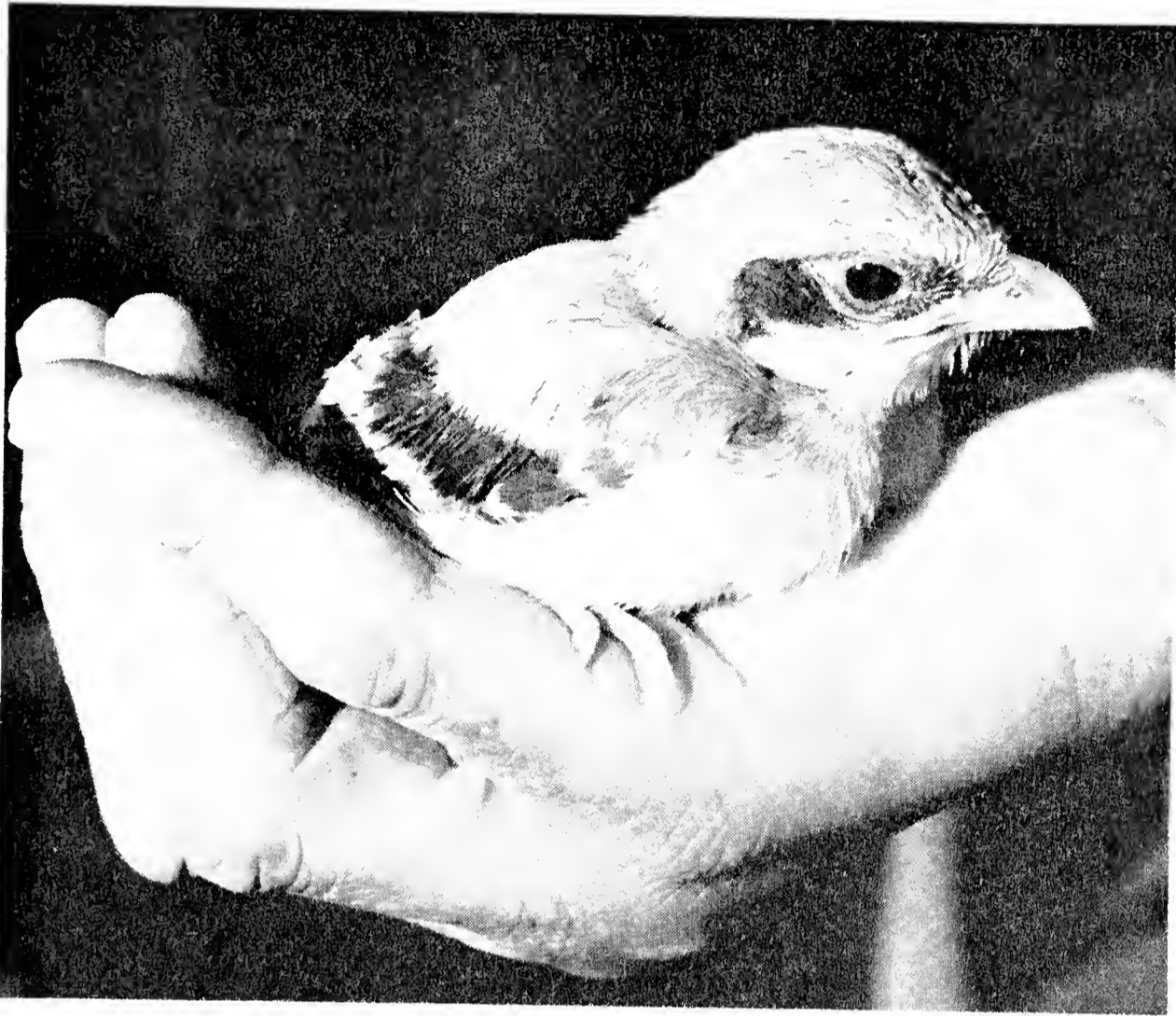
This of course was the signal for the weather to turn really nasty, and on several nights—and even days—during incubation their water was frozen. Apart from the early exasperating “messaging about”, the female sat solidly through some really shocking weather, to hatch two of her six

eggs on the nineteenth day, and two more on the twentieth. Even allowing for the very cold weather, this period—and my previous experience in captivity of 18 days—appear to make it desirable to reconsider the 16 days quoted by the *Handbook*. The incubating female habitually left the nest each evening at dusk for food and for an extensive preen, sometimes for as long as half an hour.

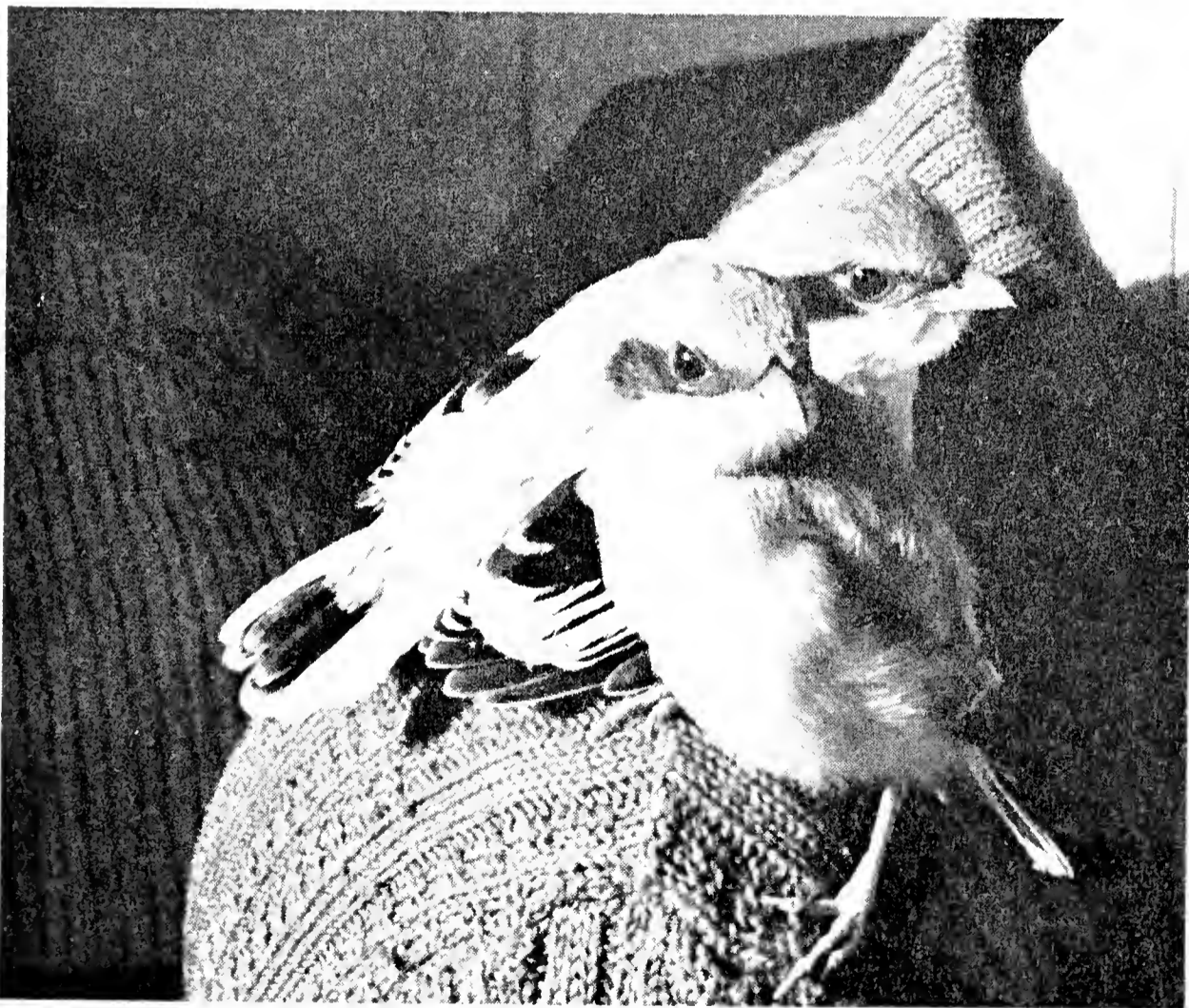
I have had a fair amount of experience of the breeding of this species in Norway, Spain and Portugal, and am familiar with its wary and secretive approach to a nest containing young, but never have I known a pair of birds to rear young while hardly appearing to feed them at all, as these did. Nor have I known birds which were more trying in their refusal to feed their young on a suitably varied diet.

I have previously recorded the fact (England, 1970) that in 1969 a pair of Rufous-backed Shrikes *Lanius schach*, by feeding only mealworms, nearly brought complete disaster to their young in the nest. The Great Greys in 1970 did their utmost to repeat this performance with their successive broods and only an almost round-the-clock vigilance in order to proffer alternative food at appropriate moments prevented them from doing so. Small locusts—one of the most suitable and natural foods—they ignored for the first two broods, adult ones being rather reluctantly accepted if we impaled them on one of their two favourite thorns in the aviary. Ox heart was similarly left alone, as were maggots. (In view of previous experience blowfly pupae were withdrawn.)

Fortunately we had managed to coincide the birth of two litters of ten and twelve white mice with the hatch of the young shrikes, and I have little doubt that they were largely responsible for the small measure of eventual success. One at a time they were placed alive in a food dish, and the male seized and impaled them and he and his mate tore off small pieces of flesh to take to the nest. The heads he usually swallowed whole himself. This worked well while the young mice were pink, but when they began to grow white hair the birds would not take them, and only half-heartedly did so when we impaled them. Apart from these, the only food seen to be taken to the nest was mealworms. These were given rolled in a mixture of Vionate and finely-powdered cuttle, sometimes with baby-food added. Most of the food was taken to the nest by the male for the first seven days, then by the female as well, while from nine days onwards the male did little but keep guard. The female preferred to take food to the young from the ground or from one of two favourite spikes on which the male had impaled it. Although she frequently took food from the spikes she seldom impaled it herself, but she was seen to do so occasionally, thus confirming my note (England, 1969) correcting what had been previously written on this point (Beven and England, 1969). On leaving the nest she would go immediately to one of these spikes to see whether food was there, leaving one in little doubt that it is usual for the male to “keep the larder stocked”. (Remains on these spikes



Young Great Grey Shrike three weeks old.



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Great Grey Shrikes five weeks old.

[M. D. England

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showed that he found some food for himself in the aviary—a small vole, a frog and a bumble-bee.) Both sexes were very bold in defence of either eggs or young in the nest, not hesitating actually to attack us when we went near the nest, sometimes quite painfully.

Two of the young survived to fledging, and at this stage one of them was taken for "hand-finishing" in order to ensure that at least one survived. However, the remaining one also survived and must of course have been fed by the parents, although they were rarely seen to do this. He sat about on various perches in the aviary, sometimes on the floor, and eventually had to be removed because he adopted as a roosting place the foundations of the new nest which his mother was by then building a foot above the previous one.

It is interesting that the vocabulary of this young bird which was reared by the parents was quite dissimilar from that of the one reared by us, even though the latter had been with the parents until after fledging. The former made only one noise—a monosyllabic "quirk" which served as a location call—and discontinued this within a short time.

Unlike most other species of shrike, the fledglings' plumage is very similar to that of the adults, the main differences being that the black is less intense, the grey is more silvery, there is some brown on the "shoulders" and secondaries and the white of the breast and flanks has faint brown markings. At five months old adult plumage had been assumed.

So much for the first brood in 1970. Two young were successfully reared, one by the parents and one partly by us.

The greater part of the incubation and rearing of the second brood took place while I was away in Spain. We are very fortunate in having an enthusiastic and helpful neighbour who, although he had no previous experience with softbills, was prepared to tackle our somewhat exacting ones and in fact does so most conscientiously and remarkably well. My wife returned from Spain, some time before me, to find a further brood of five well-feathered young Great Grey Shrikes almost ready to leave the nest. Once again the parents appeared to feed them remarkably seldom and she quite rightly removed one youngster for hand-rearing. However, although perfect in every other respect and beautifully feathered and alert, its legs were deformed. To cut a miserable story short, all five were imperfect, having deformed legs (in three the legs were actually broken while still in the nest) and some degree of polyneuritis. Despite this, she succeeded in keeping them alive until I returned, although unfortunately to no purpose. Three were taken to Dr. Ian Keymer for post-mortem examination.

Within a few days this remarkable female was re-lining the second nest and by 24th June she was incubating her third clutch of eggs—this time only three, but since the male was by now in a heavy moult there seemed little chance of them being fertile. A more than usually careful watch

was kept on her now-familiar intermittent periods on the nest in an attempt to discover exactly how long the incubation period was. It was easy to determine when hatching took place because she always carried the empty egg-shells into the shelter (the previous years she had deposited them in a corner of the flight) but it is extremely difficult to be sure when "serious" incubation begins because of her sporadic sitting during, and for the first few days after, egg-laying. It is not possible to be more precise than to say that on this occasion incubation took not less than 20 days and possibly as long as 22.

The bedraggled male did not feed the female on the nest and took no part whatever in feeding the young. In fact he hindered their development by eating all the choicest items of food. Since incubating female shrikes are usually very dependent on their mates for food there was no great hope of rearing this third brood. The female "did good by stealth" even more unobtrusively than usual, and by the ninth day was sitting listlessly most of the time on a perch near the male. However, she continued to brood on the nest at night and for short periods during the day showing that something in it was alive. On the eleventh day, 26th July, the nest seemed quite deserted so it was decided to investigate. Both parents became wildly alarmed at my approach and I was amazed when, as I reached up to the nest, a lively youngster left it. At least one more was alive in the nest. Since it was raining heavily and the youngster which had flown was obviously too advanced to remain in the nest if replaced, it was taken to my wife, who once more became a successful foster parent. It was subsequently found that there was one more chick and an infertile egg in the nest. One of the parents—almost certainly the female—eventually removed the chick, which was greatly retarded and had a deformed upper mandible, and impaled it on a thorn and ate part of it! The lively one is now seven months old and the female spends much of her time showing that she is anxious to start a *fourth* nest, by begging for food and soliciting the attentions of the unmoved male. This is especially noteworthy because the first brood was successful; shrikes are considered to be usually single-brooded except that they will replace lost eggs or young, sometimes several times.

The young commenced to sing when quite young; one—thought at that time to be a female because it was carrying nesting material at five months old—was singing strongly at 11 weeks. The "song" is remarkably like the chattering warble of a Budgerigar, *Melopsittacus undulatus*, interspersed with raucous notes which are used by the parents as alarm calls, and sometimes continues almost unbroken for long periods. When first put into an aviary by themselves one of the youngsters begged for food from a Rufous-backed Shrike in the next compartment every time that bird approached the dividing wire. One is tempted to wonder whether the broad dark eye-stripe common to both species was what made the young bird think its parent was near.

Both the above species of shrikes relish wasps and seem quite immune to the sting, since they unhesitatingly swallow them whole. But also—indeed *clamator* and *vittatus* as well—suffer much from “sore feet” in captivity, probably further evidence of a dietary deficiency. No actual lesions have ever been seen and one would be inclined to ascribe the trouble to cramp were it not for the immediate withdrawal when the affected foot touches a perch. Neither parents nor young have ever been seen to bathe nor even to drink.

SUMMARY AND DISCUSSION

In 1969 and 1970 Great Grey Shrikes *Lanius excubitor*, bred in an aviary at Neatishead, Norfolk. Nest-building was by the female, sometimes encouraged and accompanied by the male.

In 1970 fourteen eggs were laid in clutches of six, five and three, of which eleven hatched (four, five and two). The four in the first nest were physically perfect and two were reared, one by the parents and one with hand-feeding assistance. Five in the second nest were reared to fledging, though none survived to maturity. Of the two eggs which hatched in the third nest, one produced a perfect youngster which was successfully reared, the other a deformed one which died or was killed by the parents. Thus six of eleven chicks were deformed or diseased, and the result of all this effort by the parent birds—and incidentally by my wife—was only three reared to healthy independence. It is not, of course, known whether the defects arose solely as a result of deficiency in the food received by the young after hatching or was inherent in the embryo, perhaps because the female was deprived of some essential food.

The advice of a number of experts was sought during this frustrating period but it has to be admitted that, although some most interesting suggestions were made, no satisfactory solution has been found to the problem presented by three successive broods from the same parents producing the paradox of (ignoring infertile eggs) 100% healthy, 100% abnormal, and 50% healthy/50% abnormal young respectively. The food given to the parents—and by them to the young—was consistent throughout, with one small exception: on the suggestion of Dr. Ian Keymer the mealworms given to the third brood were fed on white bread rather than bran to increase the chance of calcium being available. This brood also possibly had more small locusts because the parents had started taking them in greater quantity.

An intriguing theory advanced by two dietary experts was that success was related to temperature. The three broods were in the nest during very cold, very hot and moderate weather respectively and there might appear to be a superficial relationship. It is said that calcium metabolism is interfered with in hot conditions, and there seems little doubt that one of the principal troubles of the second—100% afflicted—brood was a

failure to assimilate and utilise calcium. However, this theory seems untenable in the light of the fact that this particular pair of shrikes came from India where the temperature during the breeding season is almost certainly higher than even the hottest days of an English summer. (It must be admitted that it is just possible that they were only winter visitors to India, having migrated from their breeding quarters further north, in which case their calcium metabolism might be adapted to lower temperatures in the breeding season.)

Vitamin or mineral deficiency are obvious possible culprits, especially in the context of previous experience with shrikes of other species. However, all mealworms supplied were liberally sprinkled with Vionate powder and if anything vitamin overdose seems more likely than deficiency, though this idea is not really tenable because on a previous occasion a grossly afflicted Rufous-backed Shrike *Lanius schach* recovered almost completely when given large quantities of Vionate (England, 1970). Apart from the calcium available in the food, finely powdered cuttle was also sprinkled on the mealworms, except for the second brood when I was absent.

It is apparent that there is much to be learnt about the keeping of shrikes in captivity and especially about the rearing of healthy young. I have had five species—*Lanius excubitor*, *L. Schach*, *L. vittatus*, *L. collurio* and *L. clamator*, the first three of which have produced young. Hand-rearing wild youngsters which have had a satisfactory diet since hatching, (or whose parents have had such a diet), is comparatively easy and our only failure in this respect was thirty years ago with a family of young Red-backed Shrikes, which had rickets because we then knew even less about suitable food for them than we do now.

Shrikes are unusual in that, when breeding in captivity, they do not fail to rear their young for the same reasons as other softbills. Many species either desert their young on hatching, or throw them out of the nest, or brood them but refuse to feed them (apparently because the food offered is unsuitable), or desert them because of a too-urgent desire to start a new nest. Not infrequently the male is an obvious murderer. Olive-backed Thrushes will only feed their young on food scattered on the ground and will not do so from dishes, though they still eat from these themselves (Everett, 1959 and personal experience). Shrikes, on the other hand, cannot be accused of not trying. Their failure, when it occurs, is almost certainly the result of our ignorance and not because they have the bad habits of so many other species.

ACKNOWLEDGEMENTS

It is a pleasant duty to record my gratitude to a number of people for help with these birds. To Dr. Ian Keymer, Pathologist to the Zoological Society of London, for many painstaking post-mortem examinations,

to Prof. J. O. L. King, Professor of Animal Husbandry, University of Liverpool Veterinary School, and to Mr. John Dall of the Animal Health Trust for much helpful advice about diet; to Dr. Geoffrey Beven for innumerable stimulating discussions on the behaviour of shrikes and especially on their use of spikes and other means of holding and storing food. Most of all to my wife for so carefully tending the birds during my frequent absences and for much devoted hand-rearing.

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BREEDING OF A HYBRID OF THE INDIAN ZOSTEROPS AND JAPANESE ZOSTEROPS

By A. J. CLARE (Oxford, England)

Early in 1970 I purchased two Zosterops of different species from a gentleman who was selling-up. He did not know the sexes of the birds, which differed in colour. I knew one to be an Indian Zosterops, *Zosterops palpebrosa*, but the other was unknown and I subsequently identified it as a Japanese Zosterops, *Z. japonica*, which occurs from Japan to Thailand and the Philippines. The latter lacked any yellow on breast and belly and was darker green above.

When I received them I placed them in a large planted aviary some 20 ft. square.

This aviary was also occupied by some 60 small seed-eaters, various Waxbills, Twinspots, Manakins, Black-eared Finch-larks, Quail, Pytilia's, etc.

Within a month of having these birds, they built a nest made of hair, string, grasses, etc., in a dark green privet bush. Two eggs were laid and incubated for eight days. Both these eggs then disappeared and were never found. A fortnight then went by and they again laid two eggs in the nest. These were sat upon for nine days then to my dismay both the eggs and the nest disappeared completely. I should like to add that both Zosterops took their turns in sitting on the eggs. I did wonder whether I had two hens.

However, on the Sunday, July 12th, I had visitors in the afternoon and being a nice sunny day we all sat in the garden looking at the birds. Both Zosterops started to carry nesting material in their beaks and started to build another nest; this was almost complete that evening, and it was, in fact, finished by Monday mid-day. The birds again started to sit, and on looking in Monday evening I discovered the first egg, pale-blueish in colour. On discovering this I was again very pleased but was worried a little by the other inmates flying about, as they did in fact go into this bush; also at this time it started to drizzle with rain. As the nest made was this time a very flimsily-built affair I decided to put a sheet of plastic over the branches which held the nest. I held this in place with elastic bands. This would keep the rain off but would the birds take to being shut in like this? I had noticed that the Zosterops had a habit of always going to the bottom branches of the bushes and climbing from them to the top ones, and then sitting in the nest. However, within the hour both birds came back to the bush and being very inquisitive birds they did to my relief climb up to the nest and take possession again.

As the days went by I did notice the other birds in the aviary kept well clear of the bush. I think the plastic sheet, approximately 2 ft. square, frightened them from it.

However, on the 27th July I noticed both birds coming off the nest in turn and taking small flies back to the nest. I went into the aviary and looked inside the nest to discover one chick. I then left the aviary. As the days went by the parents were very busy feeding maggots, flies, etc. to the chick.

The parents both took it in turns to sit on the chick and as the days went by, the parent birds gradually were showing more of themselves above the top of the nest and therefore I knew the chick was getting bigger every day.

On the 7th August the chick left the nest and the parents made a great fuss, chasing all other inmates away from it.

The chick was, when fully feathered, a light version of the colouring of the parent, minus the white eye rings.

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BREEDING MRS. WILSON'S TANAGERS AND
PURPLE-THROATED EUPHONIAS

By JOHAN INGELS (Destelbergen, Belgium)

Since 1968 I have had a fine pair of Mrs. Wilson's Tanagers *Tangara nigrocincta fanny* living in a mixed collection of tanagers, which is housed in a greenhouse 20 ft. × 10 ft. × 8 ft. high, planted with tropical vegetation. This greenhouse is connected with an outdoor flight 20 ft. × 20 ft. × 10 ft. high, densely overgrown with shrubs and small trees. During summer the birds have access to both parts of the aviary, and during winter they are confined to the greenhouse, which is heated electrically to about 55°F.

During August 1969, the Mrs. Wilson's Tanagers failed to rear one young from a clutch of two eggs. The nest was built in an open nest-box, and made entirely of dried grass, roots and dead leaves. The young bird was six days old when it died from an intestinal inflammation.

This spring, at the end of April, the Mrs. Wilson's Tanagers were shut in the outdoor aviary together with a pair of Purple-throated Euphonias *Euphonia chlorotica*. The remaining part of the bird collection was kept in the greenhouse.

On 10th May, they started to make a nest in a large bush of *Taxus*. The flimsy nest was built with dried vegetable material by the female bird, although the male helped her by bringing material to the nesting site. Two eggs were laid on 13th and 14th May, the ground colour being greyish-white with brown-grey spots. The eggs were incubated by the female bird only, and the male only fed a mealworm to his sitting mate a few times a day. Normally the female left her eggs about once an hour for a short feeding. During these takings of food, the male bird always accompanied her. He kept all the time in touch with his mate by calling, until she was back on the nest again. The brooding bird was rather shy, and left the nest at very little provocation.

After an incubation period of 14 days, the eggs hatched on 28th May. The two young, covered with long dark down, were fed by both parents, though mainly by the female bird. During the first ten days only live food such as mealworms, mealworm pupae, ant pupae and a large amount of insects, caught by the parent birds in the shrubbery, were fed to the young. Only newly-sloughed (white) mealworms and mealworm pupae, sometimes moistened with vitamins or terramycin to prevent any internal inflammation, were supplied at intervals. The parents gathered billfulls of insectivorous food and passed it to the young while sitting on the rim of the nest. After feeding, the parents cleaned the nest by swallowing the youngsters' droppings.

At the age of five days the youngsters' feathers started to grow and after 10 days the young were about fully feathered and the female did no longer cover them during night. After 13 days the two young were able

to sit on the rim of the nest, and the next day they left it. At that moment the first feathers of both fledglings were fully developed, except for their short tail, and they could fly quite well. They usually sat in the shrubs and were fed by the parent birds with live food, some fruit, and soaked bread sweetened with honey; although the male took part only to a small extent in feeding the young birds. The fledglings were found on sight by the parents, and once the adult birds were nearby the young faintly called in plaintive voices to beg for food. A few days after the young birds left the nest their tails started to grow, and when about four weeks' old they were fully feathered and about the same size as the adult birds. The fledglings never returned to their nest after leaving it, and they slept at well-screened sites in the shrubs. Both did well, although they had to withstand some cold nights (50°F).

At the age of four weeks the juveniles became independent, eating mainly fruit, especially bananas, cherries, mealworms and soft food. Nectar was also appreciated. The juvenile feathering of the young has a dull dark colour with a green tinge and the brighter parts of the adult birds are replaced by bluish-green ones.

When the fledglings of the first brood were five days out of the nest I observed the parent birds mating early in the morning. During the courtship display both birds were sitting next to each other on the same perch, and with their head and tail stretched slightly upward they made deep bows forward, alternating with loud calls emitted in upright position. After a few minutes mating occurred.

The female bird immediately started to repair the old nest, and on 17th June I found two eggs in it. Incubation at once started but the female left the nest at regular times to feed the young from the first brood. Both eggs were fertile and the chicks hatched on 30th June. The young of this second brood were fed regularly by both parents, and after a nestling period of two weeks the young birds left the nest and were independent about two weeks later. During the rearing of the second brood, no squabbling occurred between the parent birds and the juveniles of the first nest. The adult birds also tolerated the presence of the pair of Purple-throated Euphonias.

A third mating occurred before the young of the second nest were fully independent, and a clutch of two eggs was laid in the relined nest on 17th and 18th July. After a fortnight (on 1st August), eggshells were found in the aviary. The two chicks of the third brood were properly fed until the female bird started to moult on the fifth day after hatching. She lost interest in feeding the young, and as the male no longer helped her both youngsters died within two days.

After three clutches which resulted in four young Mrs. Wilson's Tanagers, I removed the nest to prevent any more nesting attempts. At the time of writing, the young of both nests are moulting and the brighter adult markings slowly appear through the juvenile feathering.

Together with the pair of Tanagers, I confined a pair of Purple-throated Euphonias, *Euphonia chlorotica*, to the outdoor aviary. In 1969 these birds had a first clutch of four eggs, which were infertile, and they failed to rear two young, from a second clutch of three eggs. These two young died from digestive troubles, after they weakened for lack of food because nine days after hatching the parent birds gradually stopped feeding their young.

This year, the pair of Euphonias came into breeding condition early in May, at the same time as the Mrs. Wilson's Tanagers, and the male bird paid much attention to the female bird, starting to feed her frequently. A few days later the male was seen frequenting a nest-box with a half-open front. On 5th May he started to carry billfulls of nesting material, such as dried grass, dead leaves and small pieces of plant roots, into the nest-box, which was completely filled up after a few days. He never used feathers or hair although these materials were available. After finishing the rough construction of the nest he lined the small nest cavity reserved for the eggs with fine dried hay. The female bird rarely helped her mate with the nesting activities. During the building of the nest, short wild pursuits occurred between the male and the female. Suddenly, and without apparent reason, the male flew rather excited towards the female, who fled, persecuted by the male, into the dense undergrowth where copulation took place.

After mating, the male always flew back to a bare perch, where he slowly calmed down, with his wings hanging down, showing their white patches, and his tail pointing down, his tail feathers being spread at intervals, to show the white patches on the outer feathers, which are invisible when the tail is folded. On 16th May the nest was ready, and between 28th May and 1st June, three eggs were laid. These eggs also had a greyish-white ground colour with red-brown and grey spots. The female started incubation immediately, and was sitting very persistently. She only left the nest for very short feeding periods three or four times a day. But when she was off the nest, the male always became excited and usually inspected the nest content before recovering his calm. During incubation, the male bird was often seen hanging on the aviary wire while singing his soft pretty song. On 16th June after a normal breeding period of about 15 days I found three young in the nest. From the first day the chicks were properly fed with regurgitated food. During the first days after hatching both parents gathered large amounts of food for their young. First the male would go back to the nest, feeding the youngsters while hanging at the front of the nest-box, and his visit was always immediately followed by a visit of the female, who fed the young while sitting in the entrance hole of the nest cavity. After feeding the young turned their back to the entrance and the parents swallowed the droppings in order to clean the nest. The parent birds mainly fed mashed potatoes and soaked bread, both sweetened with honey, fruit, ant pupae,

maggots and mealworm pupae to the young. The last-born young was very weak and it disappeared out of the nest within a week after hatching. When the young were eight and 11 days old, I gave a drop of polyvitamin mixture and a drop of terramycin directly in the gaping beaks, to obviate any vitamin deficiency and to prevent any intestinal troubles.

On 30th June, after a fortnight, both young were well-feathered, and on 7th July, after a nestling period of 21 days, a first young left the nest; and two days later the second one followed. Both young were poor fliers, because their tail and flight feathers were not yet fully developed, and most of the time they were hidden in the dense vegetation.

After leaving the nest the young never returned to it. The fledglings were now fed by the male only. The female bird no longer took care of the young, and on 22nd July I found a new clutch of three eggs in the relined nest, and two young hatched on 7th August after a breeding period of 16 days; but as the male bird was still busy feeding the young of the first brood who were clamouring for food nearly all day, and as the female had lost interest in rearing her young, both chicks starved.

In the meantime the flight and tail feathers of the young birds slowly developed and they learned to fly properly. They followed the male bird through the shrubbery and begged for food with loud chirping calls and shivering wings.

A month after leaving the nest, the young were self-supporting; taking mainly bananas, pears, grapes, soaked bread and ant pupae. I assume that one of the young is a female since it has the same colouring as the adult female, and the other, a male, has much the same colours except for a dark tail and black flights. This young male is in immaculate condition and is moulting now, the yellow colour on the head already appearing through the juvenile feathering. On sunny days, he is studying the male's song, hidden in the shrubs, and I have already heard his typical call of a male Purple-throated Euphonia.

At the time of writing, I have given all the young and the adult birds, together with the other part of my tanager collection, the run of the outdoor flight and the greenhouse. They all live together amicably although sometimes I have seen short quarrels about food or roosting sites between the young birds and adult tanagers of other species.

* * *

ATTEMPTED HYBRIDISING OF SCARLET-CHESTED SUNBIRD AND KIRK'S BLACK SUNBIRD

By BRYAN E. REED (Wednesbury, Staffs., England)

The following notes are an attempt to record an interesting nesting that took place in our aviary during 1969.

A Kirk's hen (*Chalcomitra amethystina kirkii*) that is one of a trio of two hens and a cock we received from Portuguese East Africa in 1961, was put in a 3 ft. cube flight to attempt breeding. This hen however is rather a bully, and although she agrees perfectly well in a show cage with her mate, she will knock him about badly in a flight. (The other hen is frightened to death of the cock.)

However, after again trying several times in 1969 to get them to agree and being unsuccessful, we transferred her to another flight on the 1st June 1969. She built a nest, but again would have nothing to do with her own cock. We soon noticed she was calling to the cock of our mating pair of Scarlet Chested Sunbirds (*C. senegalensis*) in the next flight from which we bred two youngsters. (See AVICULTURAL MAGAZINE, Vol. 75, No. 7, 1969.)

He was introduced to her on the 29th June 1969, and she immediately invited him to copulate, which he did twice. Within the space of ten minutes however, we had to remove him as she began knocking him about.

I believe she laid on the 2nd July 1969, and she sat tightly until 21st July, when she broke the infertile egg up in disgust. (Colour of egg buff, slate blotches at larger end, estimated size 18 mm × 12 mm.)

This year 1970 we have not had much time due to business pressures, so have not attempted to breed any Sunbirds, although several were ready. However, who knows perhaps 1971 may see a Hybrid Sunbird.

* * *

REARING WADING BIRDS IN CAPTIVITY

By J. D. GOSS-CUSTARD, P. WILKINS

(Department of Psychology, University of Bristol, England)

and JANET KEAR

(Wildfowl Trust, Slimbridge, Glos., England)

Apart from Bruning's (1969) article on rearing ruff *Philomachus pugnax*, there has been rather little published on techniques for rearing waders in captivity. This article summarises our combined experience of rearing a number of redshanks *Tringa totanus*, curlew *Numenius arquata* and lapwing *Vanellus vanellus*. The small number of curlew and lapwing eggs was taken from nests threatened with destruction. The much larger number of redshank eggs were collected to provide tame birds for experiments on feeding behaviour (Goss-Custard, 1970).

INCUBATION

Whenever possible, eggs were collected during the initial stages of incubation since it was thought that they would then be most able to survive being moved. Hatchability was high as long as the eggs were incubated at a temperature of 101–102°F: all the 50 redshank, six curlew and six lapwing eggs hatched. As with hens eggs, the eggs are extremely sensitive to high temperatures and sustained exposure to 105°F, for example, kills them.

REARING

Within 24 hours of hatching all but four (brood A) of the redshank chicks were put into individual plastic cages measuring 16 ins. × 10 ins. by 9 ins. high. These were lined with expanded polystyrene sheets for warmth. A 100 watt infra-red heater was suspended 14 ins. above the floor at one end and a small amount of cotton wool was placed beneath, again for additional warmth. Brood A and all the curlew and lapwing were reared for the first two weeks in a large cage which had two suspended heating lamps and two cloth-wrapped hot-water bottles spread about. Providing only one heating source proved inadvisable in a large cage because the young chicks would sometimes wander away from the lamp, become cold and die.

The chicks quickly discovered for themselves what could be eaten and often swallowed novel food items within an hour of first being presented with them. They were fed during the first few days on minced eel and small pieces of boiled maggots, boiled egg, mealworm, meat and fish put in a petri-dish filled with water. Giving greasy meat was avoided since single birds would preen the oil into their feathers and birds in groups

splashed each other with the greasy water. This led to a loss of insulation and eventually to death. The chicks readily took live food: water fleas, greenflies* (especially for lapwings), moths, caterpillars, flies, larval locusts, woodlice and small chopped earthworms were all popular. Duckweed floating on water and turkey starter scattered over the floor were both taken readily. Clean water was provided for drinking.

The individually reared redshank chicks were removed from their boxes after about six days and transferred to a large cage measuring 9 ft. × 7 ft. × 8 ft. high where they were kept thereafter. The floor was covered with peat and/or sand and no foot disorders developed although after several months the redshanks' toe-nails needed cutting. The curlew, lapwing and redshank brood A were transferred from their initial cage at two weeks to a small room measuring 7 ft. × 7 ft. The floor was covered with newspaper which was added to daily: again no foot troubles developed.

All the birds were provided with large dishes of water in which they could bathe. Heating lamps were also provided for several weeks but by the age of about four weeks the birds rarely used them except for drying themselves after bathing.

The curlew, lapwing and brood A of the redshank were fed mainly on turkey starter and minced eel which had Bemax scattered over it. The food was changed twice daily. The remaining redshank were also given turkey starter along with small pieces of liver, heart or fish in water, boiled maggots and live mealworms. Some live food was given when it was available. A commercial vitamin additive for cage birds ("Trace") was also scattered on the food from time to time.

We found that if the precautions we have noted were taken it was rare to lose birds except through accident. A small number of redshank developed slight irregularities of the bill after a few months but these did not appear to impede their feeding. Up to ten redshank have now been kept together in a large cage for up to two years and seem to be in generally excellent condition. The plumage is good although the legs are very pale. Canthaxanthin added to the food improves the leg colour somewhat but so far has not proved possible to produce the same vivid orange/red legs characteristic of wild birds. Occasionally an individual has deteriorated in condition over a period of months with the plumage losing its lustre and indeed patches of bare skin showing through. This probably results from social stress since isolation leads to a gradual and complete recovery.

Redshank become quite tame if exposed frequently to people: some of the birds will take food from the hand. It may be particularly important if tame birds are required to expose the young chicks to people as early and as much as possible. Desultory attempts to imprint two-day-old

* These are readily collected by shaking infested vegetation, e.g. nettles etc., in a large polythene bag.

redshank on a person failed when the chicks refused to follow the experimenter; the chicks may not even follow their parents in the wild. Curlew seem similarly difficult to "imprint".

AGE OF FLEDGING AND GROWTH RATES

Detailed records of fledging dates and growth rates were kept for a brood of four redshanks and all the curlew and lapwing. The first redshank flew at 20 days, the first lapwing at 29 days and the first curlew at 32 days. The birds were weighed at weekly intervals for the first five weeks only: thereafter weighing was stopped because the birds became very nervous when handled.

Table I. Average weight in grammes of waders reared in captivity.

Age	4 redshank (brood A)		6 curlew		6 lapwing	
	Actual	Relative	Actual	Relative	Actual	Relative
Hatching	15.5	1.00	53	1.00	16.5	1.00
1 week	27.5	1.77	94	1.77	30	1.82
2 weeks	60	3.87	215	4.06	72	4.36
3 weeks	97	6.26	345	6.51	125	7.56
4 weeks	105	6.77	415	7.83	150	9.09
5 weeks	115	7.42	470	8.87	160	9.70

Table I shows both the actual weights up to five weeks of age and the relative increases obtained after adjusting all the hatching weights to 1.00. These relative weight indices are also plotted in Fig. 1. Initially, the rate of increase in all these waders was similar, but by two weeks of age they were diverging, the lapwings showing a steeper climb than the curlews and redshanks. After very early fledging, the redshank's growth curve flattened somewhat. At five weeks, the lapwings had increased their weight nearly tenfold, the curlew nearly ninefold and the redshank over sevenfold.

Figure 1 also shows the growth curve of three ruff and one reeve reared at the New York Zoo (Bruning 1969). The weight of these birds was taken from two days of age, so the hatching weight has had to be calculated. A figure of 15 g matches both the sort of gains expected of lapwing and redshank in the first two days and the relative egg size—reeves laying slightly smaller eggs than redshanks which in turn produce smaller eggs than lapwings (Witherby *et al.* 1940). The ruffs and reeve have been treated separately because, unlike the other three waders, there is a marked sexual dimorphism in size in *Philomachus pugnax*. The growth curves of both are markedly steeper than those of the other wader species. At only four weeks, the ruffs had increased their weight over 11-fold to 169 g and the reeve nearly tenfold to 149 g. Of course, these differences between

species may merely be due to the small sizes of the samples or to a differing reaction to captivity. On the other hand, the results may point to real species differences in growth potential which reflect differences in the average abundance of the food supply available to the species in the wild.

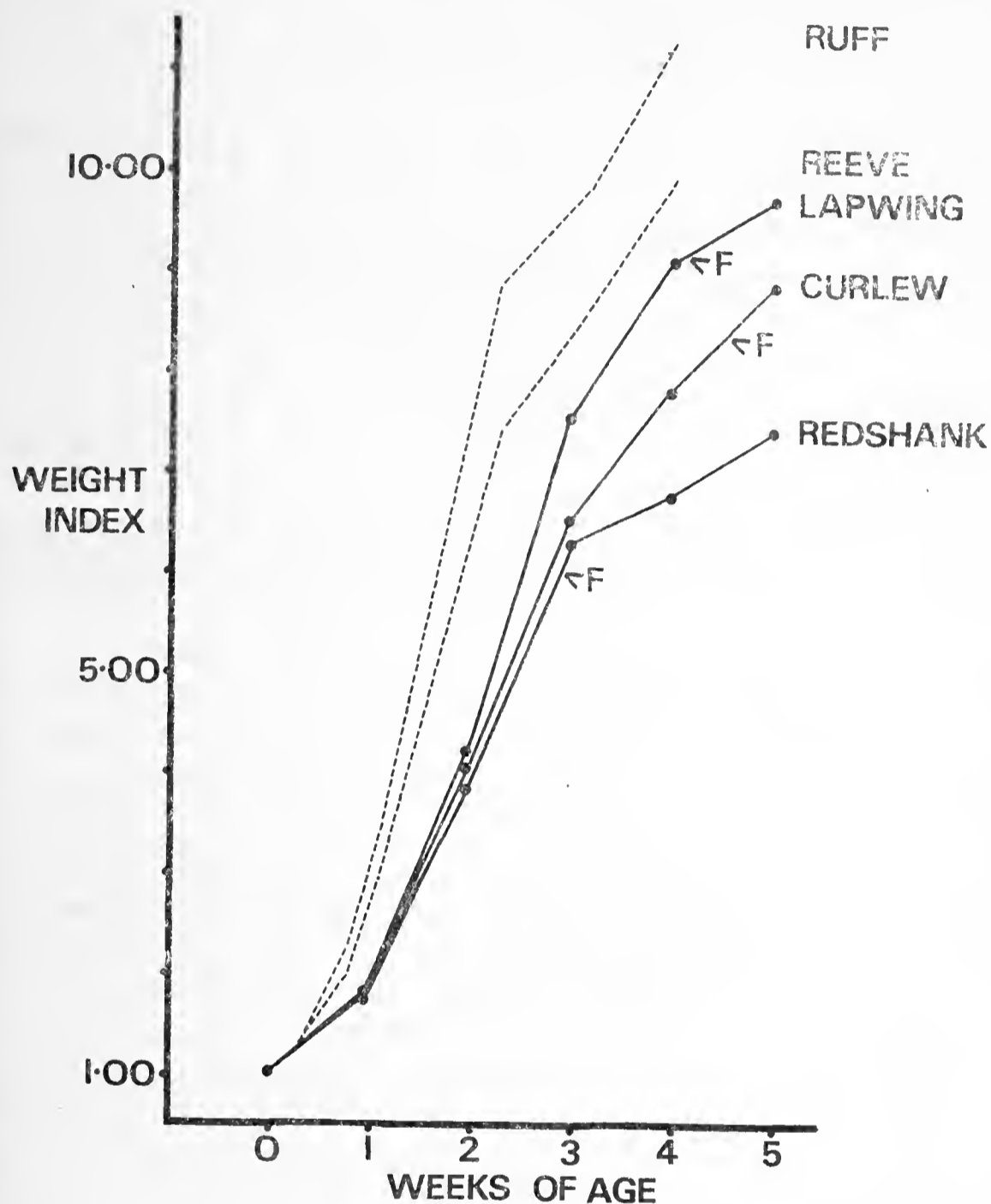


Fig. 1. Relative growth of captive waders plotted against age. F=first flights. Ruff and reeve figures after Bruning (1969).

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THE BREEDING MEXICAN GREEN JAY AT THE JERSEY ZOOLOGICAL PARK

(*Cyanocorax yncas*)

By D. G. ROLES

Ranging South from Texas to Peru, Green Jays are quite commonly found in suitable areas in the wild. These small Jays are just under 10 in. long and beautifully coloured with grass-green upperparts, lighter underneath, black bib, bill and legs, skyblue crown, nape and facial stripe and pale yellow outer tail feathers. Our female Jay is of a lighter shade of green altogether than the male and has a smaller bib.

Our original pair were brought from Mexico in March 1968, the female dying just over a year later. At no time did they try to go to nest, though they displayed frequently and appeared to be quite amicable.

A replacement female arrived in September 1969 and after initial quarantining was placed with the male. On her release into the flight the female immediately launched into display, bobbing up and down on a branch with her feathers fluffed out, producing a dry rattling sound. She broke off, beat the perch with her bill and gave the typical scolding alarm call. She has since gone through the entire performance whenever she sees someone she recognises, the male just gives a quiet chirrup and carries on.

All went well and on the 16th November the male was observed courting the female. With head and upper breast feathers sleeked and lower breast and belly feathers fluffed out to form a "skirt", he swayed up and down a couple of inches from the unmoving female, whistling, chirping and mimicking his neighbours in a very quiet love song.

On occasions one bird would appear to invite preening by sidling to within an inch of the other, then freezing and slowly erecting the head and crest feathers, the nape feathers rising first, then layer by layer all the head feathers would stand on end. Frequently the birds would assume this posture simultaneously and would wait half a minute or so before "coming to".

At other times both birds would bob up and down with "skirts" spread, giving vent to a weird variety of loud, rattling, bubbling sounds.

On 1st April 1970, the birds were transferred from their flight in the Tropical Bird House to a large outside aviary containing four Golden Pheasants (*Crysolophus pictus*). The Jays quickly settled down and were soon seen to be going through their display rituals. On the 7th May a large oval wire basket stuffed with hay was fixed up under shelter in the flight. The Jays, overcoming their initial wariness, made a thorough inspection and then appeared to ignore it. However, eight days later on the 15th May two eggs were felt in the nest, a third following on the



Mexican Jays (*Cyanocorax yncas*) 12 days old, born 2 June, 1970



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[J. J. C. Mallinson

Mexican Jay (*Cyanocorax yncas*) 22 days old, born 2 June, 1970



16th and a fourth egg after that. The eggs were of very similar appearance to those of a Blackbird (*Turdus merula*) and were brooded by the female only for 17 days, the first egg hatching on 1st June 1970, the remainder hatching the day after on 2nd June.

The parents became increasingly aggressive and bounced off my head pecking hard in passing during the daily servicing of their aviary, and they had no hesitation about attacking the pheasants, should they try to roost in the vicinity of the nest.

Being omnivorous birds, the Jays have received daily a little of all available food, favouring insects and berries. When the chicks hatched they received in addition to their usual mixture, a constant supply of gentles and mealworms drenched in multivitamin solution, and ten new-born mice four times a day—the size of the mice increasing with the size of the chicks.

On hatching the chicks were very dark skinned and quite naked. They were brooded very closely by the female, and both male and female took part in the rearing. The male behaved very well, actually pushing the female up off the chicks with his head, in order to feed them. All food for the chicks was held in the foot, then pulled to pieces and held in the pouch until it was passed on. The male was also seen to feed the female on the nest, both before and after the chicks hatched.

The chicks grew very rapidly and at twelve days old their pin feathers were starting to open.

At nineteen days old the chicks left the nest, prematurely it seemed, as not one could fly, but all hopped very strongly over the ground and from branch to branch. The colouring of the chicks was more blue than that of the parents making them quite dull. If the chicks were worried by the approach of a pheasant (which ignored them) they had only to squawk for the parents to come and dive bomb the pheasant into retreat.

All went smoothly until June 22nd when the smallest chick was removed from the aviary, as it had suffered a slipped claw and had difficulty in moving about. Unfortunately three days later the chick died. On the 29th June and 4th July we lost two other chicks. These were sent for a post mortem examination but due to partial decomposition no conclusive results could be obtained.

This left us with one chick which, I am happy to say, has survived. This was the first hatched specimen and has always been a little bit bigger and stronger than its nest mates. On the 4th July it was seen eating by itself and on 13th July it was removed from its parents' aviary, as they had been observed to mate and displayed frequently. No more eggs were laid however and at the end of July the female started to moult.

The chick started to moult at the end of August and is now in fine adult feather.

As described above the Mexican Green Jay *Cyanocorax yncas*, has been

bred at the Jersey Zoological Park. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

NEAR MISSES WITH VAN HASSELT'S SUNBIRDS

By BRYAN E. REED (Wednesbury, Staffs., England)

This article relates to two near misses that my partner Albert Holmes and myself had in attempting to breed van Hasselts Sunbirds (*Nectarinia sperata*) in 1968 and 1969.

Our stock book records that the cock was purchased on 18th June 1966 and after a long search we obtained a hen on 28th October 1967.

They were placed together to attempt breeding on 13th April 1968. A month later on the evening of 15th May 1968 after playing with the nesting material for a few days, the hen commenced to build in a finch nest-basket. (The cock did not help, but only played with the material.) The nest was finished on 20th May and she was seen tidying up the loose strands on the 23rd. She was first noticed sitting on 24th May. She would leave the nest to feed immediately fresh nectar was put on the flight, but after taking her fill she would go back at once. Two eggs were laid, possibly on 22nd and 24th.

The hen became very aggressive on 30th May and began chasing the cock about. We were forced to remove him to an adjoining flight on 1st June as the hen was attempting to kill him.

On 7th June at about 3 p.m. we heard a slight cheeping and the two halves of the egg were found on the floor about 5.45 p.m. She was given a few small spiders and she fed the youngster by hanging on the outside of the nest in the typical sunbird fashion.

The two halves of the remaining egg were found on the floor on 8th June at 9.30 a.m. The food taken was small spiders and fruit flies.

At about 7.30 p.m. on 20th June the hen seemed very restless and one youngster was found dead well away from the nest on the 11th at 7.30 a.m., the other youngster was found dead in the nest on the 12th at 5.15 p.m. (It was calling for food all day but she would not feed it, she only wanted to sit on it and keep it warm.) The hen deserted the nest at about 3 p.m., 12th June.

An infertile egg was found on the floor at 9 a.m. on 22nd June and the cock was introduced to her again on 23rd. Another infertile egg was found at 12 noon on the 23rd. She repaired the nest, but there were no further developments and they commenced moulting about a month later.

They were placed in the flight to attempt breeding again in late April 1969. (The same flight as in 1968, i.e. a 3 ft. cube.) The nest was started on 22nd May 1969 and finished on 27th May. As previously she only built when the sun was shining. Eggs believed laid on 29th and 31st May. (Colour of two eggs: brownish fawn with a zone at the large end of greyish brown. Slight fleckings of brown and grey. The two areas are separated by a darkish brown band about $\frac{1}{16}$ in. wide, size: 14 mm. \times 10 mm. The other eggs are as follows: pinkish fawn with a zone at the larger end of darkish brown fleckings which merge together. Small grey and brown flecks over the rest of the egg. Size, 13 mm. \times 9 mm. All eggs including remains of shells slightly different in colour.)

The hen then completely dashed our hopes by dying at 7.30 p.m. on 31st May 1969. I went down the aviary at about 6 p.m. and she looked very fit and was jumping about. At 7 p.m. when I again visited the aviary she was breathing very heavily with her eyes closed. She got steadily worse (despite hospital cage treatment) and died in my hand at 7.30 p.m. (A post mortem report revealed nothing.)

Since the above date we have been trying unsuccessfully to obtain another hen, but up to now we have not been successful. If any member could supply us with one, we would be very grateful.

* * *

MR. ED. FITZSIMMONS' COLLECTION OF PHEASANTS

By JEAN DELACOUR (Clères, France)

Mr. Fitzsimmons has gathered a magnificent collection of Pheasants at Livermore in Northern California. It is supervised by Mr. Vern Denton, who owns the ranch on which the numerous and very well built aviaries stand.

Rare species only are kept there, with exception of pure, recently imported stock of Golden and Amherst's Pheasants. Many Ocellated Turkeys, different Junglefowls, Mikados and Ijima's have been reared, for example. There are several pairs of many desirable birds, including Malay, Bornean Argus, arrived lately, and a most remarkable collection of Peacock-Pheasants: all the species are represented, including a pair of Rothschild's (*P. inopinatum*) and 1-3 Bornean (*P. m. schleiermacheri*), both extremely rare, and never before seen in captivity. The Rothschild's have reared one young bird this year. All the tropical Pheasants, including Green Java Junglefowls do exceedingly well at Livermore, which, being inland, has a dry, hot summer, but Tragopans are not much inclined to breed in such a climate and would no doubt be under better conditions along the coast, where the climate is cooler and moister.

DIFFICULTIES IN VERIFYING
AVIARY-BREEDINGS OF NATIVE SPECIES

By C. J. O. HARRISON (Perivale, Middlesex, England)

I would begin by defining an aviary-breeding as one in which two birds, being kept under captive conditions, pair, build, lay, incubate, hatch their own young, and successfully rear them.

The verification of a claim to have bred birds of a particular species under aviary conditions raises a number of problems. The question of verification does not normally arise where foreign bird breedings are concerned, but in the case of native birds it might be possible to practise some deception when eggs and young of the species concerned are available in the wilds within the same region.

It may be asked why one should assume that deception might occur. I can only reply that it has been done in the past for relatively trivial reasons, and that at present and for the next few years, there could be a fairly strong incentive for doing this. Proposals have been made, and are still under consideration, for a possible agreement on a limitation on the range of native species entered for shows to those which are regularly bred in captivity. Showing involves both monetary gain and status-seeking of a kind, and there may be strong incentives to producing a long list of species which are claimed to have been bred regularly, in order to use them for this purpose. Deception has occurred in the past and there is no reason to suppose it will not occur again. One of the most objectionable features is that honest men can be, and have been, unwittingly used for verifying some deceptions as true breedings, because they are unaware of how these may be contrived. It therefore seems an appropriate time to review the way in which apparent aviary-breedings can be so contrived, in order that such people are aware of the problems involved.

Opportunity seems to present itself least with the seed-eating birds. If a hen is seen sitting on a clutch of eggs of her own species, and later seen feeding a nest of young, the only possible interference would be that where a clutch of fertile eggs from elsewhere might be substituted for infertile ones, or young birds switched for some reason. In the past additional close-ringed young of such species were obtained by hand-rearing wild young or by close-ringing young in a wild nest and taking them when they were older. The fact that nests of young so ringed are occasionally encountered by those ringing wild birds for migration studies indicates that the latter method still persists to some extent.

This problem of verification is much greater in the case of insectivorous species, including all small softbills, and similar types of birds, and also such non-passerine species as woodpeckers. Once the young are hatched and growing the parents of these species seem to build up a very strong feeding drive. This fact was known and used by old-time bird keepers.

If the nestful of young are taken and one or both parents trapped, and if these are then placed in an aviary and well-supplied with food, the parents will continue to feed the young and rear them.

THIS MEANS THAT THE SIGHT OF ADULTS OF THESE SPECIES FEEDING YOUNG IN OR OUT OF THE NEST IN AN AVIARY IS NOT PROOF OF AN AVIARY BREEDING.

Such nestings are therefore very difficult to verify. Theoretically it should be enough to see first the pair, then later the eggs, and then the adults feeding young; but this is not so. The necessary steps would appear to be firstly to have a pair recognisably marked in a way that is not easily transferred to another bird, next to verify that the hen of that pair is incubating eggs, and then to witness the hatching and first feeding stage in the rearing of the young; since as far as we know the taking of young and adults of these species from the wild is not successful for this method in the first day or two after hatching. This would probably limit any deception to switching of eggs or young in an actual breeding as in the case of seed-eaters.

I understand from those interested in birds of prey that things are even more complex with these. The females of such species will at times go broody and accept a substitute nest and eggs, and incubate and rear. There are records of such birds incubating and hatching domestic hens' eggs, and one good record of a female Common Buzzard that hatched and reared a cockerel! To verify that a full and authentic breeding has occurred is again extremely difficult.

When breeding is attested to by someone it is obviously preferable that it should be someone with a knowledge of the ornithological background, but not in a position to be influenced by ties of friendship, hope of gain, or a belief in the need for a long list of breedings.

I am well aware that interference at critical periods may affect the success of nesting, and that because of this some people are not prepared to allow too much inspection of nesting birds; and that some may have difficulty in arranging independent verification. I can only suggest that such people may have to be content with the satisfaction of their own knowledge of achievement, and the pleasure and information gained from it; and that such breedings should be omitted from data on the range and total of species bred.

In concluding I would repeat a comment which I appended to a list of published accounts of aviary-breedings of European birds in Britain; namely that in view of the deceptions which have been practised at times the ultimate criterion in accepting a claim is the integrity of the breeder concerned. Cynics may like to know that since publishing that comment I have found that there is reason to believe that one breeding which I wholly accepted at the time may have been a deception; but that doesn't affect the validity of the comment.

IMPRINTING, OR OTHERWISE, IN SOME CROSS-FOSTERED RED-CHEEKED AND BLUE-HEADED CORDON-BLEUS

(*Uraeginthus bengalus* and *U. cyanocephalus*)

By DEREK GOODWIN (London, England)

It has long been known that birds of many species, if reared by other species, *often, usually*, or in some species, *always*, show their later sexual responses *partly, mainly* or, in many cases, *entirely* towards the species that stood in *loco parentis* to them. This often in spite of indifference or even hostility from the creatures they eagerly court and sexual advances from potential mates of their own species which they ignore.

It was assumed that such imprinting implied that there was no innate recognition of the bird's own species (as there obviously was in such species as cuckoos and whydahs) but Schutz's very detailed and comprehensive studies of imprinting in the Mallard and some other birds have shown that there almost certainly is some innate species recognition, since ducklings hatched and reared in complete isolation respond to their *own* species on first seeing them in a "choice situation", but that it can be overlaid or obliterated by "imprinting" on foster parents of another species. Schutz's experiments also showed that, at least in the Mallard and some other species, there were individual differences in the degree to which different individuals became imprinted and that, whereas male Mallards imprint on their foster mother's kind (provided she is not too unlike a duck!) female Mallards have an entirely innate response to the male and "choose right" no matter what they have been reared by. In ducks in which the sexes are alike, however, both sexes imprint.

Immelmann's (1969, 1970) experiments have shown that three commonly kept estrildines, the Zebra Finch, Bengalese Finch and African Silverbill, when cross-fostered, also imprint firmly on the foster parent's species and will ignore their own in choice situations.

Here I propose to describe the results of cross-fostering between Red-cheeked Blue Waxbills or Cordon-bleus, *Uraeginthus bengalus* and Blue-headed Waxbills or Blue-capped Cordon-bleus, *Uraeginthus cyanocephalus*. As some of my readers will (I hope) remember, I have for the past several years been keeping these and some other waxbills in a small indoor room. The conditions are not ideal and the room usually rather crowded but the birds nest freely and rear more young than is convenient in most years, if not as many as they would if they were less numerous. I have not made any deliberate cross-fostering experiments, but have sometimes transferred eggs of Blueheads to Cordon-bleus when insect food was in short supply and I had pairs of Cordon-bleus that I knew would give egg food and milksop to the young which the particular

Bluehead pairs involved would not at that time do. Other cross-fosterings have come about through pairs of one species laying in or (more often) taking possession of the nest *and* eggs of another species.

For reasons which I hope to discuss in a future article, adoption of young by other birds often occurs after they have left the nest, so that flying broods are sometimes being fed by as many as five different individuals of three different species.

CASE HISTORIES

(1) Bluehead male "Double Orange" (all birds are named from their colour rings), and his sister "Orange Left" fledged on 1st September 1969 together with one young Cordon-bleu, from a nest in which a pair of Cordon-bleus had incubated. I must confess that it came as a complete surprise to me when I caught the first fledgling to ring it and found it was *cynocephalus* not *bengalus*.

After they had fledged, Double Orange and his sister were adopted by a male and female of their own species and regularly fed by them as well as by their Cordon-bleu foster parents.

Double Orange was first seen to show sexual behaviour on 28th December 1969, when he responded with sexual approach and tail twist to a displaying male Cordon-bleu. Within a few weeks it was evident that he was sexually attracted to both sexes of Cordon-bleus. I was not able to make more than intermittent observations, so that I may well have missed interesting items of behaviour. It is, however, likely that what I saw was a "fair sample".

So far as I observed Double Orange had no preference as to the sex of his prospective partners. He was seen actively to court female Cordon-bleus, deliberately flying to or after them, nesting symbol in bill, and displaying at them much more often than to males; conversely he was more often seen to approach a male displaying with the symbol and greet it sexually. He was also twice seen to attempt to rape a hen Cordon-bleu but was not seen to make such an attempt on a male. These differences were, I think, due to the differing behaviour of the sexes in the Cordon-bleus (males perform the "straw-display" much more frequently than females and tend to be more aggressive and quicker to repulse unwanted sexual attentions) rather than to any difference in Double Orange's feelings or reactions.

By June 1970 he was paired to a male Cordon-bleu "Orange Left". Probably to a Cordon-bleu a Blue-head of either sex does not appear to be a male, as it has no red cheek patches.

(2) Bluehead female "Orange Left". Nest sister of Double Orange, see above for early experiences. Like her brother this bird showed no sexual interest in conspecifics of either sex. She was, however, unlike

her brother, never seen to show interest in female Cordon-bleus but only in males. She responded repeatedly and vainly, to the stem-display of males of *bengalus* but never showed any interest at all when a male Bluehead displayed near or (as happened on at least one occasion) at her. She died, possibly through injuring herself in a night panic, during a period when I was away from home in May 1970.

(3) Bluehead female "Mauve Left". Hatched and reared by Cordon-bleus to whom I had given a clutch of Bluehead eggs. Fledged together with her two sisters "Green Right" and "Green Left" on 18 August 1967. After fledging these young Blueheads were all regularly fed by a male Bluehead as well as by the Cordon-bleu pair that had hatched them.

Reacted sexually only to male Cordon-bleus. By June 1968 she was clearly deeply attached to a particular male Cordon-bleu ("Double Red"), whose attitude towards her varied from indifference to hostility. She showed intense interest in all his nesting activities, in spite of opposition from him and his mate, and fed all their broods of young as soon as they left the nest. I think she would have fed them in the nest as well had their parents been less hostile towards her. She died in November 1970.

(4) Female "Green Left"; sister of "Mauve Left" (*q.v.*) and "Green Right". This hen was also completely imprinted on Cordon-bleus and showed sexual reactions only to males of this species. For a short period in May 1968 she was actively courted by a male of her own species but she was indifferent to him although at the same time herself actively but vainly making advances to males of *bengalus*. She died in December 1969.

(5) Female "Green Right"; sister (same brood as "Green Left" and "Mauve Left"). This bird, unlike her sisters and the other female Bluehead, "Orange Left", similarly reared by Cordon-bleus, showed no sexual reactions to Cordon-bleus but paired with a male of her own species. She is still alive and paired to him. This pair have, however, been very unsuccessful at breeding and, perhaps because of this, "Green Right" has adopted several broods, of both Cordon-bleus and Blueheads, after they have fledged and fed them as regularly as, and sometimes for an even longer period than their own parents have done.

(6) Two female Cordon-bleus, hatched and reared by Blueheads. Fledged on 22nd August 1967. Neither of these showed *any* sexual reactions to Blueheads but responded and paired in a normal manner to males of their own species. During part of the period that these two young Cordon-bleus were out of the nest but still dependent, they were in company with a brood of Blueheads that had been reared by Cordon-bleus. Although their foster father (and a hen Bluehead not paired to him) fed both lots of young, I never saw the Cordon-bleus, that were rearing the young Blueheads, feed these two young of their own species, although I kept a sharp watch for it as I more than half expected them to.

REMARKS

Although the numbers of birds involved are not "statistically significant" some comment and speculation seems justified, partly because when one is dealing with living things the behaviour of individuals, however few, is in itself of interest and partly because the behaviour of even a few individuals in particular circumstances is usually a fair sample of what the reaction of much larger, even "statistically significant", numbers of the same species would be in comparable circumstances.

One cock and three hen Blueheads, that were hatched and reared by Cordon-bleus, became completely imprinted on that species even though they were fed as well by both sexes of their own species after fledging, one hen Bluehead that was so reared proved not to be imprinted. Two explanations, perhaps not mutually exclusive, seem possible. There may (as Schutz found with Male Mallards) be individual differences in the tendency to imprint, or perhaps it might be more correct to say in the tendency of (presumed) innate recognition of its own species to be obliterated by imprinting. On the other hand it is possible that the male Bluehead that fed this brood after fledging may (although I did not see it) perhaps have gone into the nest, or put his head in the entrance and fed this young bird (only) before the stage at which she had got fully imprinted on her foster father *bengalus*. I have recently seen a male Bluehead sneak into a Cordon-bleus' nest to feed young only a week old. I watched a good deal and saw him try to do so at other times but be chased off by the male Cordon-bleu. It is then, not certain that "Green Right" was so clear an exception to the "general rule" as she appeared to be.

In view of the complete and apparently irrevocable imprinting on the foster species in three out of four female Blueheads (and the one male), it is at first surprising that the two female Cordon-bleus fostered by Blueheads showed sexual responses only to their own species. Assuming, which I think is much more likely than not, that they were a fair sample albeit such a small one, the answer may, perhaps, be found in the different types of sexual dichromatism of the males of these two related species. Although his entirely bright blue head and richer brown upperparts (see Goodwin 1962, 1965) make the cock Bluehead very different in appearance from the hen, this difference is one of relative brightness or depth of colours and relative extent of blue on the head. In the Cordon-bleu, however, the crimson cheek patches of the male provide him with a conspicuous badge of his sex, no least nuance of which is possessed by the female. Extrapolating from what is known to be the case with ducks (Schutz 1965), it seems reasonable to suppose that the female Cordon-bleu could more easily have evolved an innate recognition of her mate's appearance or, alternatively, that such innate recognition would be less liable to obliteration by imprinting than would be the case with the Bluehead. The difference between the two species would thus be

comparable to that existing between the female Mallard and the female Chilean Teal. Although I have had no experience with male Cordon-bleus reared by Blueheads, or any other species, I think it is highly likely that, like male Mallards, they *would* imprint. I think this not only from analogy with the findings on ducks but also from the fact that they discriminate very well between females of their own species and the very similarly-coloured female Blueheads. An intriguing piece of behaviour was that on four occasions when I saw a female Bluehead (one of the imprinted ones) deliberately and intensely solicit a male Cordon-bleu (three different Cordon-bleus involved) with the invitation to coition, which is identical in both species, she was fiercely attacked by him. These attacks were violent and the Cordon-bleus showed no signs of sexual arousal, they did not make the "triangular head" as waxbills do in sexual contexts.

Nevertheless, it is difficult to account for the fury of the attacks other than by some frustration and I suspect that, possibly at what would in humans be called a subconscious level, the male Cordon-bleus *were* sexually stimulated by the invitation display and their being inhibited from responding sexually because of the female's "wrong" specific characters caused them to become angry and attack.

RECOGNITION OF YOUNG

It seems worth making a few comments on this subject here as it has been claimed for some estrildines that they will not rear young of other species, that have not the same mouth markings as their own, or, in some cases, will not rear them unless they have no young of their own.

The mouth markings of young *bengalus* and *cianocephalus* are the same or very closely similar (Goodwin 1965). They differ, however, in *cianocephalus* lacking the dark blue tubercles at the gape and they have, (even to my ears whose relative lack of acuity is a standing joke to some of my friends who go in for sound-recording) very different-sounding begging calls, especially after leaving the nest. Yet, as has been shown, both *bengalus* and *cianocephalus* will rear young of the other species; a pair of Cordon-bleus reared a mixed brood, showing no preferences; Cordon-bleus reared a brood of Blueheads and, after they had fledged, discriminated in *their* favour between them and Cordon-bleus of similar age. It might be added that all the fosterers involved either had or did rear young of their own species in former or subsequent broods.

SUMMARY

A male Blue-headed Waxbill, *Uraeginthus cianocephalus*, reared by Red-cheeked Cordon-bleus and fed after fledging both by its foster parents and by a male and a female of its own species reacted sexually in later life to both sexes of *U. bengalus* and not to birds of its own species.

Three females similarly reared responded only to males of *bengalus*. A fourth female, however, paired normally with her own species.

Two female Cordon-blues, *U. bengalus*, that were reared by Blue-headed Waxbills, *U. cyanocephalus*, responded sexually in later life only to males of their own species.

The reason for this apparent difference in imprinting between these two related species is discussed; it may relate to the different types of sexual dichromatism.

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BIRDS AT CLÈRES IN 1970

By JEAN DELACOUR

A large number of birds have nested at Clères in 1970, with variable success. A few species proved particularly prolific: Emus, Maned Geese, Sonneat's Junglefowls and Siamese Firebacks particularly, while others only raised a few young or failed altogether. Here is the list:

Emus, 24; Rheas, 11; Black-necked Swans, 8; Geese: Cereopsis 5; Chinese, 2; Greylag, 2; Lesser Whitefront, 1; Emperor, 3; Snow, 4; White, 2; Blue 1; Cackling, 2; Red-breasted, 2; Black Brants, 5; Néné, 1. Ashy-headed, 10; Ruddy-headed, 4.

Ducks: Fulvous Whistling Duck, 18; Ruddy Shelducks, 5; Cape, 10; Paradise, 8; Radjahs, 2; Patagonian Crested, 9; Old World Combduck, 19; Australian Wood-duck (Maned Geese), 28; Mandarin, 22; Carolina, 12; Brazilian Teal, 5; Puna, 9; Sharp-winged, 1; Cape, 1; Chestnut, 22; Common Teal, 1; Philippine Mallard, 8; Lesser Pacific Grey, 28; Yellow-billed, 5; Laysan, 8; Hawaiian, 9; Gadwall, 4; Chiloe Wigeon, 1; Bahama, 4; Kerguelen Pintail, 3; Red-billed, 1; Common Shoveller, 8; N.Z. Shoveller, 2; Ringed Teal, 2; Red-crested Pochard, 10; Red-head, 2; Baer's, 4; White-eyes, 2; Australian White-eye, 2; Tufted, 2; N.Z. Scaup, 6.

Gamebirds: Green Peafowl, 9; Common, 36; Black-winged, 8; Pied, 5; White, 4; Grey Peacock Pheasant, 7; Golden, 12; Amherst, 11; Verscolor,

12; Swinhoe's, 9; Edwards, 3; Silver, 6; Nepal Kalij, 8; Malay Fireback, 3; Siamese, 26; Red Junglefowl (*G. g. jabouillei*), 26; Sonnerat's, 30; Ceylon, 7; Elliot's, 2; Hume's, 1; Ijima's, 2; Cheer, 1; Monal, 1; Roulroul, 2; Painted quails, 8.

Pigeons and Doves: Wonga, 6; Grey-headed (*G. caniceps*), 1; Bar-tailed (*M. unchall*), 2; Bronze-winged, 2; Green-winged, 4; Maiden, 1; Mourning, 2; Senegal, 4; Turtle, 2; Australian Crested, 1; Bar-shouldered, 4; Peaceful, 8; Diamond, 7; Peruvian Ground, 6; Bare-eyed (*M. ceciliae*), 2; Passerine, 3.

Parrakeets: Cockatiel, 9 (1 white); Turquoise, 6; Bourke's, 4; Quaker, 9; Fischer's Lovebird, 6; Peach-faced, 3.

A few other birds, some rather interesting, have also been reared: Tasmanian Native Hen, 4; Collared Barbet, 1; Superb Spree, 3; Pagoda Starling, 2; White-winged Blue Tanager (*Thraupis episcopus coelestes*) 4; Golden Tanager (*Tanagara anthus aurulenta*), 1; Green Cardinal, 1.

Dr. P. Ciarpaglini will later on publish here accounts of the most interesting cases.

Considering that Clères is now mostly a show place, overrun by numerous visitors, and also the large variety of the species of birds we keep, not to speak of the mammals, the above results can be considered quite satisfactory.

The collections and installations have been considerably improved during 1970. The galleries for delicate small birds, installed in the halls of the chateau, are a great attraction, as well as the well-landscaped outdoor aviaries, now 50 years old. All are perfectly kept thanks to the skill and care of Dr. Ciarpaglini, and Jacques Dupré, the Head keeper.

Among the interesting novelties acquired in 1970, are a member of African Sunbirds, some Hummingbirds and small insectivorous birds. A pair of African Trogons (*Apaloderma narina*) are doing well, eating fruit and vegetables as well as insectile food, cake, meat and mealworms. I had never before seen them in captivity. Kori Bustards have proved a problem, as they will eat any egg or small bird they come across, and they cannot be kept free in the park as I had hoped.

We were disappointed with the Crowned Pigeons, of which we had a number belonging to the three species. Only one pair (Crested) have laid, outside the nest! An old pair in an indoor aviary of the old Jardin des Plantes, in Paris, never ceased rearing young there . . . Luck plays a great part in bird breeding successes. One cannot make a poor pair nest; but of course, it is easy to stop a good one from doing so.

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FIRST BREEDING OF THE BLACK-CHINNED FRUIT DOVE

(*Ptilinopus leclancheri*)

By DONALD G. HANOVER (Tarzana, California, U.S.A.)

Some three or four years ago, I purchased a pair of Black-Chinned Fruit Doves. They remained quite inactive until the Spring of 1969, at which time they mated and built a typical flimsy dove nest in a large shrub. No egg was laid. The male died suddenly a few weeks later.

These doves are a little bigger than the Barbary Dove, with bold, if subdued colouring. On the male the back, wings and tail are rich green and there are yellow fringes and edges on flight feathers; while head, neck and breast are silver-grey, with a small black throat patch. The duller green underside is separated from the grey breast by a broad blackish-chestnut band, and the under tail coverts are warm buff. The irides are red, and the bill yellow with a purplish base. The female has grey-green on head, neck and breast; a duller, browner throat patch, and a smaller breast-band.

Early in 1970, I was able to obtain another male, which immediately became very active and attentive to the hen. In April and May the doves nested on the ground without success. In June, again nesting on the ground, their single egg appeared. Twenty days later, on 28th June, the white, pigeon-sized, but elongated egg hatched. The youngster's colour was light-pink, with sparse white down and also elongated shaped, for the first two days.

These doves are highly arboreal. Just why they nested on the ground I do not presume to know. The only explanation I can offer is their being in captivity, their lives are no longer natural or normal.

The egg hatched during the day while the cock was brooding. When the hen took over in late afternoon, she failed to cover the youngster, sitting about 8-10 inches away. I was reluctantly getting ready to take the youngster and try to hand-feed it when I noticed the large section of the hatched egg-shell lying nearby. I gently slipped it over the rear of the youngster, then left the area. In a few minutes the hen moved in and covered the youngster. The same procedure had to be repeated the second evening, but the following evening the hen fully accepted the youngster without benefit of the half-shell cover. I don't believe the egg-shell would have fitted the youngster on the third evening.

On 7th July, the youngster walked about three feet away from the nesting site, then flew to a low limb the next day, even though he was quite naked except for some wing-feathers and a short tail. He stayed off the ground during the day, but for three nights returned to it near the

nesting site, where he was covered by the hen. Both parents were very attentive and protective until the youngster was fully on his own, which was approximately the first week in August. On August 19th, the doves nested again, but this time off the ground in a shrub, with the egg hatching on 7th Sept. This youngster left the nest when it was two weeks old. To the best of my observations it has never touched the floor of the pen.

I have had some of my various fruit doves for about six years, always feeding them boiled brown rice and, either fresh or canned fruit, but am convinced that this is not the correct diet. I lost a few fruit doves. Though they were always in good flesh, they died suddenly. In January 1970, I changed their feed to Mynah Bird pellets, and every other day to grated sharp cheese, and a small amount of fresh fruit once or twice a week. Now my fruit doves look better as well as fly better, and one pair has nested.

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THE BREEDING OF WEBER'S LORIKEET

(*Trichoglossus haematodus weberi*)

By R. T. KYME (Kirton, Lincolnshire, England)

Comparatively little has been written about Weber's Lorikeet either in freedom or captivity. I searched through a copy of Mivart's *Lories* at London Zoo Library but found very little information and no coloured plates. However, I did find a coloured plate in Dr. Max Wilhelm Carl Weber's *Zoologische Ergebnisse einer Reise in Niederlandisch Ost-Indien*, Band III, page 290, plate XVII, 1894.

According to Peter's *Check List of Birds of the World*, volume III, Weber's Lorikeets come from the Island of Flores.

The sexes look very much alike, my cock bird having a little bolder head. The general body colouring is a rich deep green, with breast and collar of a contrasting light green with a yellowish tint. (Some museum skins show a very little light blue on the extreme front of the forehead—EDS.) The beak is orange and the feet greyish. It is a small bird with a total length of about 275 mm. They are most attractive aviary birds with never a dull moment. They are in my opinion exceptionally fascinating. Their mating display is elaborate with amusing poses.

I purchased four Weber's Lorikeets from John Wilson of Old Catton after seeing them in his birdroom on several occasions over a period of two years. He delivered them on 1st July 1969 not knowing their sexes. They soon settled down in a small aviary 6 ft. high × 3 ft. wide × 8 ft.



Weber's Lorikeet. Hen, left hand; Cock, right hand.



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Cock Weber's with apple.

[R. T. Kyme



Young Weber's Lorikeets, 138 days old.



Copyright

Young Weber's Lorikeet, 138 days old.

[R. T. Kyme

long, the shelter being 2 ft. and made of flat asbestos. A nest-box $6\frac{3}{4}$ in. \times $6\frac{3}{4}$ in. \times 14 in. high with $2\frac{1}{4}$ in. entrance hole was placed in the open flight and it was not long before the Weber's were busy inspecting it.

The nest-box contained about 4 in. of a mixture of peat and sawdust. I had intended also to place pebbles and perforated zinc at the bottom but I'm afraid this never got done. They all slept in the nest-box at night and one could hear their calls at various times of the night. Some time later one of them appeared to be odd man out so I removed him from the aviary and placed him in the birdroom.

The cold and frosty weather did not appear to affect them. However their nectar kept getting frozen up so I decided to take them into my birdroom. They did not stay there long as it was obvious they preferred the open flight. I decided to place the fourth one back with the others and although they appeared to get on well together I came home one day to find him dead.

Some time later my wife called me and said that the Weber's were mating. I was thrilled, for to my knowledge I know of no record of Weber's being bred and at least this was a step towards my goal. In late January I noticed two of the remaining three were spending most of their time in the nest-box and on approaching their aviary the cock would immediately fly to the perch on the nest-box and call the hens out, so I decided when they came out of their nest-box I would close them in the shelter and have a peep. I was thrilled when I saw three white eggs which measured 28 mm. \times 22 mm.

Both hens sat well but as we all know it was very cold and frosty so I thought I had little hopes of the eggs hatching. I inspected the eggs occasionally and my hopes ran high for the eggs were dark and on the 25th February I found two baby Lorikeets had hatched. Unfortunately they only lived for three days. They had blackish beaks and were covered with white down. I took the dead Lorikeets along to our local chemist who preserved them for me in formalin. I must say he is a most helpful man with my bird problems.

As I could now sex my Weber's at a glance I decided now was the time to remove one of the hens. Elaborate displaying and mating was observed on several occasions and it was not long before they were nesting again. They made two further attempts before they got down to serious nesting.

The first egg was laid on 20th May and the second on the 22nd. The hen sat well but she soon poked her head out of the box whenever one approached their aviary. On the 15th June the first chick hatched, the second on the 17th June. They were covered with white down which later turned greyish. Their beaks were blackish.

As soon as the chicks hatched I offered the Weber's maggots and mealworms but they were not interested. Their nectar was made up

as follows: 6 oz. water, 1 heaped teaspoonful of Horlicks, 3 teaspoons of Baby Rice, 1 teaspoon of Nestle's Full Cream Condensed Milk and 1 teaspoon Gale's Honey. The Weber's relished apple before the youngsters were hatched but left it alone once they were hatched and in fact did not take it again until they left their nest.

I decided I would like a pictorial record of the breeding of Weber's so I took coloured slides of the youngsters at regular intervals from the age of 14 days. One morning I went to feed the Weber's and I found one inch solid of black ants in their nectar bowl so I had to act quickly. I borrowed one of my wife's Pyrex dishes and formed a moat around the nectar. I'm very pleased to say this did the trick and stopped any further invasions. They were noisy feeders and unfortunately they plucked the youngsters on the breast and back.

The first day I noticed a youngster peeping out of the nest-box was on 7th August. The youngsters had grown well but were slow at feathering. They ate a lot of flowering and seeding sowthistle, also seeding spinach beet which they relished.

The youngster left the nest on 13th August but returned again at night. For this I was very pleased owing to the fact they were plucked and I did not want it to catch a chill. The second youngster left the nest on the 14th August. The youngsters were smaller editions of their parents except for their beaks, one had a reddish brown beak, the other a blackish red beak. Could this be a sex distinction? After leaving the nest they soon started to drink nectar and eat spinach beet. They always returned to their nest-box at night.

Sweet apples were relished after the youngsters left the nest. They continued to develop and feather up on the breast and back. They were strong flyers from the start. On Friday, 25th September, it was noticed that the young Weber's were becoming very aggressive towards their parents so they were moved to another flight.

The young Weber's were seen by K. Russell on 15th August, John Wilson on 9th September and H. Jordan on 11th October.

As described above, R. T. Kyme has bred Weber's Lorikeet *Trichoglossus haematodus weberi*, the green-breasted subspecies of the species. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this subspecies in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

NEWS FROM THE DEPARTMENT OF ORNITHOLOGY AT THE NEW YORK ZOOLOGICAL PARK

By JOSEPH BELL (Associate Curator)

With a major new bird building, titled THE WORLD OF BIRDS, on the horizon, the first ten months of 1970 has been one of the most active periods in the long avicultural history of the Bronx Zoo. For some years the small bird collection here has been allowed to decline through natural attrition without replacement. Now with new displays, tailored basically for tropical perching birds, this section of the bird collection is being carefully rebuilt with a special eye toward the educational themes to be put forth in these new displays, emphasizing ecology, behaviour and zoogeography. Among the more interesting specimens received recently and also new to our collection were:

- Sappho Comet Hummingbird *Sappho s. sparganura*
- Green Wood Hoopoe *Phoeniculus purpureus marwitzii*
- Greater Yellow-naped Woodpecker *Picus f. flavinucha*
- East African Violet-backed Sunbird *Anthreptes o. orientalis*
- Eastern Red-faced Crimson-wing *Cryptospiza reichenovii australis*
- Hellmayr's White-browed Wood-hewer *Lepidocolaptes angustirostris hellmayri*
- Red-headed Seed-cracker *Spermophaga r. ruficapilla*

Also added but not new to the collection were:

- Palawan Peacock Pheasants *Polyplectron emphanum*
- Ross's Violet Touracos *Musophaga rossae*
- Lilac-breasted Rollers *Coracias caudata*
- Rothschild's Mynas *Leucopsar rothschildi*
- Pearled Treerunner *Margarornis squamiger*

Breeding results for the 1970 season were disappointing in the number of species breeding and the number of birds reared but several of the successes are worthy of special mention:

Scarlet Ibis *Eudocimus ruber*, reproduced for the third season. A single chick was reared.

Red-cheeked Ibis *Comatibus eremita*, reared a chick for the first time here. The parent birds were progeny of the Basel Zoo colony in Switzerland.

Puna Plover *Charadrius alticola*, a single chick reared. Probably a first captive breeding; the nest and eggs of this species were first described in 1965.

Brush Turkey *Alectura l. lathamii*, five chicks reared.

White-quilled Black Bustard *Afrotis afra afraoides*, two bustard chicks reared. This may be a first for the species and the first captive

breeding of any bustard in the New World.

Tufted Puffin *Lunda cirrhata*, an egg noted in a nesting burrow on June 19th 1970 hatched on July 26th. The young puffin emerged from the burrow on September 15th. We can find no record for a captive breeding for this species or for any member of the *Alcidae*.

One of the more interesting research problems taken on by the department involved captive rearing of a very specialized waterfowl species from the high Andes Mountains of South America, the Torrent Duck *Merganetta armata*. Mr. Marvin Cecil, a Florida based aviculturist, studied these birds on the wild mountain streams of Argentina during 1968 and 1969. He imported fertile eggs to Florida in 1968 but failed to rear the ducklings hatched there. On 12th December 1969, Mr. Cecil, on pre-arrangement with the bird staff here, arrived in New York with thirteen torrent duck eggs, in a portable incubator and three ducklings that had hatched, *en route* from South America. In all, three pairs of these unusual water birds were reared here and now resemble adults in all aspects but the bright carmine coloration of bills and feet seen on wild specimens. The ducklings were started with live food items that included: bloodworms (*Chironomus*), brine shrimp (*Artemia*) and newly-hatched mealworms (*Tenebrio*). This small flock now thrives on Turkey growing pellets (a commercially pelleted ration) dog meal and finely chopped kale.

* * *

NEWS FROM THE BERLIN ZOO

By Professor DR. HEINZ-GEORG KLOS

On September 26th, 1968 we acquired from the London Zoo two young Silver Gulls (*Larus novaehollandiae*), hatched there at the beginning of the same year. We put the birds into a large flight cage of our pheasantry where they lived together with several Spoonbills, a pair of Woolly-necked Storks, a Northern Black-headed Gull, a Mew Gull, Anhingas and another Silver Gull that we had imported from Australia several years ago. In 1970, we observed for the first time breeding activity. The first clutch, laid at the end of June, got lost. On August 9th, two other eggs were laid and incubated until September 2nd.

When the young hatched we feared at first that they would be injured by the storks and the other gulls, but just the contrary happened. The more the young gulls grew up, the more their parents cared for them and defended them. As the chicks changed their juvenile plumage, the adults became so aggressive that they continuously attacked all other inhabitants of the aviary. In order to protect them we took them out and brought them into another cage. At the moment, the large cage is occupied only by the parent Silver Gulls and their offspring.

COUNCIL MEETING

A Council Meeting was held on 20th November 1970, at the Windsor Hotel, Lancaster Gate, London, W.2.

The following Members were present:

Miss P. Barclay-Smith, Vice-President, in the Chair.

Mr. J. O. D'eath, Mr. M. D. England, Dr. C. J. O. Harrison, Mr. H. Horswell, Mr. K. A. Norris, Mr. D. H. S. Risdon, Mrs. K. M. Scamell, Mrs. P. V. Upton, Mrs. M. Haynes (co-opted), Mr. A. A. Prestwich, Hon. Secretary.

OFFICERS, 1971

Mr. A. A. Prestwich, Hon. Secretary-Treasurer, 1949-1970, resigned.

Mr. H. Horswell was elected to fill the vacancy.

Miss K. Bonner, Hon. Assistant Secretary, 1950-1970, resigned. Mrs. M. Haynes was elected to fill the vacancy.

Mr. J. Watkin Richards, Hon. Auditor, 1951-1970, resigned. Qualified applicants are asked to apply for the vacancy thus caused.

It was unanimously agreed that very warm thanks be accorded to Mr. Prestwich and Miss Bonner for their long years of invaluable and dedicated service to the Society and to Mr. J. Watkin Richards for his great help as Hon. Auditor.

CERTIFICATE OF MERIT

The Society's Certificate of Merit was awarded to: The Winged World, for breeding the Blue-crowned Motmot, *Momotus momota*, in 1970.

ARTHUR A. PRESTWICH,
Hon. Secretary.

* * *

BRITISH AVICULTURISTS' CLUB

The one hundred and fifth Meeting of the Club was held at the Windsor Hotel, Lancaster Gate, London, W.2, on Friday, 20th November, 1970, following a dinner at 7.30 p.m.

Chairman: Mr. K. A. Norris.

Members of the Club present: Mrs. D. E. Balcon, *Miss P. Barclay-Smith, Mrs. S. Belford, A. W. Bolton, R. A. Chester, M. D. Coulter, Mrs. W. Duggan, *M. D. England, R. T. Harvey, Dr. C. J. O. Harrison, *Dr. E. Hindle, Professor J. R. Hodges, H. Horswell, C. Jackson, Dr. S. B. Kendall, H. G. Kenyon, *P. H. Maxwell, C. Minjoodt, W. J. Page,

*A. A. Prestwich, D. M. Reid-Henry, *D. H. S. Risdon, Mrs. K. M. Scamell, J. Trollope, Mrs. P. V. Upton, J. R. Wood.

Members of the Club present, 27; guests, 12.

David Reid-Henry, accompanied by his Peregrine Falcon "Tomboy", gave a talk entitled "A Bird Painter talks about the work of Painting Birds".

Will Members please address all future correspondence to: Mrs. Mary Haynes, Sladmore Gardens, Cryers Hill, High Wycombe, Bucks.

The date of the next Meeting is **12th March 1971**.

ARTHUR A. PRESTWICH,
Hon. Secretary (1946-1970).

* Denotes Founder Member.

* * *

NEWS AND VIEWS

In the New Year's Honours 1971 Miss Phyllis Barclay-Smith was made a Commander of the Order of the British Empire for services to preservation and conservation.

* * *

It is fervently hoped that *all* aviculturists bear in mind the aim of the Royal Society for the Protection of Birds: "To ensure our modern world always keeps a place for birds".

* * *

Regarding the partial-submergence of Moorhens mentioned in the Magazine, 1970, 208: a correspondent reminds me that this behaviour is not confined to the Moorhen. The Little and other Grebes, if alarmed, may after a dive show only the head at the surface on rising.

* * *

Major Iain Grahame reports his breeding successes, 1970: Apart from the commoner species the following were reared:

Waterfowl. Red-breasted Goose, Emperor Goose, Ross's Goose, Australian Shelduck, Puna Teal, New Zealand Shoveler, Red Shoveler.

Pheasants. Satyr Tragopan, Koklass, Siamese Fireback, Soemmerringii Copper, Mikado, Brown Eared and White-crested Kalij.

Len Hill returned at the end of November from a visit to his two islands, Steeple and Starrid Jason in the Falklands. They are quite undisturbed, have fine seabird colonies and will be maintained as nature reserves.

Len Hill writes: "I was able to bring home over 100 penguins and you can imagine the problems these presented during a seven days delay in Montevideo!"

* * *

Professor Dr. B. Grzimek reports concerning the success in breeding the Wattled Starling in the Zoologischer Garten, Frankfurt-am-Main. It was believed that the Cleveland Zoological Park had been successful, but an enquiry proved that the success was only partial. On 11th October 1961, two young were hatched but by the 13th they had disappeared. So that it really does seem that the Frankfurt Zoo success is a world "first".

* * *

Such is the number of Seagulls using a highway along the North Carolina coast to crack clam shells that considerable damage has been done to motorists' tyres by the sharp pieces of broken shell.

The State Highway Commission has now constructed three 100-foot long asphalt "crash-pads" in the hope the Gulls will use them instead of the road. Being closer to the water and, of course, free of traffic, many Gulls are indeed showing a preference.

* * *

The idea of trying to establish the Great Bustard *Otis tarda* in Great Britain seems to have captured the imagination of the national press and radio broadcasting alike—both, ever on the look-out for novelties—have given the project very considerable publicity.

Six birds, two male and four female, have already been imported from Portugal. The present idea is to release them in the spring on a ten-acre site, surrounded by an eight-foot wire fence, on Salisbury Plain.

A Great Bustard Trust has been formed. It is greatly hoped that the present venture, unlike several previous, small abortive attempts, will prove an unqualified success, and that the expected expenditure of about £10,000 will be fully justified.

* * *

R. T. Kyme: "I have recently seen my Weber's Lorikeets displaying and mating and so I decided to have a look in the nest-box (24th October) and found they have again laid two eggs and are sitting.

My young Weber's have now feathered-up where they were plucked on the chest and back and their beaks have changed colour and they are nearly

as bright as their parents. They are very tame and will take a piece of apple from my hand. Besides the two Weber's Lorikeets I have bred and reared six Stanley's, four Mealy Rosella, four yellow Red-rumped, six Red-rumped, and 10 Turquoise. I also had four lovely young Pennant's Parrakeets but my Green-naped Lories attacked their feet the day they came out of the nest, and unfortunately I had to destroy them.

* * *

I always enjoy Dr. Maurice Burton's weekly "Nature Notes" in *The Daily Telegraph*. My regret is that the limited space at his disposal necessitates their being very brief. But here, fortunately, there is virtually no limitation. In a recent issue he dealt with "Winter Canaries", meaning Siskins. Siskin is the substantive name of several *Carduelis* (or *Spinus*) species, but in Great Britain its use is confined to *Carduelis spinus*. The derivation is probably from the Danish *Sidsken*, or Swedish *Siska*, a "chirper". It has long been known in England as a cage-bird—Turner mentioned it as such under that name in 1544.

An obsolete bird-catcher's name is Abadavine or Aberduvine (there are several variants). It was first used by Albin in 1735, but its origin seems to be unknown.

The Siskin has several nicknames. At one time it was known in Sussex as the Barley-bird, on account of its appearing at the time barley was ripe; Black-headed Thistle Finch, Golden Wren, and Tea-leaves.

* * *

An item of special interest is recorded in the 92nd Annual Report, 1969-70 of *The Royal Zoological Society of South Australia*: "In September, 1969, we were again fortunate enough to obtain nine young Ostrich chicks from the centre of the State. As they were not more than two days old when they arrived it was almost inevitable that some losses would occur during the hand-rearing process. We were able, however, to raise six, two of which were sent to Taronga Zoo and one to Perth Zoo. South Australia is the only State where ostriches were "farmed" many years ago and only a few feral birds, remnants of the farms, now exist. Because of the ban on importing birds from overseas it is important to try to perpetuate this species in Australian zoos from the small stock that now remains".

The breeding situation with birds was quite satisfactory, with 42 species bred and 149 young reared. These included 20 psittacine, nine dove and five pheasant species. Notables were two Rheas, eight Brush Turkeys and three Grey Teal.

* * *

C. V. Smith, New South Wales, comments on pheasant-keeping in Australia. "Sadly, over some 30 years of interest in pheasants I have

seen the number of different kinds dwindle from a possible thirty to about a dozen (including varieties). These include a yellow-banded Golden (a strain developed from one having some trace of Amherst, in a male, ten or more generations back). For your interest I will list those now left, from a census I did six years ago for the members of the Ornamental Pheasant Society (now disbanded). This is still virtually unchanged, but some ring-necked varieties are being bred for commercial purposes in larger numbers: Common Pheasant (including English ring-necked, Mongolian ring-necked, black-necked and melanistic), Silver, Golden, Amherst, Reeves, Nepalese, Swinhoe's, Edwards' and Cheer Pheasant are those now left.

Recently a gift of a Green Peahen to Taronga Zoo saved them from extinction here; although there are plenty of Blue Peafowl, with a few of the white variety. A friend is in his sixth year of developing pure white Helmeted Guineafowl from a strain of Silver Guineafowl which I imagine are common elsewhere in the world".

* * *

Dr. William S. Hawkins, Sunland, California, writes: " This year the breeding season in Southern California was disappointing for almost all aviculturists. We had one of the hottest and driest seasons on record which is no doubt a major contributing factor. A number of my rarer birds mated, including Meyer's Parrots, Queen of Bavaria's Conures, and Aymara Parrakeets to name three—all with fertile eggs which failed to hatch or with young which were not raised. Does one ever become completely inured to these frustrations? I raised one beautiful Derbyan Parrakeet with help in hand-feeding from my very good friend Mrs. Paul Schneider who is truly an expert in this field. Various Rosellas tried and failed, with the exception of the Stanley's who had a number of fine young. I was able to foster successfully Splendid Parrakeets under Bourke parents which seemed a questionable project but worked out very well and, I might add, the Bourke parents seemed particularly solicitous of their "unusual offspring". Of five varieties of cockatoos, only the Rose-breasted were successful and they produced only one round as opposed to the two that they usually produce. Leadbeater's, of which I have raised many in the past, did not even lay.

The Schneiders have now moved safely into their beautiful new home and their birds were transferred safely: a trip of some sixty miles and accomplished in the height of our summer heat".

A. A. P.

* * *

REVIEWS

ENCYCLOPAEDIA OF AVICULTURE. Edited by A. RUTGERS and K. A. NORRIS. London: Blandford Press, 1970. Vol. I. Price £8.

This is an English edition of a work published in Dutch in 1864-1968, and is the first of three volumes. While it is valuable to try and bring together all the information on a particular subject, it is a little dangerous to attempt a uniform encyclopaedic coverage of all aspects. In the present instance the work seems to suffer from some uncertainty of purpose, and after a series of rather short introductory essays on various topics it becomes a systematic encyclopaedia of birds, treating a selection of them species by species.

These are arranged in a systematic scientific sequence, and the present volume deals with the earlier non-passerines, starting with the ostriches, and passing through the larger seabirds, herons, waterfowl, birds of prey, cranes, rails and waders, to pigeons. At least one species of each family is included; and in those popular with aviculturists a large range of species is described. The information for each consists of names in four languages, a note on distribution, a brief description and indication of size, and general information on the species covering habits, nesting and food. Finally there are comments on it as an aviary bird. These last vary considerably in content, at times being a sentence or two, often based on early accounts, while at others a detailed breeding account may be quoted at length. In general however they have a tendency to be a little vague and generalized where one would like them to be more specific, particularly as regards the species' precise requirements.

In the case of the more popular groups—such as waterfowl, pheasants and pigeons—there is an introductory section of several pages for each, giving general information on care and housing requirements, and including instruction and diagrams on suitable aviary structures.

Some of the introductory essays might with advantage have been longer. Bird structure, eggs and nesting are all covered briefly in a "brief review of the Class Aves", but many aviculturists would like more information on such topics. "Notes on bird ecology as applied to planted aviaries" by Hawkins would appear to be the only serious discussion on the behavioural background to the problem of keeping birds in aviaries. I would not agree with his suggestion that small greenhouses are most useful for tropical birds, for in our English climate at any rate the problems of excessive heat in summer and loss of heat in winter render them some of the less useful structures. There is a valuable and up-to-date section on treatment and diagnosis of diseases, but again I feel it merits more space and greater comprehensiveness.

The work is a little unfortunate in its illustrations. There is a number of passable colour plates that tend to fail in the final details of accuracy and observation; and some plates of pigeons that appear to have originated

from an early nineteenth-century work. Black and white plates show reduced versions of pictures that appear to originate as large colour plates from Gould and his contemporaries. There are usually about five to a page, oddly interspersed with modern photographs of other species, reproduced at the same size. A large proportion of the species described are also illustrated with small drawings in the text. These vary from the passable to the inaccurate, those of the waders and pigeons being particularly bad; and some of the pheasants appear to be poor adaptations of the Gould plates that are also included.

In general this may be regarded as an encyclopaedia of birds which will be useful to those who do not have access to a range of books on birds of the world, containing a great deal of information on aviculture and forming a useful introduction to it. I consider, however, that it lacks the detail that an aviculturist, turning to some unfamiliar group of birds, might hope to find; and that as an encyclopaedia it tends to be ornithological rather than avicultural. There are also various errors, ranging from mis-statements such as that Philip Wayre re-introduced Elliot's Pheasant (and not Swinhoe's) to Taiwan, to editorial mishaps such as the un-captioned diagram on page 40, which tend to shake one's confidence in the work. This first volume is disappointing; one hopes that the others may be a little better.

C. J. O. H.

SOFTBILLED BIRDS. By CLIVE ROOTS. London: J. Gifford Ltd., 1970. Price £2.

The term "softbill" is an unfortunate legacy to aviculture from an era of semi-literate bird-keepers and usually meant a bird which does not eat seed. This could cover an enormous range of avian species, and would in fact include the vast majority of them. In the present work the author has attempted to limit his field by redefining his terms of reference to cover birds "with relatively soft bills (*sic*), which feed upon insects and larger prey animals and soft plant material, and whose young are helpless at birth". The author was until recently in charge of "The Winged World" at Morecambe, which has produced an impressive list of first breedings of such birds and this is certainly one of the best books of this type that I have recently encountered; but I could not help feeling that he might have limited the work to those species of which he has had special experience and which might have been discussed in greater detail; and that an attempt to cover a wide range of family in a book of 143 pages had inevitably led to much generalisation and trivial comment.

The first 71 pages are concerned with the acquisition and care of softbills and the author's experience is evident throughout. Establishment and acclimatization are dealt with. The section on housing seems to me too brief and as one who has tried keeping birds in a converted greenhouse

I feel that the difficulties involved are glossed over much too easily. The emphasis throughout is on the keeping of mixed groups of species in enclosures. Nutrition and food is allotted some 30 pages and is probably the most valuable section of the book. It is supplemented by an additional appendix on proven diets for the various kinds of birds. There is a brief chapter on ailments with a good section on deficiency diseases, to which birds of this type are particularly prone.

The second part deals with the various groups of softbills, which are subdivided into nectivorous, omnivorous, insectivorous and carnivorous. It is here that I feel the book's defect lies in that it can allow at times only two or three brief paragraphs for a whole family, and it is impossible to do the birds justice, and brief, and at times a little misleading, generalisations become necessary.

There are 24 colour plates showing 36 species by colour photograph. They show a range of the more unusual species and are often striking, but of variable quality and somewhat uneven coverage on the diversity of species involved. There are a few text illustrations of aviaries, nest-sites, and some poor ones of birds.

Criticisms apart, this is a useful addition to literature on practical bird keeping and one to be recommended to all aviculturists.

C. J. O. H.

THE FOLKLORE OF BIRDS. By EDWARD ARMSTRONG. New York: Dover Publications Inc., 1970. Price 3.50 dollars.

All those interested in the subject will welcome the appearance of a second edition of this account of an enquiry into the origin and distribution of some magico-religious traditions first published in 1956. The reader is presented with more than a collection of beliefs and customs concerning birds, and is invited to seek not only the historical origin but the psychological and sociological significance of bird folklore. The author starts with an account of the prehistoric background to bird folklore and especially the remarkable discoveries of certain cave paintings such as those at Lascaux which show that people of the early Stone Age were not only skilled craftsmen but also had magico-religious conceptions. Some of the paintings in the cave of Lascaux indicate that bird cults probably flourished in Upper Palaeolithic times.

The succeeding chapters, in the main, approach the subject in the reverse way and starting from modern customs and beliefs trace them back as far as possible into the past. The Michaelmas goose is the first to be considered with its gastronomic and ritual importance. Bird-maidens includes many variants of the swan-maiden legend extending from Ireland to Siberia and back to prehistoric times. The rain-disaster is said to follow ill-treatment of the robin. Both the robin and the wren are supposed to be fire-fetchers but on the continent in western Europe it is the wren rather

than the robin. In eastern Europe and Asia fire is fetched by the swallow and these birds were used medicinally in China and England. The chapter "Songbirds and Toads" comprises traditions concerning the nightingale, yellowhammer, lark, stonechat and wheatear, and the toad is associated with some of these birds in various legends. The harbinger of spring is generally considered to be the cuckoo though it shares with the swallow this prestige. Cuckoo folklore moreover, is found over a wide area, ranging from Europe to Asia and there are various rhymes in which it figures. Winged souls and bird fish comprise the last two chapters of this interesting compilation of the folklore of birds with its wealth of illustrations. There is also a bibliography and a comprehensive index.

Very appropriately the volume is dedicated to Professor W. H. Thorpe.

E. H.

* * *

CORRESPONDENCE

FURTHER EXAMPLES OF "TOOL-USING" PARROTS

Through the kindness of Miss Rosemary Low I have received four more accounts, from separate sources, of parrots using a foot-held object to scratch themselves. Two of the birds were Cockatoos (*Cacatua sulphurea*) and two African Grey Parrots (*Psittacula erithacus*). One of the Lesser Sulphur Crested Cockatoos used "A piece of stick, sometimes of some size, to scratch the sides and base of his head (he is one of those unfortunate birds that has lost its plumage through the strange affliction that seems so common to the small white cockatoos) and though he has not much to scratch in the way of feathers the stick seems to have the right feeling for him and he obviously enjoys his loofah."

The second Lesser Sulphur Crested "When given a piece of wood will bite it for a few minutes then will always scratch under its wings and on its head. It will do this for up to thirty minutes. It also likes to get a cigarette packet, or a monkey nut in the shell, and do the same thing."

The African Grey extracts run as follows: "I heard him utter little 'clucks' and 'aahs' of pleasure. He hung to the vertical bars of his cage with one foot. In the other he held half a cotton-bobbin which he was using as a back-scratcher."

The second of these Grey Parrots "Often uses a piece of twig to scratch his head and neck. I give him twigs daily off my apple tree and after he has stripped the bark he then goes through some antics which includes his scratching with the twig."

The question occurs as to whether this ability to "Chinese back-scratch" is an innate, unlearned, behaviour or whether each of these birds has been self-taught? Because so few cases have come to light I have assumed it to be learnt.

These are very sociable birds in which allopreening is particularly well-developed. Such caressing of the feathers is obviously extremely pleasing to the bird. All five of my reported cases (including the Bare-eyed Cockatoo in the July/August AVICULTURAL MAGAZINE) were kept as individually caged birds. And it may not be unreasonable to suggest that such isolated birds might be "Psychologically deprived" of the stimulus of another bird "going through its feathers". Such that a foot-held object accidentally brushing against the head might make such a "deprived" parrot persist in this pleasant tickling of the feathers. The learning of this trick would be encouraged by the very strong reward of such a pleasurable feeling.

Just as interesting Miss Low's correspondents furnish two cases of parrots using a receptacle with which they baled water from their drinking bowls. A three-year-old Lesser Sulphur Crested Cockatoo was "First noticed using an Almond shell for drinking water. She also regularly drinks from half a peanut-shell. The next line shows the limit of the bird's reasoning for the letter goes on "if she has a teaspoon held in her foot the right way up she can drink from it."

The African Grey that used half a cotton-bobbin to scratch itself was "bought toys for his amusement. One of these was a brand-new briar pipe. . . . He succeeded in baling out his water pot by holding the stem in his beak, and dipping the bowl in the pot. Our parrot made this discovery whilst indulging in his favourite habit of 'dunking' hard objects."

158 Broadway, Peterborough PE1 4DG, England.

G. A. SMITH.

BREEDING THE LESSER SULPHUR-CRESTED COCKATOO

Further to Mr. Clifford Smith's successful breeding this year of the Lesser Sulphur-crested Cockatoo, I have to report that this bird has been bred in Luton by Mr. Roy Wilson, a member of the Parrot Society and Luton Cage Bird Society in 1968 and 1969. The events have been witnessed by several members, among them Mr. D. Burgess of 442 Hitchin Road, Luton and myself.

Mr. Wilson of 71 Manton Drive, Luton, purchased the birds as babies imported from Hong Kong in March 1964. They were put into an open aviary 15 ft. long, 6 ft. wide and 6 ft. high with a grass floor in which they have lived until this year when the cock died. One end is roofed over.

The birds first went to nest in July 1968 and laid two eggs in a box approximately 2 ft. x 1 ft. placed about 3 ft. off the ground. One egg was dead in shell but the other hatched in approximately 28 days. The birds were disturbed some two weeks later and the chick was abandoned and died.

In July 1969, they nested again in the same box, laid two eggs, hatched them both and successfully reared both. One bit a hole through the roof netting this summer and escaped but the other bird is still in Mr. Wilson's possession. Both birds were considerably larger than their parents when one year old, possibly because their development was uninterrupted and their parents fed and looked after them. During the time when the youngsters were in the nest, the parents had access to seed on the ground and therefore damped or sprouting, apples and home-made bread. Photographs are available.

20 Trowbridge Gardens, Wardown Crescent, Luton, Beds. CHARLES MINJOODT.

AVICULTURAL MAGAZINE 76 (6), 239

What about what that well-known authority A. A. Prestwich says in his book of records?

Weir Cottage, Bridge Road, Chertsey, Surrey.

BRIAN KENDALL.

Note:

The record included in *Records of Parrots Bred in Captivity*, page 40, has not been overlooked, but in some quarters there is just a slight doubt regarding its validity.

In 1922, M. T. Allen, of Northwood, Middlesex, had two young ones hatched, but they died after a couple of days. In 1924 three eggs were laid; one was clear but the other two hatched in the beginning of June. The two young ones left the nest in the first week in September and were capable of flight from the start. Both parents fed them for another month, when quite unexpectedly the male parent attacked them, tearing one of them literally to pieces. The other was rescued only slightly injured. It was apparently a female, as Allen advertised it as such for sale in 1926.

The several breeding notes are reasonably full and informative and one would have thought this event merited the award of the Society's Medal. Such an award does not seem to have been made, but too much importance must not be attached to this as Allen was not a member of the Society at the time of his success—he was not elected until March 1925.

A. A. PRESTWICH.

CORRIGENDUM

BEHAVIOUR OF BARRED AND ANDALUSIAN HEMIPODES

AVICULTURAL MAGAZINE 76 : 6, 219-227

On page 222, under the heading: INTRODUCTION OF HEN TO TWO COCKS, (7 *suscitator*), the sentence: "Two cocks were therefore released into the aviary on the 25th June 1968", should read: "25th May 1968".

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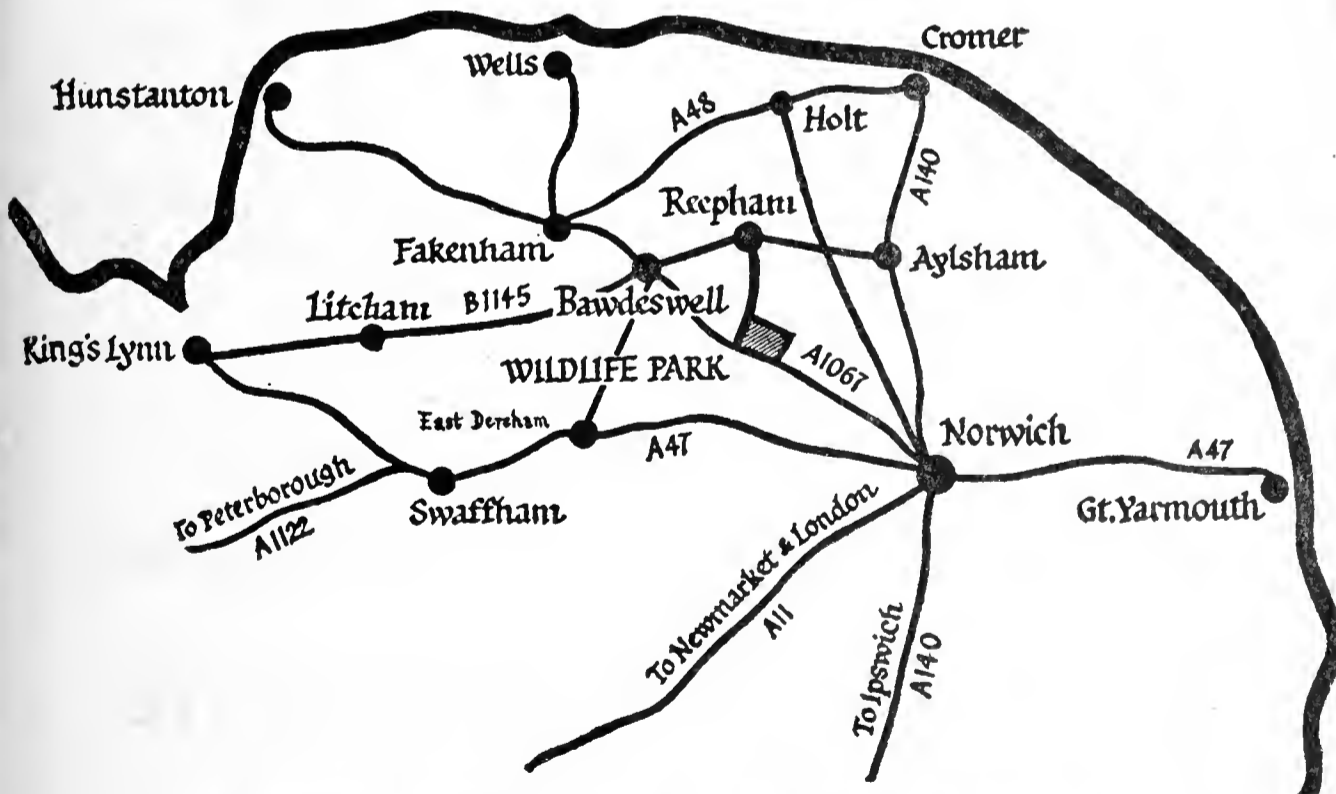
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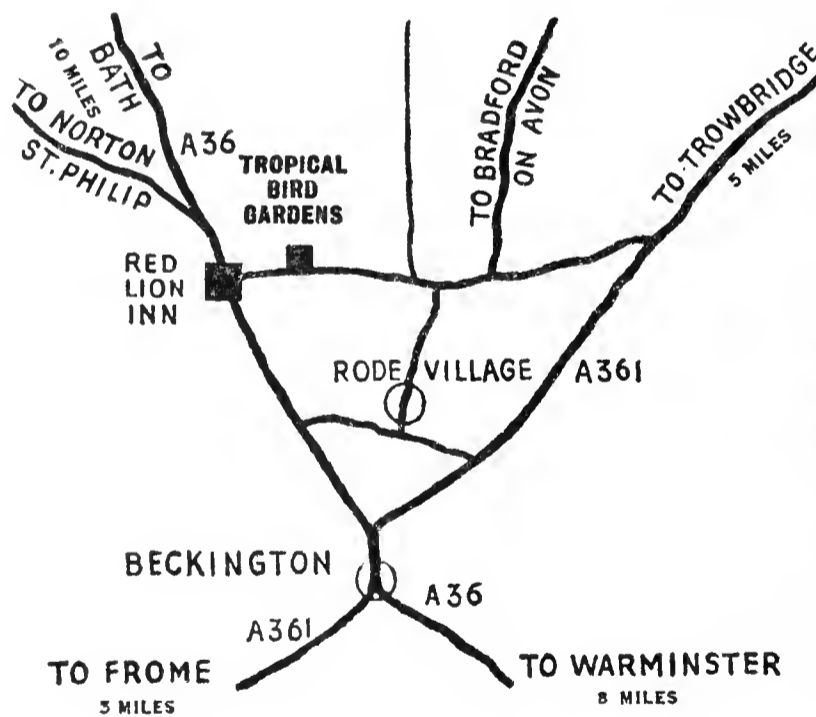
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Mr. K. A. Norris, Chairman of the British Aviculturists' Club and past President of the Foreign Bird League of Great Britain, was one of the over-all editors of the original Dutch publication. The appearance in three volumes of the English edition is the result of extensive research and revision on his part, and he has contributed additional descriptions and details. Mr. Norris, who has made a life-long study of exotic birds, has an extensive range of aviaries and is the editor of two previous books, *The Handbook of Foreign Birds in Colour I and II*.

With certain exceptions, the classification followed throughout the work is that adopted by Peters in his Check List of Birds of the World, and for orders and families not covered by the volumes of the Check List so far published, *A Classification of Recent Birds* by Mayr and Amadon has been used.

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Founded 1894

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CHÂTEAU DE CLÈRES

The three windows on the left on the first floor are those of the former drawing-room of the château in which the new aviaries are now installed.

AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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MARCH-APRIL 1971

NOTES ON BREEDING UNCOMMON BIRDS AT CLÈRES IN 1970

By P. CIARPAGLINI (Clères, France)

The breeding of the Golden Tanager is undoubtedly the most exceptional of the breeding results described in this article, and therefore we feel it would be useful to give a more detailed account of this.

GOLDEN TANAGER (*Tangara arthus aurulenta*)

Three Clutches—one young reared

During 1970 our pair of Golden Tanagers, acquired from a dealer in 1969, nested three times, but only the second brood was successful.

Housing

The pair was placed on arrival in an indoor aviary which is part of a summer recently constructed in what was once the drawing-room of the château. This aviary is 2 m. long, 1.80 m. wide and 3 m. high and is made of plywood panels, but the top, and an area measuring 1.20 m. × 0.80 m. and 0.95 m. above the ground and facing the gallery where the public walks, are covered with thin wire-netting. The main lighting is artificial (fluorescent tubes suspended from the ceiling), but there is also a certain amount of daylight through the frosted glass constituting the upper third of the back which is opposite a large window of the château. The floor is covered with fine sand and a bare tree planted in a bed in the centre of the aviary serves as a perching place. Some large rocks, a dead log, and two plants *Cissus* (*Vitis*) *antarctica* about 1.30 m. high growing in pots placed in diametrically opposite corners make the aviary more attractive. The Golden Tanagers share the aviary with a pair of Chinese Painted Quail (*Excalfactoria ch. chinensis*), a Blue-tailed Pitta (*Pitta guajana irena*), a male Rosita's Bunting (*Passerina rositae*), a male Purple Sugarbird (*Cyanerpes caeruleus*), and several other Tanagers—a pair of Golden-capped (*T. r. ruficervix*), one Blue-necked (*T. cyanicollis caeruleocephala*), one Golden-eared (*T. chrysotis*), one Paradise (*T. ch. chilensis*), and one Yellow-bellied (*T. x. xanthogastra*).

Food

Our Tanagers are given the following diet: fruit: white sultanas soaked in water for several hours then dried and cut slightly so that birds with a weak bill can eat them more easily; ripe apple, peeled and cut up

into very small pieces; sliced orange; a very little banana cut up very finely and mixed with two or three times as much sponge-cake; other fruit according to season: cherries, grapes and very ripe pear (cut up in the same way as apple). Lean beef very finely minced and well mixed with Purina feed for young pheasants¹, mashed carrot, and sponge-cake. A little hard-boiled egg and a few mealworms (we take care to crush the head) are sprinkled over this mixture which is given in smaller quantities than the fruit. Finely shredded lettuce is also given. In addition the birds are always provided with feeding bottles of "nectar," a preparation for Humming Birds and Sunbirds, which is renewed twice a day.

Breeding

First Clutch

The Golden Tanagers first showed signs of nesting in mid-January; they continually carried about twigs or leaves plucked from the plants in the aviary, and the male, while displaying, often offered them to the female.

17th January. Various materials (dry grasses, moss, rootlets, small dry leaves, feathers) were placed on the floor of the aviary, and the base of a wooden nest-box, without a lid, and with a crude nest was firmly fixed 1 m. from the ground in the *Cissus* in one of the corners of the aviary nearer the public gallery. The nesting site we chose was immediately accepted by the female, who alone built the nest, mostly using rather coarse dry grass and small leaves (dead or green) for the main structure. The situation of the nest and the great tameness of both birds, particularly the female, made it possible for us to observe the different phases of reproduction without too much difficulty.

20th January. First egg laid and brooded irregularly by female during the day.²

21st January. Second egg laid and incubation begun, by female only

4th February. After 14 days both chicks hatched, one at 2 p.m. and the other at 7 p.m.

5th February. Both nestlings, which open their beaks as soon as the female rises from the nest, are fed, so it seems entirely by her on mealworms and pupae (*Tenebrio molitor*) which are scattered, cut into small pieces and mixed with sponge-cake, on the log in the aviary. But this animal food is also very much appreciated by the other occupants of the aviary and we are obliged to renew it eight to ten times a day. Before giving it to the young birds the food is mandibulated for a long time by the female. When provided with such a beakful of provender she sometime

¹ This complete food is much better than prepared foods for insectivorous birds.

² The eggs measure 19×14.5 mm., ground colour whitish very slightly tinged with pink, with reddish-brown spots which are very numerous and coalesce near the larger end, changing into lighter and lighter speckling near the pointed end which is almost clear.

displays to the male carrying out movements very similar to the nuptial display of her mate; head thrown back, wings dropped, tail slightly raised accompanied by shriller and shriller cries ending with a trailing note. We noted that the young are fed once only before being brooded again till the next feed.

7th February. One chick found dead outside the nest on a large stone; it had the mark of a blow on its abdomen and its liver had burst.

9th February. The second chick appeared vigorous but an unforeseen cut in electric power, lasting all day, caused the female to abandon it in spite of gas-light being provided as quickly as possible.

Second Clutch (replacement clutch)

Already by 12th February the female began rebuilding her nest in which she laid two eggs on 16th and 17th February.

4th March. After 15 days of incubation only one egg hatched, the other egg being infertile. Again the female only cared for the chick, the male appearing entirely uninterested.

7th and 8th March. The youngster's squawks are completely audible when it calls for its ration of mealworms and its growth seems more rapid than that of the first brood. The female, which at first regularly swallowed the excreta of the young, began to throw this out at some distance from the nest although occasionally returning to her former practice.

9th March. We often saw her feed the chick twice before brooding it until the next meal, though up to now she had only fed it once at a time.

10th March. In addition to mealworms she also gives a few beakfuls of meat (prepared as already described), pear cut up and mixed with sponge-cake, or small earthworms which she finds in the mulch of the aviary. These, which later were added to the daily ration, are much appreciated not only by the parent but also by all the other Tanagers.

11th March. The female now gives her young from three to six beakfuls at a feed and does not brood it regularly during the day, though she continues to do this at night.

14th March. The rectrices are now clearly visible on the back of the young bird. On average of 15 beakfuls given to it, 10 consist of mealworms, three earthworms, one of fruit (pear and apple), and one meat. For the first time the male seems to show some interest in his youngster. We saw him collect a beakful of food but he offered it to the female who refused it. Further he often intervenes if the female has a quarrel with another inmate of the aviary. He also helps her to chase away any birds which come too close to the nest, and frequently perches on a plant above it, and less often below.

15th March. Several times we saw the male with a beakful of mealworms and he even took them to the nest but the young bird did not open its beak and he went off and swallowed the food he had collected.

16th March. Only once did he succeed in feeding the young, but very clumsily. We never saw him try again although we quite often see him with a beakful of food.

19th March. The male was inciting the female to nest again by continuously offering her twigs.

20th March. All day long the female was carrying materials to the nest, even placing them on top of the chick, which nevertheless she continued to feed normally. But, for the first time she did not brood it at all during the day. In the evening she tried to brood it, but was evidently disturbed by its size and gave up and settled for the night on a small branch beside the nest. The male sleeps each night about 20 centimetres above and slightly behind the female.

21st March. The young aged 17 days, left the nest. It was well feathered, the rectrices measuring 15 to 20 mm. long, but the ear-coverts (blackish) were hardly marked round the ear-hole which is surrounded by an area of bare skin. The female, still courted by the male and very excited, devoted herself to the active rebuilding of the nest to such an extent that we decided to put her with her youngster in a smaller cage where we could ensure that she continued her duty in feeding it. We noticed that she took more and more pear for the food she gave the young.

1st April. The young bird is now four weeks old; its plumage only differs from that of the adults by the slightly duller and lighter colouring. The dark grey of the bill and light grey of the legs are also paler.

20th April. We only decided to put the female back with the male today. Up till now she never ceased to feed her young (though recently she had been inclined to chase it and peck it), but at the age of seven weeks it is perfectly able to feed itself though we cannot determine exactly since when. It moulted in July and proved to be a female.¹

Third Clutch

From the beginning of May the female began building a new nest in the same place. This took a week till 8th May when she laid the only egg of this third clutch. Incubation followed normally for about 10 days, but on 19th May we several times saw the male violently pursuing the female who was quite upset and desperately tried to hide among the plants and rocks in the aviary. To avoid accidents we decided to take the aggressive male out of the aviary, but this unfortunately did not stop the female from abandoning her egg. On examination it was found to contain a well-developed embryo. This sudden aggressiveness of the male towards the female has remained quite inexplicable.

¹ As in most Tanagers the differentiation of sexes is not easy in this species; the female can only be distinguished from the male by its slightly paler and duller plumage.

BLUE TANAGER (*Thraupis episcopus coelestis*)*Two Clutches—four young reared*

Our pair of Blue Tanagers (the brightly toned white-winged subspecies of the Western Amazonian region) was purchased from the same dealer in 1969 and was first housed in an indoor aviary of the same type as that of the Golden Tanagers already described. In early spring 1970, these birds, although very wild, showed signs of wishing to nest, carrying about leaves which they plucked from the trees in the aviary. On being moved to a large outdoor aviary, planted mostly with privet, they soon built a nest in one of these shrubs about 1.80 m. above the ground using rather coarse dry grass. The aviary also contained several pairs of Diamond Doves, a pair of Bar-tailed Doves (*Macropygia nuchall*), three Victoria Crowned Pigeons, a pair of Jackson's Whydahs and an Indigo Bunting.

On 20th May the female was incubating two eggs (very light blue with rather large brownish blotches all over the surface) which hatched on 4th June (incubation period 15 days). The young left the nest on 21st and 22nd June at the age of 17 and 18 days. Their plumage resembles that of the adults but with duller and greyer tones and without the white bar on the wing.

Another clutch was laid very quickly on 1st and 2nd July, in the same nest which had previously been strengthened. Two young hatched on 16th July (incubation 14 days), and left the nest 18 days later. During the whole period of rearing the second brood the parents tolerated the presence of the young of the first brood.

The food given was the same as that provided for the Golden Tanagers (without nectar), but the addition of a supplement of mealworms four or five times a day is necessary. It was observed that during the period of rearing the young the adults hunted for insects with more eagerness than usual.

COLLARED BARBET (*Lybius t. torquatus*)*One Clutch—one young reared*

Our Collared Barbets have been in the collection for many years. They were always kept in indoor cages where they had laid eggs and even hatched young, but never reared them. Last spring they were moved to an outdoor aviary which they shared with a pair of Green Cardinals, a pair of Jamaican Amethyst Doves, a Gough Island Moorhen and a trio of Bonnerat's Junglefowl. They took to a nest-log (a hollow tree-trunk) which was hung vertically below the roof of the shelter. The cavity of the log was 50 cm. deep, and the diameter 18 cm. The entrance-hole, 6 to 7 cm. in diameter and about 40 cm. from the base, was certainly found too large and too high up by the female, as she made another smaller hole 20 cm. below. She also altered the bottom of the log making

it slope down towards the back opposite the entrance-hole. The clutch of three eggs was deposited at the bottom of the log without any nesting material. One chick hatched on 17th July. Its growth, and particularly the development of feathers, was very slow and it only left the log on 20th August, at the age of 34 days.

The food provided for these birds was much the same as that given to the Tanagers but with more meat and yolk of egg, and during the rearing period more supplies of mealworms each day.

SUPERB SPREO (*Spreo superbus*)

Three Clutches—three young reared

In 1968 and 1969 we had several broods of Spreos in a large outdoor aviary which was shared with a dozen of these birds and others, such as Glossy Starlings, with the result that no young were reared. The nest, either built in a Thuya 1.50 m. above the ground, or on the ledge of a small window in a wall situated 2.50 m. above the ground, was a coarse ball of dried grass, rather voluminous with a large opening at the side giving access to the nest-cavity which was well lined with feathers.

In the spring of 1970 three Spreos were placed in a smaller but quite spacious outdoor aviary already occupied by a trio of Ceylon Junglefowl and a pair of Indian Tigrine Doves. A pair was promptly formed and a nest was built in a rectangular box (40 × 25 × 25 cm.) hung horizontally under the roof of the shelter, with a large semi-circular opening on one of the smallest sides where the base protruded to form a platform. (We usually give this type of nest-box to certain doves.)

Three clutches of four eggs (turquoise-blue and somewhat elongated) successfully hatched during the summer.

First Clutch

Incubation started on 11th May. Two young hatched 24th May (length of incubation 13 days) and flew 14th and 17th June (21 and 24 days old).

Second Clutch

Incubation began 26th June. Two young hatched 9th July (length of incubation 13 days); one died after two days and the other left the nest on 31st July (22 days old). During the rearing of this youngster the parents tolerated the presence of their first brood in the aviary.

Third Clutch

Incubation began 12th October. Three young hatched 25th October (length of incubation 13 days) but were found dead the next day after a very cold night.

The Spreos were given the same diet as the Barbets with, during the rearing of the young, a supplement of earthworms and mealworms, which they greatly relish. It is worth noting that the third adult Spreo remained with the breeding pair all the time without ever being chased away.

PAGODA STARLING (*Sturnus pagodarum*)*One Clutch—two young reared*

Our pair of Pagoda Starlings remain outside all the year round in a large aviary occupied, especially during the summer, by many other birds. A pair of Scarlet Ibis, a pair of Palawan Peacock Pheasants, a Crowned Pigeon, 20 doves of a dozen different species, two Giant and one Blue-throated Barbet, a pair of Rosy Starlings, a Black-winged Starling, and a dozen Glossy Starlings (Green and Purple-headed).

Early in June 1970 the Pagoda Starlings made a nest in a rectangular nest-box (50 × 25 × 25 cm.) placed vertically under the roof of the shelter and with a round entrance hole 6 to 7 cm. in diameter 35 cm. from the base. The female began incubating on 8th June and four young hatched on the 21st and 22nd (length of incubation 13–14 days). Unfortunately, two days later two young were found dead outside the nest, undoubtedly as a result of lack of food due to the large population of the aviary. The two survivors left the nest at the age of 20–21 days. The food provided for these birds was identical with that given to the Superb Spreos.

About three weeks after leaving the nest however, the two young Starlings showed great difficulty in breathing accompanied by fits of coughing and repeated yawning. These symptoms immediately made us think of syngamosis, which is endemic in our pens, the occurrence in the Starlings being explained by the fact that these birds like to forage for food in the grass lawn in the aviary. This condition was proved by the examination of one of the birds which had rapidly died. Several pairs of gape-worms (*Syngamus trachea*) were found in the trachea and also pneumonic lesions, certainly caused by the migrations of their larvae. By adding an anthelmintic (Thiabendazole) to the food, particularly to the mealworms, whose skin had been scratched in order to increase the adherence of the medicinal powder, a cure was effected within a fortnight. It was noted that in the meantime the female, who was more exhausted by her various reproductive duties than the male, also showed the same symptoms but fortunately responded to the same treatment.

MAIDEN DOVE (*Turtur brehmeri*)*Four Clutches—two young reared (1967–68)**Two Clutches—one young reared (1970)*

This species is rare in captivity and only exceptionally bred.

The pair at Clères are housed in an indoor flight with small birds (seed, insect and fruit eaters). Hitherto they had been placed in indoor aviaries, and moved to outdoor aviaries in summer, but had never shown any signs of nesting.

In October 1967, when we had lost all hope of their ever breeding, the birds began to take great interest in a small basket hung for them on a

branch of a *Thuja* placed in the corner of the flight. A nest was quickly built and two eggs laid, the relatively glossy shell being greyish olive-green. But this clutch was clear and the same was the case in a second clutch laid in November. One young hatched from a third clutch laid in December, but unfortunately died when 10 days old. Examination showed that it had advanced rickets and it was noted that its crop was full of water. In the second half of January 1968 a fourth clutch was laid and two young hatched on 6th February. On 12th February their larger feathers, remiges and rectrices, were already sprouting and we decided to take them away from their parents and try to hand-rear them. This was achieved successfully by giving them a paste composed as follows: seeds (millet, canary seed, hemp and shelled sunflower) soaked in tepid water; sponge-cake; grated lettuce and carrot; banana and sultanas soaked in water; meat, hard-boiled egg and mealworms cut up small; some poly-vitaminated minerals; and the whole mixture finely mashed till a sufficiently liquid paste is formed to be able to be given to the birds by means of a pipette with an enlarged hole.

Unfortunately various construction works from spring 1968 to summer 1969 disturbed the life of the breeding pair, and it was necessary to place them elsewhere. It was not till the spring of 1970 that a further clutch was laid in a nest-box; one young hatched and this time was entirely reared by the parents. A further later clutch was destroyed by the Blue-headed Tanagers who tried to nest in the same box.

It appears that success in rearing is connected with the composition of the food supplied to the breeding pair. These birds, which are given the traditional diet for doves of a mixture of seeds, are very fond of and benefit from the fruit, and even more the animal food (meat, egg-yolk and mealworms), provided for the other inhabitants of the aviary.

BARE-FACED DOVES (*Metriopelia cecilae*)

Twelve Bare-faced Doves are housed all the year round in our largest outdoor aviary, which is well planted, mostly with evergreens. They breed mostly from the end of summer till autumn. They like to nest in holes sometimes very deep, such as parrakeet nest-boxes, dove nest-boxes or wooden compartments specially built for this purpose, and they prefer those attached to a wall or under a shelter to those placed in trees.

On 12th November we were surprised to see a young bird just out of the nest, with very light-coloured plumage. Unfortunately it was found dead on 15th November, undoubtedly as a result of the bad weather with violent and cold rain-storms. Its characteristics were as follows: plumage entirely white lightly washed with rusty-buff, particularly on the underparts, the red eye of albinos, and the bare skin round the eye bright light yellow instead of orange yellow; bill and feet very pale pinkish-yellow.

FAIRY BLUE BIRD (*Irena p. puella*)*Partial success with the help of a pair of wild Blackbirds*

During the last few years our pair of Fairy Blue Birds, which during the summer are placed in an outdoor aviary, have laid several clutches but have not succeeded in rearing them.

On 7th May 1970, the female was again brooding two eggs in a nest built in a pigeon nest-basket fixed below the roof of the shelter.

Having found a Blackbird's nest in a creeper on a wall in which the hen bird had just begun to incubate five eggs, on 10th May we decided to replace two of these (which we put in the nest of another pair) with the eggs of the Fairy Blue Birds. Compared with the Blackbird's eggs those of the Fairy Blue birds are larger, less elongated and with larger and browner blotches, the light green almost white ground colour being hardly visible.

We visited the nest on 25th May and found a young Fairy Blue Bird and three young Blackbirds (the second egg was infertile). It appeared to be three or four days old and the pin feathers already looked darker than those of the Blackbirds which were obviously younger. We saw it open its beak and it appeared to have a black line bordering the gape around the mandibles. We visited the nest again on 30th May and found the Fairy Blue Bird very lively, with large dark eyes and plumage beginning to sprout, darker than that of the Blackbirds. We decided that the next day it should be removed from its foster-parents to try to hand-rear it. But alas a tragedy had occurred during the night as the whole brood had fallen victims to a Lerot (*Eliomys quercinus*). These small rodents, a species of Dormouse the size of a small rat, are very common in Normandy and destroy many nests. After searching we found the Fairy Blue Bird half-eaten and minus the head.

* * *

SOME NOTES ON THE REARING OF BUFFLEHEAD AND HOODED MERGANSERS

(*Bucephala albeola* and *Mergus cucullatus*)

By W. M. H. WILLIAMS (Harpenden, Herts., England)

NEST BOXES

Saw a 3 ft. pine log down the centre and then hollow out the inside to an internal diameter of $6\frac{1}{2}$ in. to $7\frac{1}{2}$ in., except in the nest area where you should increase the internal diameter to say 9 in. to allow more space for eggs.

For Bufflehead the entry hole should be 3 in. in diameter and for Hooded Mergansers $3\frac{1}{2}$ in. These figures are on the assumption that there are no other competitors for the nest, such as Carolina ducks. If there are competitors, then reduce the size so the Bufflehead has a hole of $2\frac{7}{8}$ in. in diameter and the Hooded Merganser $3\frac{1}{4}$ in. The distance between the bottom of the entry hole (lip) and the bottom of the nest area is 15 in. Place some 3 in. of sawdust at the bottom of the nest area. This will leave you 12 in. to the lip of the hole. The hole should be between 18 in. and 24 in. above the level of the water. It is very desirable that the log be placed in the water to prevent the birds injuring themselves if they fall off the wooden ladder. To avoid water seeping up into the nest area, you can place polythene around the base and up the log above the water level.

The birds are territorial and so space the nest boxes as much as possible in the pond.

A ladder is required for the birds to enter the nest box. Use a plank some 8 in. in width. Then $\frac{1}{4}$ in. battens can be used for the steps which should be about $2\frac{1}{2}$ in. apart. The ladder should be secured at an angle of 45 degrees to the log using a large hinge. Obviously the ladder must be secure and rest on either the bottom of the pond or some plank placed across in a corner position to which the ladder can be nailed.

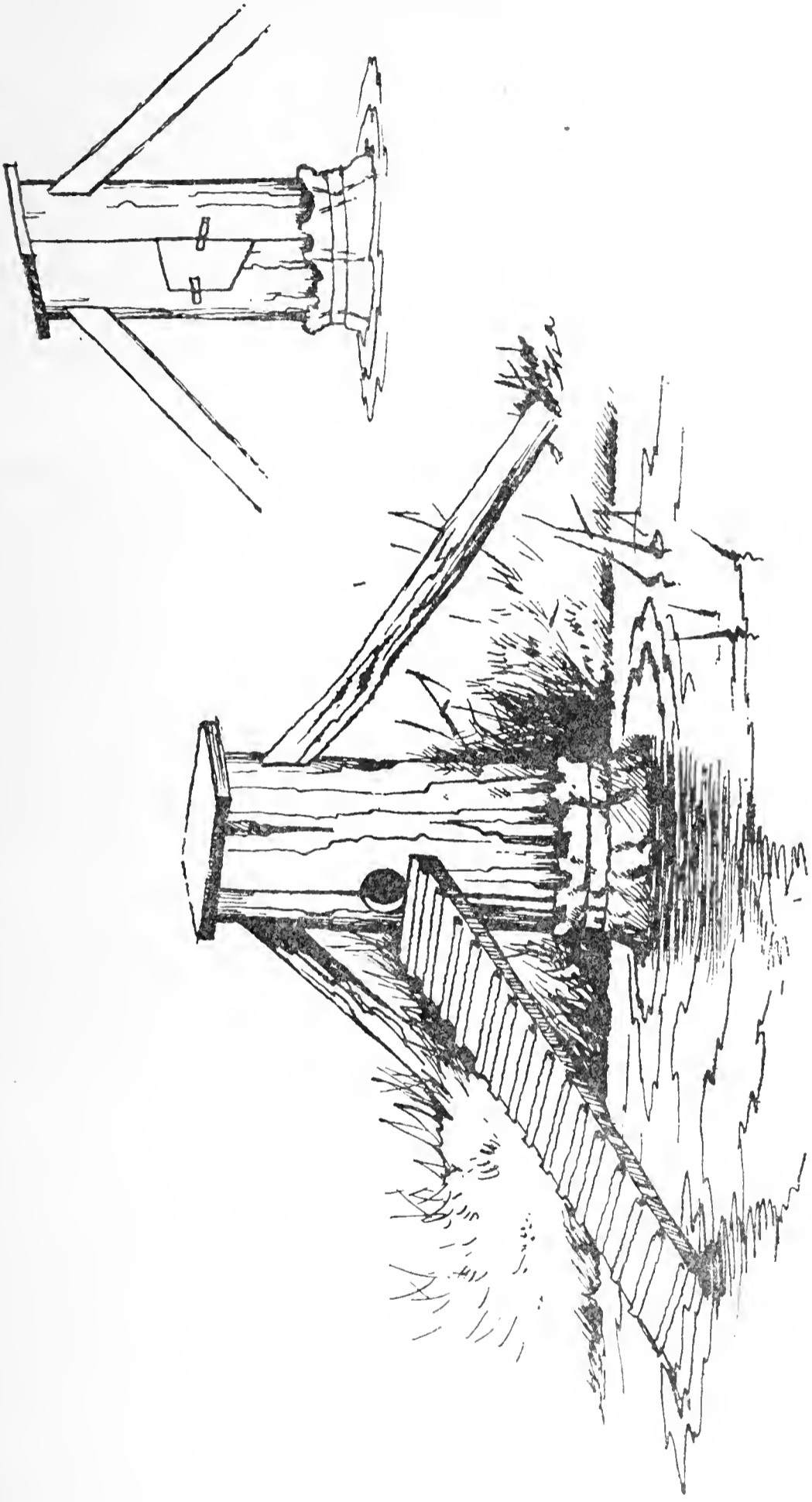
The sawdust to be placed in the nest box should preferably be fairly fine sawdust and not thick wood shavings.

It is usual to have an inspection hole at the rear of the log. All that is involved is the cutting out of a section as shown in the drawing. An alternative to this is to have a roof for the nest box which is fixed by screws so the lid can be easily removed.

It is desirable for the nest boxes to be placed in position by 1st March in each year.

EGGS

It is better to let the duck lay all her eggs without disturbance. If you are going to use an incubator, then allow the duck to sit on the eggs for, say, 21 days. This will give an opportunity for the eggs to become settled



and there is far less risk if they are then being removed for the final eight days in the incubator.

It should be noted that Bufflehead eggs normally take 29 days to hatch and Hooded Mergansers 31 days.

If you are going to remove one egg a day and replace with a dummy or bantam egg, then the storage is important. About 60°F is a good temperature—some wheat in a box makes a good storage place as the wheat has its own natural dampness. The egg should be marked on each side. Cover just over half the egg in the wheat. The egg should be turned twice a day through 180°. When the time comes to take all the eggs from the nest it is advisable to remove also all the down. The duck should not be allowed to sit more than 48 hours if you hope to get a second clutch.

COOP

The construction and dimensions of the box are shown in the diagram. It is very important for the duckling to remain under the bantam not only whilst it is hatching but for about 24 hours after hatching. The reason is that the duckling must establish a "mother image" for the bantam. If the box is too big then the ducklings will not be close enough to the bantam to feel her feathers, and they may try to hide in the corner of the box. There are two possibilities for the nest in the coop, namely:

- (a) Using sawdust and broken straw build a nest about 4 in. high inside the box. It will be necessary to add more material from time to time. It is very important to check that there are no gaps between the nest and the sides of the box as a duckling might slip down and die from cold, or
- (b) dig out a small circle of turf—about 4 in. deep. Remove all stones and then make a smooth nest in the hole from broken straw. Make sure the hole is not dug in an area where water could drain into the hole. If this type of nest is used then the nest box must be made without a bottom—also rather than have the front opening it is better to have a roof which will lift off.

BROODY

Choose a small and reliable bantam. Spray her a week or so before sitting with an aerosol to kill any fleas or bugs. Some dummy or bantam eggs should be placed under the broody to make sure that she is settled. When you are ready to place the duck eggs under the broody the first thing is to take her off for a feed. Then let her return to the dummy eggs—after an hour or so when sure that the broody has settled you can then remove the dummy eggs and replace with the duck eggs.

Except when let out for feeding and exercise the broody must be left shut up in the coop—in the dark.

Take care, when lifting the broody off the nest to put her in the run for feeding etc. that there are no eggs caught up under her wings—avoid the

disaster of an egg dropping onto the others from a great height. If you do crack an egg then stick a piece of elastoplast over the crack, and put the egg in an incubator. Initially the broody can be off the eggs for 10 minutes or so—the periods can be increased as the incubation progresses to up to 30 minutes during the last week. A woollen cloth should be placed over the eggs whilst the broody is off the nest and feeding.

It is advisable to wet occasionally the nest material. During the last 10 days squeeze a little warm water over the eggs from a sponge—otherwise the shells may be so hard that the ducklings cannot get out.

Eggs which are soiled should be carefully washed in warm water before putting under the bantam.

There is no need to turn the eggs over in the nest; the bantam will do this.

HATCHING

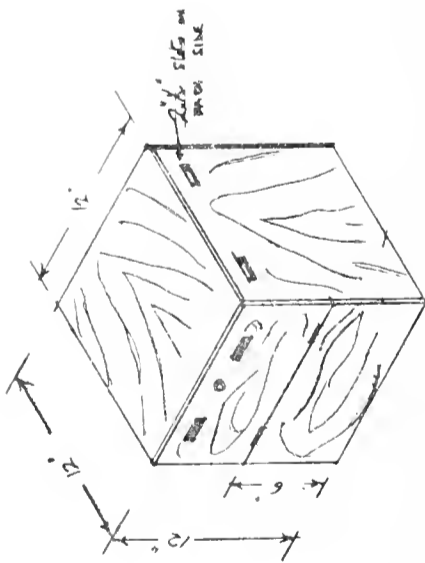
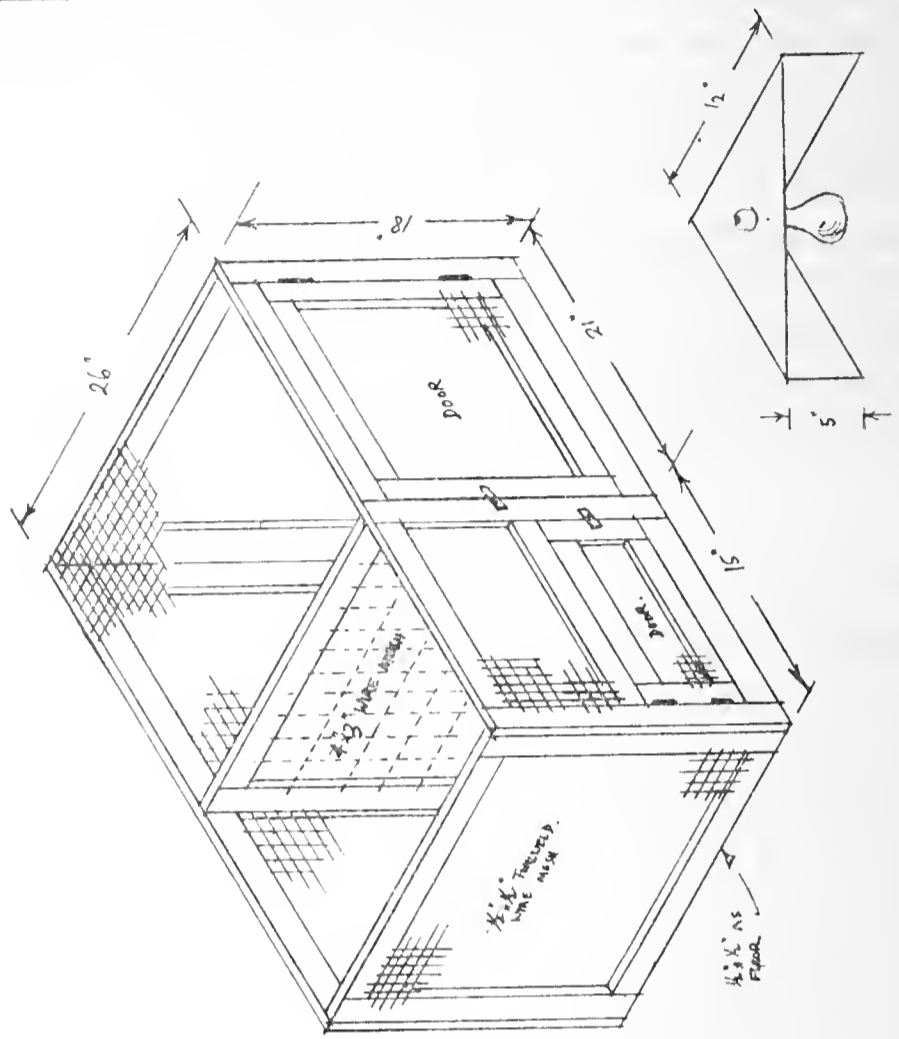
Do not allow the broody out of the coop once the eggs are actually hatching. Leave the broody alone until the ducklings are hatched and dry. A small can containing grain and a can of water can be placed in the coop—it is not essential—the cans must, however, be removed after the bantam has eaten and had a drink. Once the ducklings have dried the bantam can then be let out in a run for food and exercise. Then the broody must return to the nest box.

Until the ducklings are all hatched and dried it is advisable to keep some eggs under the bantam. The eggs will keep her in the nest and stop her sitting too tightly on the ducklings. Two warmed up bantam eggs could be used.

Broken shells should be removed. Do not discard unhatched eggs until three to four days have passed and they show no sign of life—transfer to an incubator or another bantam.

BROODER

The bantam and ducklings are best kept inside a building for the first few weeks. A suggested cage has a length of 3 ft., a width of 2 ft. and a height of 1½ ft. The bottom should be made of ½ in. wire mesh (for the first seven days or so have a newspaper over the wire; thereafter the feet of the duckling should have hardened). A 40 watt bulb in the corner is desirable for heating—a bar in front of the shelf will stop the bantam touching the light. Have a small shelf over the bulb, as this prevents the ducklings being burnt by it. The bantam and ducklings should be placed in the brooder 24 hours after hatching out. They should stay in the brooder for about 30 days. The diagram shows the partition wire—the ducklings' food should be kept in the left hand partition as the bantam should not be allowed to eat the ducklings' food. The bantam should be fed with corn in the other half—the corn should not be left in the cage as it



might be eaten by the ducklings. If an incubator has been used then place an infra-red light over the cage using a 250 watt bulb—this can then be replaced by a 150 watt bulb after the ducklings are a week old or if the weather is very hot.

FEEDING

(i) *The Start*

(a) When using a bantam feeding should start between 24 to 36 hours after the ducks have hatched. With an incubator feed them immediately after removal from the incubator which should also be in the region of 24 to 36 hours from hatching. (The ducks are too delicate to survive the 48 hours in the incubator which many manufacturers recommend, particularly in hot weather when the incubator temperatures may get too high).

(b) The ducklings should be fed four times a day at 3 to 4 hour intervals until they can eat by themselves. This will work out at about 3 to 4 meals per day. As a rule, it is more difficult to get Hooded Mergansers to eat than Bufflehead.

(ii) *Equipment*

Shallow water dish: a small water container; a flat feeding tin; and pipette (3 millilitres).

(iii) *Food*

(a) Mix some strained beef heart (as sold for infants) with water until it has a paste-like consistency. Fill the pipette about $\frac{1}{3}$ full for Bufflehead and $\frac{1}{2}$ full for Hooded Mergansers. If two people are feeding the duck it makes life easier. One of them should hold the duck in the palm of the hand and assist the other (who is holding the pipette) to open the beak—usually it is a combination of the end of the pipette and finger-nail. Then squeeze the contents of the pipette down the throat—but not all at once.

The pipette need not be used once the ducks start eating the food. To use the pipette you should hold the duckling in the palm of the hand. The feeding with the eye pipette should continue for 14 days or until the ducklings eat by themselves, which is normally within a few days.

(b) The Hooded Mergansers and Bufflehead should have a half and half mixture of Purina Dog Meal and Chick Starter Crumbs.

The Purina Dog Meal and the Chick Starter Crumbs must be ground and then passed through a fine sieve—this is most important. Also add some egg (yolk only for the first three days) and then a little water to make it crumbly. Chick mash and crumbs have a lot of small husks which must be sieved out—crumbs after they have been ground have far fewer husks than the mash and are, therefore, better. Some ducks have no problem eating Mash—however, experience has shown that many Hooded

Merganser and Bufflehead Chicks have died because their gizzards and throats are blocked by the husks.

Place the mixture in a shallow pan—add a few meal worms as this will encourage them to eat.

Once the ducklings start eating the mixture of Purina/Chick Crumbs the meal worms should be discontinued for a day to avoid the birds becoming too dependent on meal worms and eating nothing else. As soon as the birds are settled down to the mixture a few meal worms should be given every day.

(c) In the shallow water dish there should be some duckweed or finely-chopped lettuce. A waterdrip will encourage the ducklings to eat the weed.

(d) The ducklings should have grit. This should be a very fine gravel washed through a fine sieve.

(e) Do not allow the food to get into the water pan. For the first week or so place some pebbles in the water pan to prevent the ducklings getting too wet.

Note—On 6th June 1970 I had five Bufflehead eggs in my incubator. During the day it was obvious that three ducklings, although the eggs were well pipped and cracked, would be unable to get out. I therefore broke away the egg shell in several stages. Three were finally out of their shells by the late evening. On the morning of 7th June I had to help the fourth duckling from its shell. (The fifth duckling died in its shell.)

The 7th June was very hot and the ducklings by the evening were unhappy. I therefore removed them from the incubator and put them in the brooder. They then had their first forced feed of strained beef heart.

On the 8th June I gave the four ducklings forced feeds in the early morning and then three hours later. I had some meal worms in the water pan which they started to eat in the afternoon. In the evening I put some wet mealworms in the Purina/Crumbs. The mealworms were eaten and a little of the mixture. A forced feed was given late at night.

On the morning of 9th June I gave them another forced feed. The next meal was a mixture of sieved egg yolk and the Purina/Crumbs. I noticed that they did not eat from the dish but ate the mixture which spilled on the newspaper on the floor of the brooder. In the evening they had their last forced feed. They then settled down to eating the mixture.

I force fed my Hooded Mergansers for two days.

IMMATURE/ADULT DUCKS

After the ducks are eight weeks old, then the feeding procedure should change as follows:

Morning

A mixture of split maize and wheat.



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W. M. H. Williams

Drake Hooded Mergansers



Noon

B.O.C.M. Turkey breeder pellets and Purina dog meal (available in England).

Evening

B.O.C.M. Turkey breeder pellets and Purina dog meal. This can be fed throughout the year.

Certainly it is very helpful to give some meal worms each morning and, if obtainable, some dried shrimps. Some French toast in the water at breeding time is a good idea—bread soaked in eggs and milk and then fried.

REMOVAL FROM BROODER

Normally the ducklings can be removed from the brooder after four weeks—it depends on the weather. It is most essential to ensure that the ducklings do not get soaked. The run should be covered overhead so the rain does not wet them.

For the first few days the ducklings are in the run they should only be allowed a very shallow pan for a minute or so. It must be easy for the ducklings to get out of the pan—the ducklings will be waterlogged and must be kept under observation. More ducks are lost through getting soaked and cold than any other reason.

Each day the ducklings will get more oil from their preen glands—but until they are about 2 months old it is essential for the ducks to get properly dried out. Even at a month old they are not sufficiently oiled to withstand getting soaked by rain.

A coop with an infra red light in the roof should be attached to the run so that the ducklings keep warm at night and can be dried out if they get too wet.

ACKNOWLEDGMENTS

I should like to pay tribute to Chuck Pilling. He is one of the greatest waterfowl men—it was Pilling who first bred in captivity the Bufflehead and Hooded Mergansers whose descendants I have in England. Chuck Pilling is also one of the kindest and most helpful of people, particularly to the beginner. I have spent many hours with him jotting down his words of wisdom. I thought it might be helpful for others to have the benefit of Pilling's great experience and knowledge.

Finally my thanks to Donald Price of Kimpton whose skilled employees built the nest boxes and coops at very short notice.

* * *

SOFT FOODS FOR WAXBILLS

By DEREK GOODWIN (London, England)

As those readers who devour our magazine from cover to cover will be aware, I have been keeping various waxbills of the genera *Uraeginthus*, *Lagonosticta*, *Amandava* and *Estrilda*, since August 1958 (this written December 1970). My early attempts to get my waxbills to eat egg food and milk sop failed completely. In the early 1960s I had a hand-reared Blue Tit which had been given me. This bird would eat little but sponge cake (that is, in bulk, but it would eat minute quantities of various foods) which I made fresh daily for it by adding two eggs to a commercial sponge mix. This resulted in much spare spongecake, which, for a time, I added, crumbled, to the waxbills' seed dish daily.

This was soon readily taken by some Black-capped Waxbills, *Estrilda nonnula*, that I then had and, eventually, some of the other birds began to take it also. However, as the Black-capped Waxbills did not breed successfully and were mostly very fat when, one by one over a period, they died, I feared there might be too much sugar in the spongecake and ceased to use it.

I made no further serious attempts to get the waxbills to eat soft food (although they were sometimes offered it) until early in 1966. The main reason then was the growing difficulty of getting supplies of meadow ants (*Lasius* spp.) that, (I hope not entirely as a result of my predation), seem to have greatly decreased in south-eastern England and, so I gather, elsewhere as well. Also I thought that eggs and milk would be a desirable addition to the diet, if the birds could be induced to eat it.

I, therefore, started putting a dish of milksop and one of egg food into the bird room each day. As many birds show suspicion and, in some cases actual fear of any new (and some old) foods when presented in large masses, I also sprinkled some egg food each day over their tray of panicum millet. I may here digress to explain that, apart from such insects as they may be given, the waxbills get a long zinc tray (about ten inches by 30 inches) on which panicum millet, treated with halibut oil about once a week in summer and twice a week in winter, is spread each day on a clean folded sheet of paper. In addition to this, Japanese millet and canary seed are scattered on clean parts of the floor and mineralised grit, cuttlefish, both crushed and in lumps, and crushed dried eggshell given *ad lib*.

After a few weeks of this régime, during which little if any of the soft food had been consumed, I tried mild coercion. Each week and sometimes more often, after cleaning out the room, I left the birds without food for about 30 to 45 minutes. They had, in each instance, had at least an hour of light to feed after waking before this was done. When I put back the water containers I put in the egg food and bread and milk,

scattered morsels of former in the (empty) millet tray and of the latter on the clean newspaper around the dish.

The birds always flew down, expecting food. The first few times only one or two half-heartedly pecked at egg or milksop. Within a few weeks, however, several of the birds were eating it, although without much enthusiasm. In all cases I only kept them without seed for half an hour or less (usually less) after the soft foods had been put in. I should add that when similar experiments had been tried but without first making eggfood a milksop available daily for some weeks previously, *none* of the birds had eaten any.

Once a few of the birds started to eat soft food, the others "learnt" relatively soon to do so. This was not, however, a matter of sudden learning. Often a bird would show definite interest when it saw another waxbill, especially one of the same species, eating egg or sop, but although this usually led to its investigating the food, I did not see an instance in which such an apparent "first try" led to immediate acceptance, as it sometimes does with pigeons.

For example, in early December 1969 (at which time all of my waxbills except the old Jameson's Firefinch were eating egg and milksop readily) I bought two pairs of wild-caught Blueheads and put them into the room. On December 21st, I kept all the birds half an hour without food and then put in egg and milksop as described above. The two new male Blueheads had evidently learned to eat egg as they did so without hesitation but the females did not. One of the new females watched her mate eating egg very intently, then pecked at some egg herself but at once wiped her bill as if disgusted with it. Later, however, both these females ate soft foods readily.

With Cordon-bleus, *Uraeginthus bengalus*, Blue-headed Waxbills, *J. cyanocephalus* and Golden-breasted Waxbills, *Amandava subflava*, all the individuals seen to be among the first to start eating milksop or egg food were captive bred birds, although the wild-caught individuals sooner or later followed suit. Two wild-caught hen Red-eared Waxbills (do males of this species *ever* get imported?) are, however, by far the most enthusiastic egg-food eaters of the lot, especially when they are laying or about to lay. The Jameson's Firefinch was the last to be seen to eat such foods, holding out for over three years after the rest of his fellow-captives were readily taking them. For the past seven months or so he has, however, taken a little egg and, rather more rarely I think, a little milksop.

Some of the Blueheads and Cordon-bleus will feed milksop and egg-food to their young and rear them quite well on this together with whiteworms and what few wild insects are available. I am not, of course, suggesting that this is better than giving fresh pupae and grubs of meadow ants *ad lib.* but it does solve problems when they are not available. Especially now that even maggots cannot easily be got at all times and are, in any case, usually too big and tough to be suitable when the young are small.

I do not mix any biscuit or bread with the egg as its purpose is to add some animal food to the diet of (partly) seed-eating birds. They are, obviously, getting quite enough cereal food from their seed. I prepare it by putting an egg in cold water, bringing it to the boil, then turning down the gas and letting it simmer for about ten minutes. As soon as it is cold enough to handle (but while it is still quite warm) I shell and peel it, then force rather more than half the white and all the yolk through a clean gauze strainer and mix it up with a fork, then loosen it to a crumbly consistency. This is given in a round flower pot saucer (where it tends to dry up rather than go sour as it would in a small, angled container) placed on the ground and some is sprinkled over the millet in the tray to encourage all the birds to eat it. The milksop is made of white bread. Since, for convenience, I used Carnation tinned milk myself I also use this, diluted with about the same amount of water, for the milksop. I make it "crumbly wet" rather than the usually recommended "crumbly moist" (a state that more easily becomes the sort of "crumbly-STICKY" of some proprietary foods and than which nothing seems more distasteful to most birds) and give it in a small plastic dish, rather heaped up in the middle so that broken moats of milk form around it. I find that many of the waxbills, probably all of them on some occasions, will often drink this milk even though water is always available.

While on the subject of food for waxbills here is a simple and relatively trouble-free way to breed whiteworms that entails none of the messing about with complicated mixtures of loam and soil and leafmould and the sheets of glass and other paraphernalia that some books recommend. Buy one or more large plastic washing-up basins. Buy also some sphagnum peat or one of the peat-like types of bulb fibre but the peat itself, which can be bought from Woolworths among other places, is cheaper. Mix it with water until it is wet but crumbly and not sopping. Fill the basin or basins. Buy some whiteworm culture from your local tropical fish shop.

With a large spoon, which is best kept handy on top of the peat in the basin, scoop out one or (preferably) more hollows in the peat. Put in each a spoonful or so of whiteworm culture (which consists of some clay or earth with, if you are lucky, a lot of very hungry but not yet moribund whiteworms mixed with it) and a dollop of rather wet milksop. Cover up both whiteworms and sop with peat. If this last is not done mould will grow on top of the milksop. Place the plastic basins under the bed in the spare room, as I do, or in any equivalent place in a fairly cool but not freezingly cold room.

Keep the substrate moist. After a week or more have a look and if the milksop has largely gone, add some more. Within a month or less you should have large numbers of whiteworms. They can be fed to the birds by putting spoonfuls or better handfulls of peat and worms and spreading it on a clean part of the floor. When waxbills have young and if you have

to leave them most or all of the day, you can also put in one or two low heaps of peat and worms which will not dry out so quickly and will keep them busy digging about in it.

Unlike mealworm cultures these whiteworm cultures seldom go wrong and, if they do, can easily be thrown out and a new start made. Besides the whiteworms, wild fruit flies will sometimes find these cultures and breed in them, although tending to die out or disappear after a time. They, or rather their grubs are, of course, a welcome addition to the waxbills' diet. I have even once had a House Fly lay its eggs in one and provide me with some really usefully-sized maggots. This useful creature is not, alas, any longer a "common object" of either town or country so there is little likelihood of being able to breed its maggots by design. I suspect that the Bluebottle only holds its own so well by virtue of its larvae's use, by and probable frequent escape from the sessile predators that infest our waterways.

* * *

CUCKOO DOVES ADJUST QUICKLY TO AVIARY CONFINEMENT

By PROFESSOR CARL NAETHER (Encino, California, U.S.A.)

Cuckoo Doves derive their name from the fact that their plumage suggests to some degree that of the cuckoo, with its bars and stripes. However, they are called also Brown Doves, since their overall colouring is in various shades of brown, usually an unobtrusive brown which serves them well as protection against easy discovery by enemies. This brown blends perfectly with other, more or less dark colours of their native habitat, where Cuckoo Doves live largely in trees. Being short-legged, they indulge in but little walking on the ground, where now and then they seek food and drink. This fact holds true also in the aviary, where these lovely doves perch high most of the time.

I was much interested in one observer's comments that Cuckoo Doves are allopatric, that species and subspecies, though resident in different countries, are yet fairly closely related, as evidenced largely by their brown coloration and their usually long tails. These Wood Doves are found in Australian and Oriental lands, from the Himalayan mountain regions to Indo-China, Hainan and the Philippines, south to Australia. Among the better known species are the Bar-tailed Cuckoo Dove, the Pink-breasted Cuckoo Dove, the Red-headed Cuckoo Dove, the Pheasant-tailed Cuckoo Dove, and many others, their popularity in captivity rising and falling with the frequency and numbers of their importations, which in recent years have been quite limited.

While in their more or less modest brown-feathered dress, Cuckoo Doves are nevertheless handsome aviary birds: their long, slender bodies made still longer by means of their "far-reaching" tails—the whole lending a grace and a charm which combine to delight the appreciative lover of this rare bit of wild life. This writer has had the pleasure of seeing Cuckoo Doves in his aviary on repeated occasions, the last occasion being now. In point of fact, one of his pairs has a husky youngster just off the nest. He has been perching away from the nest now for several days, always near his parents. At night he returns to his next-box in the half-dark of the shelter, where one of his parents will still warm him during the long, cold nights which we have been not enjoying now for nearly a week. Being arboreal like his elders, the youngster has not touched ground since his sojourn away from the nest. He is not as slender as his parents, but rather plump, and his tail is short, only about half the size of that of his father or mother. His overall colour is black-brown, with but little evidence of barring.

Cuckoo Doves make very suitable aviary birds. Above all else, they are gentle in their behaviour—no wild fluttering or flying about when I enter their abode, only an interested look in my direction, measuring the likelihood of a closer approach on my part. The behaviour of the sitting, brooding bird when I came near the nest never varied: always he or she would lift the small, pretty head up high facing me, and settle down on egg (they lay but one) or youngster only after I was gone. The pair did not build much of a nest, only a fragile platform of a few sticks in a very shallow, open box, 5 ft. off the ground in the half-dark of the pen. There male and female took their turns regularly at incubating and then brooding the youngster. These slim, long-tailed doves are graceful, swift flyers. They are quiet bodies. I do not think they would thrive if kept with other, perhaps aggressive species in the same enclosure. I keep mine separately, thus avoiding all possible conflict and trouble.

Even though some authorities assert that Cuckoo Doves eat, besides seeds, berries and other kinds of fruit, mine prefer hard grains, such as popcorn and milo, and some large millet. At this time especially when we have frosty days and nights (it is early January as I type these lines), they consume popcorn in generous quantities. I have offered them live mealworms now and then, also diced cheese, but neither protein-rich food did they touch. In other words, these Cuckoo Doves are very easy to care for and to keep in good health. I can recommend their keeping to any man or woman who loves simple beauty and natural grace in birds of this kind. And while, perhaps, they are not so-called fast breeders they are steady, dependable breeders and reliable feeders of their offspring. What more can a foreign-dove fancier ask?

TRAFALGAR

By JOHN MALLET (Trinity, Jersey, Channel Islands)

I was given this feral domestic pigeon when it was about two weeks old and had fallen out of its nest. She (I discovered her sex later) was put in a box on soft hay and fed on soaked maple peas twice daily until she was weaned on to plain canary seed and wheat. At about five weeks old she first ventured out of the box and started to fly about the shed where she was kept. She would fly to me whenever she wished to be fed. She began to remind me of one of the pigeons around Nelson's Column and so I named her Trafalgar. She was a fine blue, resembling a racing pigeon.

I left her completely free and she would always come when I whistled. After moulting her nest feathers she started to treat me as though I was her mate. One day I took her to work, expecting her to fly back home, approximately half a mile as the crow flies. Instead she flew on to the flat roof of a malthouse chimney nearby and started to preen herself. Twenty minutes later she was still there, so I whistled and she immediately flew down to me and then on to the ground, where she followed me into the house. She continued to follow everywhere I went until I left to go home, leaving Trafalgar by the front door. About an hour later she arrived home.

The following morning when I left for work she was on the shed roof, but when I arrived at work she was waiting for me at the front door. She spent the whole day following me, arriving home about an hour after me. On Sunday when I stayed at home she stayed also. My employer kept racing pigeons so I introduced her to them. She reacted as any normal pigeon hen to a displaying male, and they mated.

At home I fixed up a nest-box for her and gave her some sticks and twigs. She started to build a nest in the box and also displayed to me, taking any twigs that I gave her to her nest. Eventually she laid her two eggs and incubated for 19 days. During this period she did not pay her visits to St. Clements where I worked. One egg was infertile, but the other hatched and she reared it until it was about 10 days old, and then appeared to expect me to carry on. Two or three days later the visits to St. Clements were resumed and resulted in a second nest from which two young were hatched which I was expected to finish rearing.

Trafalgar ignored her first chick which I gave to a friend, and I also gave away the other two. She had a third nest with one fertile egg, but this time she reared it to independence with my help and then went into the moult. She did not nest after the moult and discontinued her visits to St. Clements.

The following season she paired up with her last chick which had turned out to be a red pied like its father. Both birds remained very tame and

treated me as another pigeon. When they nested they began to treat me as an intruder. Neither would allow me to inspect the nest, and the male would attack me when I entered the shed.

They remained paired and reared many young.

* * *

THE NESTING OF APOSTLEBIRDS AT WASSENAAR ZOO

By J. LOUWMAN (Dierenpark Wassenaar Zoo, Netherlands)

In 1953 we imported 11 Apostlebirds (*Struthidea cinerea*). We, at that time, liked to tell our visitors that we did not want to buy the twelfth Apostle (Judas). After a short quarantine period we put them in one of our side-aviaries in our bird house, The Louise Hall. The aviary was provided with heavy trees and had a grass floor. They did not share their aviary with other birds.

It took $1\frac{1}{2}$ years before we saw some nesting activities, this was during our European spring. Before and during this period the birds had many serious fights which may have been caused by the unequal proportion of the sexes. Within a year we had to separate six birds out of the group. All the six birds we had to keep separate. We never managed to tell the sexes of live Apostlebirds.

It is now about 15 years since I started keeping notes on their breeding and nesting activities. My observations were not always thorough and only taken at intervals. I was interested to find out whether more than two birds would help one another in nesting and breeding, as they are known to do in the wild.

Although we often use coloured bird-rings, our Apostlebirds were not ringed. At the time of my observations we had five birds together and I managed to recognize each one by small differences.

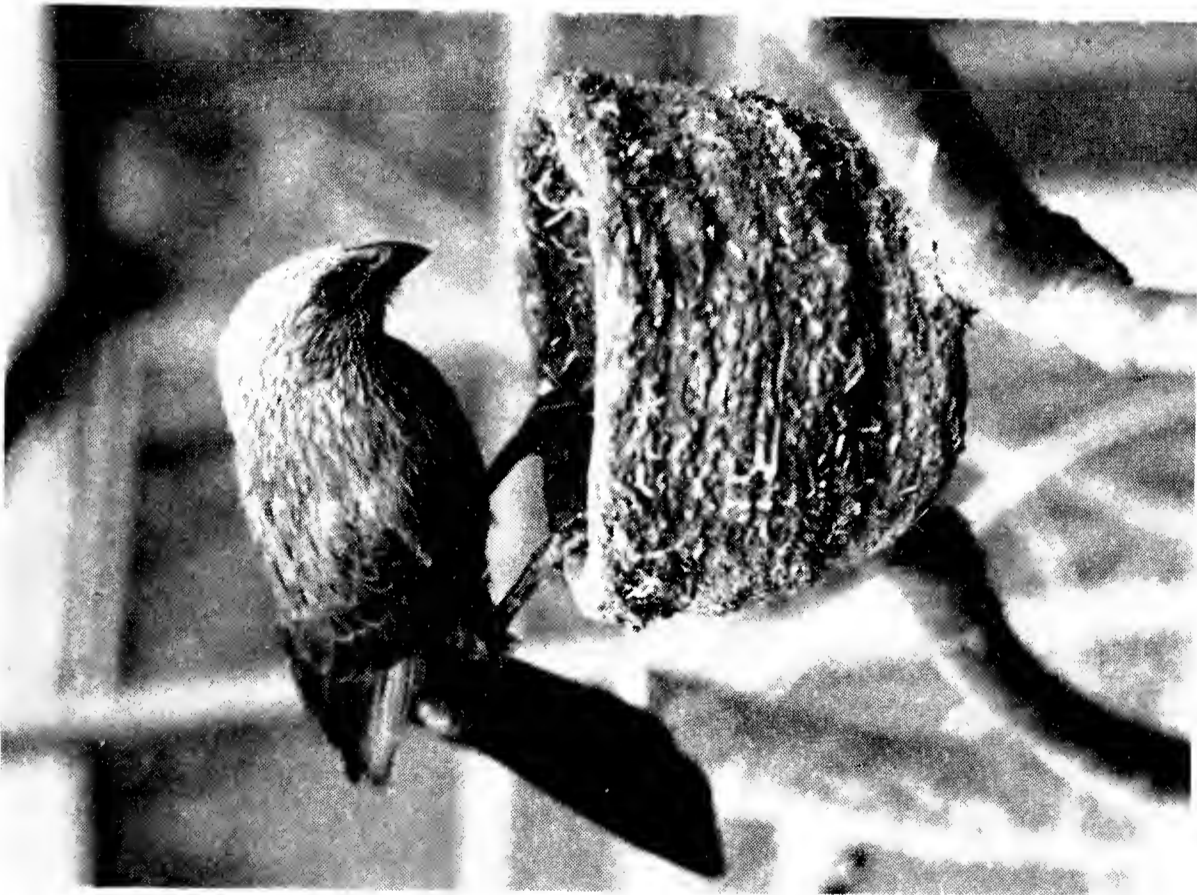
Although (as we later found out) we had two males and three females, at that time only one cup-like nest was made by the birds, with mud and clay, which we supplied them in their aviary. They used grass-blades in the clay to strengthen it. The inside part of the nest was lined with grass, which prevented the birds' feathers and eggs from sticking to the clay (after it had been damped by the artificial daily rain-showers which we provide in the Louise Hall).

We noticed that they make new nests every year. We also noticed that they sometimes repair the top edges when necessary, especially before their second clutch. We observed three Apostlebirds building one nest and we also observed four birds feeding just-hatched young ones. We only saw two different birds brooding the four black-spotted creamy-white eggs. Our young Apostlebirds never lived longer than four days, although they had enough live "grass and tree plankton".



J. Louwman

Pair of Apostlebirds

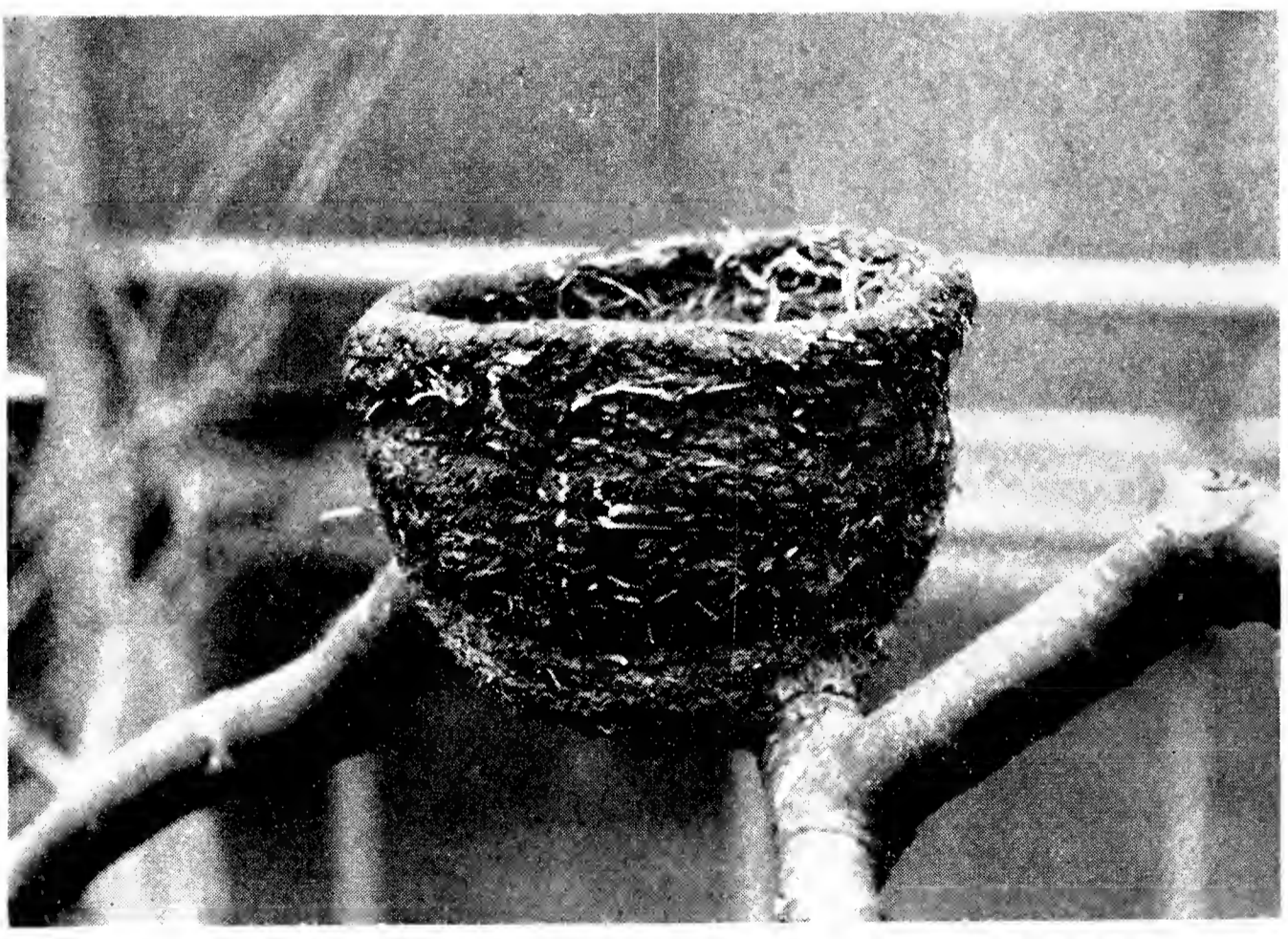


Copyright]

Apostlebird and nest



Apostlebird on nest



Copyright]

Nest of Apostlebird

[J. Louwman

After the death of one of our female Apostlebirds we had to separate the two remaining pairs, because they started fighting with each other. Both pairs are still living in separate aviaries and have been in our zoo for 17 years now. They both breed every spring, although we still have not had any success. We are now planning to give them a quiet outside aviary which is situated outside the zoo. We have never read any article on Apostlebirds kept in captivity, although some Australian aviculturists must have had some experiences. We would be glad to have any information from others concerning these birds.

* * *

BREEDING THE BLUE-WINGED SIVA

(*Siva cyanouoptera*)

By D. G. OSBORNE (Aylesbury, Buckinghamshire, England)

Blue-winged Siva's are small babblers from the Himalaya's, and are similar in size to a Pekin Robin, but are much slimmer with a much longer tail, which gives them the appearance of being larger birds. The cock and hen are alike in both appearance and colour; breast and belly being light cream, back and upper wing light creamy brown, the main wing feather being cobalt blue with black and white streaks running down the length, this also applies to the tail which also has a white edge at the end. The crown is also streaked with cobalt blue and light cream. The bill and legs are grey, with a few whiskery hairs at the base of the bill.

The Siva's are very active birds, perpetually on the move, and become very friendly, learning to take meal-worms from the hand. Their diet is similar to that of Pekin Robin, but with plenty of live food. They have a good insectile mixture, fruit, such as sweet apple and pear, maggots and a little mealworm. Tit-bits offered once or twice a week include cheese, brown bread soaked in honey water, berries, soaked dates and various fats. My birds have never taken seed as far as I have noticed.

I first purchased a single bird in December 1968, and asked the dealer, Mr. Clark of White Hart Bird Farm, to let me know immediately any others arrived. It was not long after that I collected another from him. Because of the difficulty in sexing these birds, as they are so identical to each other in all respects, I thought that only by observing their behaviour would I be able to tell. I kept the birds separate but adjacent to each other. I felt I must have two of the same sex as no reaction was shown until I put them together, when fighting immediately commenced, and was very serious, which meant I had to part them.

Mr. Clark had said he would change them if they were the same sex, and this he did. This time, when separated but within sight of each

other, one of the birds let out a deep-throated short song, similar in tone to a Pekin Robin, but quite distinguishable. This did not last long so I put them together, and for the first five minutes or so they kept their distance, with occasional short spells of fighting, but nothing very serious; then suddenly they sidled up to each other and sat very close together. After that they were completely compatible. I thought this must be a pair, which later proved correct.

In 1970 I put the pair in a planted outside aviary with access to a small indoor birdroom. The outside flight is 8 ft. 6 in. \times 8 ft. 0 in. \times 6 ft. 6 in. high and is planted with various shrubs, i.e. bamboo, forsythia, black-currant, and variegated grass. There is a brick wall at the back on which I hang branches giving a thick cover. I have a length of P.V.C. sheeting over this to provide a shelter for the birds. The inside birdroom is only 6 ft. 0 in. \times 2 ft. 6 in. \times 4 ft. 0 in. high, standing on legs to allow for storage under. This birdroom is then incorporated inside a brick and cedarwood outbuilding.

I noticed at various times through the summer one bird carrying dried grass in its bill and displaying and calling to the other, which I now assumed was the hen. When displaying, they get very close together with their heads only moving away from each other as if they are too close to see each other. They then move up and down doing a throaty chatter.

I soon noticed them building a neat cup-shaped nest in a large wicker basket placed in the birdroom; put there originally for the smaller finches. The nest was made of dried grasses and string fibres. These I had made by cutting up the string into short lengths and looked similar to horsehair.

The first egg was laid on the floor inside the birdroom, then later another two eggs were laid in the nest, but the birds showed no sign of sitting on them and I removed the eggs from the nest. Not long after that another three eggs were laid, this time in the nest, but, unfortunately, after ten days of sitting by the hen she deserted the nest for no apparent reason. All three eggs were fertile. At this stage, I thought any chance to breed had now gone, but the hen had other ideas and again laid three eggs in the same nest. The eggs are about the same size as a linnet or bullfinch egg; pale blue in colour and mottled with reddish-brown blotches.

This time the hen sat the full fourteen days from 12th August to 25th August, when three young hatched out. The hen immediately started feeding the youngsters with soft mealworms that were changing their skins, flies and blowfly pupae. The cock took no part whatsoever and in fact was more of a nuisance by trying each evening to encourage the hen off the chicks and to roost outside with him. On a couple of occasions he succeeded, but I managed to chase the hen back into the birdroom and close the hatch for the evening. Luckily, she would then settle down with the chicks, keeping them warm, and it was not until I saw that the chicks were feathered, after about twelve days, that I allowed her to stay

out with the cock. Fortunately, she was a good hen and continued her duties each day, feeding the ever-growing over-hungry youngsters.

After about a week, one of the young just disappeared. I assumed it had died and had been removed from the nest, probably due to the fact that the hen couldn't keep up the enormous effort needed to sustain three very hungry babies with mainly live food.

The remaining two youngsters quickly feathered up and left the nest on the 9th September, sixteen days after hatching. I tried to provide as much extra live food as possible in addition to the normal supply of soft mealworms, blowfly maggots and pupae. Although most of these were always available, together with bread soaked in milk, the hen seemed to vary the diet herself by taking a little of each at various times. I was also able to supply between two and four medium-sized stick insects per day. These I had previously bred from eggs for my summer season. The hen was also supplied with a fairly large quantity of flies each day, together with earwigs which I caught. The flies I caught with a net. The earwigs I obtained at night when they were feeding on fruit on the aviary wire netting.

Although for the first few days the hen only fed pupae and live food, including earwigs, she later started to feed to the young the bread soaked in milk. I observed that the hen removed all wings of flying insects, and also the legs off stick insects and the pincers out of earwigs.

All in all, I consider it was a combined effort between myself and the hen to rear her brood; as the cock bird took no part whatsoever, except to steal the extra food provided for his family.

The hen continued to feed the two young birds for approximately two weeks after leaving the nest. This may be a longer period than in the wild, but I wouldn't risk parting them until I was absolutely sure the chicks would feed themselves properly.

The cock was aggressive to the young birds after approximately a week of leaving the nest, so to avoid any tragedies I separated the cock parent bird from them and left the hen to feed the young.

When first coming out of the nest, the young were identical in colour to their parents, the only difference being that they had a short stubby tail which seems to grow rapidly. With birds in which the sexes are similar I always put a split plastic ring with a different colour on each bird, so that I can be sure which is the cock and which is the hen.

These youngsters are now thriving in an unheated birdroom after taking rather a long time to get through their first moult. The parents are kept separate from the young in an outside flight. The only time I have used heat for these birds was when I first purchased them (the parents) to acclimatize them through the first winter, since then both the parents and young have been kept with no heat whatsoever, in fact, I find these birds, once acclimatized are very hardy and the parent birds have been outside constantly throughout this winter.

NEWS FROM THE BERLIN ZOO

By PROFESSOR DR. HEINZ-GEORG KLÖS

The Berlin Zoo has a long tradition in keeping bustards. For this reason this bird family always was well represented here. At the moment our collection consists of Great Bustards (*Otis t. tarda*), a species which still occurs in the surroundings of Berlin and which was bred for the first time in captivity in 1964, Kori Bustards (*Ardeotis kori*), Black Korhaan (*Afrotis afra afroides*) and Senegal Bustards (*Eupedotis senegalensis*). The pair of Senegal Bustards was purchased from East Africa in 1967. In 1970 the hen laid eggs which were put into the incubator. After an incubation period of 22 days three young hatched: on 19th July, 10th August and 30th September. Mrs. Elisabeth Johst, head keeper of our bird house, hand-reared them with patience and skill. Whereas one of the young bustards died, the two others grew up very well. We do not know whether this species has been bred before elsewhere, but we suppose this to be the first successful breeding result.

Another satisfactory event was in 1970, the breeding of an Andean Condor (*Vultur gryphus*) which has reached by now the size of its parents. The young bird remained only a few days in parental care and was then taken away to be hand-reared. We were forced to do this because in 1967 and 1968 we had lost two young Condors because the adults overfed them with stones and feathers and other indigestible things. A third one, which hatched in 1969, strangled itself when it was six months old by the cable of an infra-red lamp. The sex ratio was two males : two females, the incubation period 60 to 61 days.

* * *

NEWS AND VIEWS

R. T. Kyme: "My Weber's Lorikeets chewed a hole in the side of the box, water got in before I noticed the damage, and unfortunately the eggs got chilled and the hen left them—both contained chicks."

* * *

E. Kirchhofer, Interlaken: "This year (1970) we have had several first breedings for Switzerland—São Thomé Lavender Waxbill *Estrilda thomensis sousa*, Violet-eared Waxbill *Granatina granatina*, Blue-bellied Tanager *Tangara velia*, and Syrian Bulbul *Pycnonotus xanthopygos*."

* * *

Mrs. Kay Wagner has retired after nine years as Editor, *Avicultural Bulletin*. Lui Kinuya and Ivo Lazzeroni have been appointed co-Editors. All articles, advertisements, correspondence, etc., should now be sent to: Lui Kinuya, 13523 Fenton Avenue, Sylmar, California 91342, U.S.A.

* * *

Attempts are to be made to re-establish the Chough in Cornwall. With this in view a number of birds have been imported, and six are being released in a sanctuary at Newquay Zoo, where Peter Howe, the Curator, hopes they will breed. While wishing all such ventures every success one cannot help but fear, to put it mildly, that the results are very likely to fall short of those desired.

* * *

The object of the Society is "The study of British and foreign birds in freedom and in captivity." It is to be regretted that but little appears in the Magazine in relation to British birds. This is not, of course, by choice of the Editor. It is mainly that Members do not trouble to make known their experiences, possibly thinking they are of little interest. But *all* notes are of interest to someone.

* * *

George Bray, writing of the late A. H. Isenberg: "Amongst other things Alex was on the Board of Directors of the San Francisco Zoological Society. The Zoo intends to purchase the Isenberg collection of birds and, as a suitable memorial, are going to install his vast library in the Society's Library as 'The Alex Isenberg Collection.' A walk-through aviary is nearing completion and it is proposed that this too, shall be named after Alex."

* * *

The portrait of Len Hill now appears on the stamps of Steeple and Grand Jason, Falkland Islands. They are, of course, intended for internal use only, but as the islands are uninhabited one is free to imagine they are quite useless for postage purposes. This must surely be the first time a Member of the Society has been depicted on a stamp. They may be worthless from a postage point but they are of considerable philatelic interest.

The Kansas City Zoological Gardens has recently recorded a remarkable breeding success, the White-tailed Sea Eagle *Haliaeetus albicilla*. An egg was laid on 7th–8th March, 1969, and another on 11th–12th March. The female commenced incubating after laying the first egg. On 28th March it was discovered that one of the eggs had disappeared. The other, however, hatched on 5th April. The young one flourished and left the nest on 30th June. It was fully capable of flight by 20th July, by which time it was approximately the size of the female.

* * *

Professor J. R. Hodges: "It must be about 20 years since a reference to the blue mutation of the Princess of Wales's Parrakeet appeared in the Magazine. A cock which was bred in an Adelaide aviary was sent to David West in California where it bred successfully when mated to a normal hen. However, apparently David West was unsuccessful in producing a blue strain. I thought that chances of establishing the mutation had disappeared and, therefore, I was delighted to see recently several specimens in three different aviaries in Victoria. Ron Hastings at Bacchus Marsh has several blue and split-blue specimens. His aviaries are perfect and beautifully kept and he is making great efforts to establish the blue mutation. I hope he can because, like the blue Splendid Parrakeet, it is exquisite."

* * *

Curt af Enehjelm, for many years Director, Helsinki Zoo, now in retirement in Gedser, Denmark, is maintaining his great interest in birds. He has two birdrooms in the house, with five indoor flights and about 40 cages. He is studying inheritance by the cross-mating of two subspecies of Bicheno's Finch—the White-rumped and Black-rumped; and also of the Parson Finch—White-rumped and Black-rumped. Having reached the third generation he thinks he has solved the problem. He is also experimenting in crossing Yellow-rumped and Chestnut-breasted Mannikins. Nine hybrids have been bred, also two hybrids *inter se*. The intention is to mate the F-1 hybrid cocks back to Yellow-rumped hens. There is some variation in the colour of the F-1 hybrids, but the Chestnut-breasted colour appears to be in some degree dominant, so there is little reason for back-crossing to the Chestnut-breasted. The birds are moulting rather slowly, especially the hybrids.

* * *

Dr. Dieter Overländer, Bad Honnef/Rhein: "1970 may be considered to have been a good season. I bred King Parrakeets for the first time. My principal pair consisted of an Australian male imported in 1969, in adult plumage, and a three-year-old female from Switzerland. They had four eggs, three of which were fertile and three young were reared. The female laid a second time but did not sit. A second pair, both two years old, the male still in immature plumage, had four eggs, two of which were fertile. I have now obtained two more young King's,

first brood birds. Their female parent reared a second clutch successfully. I am hopeful of founding a strain that is double-brooded. This is not with the object of getting as many young as possible, but so that should the first clutch be lost by accident, bad weather, etc., there will be a second with further possibilities. The Indian Ring-necked Parrakeets had four young blues, two from blue parents and two from splits. The old blue hen from Keston died while sitting on eggs. She bred every year, with one exception, since 1965. She bred with a normal green cock, an escaped bird that we caught on the aviaries."

A. A. P.

REVIEWS

A FIELD GUIDE TO THE BIRDS OF SOUTHERN AFRICA.

By O. P. M. PROZESKY. Illustrated by DICK FINDLEY. Collins:
London. £12.50.

South Africa has had a good coverage with books on bird identification. The most complete is Mackworth-Praed and Grant's two thick volumes of the *Handbook to the Birds of the Southern Third of Africa*, giving a concise text for not only each species but also the subspecies, and fully illustrated, although the birds are small at times. Maclaren and Livesidge's revision of Robert's *Birds of South Africa* gives a single volume of more manageable size in which all species are illustrated in colour. It has, however, the disadvantage that the appearance of the birds is not described in the text and that the plates were prepared by a draughtsman using skins and mounted birds and relatively unfamiliar with them in the field. Collins have now produced a field guide of the larger pocket size, intended as a handy work for the field, smaller and cheaper than the other books.

Of the 900 or so species involved 411 are illustrated, 327 of these in colour. Species entries are in three categories. The commoner birds are illustrated and given a fuller text with details of appearance, habits, voice and habitat. Other relatively common species are listed as allied species, with a briefer text discussing only identification with reference to those already depicted. Finally a number of rarer species are merely listed by common and Latin names with no details. Since the relevant species numbers of Robert's book are given, one is presumably expected to consult this for rarer birds. It is useful to know what other species might be present, but users may find it annoying to have no indication of how they might be recognized.

The plates do give an indication of the colour and appearance of the birds, but the artist has a number of consistent faults. Eyes are too large, skulls too narrow and bills too large; and a number of birds, such as hoopoe and plovers, follow too closely the inaccuracy of the Robert's plates, while others are worse.

In general it is a concise little guide, of which the text is the better part; but with inadequacies of which the potential user will need to be aware.

C. J. O. H.

GUIDE TO THE BIRDS OF SOUTH AMERICA. By R. MEYER DE SCHAUENSEE. Wynnewood Pa., U.S.A.: Livingston Publishing Company, 1970. Price \$20.

For most aviculturists and ornithologists alike, South America has been a dark continent with an avifauna that was tantalisingly and incompletely described in works that dealt with some peripheral part of it; the entire picture never fully being revealed. Recent books had begun to deal with larger areas but it was not until de Schauensee published his *Species of Birds of South America* in 1966 that we finally had a distributional list that gave an overall and up-to-date picture of the number and variety of species present on that continent. He has followed this up with the present work, and we now have in a single volume a complete, if somewhat abbreviated, guide to South American birds which enables us to review all the species; and not to be left wondering whether perhaps there was one that wasn't included in the work which we consulted. There are 2,926 species involved and the fact that 15 new species have been described in the last decade is an indication of how little has been known of this part of the world.

To cope with this number of species in some 430 pages requires careful use of space, and the work is a masterpiece of compression. The introduction lists the typical habitats and discusses the major types of distribution. Each family is introduced by a paragraph of general characters, and a brief key to aid identification. Species are dealt with in double columns, with common and latin names, the latter with asterisks to indicate where subspecies occur. A statement of overall length is followed by a very abbreviated plumage description, confining itself to main diagnostic characters and often comparative, but at times contriving to indicate well-marked subspecific variation. Distribution is given, and for most species a brief indication of habitat. Four endpaper maps help the user to understand the distributional information.

Compressed as it may be, I feel that the usefulness of the single volume outweighs the brevity of the text. I wish, however, that I could feel more enthusiastic about the plates; 50 of them, with 31 in colour. Admittedly, as the author points out, 676 species are shown, including at least one member of every family, and representatives of 680 genera. This has been achieved by reusing the 20 plates by E. L. Poole from the *Birds of Columbia*, and adding a further 30 by J. R. Quinn. Both artists have trouble at times with head and bill shape and expression, and Quinn has a habit of painting his birds with partly-closed eyes; and in spite of the limit on

numbers, apparent lack of liaison has resulted in some species being illustrated twice. Quinn's attempts to use perspective to cope with size differences are relatively unsuccessful. The 22 text drawings by G. M. Sutton are rather more natural in appearance. However, in spite of faults and inadequacies this probably represents the biggest assemblage of South American birds to be found in illustrations of this kind.

I feel sure that this is a book which a growing number of aviculturists interested in South American birds have been waiting for; and one which is likely to remain a standard work of reference for some years to come. Even where it does not provide a final answer it does provide the initial solid basis from which the further search for information can proceed.

C. J. O. H.

FANCY PIGEONS. By W. WATMOUGH. London: Cassell, 1970.
Price 10s. or 50p.

Some fancy pigeons, such as Archangels and Clean-legged Ices, are creatures, (or ought one to say human artifacts?) of great beauty; others, such as Fantails, Carriers, Chinese Owls and Russian Trumpeters, are distorted and hideous monsters. So far as I am aware, no pigeon fanciers, anywhere, have ever thought it worthwhile to perpetuate the original type in a domestic state.

Whether one is attracted or repelled by fancy pigeons, this very well-illustrated booklet, which gives excellent photographs of (unless I have miscounted) 23 different breeds, is well worth its trifling price. A useful introduction to the subject for the aspiring fancy pigeon breeder and shower; good ammunition for those who are opposed to the fancier and all his arts and crafts. Among these, when preparing his productions for their début in the show pen, are "removing certain feathers which form the marking pattern", improving (*sic*) "the wattle of most breeds . . . by the use of fine sandpaper to make it smooth" or cutting off the end of overgrown upper mandibles "to allow the mandibles to fit close together."

Throughout, the emphasis, quite justifiably in view of the title, is on breeding fancy pigeons for show. There is a short final chapter on keeping pigeons in garden dovecotes. Here the remarks on settling pigeons to a new home are so brief as to be of little help to a complete novice. He is told to keep his pigeons in for four or five days and then allow them out "for only a few hours at a time for several days" as "this method prevents them leaving home". He is not, however, told how to get them *back* after the few hours leave or how, given luck, he can prevent them leaving home during their outing.

D. G.

NOTES

NEWCASTLE DISEASE IN FRESHLY IMPORTED LARGE PARROTS

The following is an abstract of a paper by W. Lüthgen and G. Wachendörfe which appeared in the *Deutsche tierärztliche Wochenschrift*, August 1970.

Disease occurred this summer in three West German quarantine stations for parrots. In the first instance 250 out of 285 Amazon parrots died within a few days of arrival; in the second, all of 137 birds of three separate shipments (Macaws and Amazon and Gray parrots) died within a fortnight. In the third instance 50 per cent of a mixed batch of Amazons and a few Macaws died within a week.

Tests for ornithosis and for the presence of specific bacterial pathogens proved negative but the virus of Newcastle disease was identified. The clinical symptoms observed were related to disturbances in the central nervous system which resulted in head contortions, tremors in the head and body and paralysis. The pupil was sometimes enlarged and breathing was difficult. Birds sent for post-mortem examination were in average to good bodily condition. Typical findings were cerebral and liver haemorrhages and enlargement of the spleen. It is clear that, to obtain a proper diagnosis, isolation of the virus is essential.

A member comments: "It has been known for a long time that parrots can be affected by the virus of Newcastle disease (better known for its effect on domestic poultry) and there have been several cases in Britain during past years. The particular interest of the present report lies in the extreme virulence of the strain involved—the speed with which the birds died and the very heavy rate of mortality. Strains vary considerably in virulence."

"The authors comment on the dangers to the poultry industry in the Federal Republic, which has in general been free from Newcastle disease for some years. The report is an interim one and there is no information on whether the disease was likely to have been contracted from contact with poultry while the birds were being assembled prior to shipment or whether latent infection was activated by stresses to which the birds were subjected at this time.

"Unlike ornithosis, Newcastle disease, while it may be contracted by them, is not regarded as dangerous in humans, but it is of course extremely serious in domestic poultry. There might well be repercussions if such an active virus were shown to have been introduced into Britain in such a way. Complete avoidance of danger presumably would depend on radical changes in the conditions under which birds are collected and imported. Aviculturists can limit the possibility of damage resulting from the purchase of freshly imported infected birds by careful quarantine and by scrupulous hygiene, particularly of course with regard to the disposal of waste food and cage sweepings."

CORRESPONDENCE

ENGLISH NAMES OF "WHITE-CAPPED" AMERICAN PARROTS

In the November–December 1970 issue of *AVICULTURAL MAGAZINE*, C. J. O. Harrison explains his insertion of the name "White-capped Parrot" for *Pionus seneloides* of South America, because that name is used by R. M. de Schauensee in his various books on distribution and identification of the birds of that continent. As Mr. Harrison points out, the names adopted by de Schauensee, the first real effort to standardize bird species names for South America, have been widely followed in other works. He mentions that there is a Central American parrot *P. senilis*, which has also borne that name. However, in the numerous current ornithological works published in America, from and including Ridgway's 1916 parrot volume down to the recent 1970 work by H. Land, "Birds of Guatemala" *P. senilis* is always designated "White-crowned Parrot". Hence there should be no confusion—unless aviculturists persist in calling them both by the same name

THE AMERICAN MUSEUM OF NATURAL HISTORY,
CENTRAL PARK WEST AT 79TH ST.,
NEW YORK, .Y. 10024, U.S.A.

E. EISENMANN.

BREEDING ORNATE LORIKEETS

I have just got around to reading December's AVICULTURAL MAGAZINE, with special interest in John Bunker's article on his breeding of the Ornate Lorikeet.

We have a pair of these birds which we obtained in January 1968; the following May they were put in an outside aviary with a "Grandfather Clock" type nest-box. These were young birds so we did not expect any results, but in May 1969 the hen had laid two eggs which were infertile. About the beginning of July she laid two more, both fertile; one chick died but the other was reared. In 1970 this same pair reared another one and both of these birds are doing well.

May I also add that we bred two Edwards in 1969 and two in 1970. All of these Lorikeets are kept outside all the year round without heat.

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VERNACULAR NAMES OF BIRDS

Dr. Harrison's note in the November-December AVICULTURAL MAGAZINE on the renaming of Massena's Parrot the "White-capped" Parrot, raises the interesting point—should well-established English names for birds be superseded by fresh ones gratuitously, it cannot help but seem, coined up by some scientific worker? I cannot see why unless, as when "Hedge-sparrow" becomes "Dunnock", it is done to avoid confusion—and in this case Dunnock was the Scottish name. Unfortunately no rules of general acceptance—through priority or common usage—seem to be adopted for the everyday names of animals or plants. It is said that common names have but little point anyway—because the only name of value is the taxonomic one—the "Latin name"—as this is universal and, once fixed, immutable. This is hollow reasoning as, even in ornithological literature, the Latin name is bracketted in small italics somewhere at the beginning of the article and from then the birds is referred to by its common name. But secondly, and of more importance, because, as anyone searching through such literature generally finds, the colloquial name tends to retain more stability in usage over time and is therefore of equal, or more value, than the, perhaps, often-changed Latin one.

Parrots, as a family of birds, are extremely well-served by their English names. As well as the specific and subspecific they are further subdivided into useful groupings—Parrots, Parrakeets, Lories, Lorikeets, Hanging-parrots, Lovebirds, Parrotlets, Cockatoos, etc. These can then often be further subdivided, e.g. Amazon Parrots (which to avoid ambiguity is invariably abbreviated to "Amazons," meaning parrots belonging to the genus *Amazona*). The English names may lack the precision of the taxonomic ones but they do allow for some large degree of differentiation.

In Central and South America three parrots have white on the head or face: Massena's Parrot (*Pionus seniloides*), White-headed Parrot (*Pionus senilis*) and the Spectacled Amazon (*Amazona albifrons*). Meyer de Schauensee, and other recent authors, call these, respectively, "White-capped Parrot," "White-crowned Parrot," and "White-fronted Parrot". This contrary to the case of the "Dunnock", seems unnecessarily confusing—when is a cap a crown? Further five other New-world parrots—The Yellow-lored (*A. xantholora*) and four Caribbean island amazons—Hispaniolan, Jamaican Yellow-billed, Cuban and St. Vincent (*A. ventralis*, *A. collaria*, *A. leucocephala*, *A. gouldingii*)—have white on the face or crown. They, because no change over common names has occurred, may not be pertinent to the argument.

English names "invented" by committee and individual scientists are often unnecessarily simple. Every dictionary that I have consulted contains the word "parrakeet", defining it as "A small, long-tailed parrot". The R.A.O.U. in its check-list is more elementary than a lay bird book for it makes no use of the word. All seed-eating Australian parrots, save cockatoos, are called simply "Parrot". Which is a loss and misuse of language and the sad bowdlerization that makes the

"Red-rumped Parrakeet" become the "Red-backed Parrot" is descriptively wrong. It has a green back and red rump. Likewise Massena's Parrot has a grey head, which is its alternative and perhaps better name, and certainly not a white one.

It is perplexing to me as to why "Caique", "Conure" and "Amazon" have not been retained by de Schauensee, and the other authors, yet "Parrotlet" and "Macaw" are kept. Some of the fresh names, in my opinion, seem to be conjured up by a poet in "Basic-English". "Red-fan Parrot" instead of the very long-standing Hawk-headed Parrot—which is after all its Latin name in translation. "Blue-bellied Parrot" replaces "Purple-bellied"—republican tendencies? Sometimes, by way of change, the simple becomes inflated to the gradiloquent as when the humble "Blue-fronted Amazon" becomes the "Turquoise-fronted Parrot".

The "old" names, though often taken directly from the original taxonomic ones, keep stability. Amazon Parrots spent many years as *Chrysotis* until Peters restored them to *Amazona*. Eclectus has remained the common name for that bizarrely sexually dimorphic parrot. Laterly *Eclectus* has been restored as the generic name. Perhaps the previously used *Lorius* can now be "given back" to the Lories of the genus *Domicella*?

Sometimes I am left wondering just how well people know some of the birds that are described in their books. Mr. A. A. Prestwich has lately published a list of accepted English names of the parrots, it would seem a terrible waste of his undoubted erudition if his list of well-trying names is to be lapsed in favour of fresh, original ones.

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G. A. SMITH.

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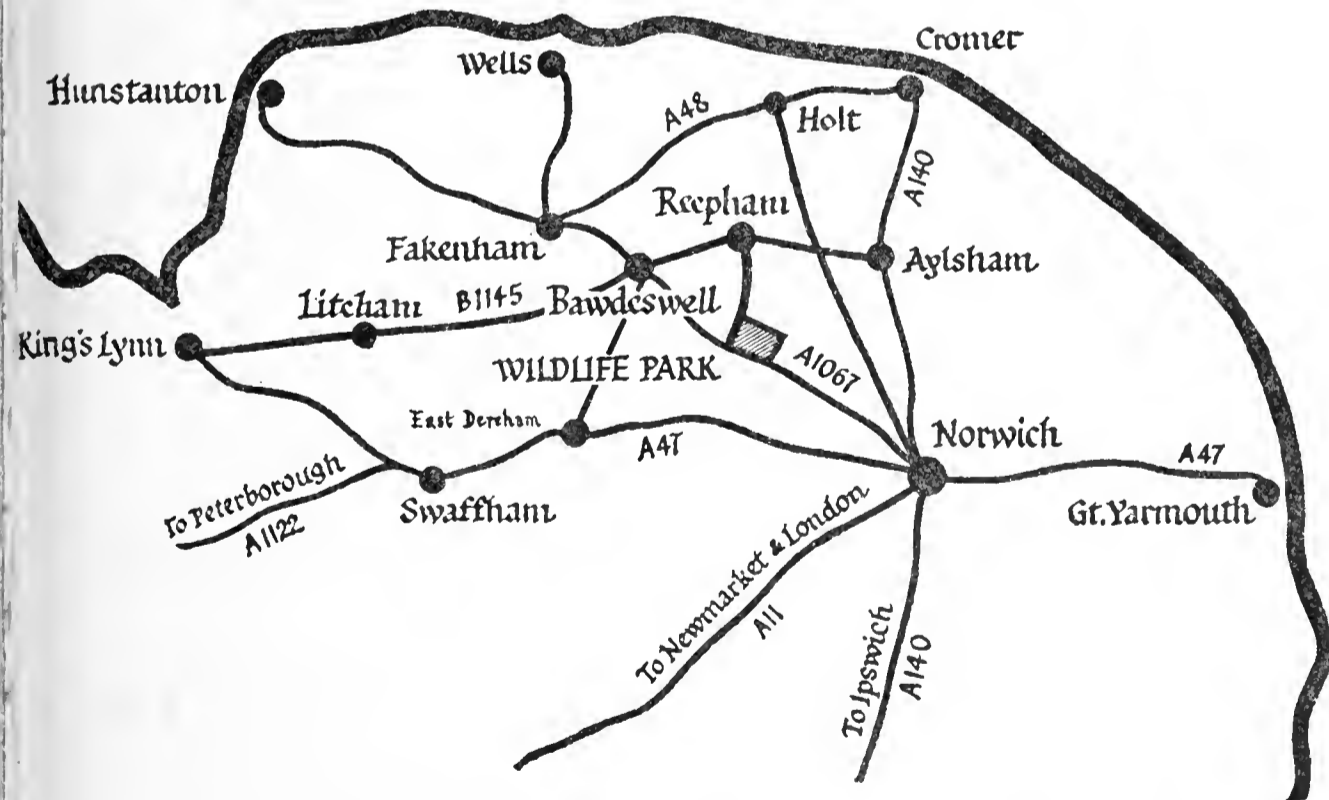
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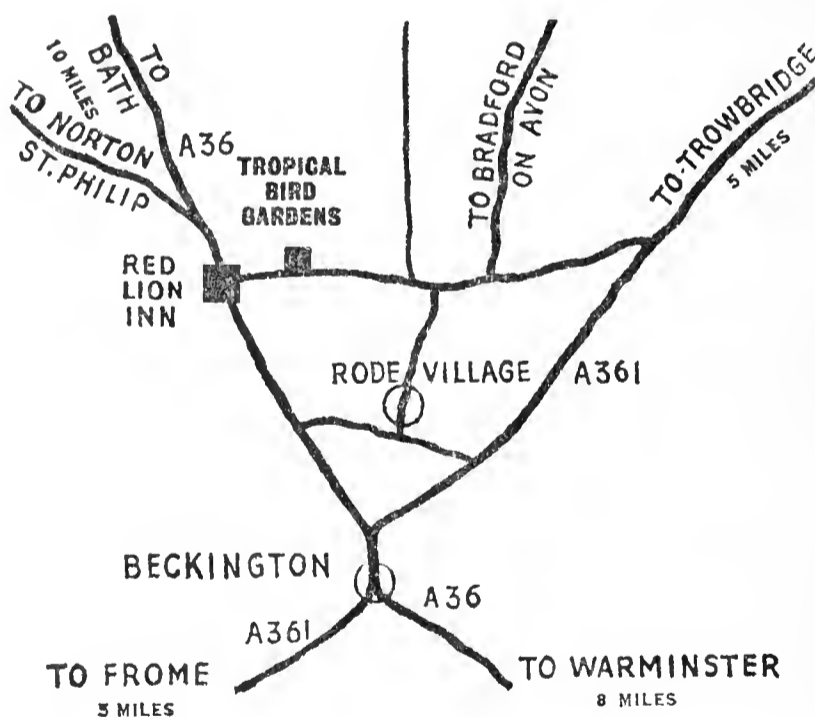
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Mr. K. A. Norris, Chairman of the British Aviculturists' Club and past President of the Foreign Bird League of Great Britain, was one of the over-all editors of the original Dutch publication. The appearance in three volumes of the English edition is the result of extensive research and revision on his part, and he has contributed additional descriptions and details. Mr. Norris, who has made a life-long study of exotic birds, has an extensive range of aviaries and is the editor of two previous books, *The Handbook of Foreign Birds in Colour I and II*.

With certain exceptions, the classification followed throughout the work is that adopted by Peters in his Check List of Birds of the World, and for orders and families not covered by the volumes of the Check List so far published, *A Classification of Recent Birds* by Mayr and Amadon has been used.

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WHITE-BROWED ROBIN-CHAT

AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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MAY-JUNE 1971

THE WHITE-BROWED OR HEUGLIN'S ROBIN-CHAT

(*Cossypha heuglini*)

By DAVID REID HENRY (Woodford Green, Essex, England)

Lying on a camp bed in the African bush under the paling sky of early morning, when the stars are just beginning to flicker away their light, one slowly becomes aware of much that has occurred during the hours of the night.

The camp fire which was replenished at intervals is now dead, and one is made to feel its absence by the chill in the air. Bush-babies, those queer little animals which are reminiscent of both ape and squirrel, have investigated the camp area and probably the sleepers too; but now they are gone. Possibly a jackal has sniffed as near as his courage and the mantle of darkness have allowed. A timid duiker or steinbok has been drawn by curiosity to the unusual fiery glow, and owls have been present in the hope of finding food forced out of hiding by the fire's heat; for this is a well-used camping site.

All these are now away and preparing for their rest, and as the sky quickly lightens in the East there come the first notes of birds.

Africa has its dawn chorus in spite of the popular misconception that tropical birds have not much idea of song. The grey plantain-eater or "Go'way bird" is heard with his tedious yell and the Klaas' cuckoo starts his plaintive call, "Tu-ee-chi, tu-ee-chi, tu-ee-chi".

One voice is however awaited with some expectancy by anyone who knows it, that of Heuglin's Robin-chat, for this song is as lovely as anyone could wish to hear. It may be true that there are finer performers, but I find my appreciation of music depends to a great extent upon the associations I can attach to my hearing of it. Thus it is that I find I love a certain Chopin nocturne more than any other because I first heard it after a particularly wonderful day in the Ceylon jungle many years ago. The melody and the music go inseparably for me.

So my love for the song of Heuglin's Robin-chat is associated with carefree happy days, and chilly dawns under the African sky. I will not attempt to put his voice into words, because I cannot: but it has a wonderful triloquial quality which is coupled with a peculiar power of *crescendo* I have not noticed in many other birds. The notes are liquid and full

of an apparent urgency as they build up towards the full-voiced culmination.

He sings at any time of day and is heard in almost any place, for he is a common garden bird as well as a dweller in the remote bush country far from any human habitation. He is equally at home in the cool highlands and in the hot, dusty country at lower altitudes.

The nest is a structure of roots, grass, dead leaves and other natural debris placed rather untidily in a cavity amongst the stems of creepers or in a hole in an ivy-covered bank, or on top of a dead stump amongst the natural mosses and ferns that grow in such a place. The eggs are usually said to be two or three in number, but I have found four young in two nests that I knew. The eggs are bluish with such a heavy spattering of brown markings that the ground colour is not very evident.

As far as I am aware the food of this bird is that of a typical insectivorous and fruit-eating small thrush. All sorts of spiders except the big hairy ones which everyone (other than baboons) avoids, caterpillars, grasshoppers, flies and termites are taken along with quantities of berries, figs and other fruit. Most of this is collected down amongst the lower foliage or on the ground. It is a bird which prefers good cover and seldom comes far into the open; nor have I seen it in the higher canopy of a tree. For this reason its presence is more often known from its song than from its being actually seen by a casual eye.

It is like most thrushes an easy bird to rear if taken from the nest and like most birds hand-reared becomes beautifully tame. The young are typical of the thrush family with predominantly brown plumage spotted with buff and lighter brown.

I have never known an example of this species in any European aviculturist's collection although I cannot doubt they have from time to time been imported. But many a schoolboy in Africa has reared and kept a nestful, later to release them into the garden when the holiday come to an end. It must be a popular bird in an aviary collection provided a watch is kept to forestall any fighting; for like most thrushes this bird can be very quarrelsome with other birds, particularly other members of its family the *Turdidae*.

Ideally the aviary should be planted with bushes and this can be tiresome to some who dislike the destruction of growing plants in aviaries by the acidity of birds' droppings. My own way out of this difficulty is to have my bushes of whatever sort in large pots which can be moved in and out when necessary and so renewed. I like a good carpet of leaf-mould, peat and sand which encourages the birds to turn it over constantly in their search for insect life and so keep themselves occupied. A bare aviary seems to me to house bored birds, and my feeling is that as they are my guests rather than my prisoners I do well to make the accommodation as natural to them as I can.

There is a cult in aviculture today which preaches that comprehensiveness

foods, by which I mean foods that contain all the vitamins, trace elements, etc., *must* be the right food to give our birds. It is in my submission a mistaken view. Prisoners in gaol are treated like that and I suppose they stay, or are kept healthy, but our birds have not done dreadful things to deserve a like incarceration, and the one thing they seriously are deprived of in these comprehensive foods is the fun and work in finding or pulling the food to pieces. Where it is natural for birds to scratch around and turn things over in their search for food we do them no good service in providing stuff they only have to pick up and swallow.

* * *

BREEDING THE RED-BILLED WEAVER

(*Quelea quelea lathami*)

By K. S. HARRAP (Bulawayo, Rhodesia)

Such a well-known bird needs no description, suffice to say that our sub-species in Rhodesia, *Quelea quelea lathami*, is a little larger and paler than its West African counterpart.

The Red-billed Weavers come to civilization to feed during the months of April to November, when they all depart for their breeding grounds in the Lowveldt. It was during this period that my birds were trapped and placed in an aviary 21 ft. × 18 ft. × 6 ft. with various other Weavers and Widows for companions. Two pairs only of the Red-bills were in this collection.

About August 1970 one male was seen weaving a nest in a bush in the covered shelter. Strips of palm leaf were used, this having been placed in the aviary for the Village Weavers to use for building. A covering porch over the entrance made from pampas grass was added on completion of the nest, the adult birds entering from beneath this.

Mating was observed with much wing vibrating from both male and female. Three pale blue unspotted eggs were laid. When the female left the nest during incubation, the male would mount guard and woe betide any bird that ventured too near as it was speedily driven off. From observation they are not polygamous and there is a very definite pair bond. The incubation period was 12 days, two chicks hatching, one disappearing after five days. The survivor was reared mainly on white ants regurgitated by both parents, but as the youngster grew, seed was also fed.

The young Red-bill left the nest at approximately 14 days and, although very small, was a strong flier; it resembled the female but had a horn-coloured bill. Females of this species have three bill colour changes; horn when young, wine when adult, changing to yellow when in breeding condition, and back again to wine in the off season.

Food provided was the usual mixed millets with the addition of the white ants given daily, and the youngster is now completely self-reliant.

In conclusion, I would like to add that I have had many Red-bills over the last 40 years, both in Britain and Rhodesia, but have never even had eggs before this, although as fanciers who have kept this bird know, they are industrious nest builders.

* * *

ANTING BY RED-CHEEKED AND BLUE-HEADED CORDON-BLEUS

(*Uraeginthus bengalus* and *U. cyanocephalus*)

By DEREK GOODWIN

The "anting" of many passerine birds is, I imagine, familiar to almost all aviculturists and to most people interested in birds. By the term is understood the bird's application of ants to the underside of the wing quills, and sometimes to other parts of the plumage. In some cases other pungent objects, such as acid fruits, cigarette ends and hot soapsuds, may be used, at least by some individuals. Some time ago (Goodwin 1955) I wrote an article on anting in our magazine, and Simmons (see References) has more recently written very comprehensively on it.

Although the waxbills of the genus *Amandava* regularly ant when given the opportunity (Goodwin 1960), there do not appear to be any records of the cordon-bleus or blue waxbills anting. My own blue waxbills do not ant, with ants, although they eat ant pupae, and the winged male and female ants eagerly and repeatedly see the Avadavats and Golden-breasted Waxbills, kept with them, anting. I have, however, seen blue waxbills of two species, the Red-cheeked Cordon-bleu, *Uraeginthus bengalus**, and the Blue-headed Waxbill or Blue-headed Cordon-blue, *U. cyanocephalus*, show anting movements in response to centipedes and millipedes, and also, one bird only, in another situation.

I give the observed instances in chronological order from my notebooks. There were, I regret to confess, a few early instances, involving millipedes, *Cylindroiulus* spp., which got lost before the rough notes jotted down were transferred to the species' notebooks.

24th April 1967

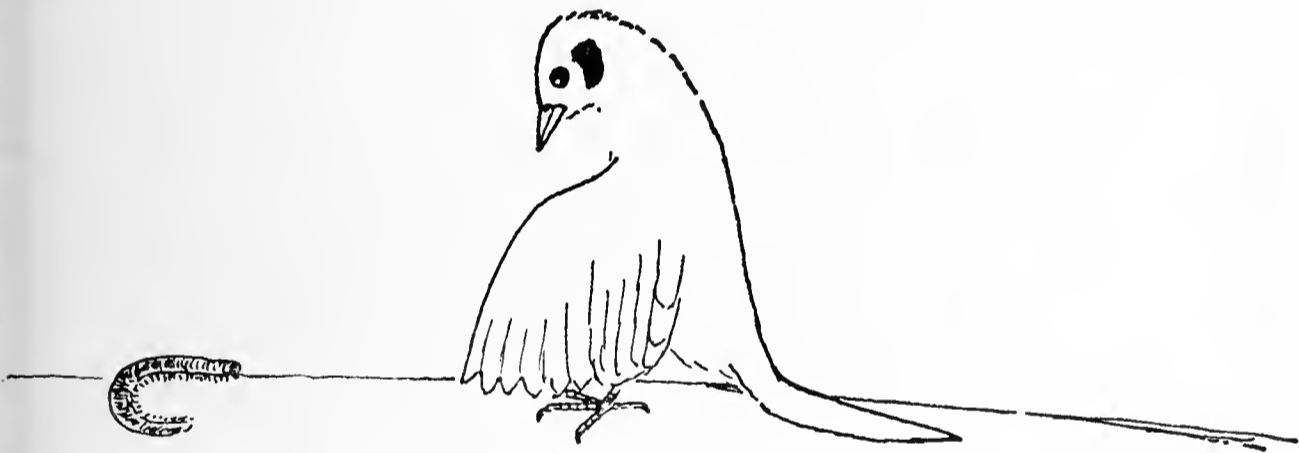
I had put into the room some "top spit" earth from the garden in which there were a few very thin, slender, bright brownish-yellow centipedes (*Geophilus* spp.). These are taken by Blue Waxbills, especially when they are feeding young. They are seized, thrown down, picked up again, beaten on the ground or perch and so on for some moments before

* This species is, of course, *the* Cordon-bleu to most aviculturists although, unfortunately, writers on African birds usually mean *U. angolensis* by (unqualified) "Cordon-bleus".

being consumed. The Bluehead female Double Orange (who had young in the nest) had seized a centipede and was beating it about as usual. Suddenly she dropped it and anted, bringing her tail forward and running her empty closed bill down the inside of her primaries. This was repeated three times, following three further pickings up of the centipede. Thereafter, however, she only beat it about in the usual way.

19th September 1967

The same female Bluehead pecked at a very long specimen (about an inch and a half) of the same slender centipede. She at once "flinched" back and made typical anting movements. Again and again she pecked at or rather towards the centipede. In most cases she appeared not to open her bill but to "flinch" back and make an anting movement just as, or I think in some cases just *before*, her bill touched it. The centipede was then taken by another Bluehead, who bit its head and flung it about. Double Orange got it back, took it by the head and ate it without further ado.



♂ Cordon-bleu making anting movements at sight of millipede. As described in text, this he actually did at a greater distance from it than shown here.

7th October 1969

I put a millipede on the broad inside window ledge of the room. A male Cordon-bleu, Orange Left, came down to it. He performed anting movements when about 2 ft. away from it. Then he several times picked it up in his bill and made as if to ant with it, but each time dropped it as he brought his wings and tail forward. His tail was pressed against the substrate, but not brought round to one side or between the legs.

9th and 10th April 1970

I had found about 30 millipedes shortly before, and on each of these days some were placed on the floor and some on the inside window ledges in the room. Several of the waxbills, including both species of *Uraeginthus*, looked at them with interest but none showed the least sign of anting.

2nd June 1970

A millipede was put in. A Bluehead male, White Left (a wild-caught bird that had been purchased the previous January and had shown no signs of anting before on being presented with millipedes), came down, looked at it from about 3 ft. or less away and performed anting movements. He did not touch or go nearer to it and gave no further reaction. However, on 15th June, when ants and pupae were put in, I saw what appeared to be very brief and low intensity anting movements from this Bluehead and also from a male Cordon-bleu whose ring I could not see.

13th August 1970

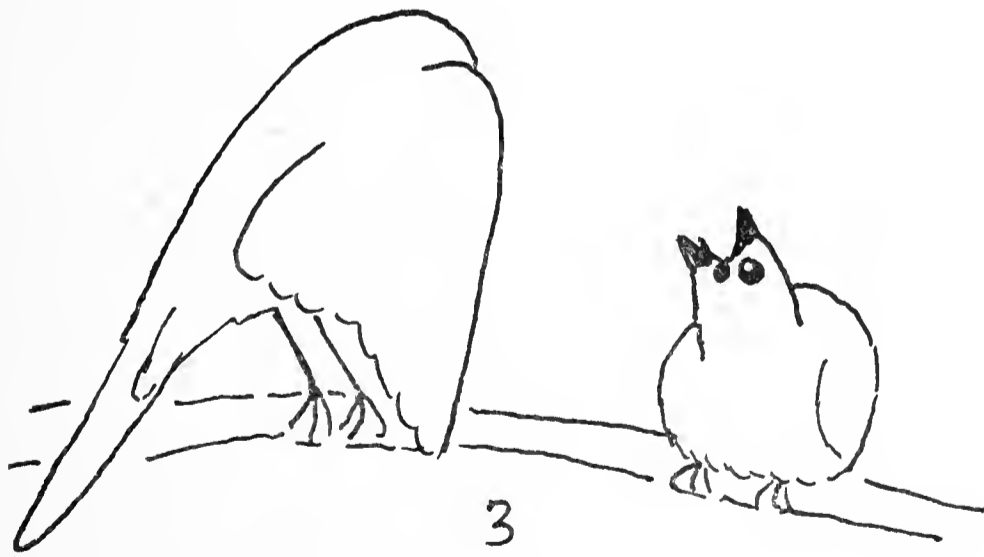
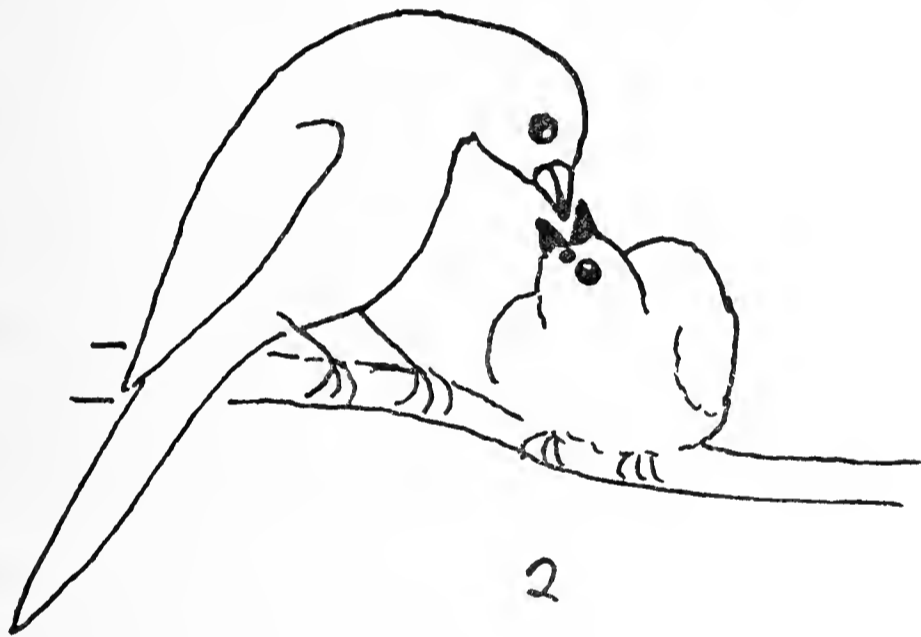
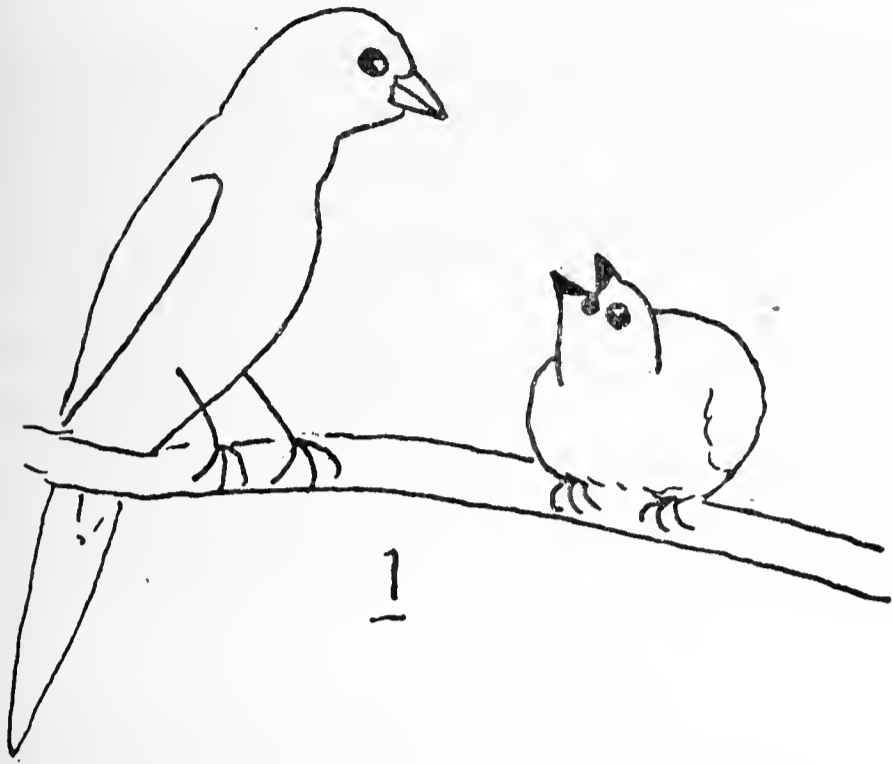
Bluehead female, Green Right, approached two young Cordon-bleus that had fledged the previous day. She brought up food into the upper part of the gullet as she came near to them, made as if to feed one of the young *bengalus*, which were now begging to her, but, apparently at the very moment that their mouths made contact, she drew sharply back and all in one movement, anted under her left wing. She repeated this three times and then flew off without having given any food to the young.

One of these young Cordon-bleus died. This female Bluehead was not seen to show further interest in the survivor. The latter was however, adopted by two male Blueheads and kept so well supplied by them that it was not very demonstrative, and even its own parents seemed disenchanted with it ("Thinks more of these odd people who've taken him up, and after all we've done for him!") and seldom fed it.

3rd September 1970

Two of three young Blueheads, that had fledged on 28th, seemed very hungry. I saw them beg several times to their mother but she did not feed them.

Then the female Green Right came to them. They begged intensely to her. She kept bringing up food into the upper part of her gullet as if she wished to feed them but seemed afraid of coming too close. Then she came closer to them. Again and again, at least ten times within half as many minutes, she made regurgitating movements to bring food into the upper part of the gullet, then put her bill down to a begging young bird's mouth, only to flinch back as if stung and make an anting movement under her left wing, as she had before with the young Cordon-bleus. The same evening, however, I saw her feed one of these youngsters in a perfectly typical manner and she had, I think, previously fed the other two as they were obviously sated and did not beg to her. They may, however, have been fed by their father who was still caring for them.



Rough sketches to show sequence of events when ♀ Bluehead "anted" at or just before making mouth to mouth contact with young Cordon-bleu. See text for full details.

6th September 1970

I watched for some time. The three young Blueheads were now being cared for by their father and a male Avadavat also. They had also begun to eat both seeds and insects for themselves though still begging and accepting food readily. Green Right fed them several times normally, but at other times she repeated her "flinching and anting at the last minute instead", as described above. Sometimes this seemed to be caused by the male Avadavat interposing himself between her and the young one she wished to feed, so that she *appeared* to be unable quite to reach it over him, but at other times nothing overtly prevented her and she would flinch back as or just before she made mouth-to-mouth contact. In all these cases only a single anting movement was made and always under the left wing.

REMARKS

Although anting movements were (sometimes) elicited by centipedes or millipedes, the blue waxbills did not actually hold them in their bills when anting. Whether this is because they were anting only at low intensity (which is very likely in view of the few occasions on which this behaviour was seen) or because these species do not normally ant with anything in the bill remains to be discovered. Avadavats and Golden-breasted Waxbills, *Amandava amandava* and *A. subflava*, which ant regularly and enthusiastically (Goodwin 1960), do not, so far as I have seen, ever hold an ant in the bill when so doing. On the other hand the only estrildine that, so far as I know, has been recorded anting with millipedes, the Red-headed Blue-bill, *Spermophaga ruficapilla*, always seized the millipede by or near the head and held it while anting (Kunkel 1967).

Like my blue waxbills, Dr. Peter Kunkel's Blue-bills never anted with ants. The blue-bills were, however, always induced to ant when presented with a millipede. Possibly this difference was because the blue-bills, which were in captivity in their native land, were presented with the "right" species of millipede, which was almost certainly not the case with my birds.

The use of the typical anting movement, always under the same wing, by the female Bluehead, Green Right, under the circumstances described above is puzzling. It may represent nothing more than the anting movement, which is also essentially a preening movement, being used as a "displacement movement", but the most impressive thing to the watcher was the appearance of a sudden uncontrollable flinching away by the bird just as she was about to make mouth contact. It is difficult to think why the gaping mouths of the young should elicit a response otherwise elicited by pungent invertebrates. More especially as she later fed them in a normal manner and, indeed, sometimes both fed them and "flinched away and anted" within a short space of time.

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* * *

THE USE OF THE FOOT IN FEEDING, WITH ESPECIAL REFERENCE TO PARROTS

By G. A. SMITH (Peterborough, Northants, England)

The majority of land-vertebrates, excepting birds and those that graze, use the forelimbs to assist them when feeding. To take two examples: a toad when it eats a worm stuffs the wriggling ends into its mouth with its hands; and a tortoise tackling a crust of bread gets hold with its jaws and pulls off a mouthful by breaking away the remainder with a thrust of its arms. Birds—because the forelegs have become wings—are handicapped when it comes to dealing with bulky-sized foods. A Blackbird with a worm, or a Sparrow with bread, is a far more laborious feeder than the toad or tortoise. Animals are especially vulnerable to predation when feeding because their attention is distracted and the increased movement involved makes them conspicuous. Anything that will reduce time so spent must be of benefit. The gape and gullet can be enlarged—by natural selection—to enable large, smoothly stream-lined foods such as fish and thick-skinned fruits to be engulfed whole. Yet meat other than fish, irregularly shaped food that requires breaking into smaller-sized edible portions for swallowing, or vegetable matter that is not firmly attached require to be fixed in position so that the beak might work on them the more easily.

Nuthatches and some woodpeckers get stability of the food mass by wedging nuts and such cumbersome items into the crevices of tree-bark. Few birds have taken, what would seem to us, the obvious step and substituted legs and feet for the "missing" arms and hands.

In perching birds (Passerines) crows, titmice, some "finches" (Fringillidae and Estrildidae) and Tyrant-flycatchers can hold down the food with a foot while they feed. It may be that steadying food in this

manner has been separately evolved for each of these families. Thrushes and Shrikes—both of which feed on large items—have perhaps yet to develop this practise. Shrikes impale food to stop it moving and Song-Thrushes (*Turdus philomelos*) hammer snails on stones. Apart from this exception the other thrushes rely on the trauma of rubbing the food harshly along the ground, and the inertia of the food mass to break off portions as the bird shakes its head. Neither seem to be as efficient, as perhaps they otherwise might be, if they used the foot for purchase. Shrikes must find beetles and small mammals tough to thrust a thorn through and many trees are thornless or lack sharp spurs. Likewise Song-Thrushes may not always have a stone to hand and the ground may be too soft and yielding for rubbing and mutilating worms against.

Two species of pigeons are exceptional in that they can fix food with the foot (Goodwin) the remainder of the Columbidae peck away, when tackling something bulky, at a continuously deflected target. Not surprisingly one of these foot-holding pigeons—the Tooth-billed Pigeon (*Didunculus strigirostris*)—has developed a thicker, tougher bill to increase its efficiency (by rasping?). The other bird—the Marquessa Ground Dove (*Gallicolumba rubescens*) has a beak that seems to be no stouter than other members of the same genus (Bleeding-heart-Pigeons, say).

Eating in this way—food clasped to the perch or pressed on the ground—retains the disadvantage that a bird so eating will have to continuously break off from its meal to raise the head and look out for danger. The “logical” step is to take the food up to the mouth clasped in a foot. Whereas this is almost universal in small, predator-prone mammals—such as rodents—it occurs in, as far as I can determine, very few families of birds: Rails (Rallidae), hawks (Accipitridae), falcons (Falconidae), mousebirds (Coliidae) and parrots (Psittacidae).

Anatomically the foot of a bird does have certain structural disadvantages in being used as a hand. Ankylosis of bones forming the leg-skeleton makes rotatory movements of the “ankle” impossible. Similarly flexion of the leg simultaneously bends both stifle and “heel”—they do not move very independantly one of another. Once the leg is lifted most movement comes from the hip joint and it is the “outside” of the foot that is uppermost—not the “thumb-side” as would be a mammals foot. In the same way that a bird walking straight ahead, especially on a thin branch, is exaggeratedly “pigeon toed”—the outside edge of the foot leading.

For the purpose of this article I shall refer to those birds that clamp the food with the foot as being *tether-footed*, and those that use the foot as a hand as *prehensile-footed*.

Except for vultures—which have short-toed, stocky legs—most diurnal birds of prey show great dexterity in the use that they make of their feet they use them to strike at, to grasp, to kill, to carry and, in Honey-Buzzards

(Pernis), to dig with. The feet of these raptors may be facile enough to enable them to feed in a prehensile-footed manner but the dismembering of a carcass, requiring as it does the very maximum of leverage, can only be satisfactorily achieved by standing upon it with the full weight of the body and tearing with the beak. It would be a pointless feeding "development" to eat in any other than a tether-footed way. However those falcons that feed on aerial insects and the nocturnal bat-falcon (*Machaerhamphus*)—which eats bats, swallowed whole—catch and kill their prey with the feet, then, while still in flight, eat by holding the food prehensile-footed up to the bill. Snail kites (*Rostramus spp.*) likewise feed from a raised foot but the bird settles on a perch before holding the fresh-water winkles which they eat up to the head.

Parrots form a very natural Order of birds. The anatomical characteristics that distinguish them from other birds—the short neck, hinged hooked bill enclosing a thick muscular tongue, and the short legs with zygodactyled feet—have developed as a consequence of being arboreal. Parrots not only use the foot as a hand but can use the bill as a foot. The usual progression when climbing is tripodal. The beak bites onto the branch ahead and by flexing of the neck takes its stride in co-ordination with the feet. (Hoatzin chicks are said to clamber in similiar manner using the beak for purchase as well as their "fingered" wings). Instead of clasping, the beak may be rested firmly down on its tip stabilising the stride like a walking stick. Thirdly the tip of the hooked upper mandible can be looped over a twig, the lower mandible passively closed, and progression is then akin to a mountaineer climbing with an ice-pick.

Exceptionally few parrots seem not to climb. *Strigops*, the New Zealand Kakapo, *Pezoporus* the Ground-parrakeet and perhaps *Geopsittacus* the extinct Night-parrot. These are terrestrial and are said in captivity to avoid branches unless wide and sloping. *Cyanoramphus*—New Zealand parrakeets—can "tripode" yet, even when scaling vertical wire netting, do not often use the beak. The head is held high, like a climbing woodpecker, and they proceed thus much faster than a parrot climbing in the orthodox manner. Incidentally Tavistock (1931) mentions that an Antipodes parrakeet (*C. unicolor*) he possessed could not scale netting. These four genera of parrots have longer tarsi than other parrots. Contrariwise those parrots that have very short legs, such as *Amazona* parrots, often use the beak as a "walking stick" even when moving on the ground or on horizontal, thick branches.

The way parrots use the beak, when feeding or destructively biting, is also exceptional in birds. Birds as a rule peck—their bill is analagous to a pair of forceps—albeit forceps of varying shapes. Parrots gnaw or chew into food exactly as do ruminant mammals. These both have the sharp cutting edge of the lower jaw working against the blunt surface of the upper jaw. Ruminants have no upper incisor teeth and parrots have no "edge" to the upper mandible. In a parrot the item to be dealt with is

steadied by the stubby tongue against the rather broad, flattened and ridged base of the hooked beak tip: whilst the C-shaped edge of the lower bill is driven forward to pare into the item just like a carpenter's gouge working on a piece of wood held in a vice. When the tongue (which is used as, and looks not unlike, a human thumb even to the extent in some parrots of having a "nail") is insufficient to give stability to whatever is held in the beak then extra purchase is given by the foot. Unlike birds of prey and Colies the item is not generally lifted up directly by the foot. It is almost invariably taken by the beak first. The only exceptions to this rule that I know of is an African Grey Parrot owned by Mr. Clifford Smith (1970) that is said always to feed by grabbing a fistful of seeds which are then transferred to the beak, and Yellow-fronted New Zealand Parrakeets may pull distant bud-bearing twigs towards the head with a "hand". It is also very rare for a parrot to carry something in the foot, which is something that Shrikes can do. It has been seen however in a Stanley Parrakeet disturbed while feeding (Marriot); the landing of the bird was said to be remarkably awkward.

As the majority of parrots are prehensile-footed the selective pressures originating and maintaining this behaviour must be very strong. Few parrots cannot use the feet when feeding and those that do not are all similar in that they are (a) usually sexually dimorphic, (b) are small for parrots, weighing less than 90 grams (three ounces), (c) and feed either on the ground on grass seed and other small seeds, or eat seeds of figs and other fruits rather than the fruit substance.

Though small in number of species they are important aviculturally as they form the larger proportion of parrots that are regularly bred and kept in captivity.

Parrots may, for all purposes, be conveniently divided into three geographical groupings:

- (1) Those found in the Americas.
- (2) Those in the Old-world west of Wallace's Line—the Afro-Asian parrots.
- (3) Those living in the area east of Wallace's Line—the Australasian parrots.

Three genera—*Loriculus* (hanging parrots), *Tanygnathus* (large-billed parrots), *Prioniturus* (racket-tailed parrakeets)—cross the Macassar Strait (as does one sub-species of Cockatoo in a contrary direction). These three genera are most close taxonomically to the Afro-Asian group and I have considered them in that placing.

(1) *New-world parrots* are characterised by the sexes being identical in colouring. Ignoring the 12 species of parrotlets (*Touit* and *Forpus*) then only six species from a total of the other 125 American parrots are sexually dimorphic—Red-capped parrot (*Pionopsitta pileata*), Massenas' parrot (*Pionus seniloides*), Purple-bellied parrot (*Triclaria malachitacea*)

and the northern form of the Mountain parrakeet (*Bolborhynchus a. aurifrons*)—the southern race has both sexes uniformly green—and two Amazon parrots (that may well be judged conspecific for they are allopatric and differ one from another only by the colour of the loreal feathers) the Spectacled and the Yellow-lored (*A. albifrons* and *A. xantholora*).

Forpus parrotlets are not, to my observation, prehensile nor tether-footed. All five (or six) species are sexually dimorphic. Unfortunately the second genus of parrotlets—*Touit*—never seem to be kept in captivity. Very few published accounts of any parrot species, and *Touit* parrotlets are not exceptional in this, make remark on the use played by the feet in feeding. The related *Brotogeris* parrakeets are definitely prehensile-footed. This is no guide (c.v. Australian Broad-tail Parrakeets in (3)) as to how *Touit* parrotlets may behave. Five of the seven *Touit* parrotlet species are sexually dimorphic. To my knowledge all the American parrots, save *Forpus* (and possibly *Touit*) are prehensile-footed. Or one genus (or two) from a total of twenty-two genera. And these exceptions are the smallest of the parrots found in this geographical area.

(2) *Afro-Asian parrots* are in strong contrast to (1) mostly sexually dimorphic (33 of the 47 species). To be more accurate all but two of the 31 Asian parrots are dimorphic and five of the 16 African ones. Three of the five sexually dimorphic African parrots are lovebirds (*Agapornis*), and one—the Ringneck Parrakeet (*Psittacula k. krameri*)—is a fairly recent “invader” from Asia.

Lovebirds are the only Afro-Asian parrots that are not prehensile-footed, and as stated above, three of the six species are sexually dimorphic. Lampe (1936) notes that lovebirds may sometimes try, ineffectually, to carry items in the foot up to the beak and fail because they invariably drop it. Lovebirds are tether-footed and they purposely stand on feeding heads of grasses when they are feeding. The Abyssinian lovebird (*A. taranta*) seems often to use both feet together when clutching fruit to the perch.

Hanging parrots (*Loriculus*) are slightly smaller than lovebirds, all are sexually dimorphic yet they are prehensile-footed. Yet though food is held poised in the air, often when they do so the limb is dropped to rest the food, or the tarsus, on the perch and they continue to feed tether-footed.

The remainder of the Asian parrots are sexually dimorphic. However, they feed on fruits, buds, flowers, nuts etc. taken from trees, as well as seeds from off the ground. When they do eat fruit more attention seems to be directed towards the pulp and rind than to the enclosed seeds.

(3) *The Australasian Group*: this is the most diversified as this group contains all of the six “subfamilies” into which parrots may be conveniently subdivided (Delacour 1964).

Loriinae The Brush-tongued parrots

From 56 species of which only eight are sexually dimorphic—the genera *Charmosyna* and *Oreopsittacus*, nothing of relevance seems to be written as to the habits of either genus. However, all of the commonly kept brush-tongues (*Trichoglossus*, *Domicella* and *Eos*) are prehensile-footed. As with hanging parrots the foot is never held poised as high as would, say, a conure or an *Eclectus* parrot. Often it may be held so low that the food may actually hang below the level of the perch. Again, like hanging parrots, the foot holding the piece of fruit is often lowered to rest the tarsus or food directly on the perch. What is most noticeable is that all Loriinae seem to be just as strongly tether as prehensile-footed and some individuals never seem to involve the feet at all when feeding. (It should be noticed that a large, unwieldy portion of fruit be offered if observation of this habit is to be made.) The individuals that cannot be coerced into using the feet one way or another feed clumsily on large free objects by simultaneously holding them on the perch with the beak and at the same time gnawing into them. Perhaps the Loriinae scrambling as they do about flowering and fruiting trees have little need to hold food with the foot in the wild. If this is the case then the facility may be in abeyance in this “sub-family” through lack of selective pressures.

Nestoriinae, Keas and Kaka's

These large birds, that seem in so many ways to fill the ecological niche in New Zealand that is occupied by crows in other parts of the world, are probably related to the Loriinae. The tongue is papillated, they have similar vivid underwing coverts and they progress by a series of skips and hops—rather than walking as do other parrots. They seem to prefer vegetable and animal food to seeds. Seeds taken with fruits are voided in the faeces intact (Porter 1934). Large items are said by Yealland to be “impaled on the upper and grated with the lower beak”. They are tether-footed seldom feeding prehensile-footed—though Kakas at least can hold food in this way.

Kakatoeinae, Cockatoos

Fourteen of the 15 species are strongly prehensile-footed. The exception—the Cockatiel (*Nymphicus hollandicus*) is by far the smallest in size and is one of two that are extremely dimorphic. Cockatiels make no feeding use of the feet.

Micropsittinae, Pigmy parrots

The six species are all sexually dimorphic. Little seems to be known concerning the feeding habits of pigmy parrots. If they, as seems likely, live on fungal mycelia growing on the bark of trees (Bergman 1960) then it may not be unreasonable to suggest that they may not need to involve the feet in feeding.

Strigopiinae, the Owl-parrot or Kakapo

Nothing recorded.

Psittacinae, the parrots "proper"

Members of this "subfamily" are the most commonly kept in captivity and consequently the most written about yet there is a dearth of information on any behaviour, least of all use of the feet, other than breeding activities.

Fifty-eight Psittacine parrots inhabit the Australasian area. Fourteen species make no use of the feet whatsoever. These birds are all ground feeders and are—with two exceptions—sexually dimorphic. They are the Grass-parrakeets (*Neophema*), the Redrump family (*Psephotus*) and the Budgerigar. It is a strong assumption that the Ground Parrakeet and the Night Parrakeet, feeding as they do on similar foods and being even more markedly terrestrial, also do not use the feet.

Rosellas (*Platycercus*), Australian Ringneck Parrakeets (*Barnardius*), Pileated (*Purpureocephalus*), Kakarikis (*Cyanoramphus*), Horned parrakeet (*Eunymphicus*) and the Swift parrakeet (*Lathamus*)—a total of 18 species—are all prehensile-footed and the sexes are alike, or but slightly differentiated. These birds obtain their food both from trees and off the ground.

The three *Polyteline* Parrakeets are all dimorphic, use the feet, and feed off the ground. When fruit is thrown on the ground aviary-housed Princess of Wales' tend to eat it where it falls rather than picking it up in a beak and flying to a perch to feed from the feet.

The final group of Australian parrots are arboreal. In aviaries they tend, unless the room given is very large, to be wary of settling on the floor and therefore make dull exhibits. Most are extremely sexually dimorphic and in their food preference show similarity to the Asian sexually dimorphic parrots. *Aprosmictus*, *Alisterus*, *Prosopeia*, *Eclectus*, *Geoffroyus* and *Psittarchas* (Kings, Crimson-wings, Shining, Geoffroy's and Pesquet's parrots) are all prehensile-footed. The Ground parrots of New Guinea (*Psittacella*) I infer use the feet. (Rand and Gilliard say the diet includes seeds from coniferous trees. All the birds that I know of that live on a similar diet—Crossbills, Nutcrackers and two American parrots *Enicognathus* and *Rhynchopsitta*—Slender-billed and Thick-billed Parrakeets—steady the cone with a foot when extracting the nuts).

Unfortunately I have not seen, nor do I know of anyone who has kept—that I might ask—the fig parrots *Opopsitta* and *Psittaculirostris*. My suggestion is that they probably are no different from the other arboreal, fruit-eating parrots in making use of their feet when feeding.

Grzimek says "parrots, as is well known, perch on one leg to feed, and use the other for conveying what they are eating to their beaks. Even the least observant parrot-owner will have noticed that his pet never uses the "perching leg" for picking up food, or the "feeding leg" to perch on". From a six week daily observation of six Black-headed Caiques this was not found to be so. The birds almost always used the same foot to feed with but it was not always the dextrous foot that was rested during

perching. Standing on one leg, the other buried in the breast feathers is done to avoid unnecessary loss of heat. Either leg is raised in these Caiques though the probability was more in favour of the "feeding leg" by a ratio of 2 : 1.

ACKNOWLEDGEMENTS

I would like to thank those "parrot-keepers" who assisted in gleaning the above facts with especial reference to Miss Rosemary Low, Signor P. Bertagnolio and Mr. John Wilson.

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BREEDING THE THICK-BILLED EUPHONIA AT THE JERSEY ZOO PARK

(*Tanagra lanirostris*)

By D. G. ROLES (Deputy Curator of Birds)

Birds of dry forest and open woodland, Thick-billed Euphonias are found in the tropical and sub-tropical zones of Northern South America.

The male is attractively coloured with brilliant golden-yellow underparts, crown and forehead and glossy purple-blue upperparts. The female is a uniform sage-green, lighter beneath.

Our pair arrived in August 1969, but it was not until March 1970 that any sign of courtship was observed, when it was noticed that when the birds perched within a few inches of each other, usually the cock slightly higher, the birds would face each other, all body feathers erect and "cheep" loudly and continuously for 3 or 4 seconds. Apart from these short outbursts the cock was rarely heard to make a sound, but the female—when moving about the flight—called loudly and regularly.

On the 25th March the female was seen carrying small pieces of dry grass into a dense clump of gnarled ivy, about 3 feet from the ground. For about three days no real progress was made as the grasses kept falling out, so a small hand-made cup of soft, dead grass was placed in the site chosen by the birds and a close watch kept.

Both birds soon flew down to investigate, the female quickly entering to rearrange the nest to her liking. Additional material, moss and root-lets, were added by the birds, the female doing most of the work, the male merely passing suitable pieces on, and by the 1st May the domed nest appeared complete. On that day the female spent quite some time in the nest, and it was now, for the first time, that the cock was heard to sing a surprisingly long and varied song, liquid and sweet.

On the 2nd of May it appeared that an egg had been laid as the female left the nest only to feed and drink. Throughout the incubation period it was the female only who brooded the eggs, though the male frequently inspected the nest while his mate was away.

On the morning of the 19th May an egg-shell was found lying about a foot away from the nest. The shell had a pinkish-white ground colour heavily spotted at the broad end with light brown, lightly spotted elsewhere.

That evening both birds were seen to regurgitate food to a chick in the nest—the male usually fed from just outside the nest, or perched upon the nest entrance, the female at this time usually entered to feed the young.

We now had a very difficult job in finding sufficient suitable livefood, as the only food the adults would take was spiders, which were placed one at a time upon the wire mesh of the flight; the bird upon seeing it would

zoom down, hover for a second or two then dart and grab it, taking it to a favourite perch to rub off the legs before swallowing it.

Before feeding the spiders to their young the adults would usually take a few pieces of grape (which were doused in a multivitamin mixture) just swallowing the pulp and leaving the skin.

On the 31st May three bright pink gapes could be seen at the nest entrance, the chicks squeaking loudly at the adults approach. Should the chicks be unaware of the adults approach the adult would give a quiet mewling "cheep" which immediately resulted in the chicks begging vociferously.

On the 3rd June one chick was found on the floor beneath the nest, chilled and unmoving. Despite attempts to revive it the chick died. Weighing 2.5 gms. the dark-skinned chick was quite well covered with sprouting pinfeathers which showed sage green on the back and yellowish green beneath.

On the 8th June the parents were seen to feed plain fruit, i.e. banana and grape to their young and on the 13th June a chick left the nest, 26 days after the first egg hatched.

The parents were not seen to visit the nest again and on investigation the third chick was found dead.

The surviving chick, a miniature of its drab mother, moved about quite well though its flight was peculiarly weak. The chick was caught up and it could be seen that the flight feathers were imperfectly formed, the vanes being fibrous, partially disintegrated and whitish. All other feathers including the tail were normal.

However the chick got about well enough and on the 28th June it was seen feeding itself upon banana, though at this time it still continued to beg food from its parents.

Now almost 1 year old the chick has the same drab plumage as its mother, but it has been heard to sing on two occasions.

Euphonias sometimes take more than a year to gain their adult plumage and are believed to sometimes breed in transitional plumage.

When a flight feather was removed a perfectly formed grey feather grew to replace it. The abnormality of these feathers has been attributed to the insufficient supply of spiders, they being the only livefood that the birds would feed to their young.

REFERENCE

R. MEYER DE SCHAUENSEE, *The Birds of Colombia*.

As described above the Thick-billed Euphonia (*Tanagra lanirostris*) has been bred at the Jersey Zoological Park. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

SOME OBSERVATIONS ON AUSTRALIAN AVICULTURE AND A REVIEW OF THE BIRD COLLECTION AT TARONGA ZOO, SYDNEY, FOR 1970

By KERRY A. MULLER

(Curator of Birds, Taronga Zoological Park, Sydney, N.S.W., Australia)

The world's aviculturists and ornithologists have maintained a keen interest in Australian birds ever since their discovery. It is an unfortunate fact, however, that news on events of Australian aviculture seldom become available to other aviculturists. Occasionally a visiting dignitary, such as Dr. Jean Delacour, publishes impressions of the collections he viewed while passing through Australia but, in general, many achievements in Australian aviculture remain unknown and unpublished.

Communication among aviculturists within Australia is not much better. There are several reputable avicultural societies in Australia, and a lot of work is done to promote articles, lectures and tours among members—often without a lot of co-operation from the members. One problem seems to lie in the unfortunate fact that bird theft and smuggling to foreign countries is a highly profitable and well organized business in Australia. I wonder how many European and American aviculturists have seriously questioned where all the cockatoos, Rosellas and other Australian parrots come from? None were exported legally. Because of this situation many Australians have learned the hard way that to invite a stranger (or even acquaintances) to view their collection may result in the eventual theft of their most prized birds. Because of this, many aviculturists are suspicious of strangers and do not advertise their breeding successes, particularly with psittacines.

A second problem in communication among Australian aviculturists seems to lie with the complex laws, both Federal and State, governing the right to keep Australian birds in captivity. Many aviculturists keep and propagate a wide variety of native species but, because of uncertainty as to their legal status in doing so, do not advertise their successes.

The major zoos in Australia are leading the way to productive interchange of ideas and techniques in aviculture and the management of birds in captivity. The association of Zoo Directors of Australia and New Zealand, inaugurated in 1967, is opening new vistas of professional co-operation and combined research into shared problems. This pool of intellectual resources and experience of some very talented and forward thinking zoo directors and their respective staffs, has resulted in a very healthy environment for the growth of these major zoos in Australia and New Zealand, and is reflected in their expanding and improved exhibits, and in the increased scope of their inventories and propagation results.

In their degree of involvement in public education the major Australian zoos occupy a leading position in the world.

In Australia the Taronga Zoological Park has traditionally held pre-eminence, both in size and the variety of the collection. The bird inventory is among the world's largest in a zoo, the count as of 30th June 1970 being 3,082 specimens. The number of species, however, has remained relatively small, and, at that time, was 234.

The greatest obstacle to expansion of a bird collection in Australia is the absolute ban on importation of any birds under any circumstances from any country except New Zealand. This restriction has been in effect in Australia for twenty-two years, and it is quite a tribute to Australian aviculturists that there are still quite a few species of foreign birds in aviaries. These are either very old or have been propagated in the country over a period of at least 22 years.

Several species of foreign finches are common in aviaries here. For instance the Cuban Finch, which has been scarce in the United States for several years (for obvious reasons) is a common aviary bird here. Other species often seen are Senegal Fire-finches, Cordon-bleu, Orange-breasted and Common Waxbills, Aurora, Melba, Cut-throat, Spice, Pale-headed and other species of Munias, Java Sparrows, Red-crested Cardinal, Jacarina Finches and several others. A few species of Asiatic parrots can be seen, including Lutino, Blue and Common Indian Ring-neck, Blossom-headed Parakeets, Moustache Parakeets, Long-tailed Parakeets, Slaty-headed Parakeets and Derbyan Parakeets. Peach-faced, Masked, Nyassa and Fischers Lovebirds can still be found. Several species of pheasants are also common, including Golden, Silver, Amherst, Reeves, Nepal kalij, Swinhoes; the Chinese ringnecks, Mongolian ringnecks, Black-necks and Melanestic mutant forms of the Common Pheasant; Siamese Firebacks, and a few Edwards and Cheers, as well as Blue and Green Peafowl.

Foreign waterfowl are scarce but some Mandarins, Mute Swans, Ruddy and Paradise Shelducks can be found, and lots of Mallards. Rheas and Ostriches still are propagated in zoos.

A second difficulty in the expansion of a zoo bird collection lies in the difficulty of obtaining native species. There are over seven hundred species of birds in this country, and many are unique to the Australasian regions, but a very small percentage of these are to be found in zoos. Although most of the parrots and finches can be obtained from reputable dealers, very few other species are available, and the permits necessary to trap them in the wild often prove difficult to obtain. Even when permits are obtained, a trapping expedition can prove both costly and time consuming.

The breeding season from 1st July 1969 to 30th June 1970 at Taronga Zoo was moderately successful. 329 birds of 40 species were hatched. Noteworthy examples were 1 North Island Brown Kiwi, 2 Musk Lorikeet

1 Glossy Black Cockatoo, 1 Sacred Kingfisher, 1 Blue-winged Kookaburra, 1 Regent Bower-bird, and 4 Red Wattlebird. The remainder were a variety of waterfowl, game-birds, pigeons, parrots and finches.

The current breeding season, beginning 1st July 1970, is going well. To date we have hatched 2 Regent Bower-birds, 2 Blue-winged Kookaburras (female now on second clutch of eggs), 3 Owlet-nightjars (first breeding record), 3 Musk Lorikeets, 3 Swift Parrots, 7 Yellow-crowned Kakariki, 3 Hooded Parrots, 4 Blossom-headed Parakeets, 1 Victoria Crowned Pigeon, 4 Paradise Shelduck and lots of other species.

In an effort to expand the collection in variety from the traditional Parrots and Finches, several species representing new families and rarer varieties have been added. Included in these are Green Pygmy Geese, Crimson-chats, several species of Honeyeaters, Dollar birds, Bee-eaters, Olive-backed Orioles and Southern Figbirds, Variegated Wrens, Eastern Shriketits, Golden and Rufous Whistlers, and several species of Flycatchers and related insectivorous birds. A marine bird display has been completed with running sea water in which we are successfully keeping Wandering Albatross, Giant Petrels, Gannets, Cormorants, Fairy Penguins, Gulls and Terns.

Under construction at present is a large outdoor walkthrough flight cage of unique design, in which it is planned to provide a rainforest for those species adapted to the various ecosystems within this type of habitat. A series of new waterfowl ponds are also under construction, in the hope of eventually keeping and propagating the rarer species of Australian waterfowl.

I regard one of my responsibilities as curator of birds (a post I assumed here on 1st August 1970), to keep informed of events in aviculture from other parts of the world, and also to inform other aviculturists of what is occurring here. To that end I shall endeavour to submit periodical reports, via the AVICULTURAL MAGAZINE, on what is being achieved here and on my observations of other Australian avicultural events.

* * *

[We are glad to hear of the success of Australian aviculturists with the Cuban Finch, which for lack of serious attempts at breeding has disappeared from British aviculture. We hope that Mr. Muller will let us have more details of some of the interesting breedings that he mentions. —EDS.]

COLD HARDINESS IN THE KEA AND THICK BILLED PARROT

(*Nestor notabilis* and *Rhynchopsitta pachyrhyncha*)

By G. MICHAEL ELIEG (Curator of Birds, Brookfield Zoo, Chicago, U.S.A.)

In the fall of 1970 at Brookfield Zoo (Chicago), I had a chance to experiment wintering two species of parrots outdoors—the Kea and Thick Billed Parrot. These species were decided upon because of the frigid natural habitats they occupy. The Kea is found above the timber line in New Zealand whereas the Thick Bill lives in the high mountain forests of the Sierra Madre Occidental in Mexico.

Three Keas were housed in an aviary 5 × 3 × 4 metres and three large barrels were provided for shelter. The Thick Bill was in a nearby aviary 3 × 3 × 4 metres. Both roofed aviaries were open only on the northern exposure and took the full brunt of the winter.

Meteorological data from November through March is shown in Table 1 to give an idea of the Chicago winter. There were seven days below 0°F. in January. Wind gusts of up to 58 miles per hour were evident all winter long. There was generally an absence of sunshine as shown in Table 1 and precipitation in the form of rain or snow was normal for the season.

Table 1. Meteorological Data, Winter 1970-71
Midway Airport Chicago*

	Maximum	Minimum	Average	Average Wind Speed	Cloudy Days	Precipitation in Inches
November	48·1	33·3	40·7	11·9	20	3·57
December	39·1	23·6	31·4	11·6	19	1·71
January	27·0	11·4	19·2	13·3	15	1·11
February	35·5	20·9	28·2	13·4	21	2·39
March	43·5	27·8	35·7	12·8	19	3·30

* U.S. Weather Bureau, Chicago—Midway Airport
Local Climatological Data—November 1970—March 1971

The Keas never used their barrels and were out climbing the aviary wire a great deal of the time. The only problem attributed to cold was that of a Kea touching his foot to the cold wire after stepping into the water dish. This caused the integument to adhere to the wire. When the bird pulled his foot away there was a sore which healed quickly with no adverse effects.

The Thick Bill used the box constantly, coming out only to feed or to soak in the occasional sunshine. We can conclude that these two species are extremely cold hardy and can possibly be worked into year-round

outdoor exhibits. I wish to thank the U.S. Weather Bureau Midway Airport—Chicago for the meteorological data contained in his article.

The Keas have now (April 27, 1971) successfully bred and hatched three of four eggs. A first for the species at this Brookfield Zoo.

* * *

NEWS AND VIEWS

Under the Commonwealth of Australia's List in the New Year's Honours, Mr. Fred Shaw Mayer was made a Member of the Most Honourable Order of the British Empire for "services to aviculture". Mr. Shaw Mayer's work for aviculture has long been highly regarded in avicultural circles and this unique honour will be warmly welcomed all over the world, not only as a tribute to Mr. Shaw Mayer but also as the first ever official recognition of the value of aviculture.

* * *

"Hector", the youngest of the six Ravens in the Tower of London, is perforce spending the greater part of each day in confinement. This is not on account of any viciousness but because of his mischievousness. Now one year old and very tame, having had close contact with a family since a nestling, he has developed a fondness for stealing bits and pieces from children and pecking stockings.

* * *

Everyone knows that a rookery is the breeding place in a clump of trees of a colony of rooks. Colonies of gulls and herons have the same contracted suffix aery or eyrie, signifying a breeding place of birds (especially of any bird of prey). But rookery is a name used for the breeding-ground of various, gregarious seabirds, seals and other marine mammals. It may properly be applied to colonies of gannets and penguins. A "rookery of penguins" sounds inappropriate in the extreme.

* * *

When, in 1929, the Marquess of Tavistock published his "Parrots and Parrot-like Birds in Aviculture" he wrote fully and informatively on the species that he had kept, but many others rated little more than a description. Lord Tavistock did, however, include a few asides. When, for instance, a Mexican trapper was asked why he did not catch Thick-billed Parrakeets, he replied: "Señor, they are no good. Bite like hell. Perhaps catch three, four pair; no can use hands for weeks. Lady no buy; gentleman no buy; and dam bird no good to eat. What de hell le use?"

Mrs. Brenda Rhodes (*in litt.* 17th March, 1971): "My Black-tailed Conures *Pyrrhura melanura* that gained the Society's Medal for me last year have again been successful. Four lovely young ones have left the nest and are starting to feed themselves. The parents were not so shy this time and so I was able to look into the nest early on and I counted five eggs. When the oldest young one was four weeks I looked in again and there were four chicks. All were covered in dark grey down with a few quills showing. The one I took to be the oldest had a flash of red on the shoulder."

* * *

In the MAGAZINE, 1964, 15-18, Charles Everitt gave a breeding account of the Natal Kingfishers *Ispidina picta* in the Edward Marshall Boehm aviaries. Now a success has been obtained in Europe, at the Zoo in Frankfurt am Main. In 1969 the first hatching consisted of two young ones that left the nest after 20 days; in the second one young left after 19 days. The third nest produced three young that were found dead in front of the nest-hole 13 days after hatching. A fourth consisted of two young; one was thrown out of the nest after five days, the other left the nest but had a deformed foot.

* * *

Included in the recent Sotheby sale of Natural History specimens was a semi-fossilised egg of the long extinct "Elephant Bird" *Aepyornis maximus*, of Madagascar, for which Quaritch gave £1,000. This was a very tall (nine to ten feet) Ratite bird of particularly massive build, with very stout legs. It is said to have weighed up to half a ton. The present shell, of an off-white colour, measures: longest circumference 33.25 in., girth 28 in., length 15 in. Eggs weighed about 20 lb. and it is estimated that the liquid content of average specimens was as much as two gallons—148 hens' eggs. Between 1893 and 1919 about ten similar eggs were sold at Stevens Auction Rooms for prices up to 70 guineas.

* * *

During the course of a year I receive many requests for information on birds. The great majority are of a serious nature but just a few may be classed as facetious. A recent query concerning "The Liver Birds", a current television series on the amorous adventures of two Liverpool batchelor girls, certainly falls into the latter category.

There have been many theories on the origin of the City's name, but none is very convincing. In the early 17th century a bird was depicted on the Common Seal of the town. It was lost during the siege of 1644 and the copy then made was so unskilful that the bird resembled a Cormorant rather than the original eagle of St. John the Evangelist. For want of a better name, and by back-formation, antiquarians have called it the Liver. A Liver appears twice in the Coat of Arms of the City and also as the Crest.

A mounted specimen of the Great Auk or Garefowl *Pinguinus (Alca) impennis* realised £9,000 at Southeby's on 4th March 1971, an auction record for a natural history specimen. It was sent by Baron Raben-Levetzau, Aalholm Castle, Denmark, and is believed to have been collected by Count F. C. Raben, in Iceland in 1821. The purchaser was Dr. Finnur Gudmundsson, Director, Museum of Natural History, Reykjavik, with funds raised by the Rotary Kiwanis Lion Clubs. There are 79 or 81 skins in 39 museums, but none apparently in Iceland until now. It is believed there are 68 or 70 eggs in existence; 45 of which are, or were at one time, in the British Isles. This large, flightless, North Atlantic seabird was exterminated by the wholesale slaughter at the breeding places by French sailors who visited Newfoundland to fish and who depended greatly upon the "Penguin" for a supply of food. The last pair was killed between 2nd and 5th June 1844, on Eldey, a skerry off the south-east coast of Iceland, and was sold for about £9.

Also included in the sale were the mounted skins of two Passenger Pigeons *Ectopistes migratorius*, a Carolina Parakeet *Conuropsis carolinensis*, a Norfolk Island Parrot *Nestor meridionalis productus*, and a pair of Huias *Heteralocha acutirostris*.

* * *

Some years ago I tried to obtain eggs of the Onagadori—the long-tailed fowl of the island of Shikoku, south-west Japan. I was quite unsuccessful and, I believe, others have had as little success. But last year Dr. Frank X. Ogasawara, an avian physiologist at the University of California, Davis, returned to the U.S.A. from a visit to Japan, sponsored by the National Geographic Society. The doctor took with him 30 eggs, 15 of which hatched.

The Onagadori is the fowl that has been known to grow tail plumage that may exceed 30 ft. in length. Both the male and female are able to pass on the special genes to their progeny, but only the males grow the long feathers. They are not moulted and do not reach their full, magnificent length until the bird is perhaps nine or ten years old. A matter such as this may be considered as rather outside aviculture as understood by the majority of our members. It is not included on account of shortage of material, due in the main to the postal dispute, but it is considered of sufficient general interest to warrant inclusion in this column. Some research has already been done at the Nagoya University, but the field is wide open to Dr. Ogasawara for studies of the abnormal cell growth that produces the long feathers.

A. A. P.

REVIEWS

BIRDS OF GUATEMALA. By H. C. LAND. Pennsylvania: Livingston Publishing Company, 1970. \$10.

This book, published for the Pan-American Section of the International Council for Bird Preservation, is a small field guide which helps to fill one of the remaining gaps in the world coverage of bird identification—that of the Central American mainland. The text, and half of the plates, were prepared by the author, but regrettably he died at the age of 39, before the book was in its final stages. The remaining half of the plates are by H. Wayne Trimm.

There is a valuable introduction on the country and its bird distribution, with maps of relief, vegetation and habitat zones. In the main text distribution maps are given for species, with relative commonness indicated to some extent by intensity of shading. The text for each species is a brief statement of range, status, elevation (in a rather rugged country), habitat, description, and brief comments on voice and behaviour where appropriate. Within Central America species with wide range but distinct subspeciation may occur, and the relevant subspecies are indicated. There are 667 species recorded for Guatemala.

The plates are in colour, with the grouping of related species for comparison to which we have become accustomed in these field guides. There are 45 plates and 294 species are shown; mostly resident birds rather than migrants that might appear in other works. Dr. Land's birds are adequately illustrated, but somewhat stiff and wooden in posture, and the type of colour that he has used reproduces poorly; rather dark and heavily coloured. Mr. Trimm's plates are more life-like and of better colour, occasionally erring towards the other extreme of fussiness in background and arrangement.

The book ends with a brief section on bird-watching in Guatemala, and a selected bibliography. This is a very sound and useful guide to the birds of this country; and the first one to cover this region.

C. J. O. H.

* * *

BIRDS OF THE WEST INDIES. By JAMES BOND. Revised and enlarged edition, 1971. London: Collins. £2.25.

This is a new edition of the 1960 version of this field guide, now out of print; and has been revised. It covers the 430 or so species of the faunal region from Grand Bahama to Grenada and St. Andrew, omitting Trinidad and Tobago and the offshore islands of South and Central America. It

is illustrated with excellent colour illustrations of 80 of the more important endemic species by Don Eckelberry, including a number of parrots and hummingbirds; and a further 186 are illustrated by very good line drawings in the text. The text for each species, in addition to a brief description and notes on the voice, includes comments on habitat and nesting, and a list of local names to help the traveller. This is the standard, and only, work on the identification of the birds of this region, and sets a high example for this type of guide.

C. J. O. H.

* * *

NOTES

ENGLISH NAMES OF PARROTS

The use of personal common names for birds is now generally condemned; and in some quarters names suggesting a characteristic in regard to appearance are preferred to those of geographical association. Having regard to the many forms that during the past few years have been renamed, it is perhaps only natural that in some cases the results may seem quite extraordinary. It must be agreed that some original names were inappropriate or unimaginative and that some changes would eventually have to be made.

Rodolphe Meyer de Schauensee, in his latest work "A Guide to the Birds of South America" (1970), Curator of Birds, The Academy of Natural Sciences of Philadelphia, describes 2,926 species inhabiting South America. Of these 111 belong to the great Order PSITTACIFORMES. No less than 64 have had new names bestowed on them, some are merely variations but some are completely new. Gone are various old familiars: Lear's Macaw is now the Indigo; the Half-moon Parrakeet becomes the Peach-fronted; Patagonian Conures are now Burrowing Parrots; the Celestial Parrotlet, the Pacific; the All-green Parrakeet, the Plain; the Hawk-headed Parrot, known as such since 1751, becomes the Red-fan Parrot. And even our old favourite the Blue-fronted Amazon is not sacrosanct—it becomes the Turquoise-fronted Parrot. This is surely just change for the sake of change.

Mention has only been made of some of the parrots and parrakeets, but presumably there have been changes in all sections. The List gives 233 species of Humming Birds. Here surely standardization is badly needed. All too many members of this group have never had consistent names—they have been "coined" by writers to suit their own fancy. Now, at long last, some order may come out of confusion—at least in this group.

A. A. PRESTWICH.

NOTICE

REQUEST FOR INFORMATION REGARDING ANY PREVIOUS
RECORD OF BREEDING THE GREAT GREY SHRIKE

In the January-February number 1971 of the MAGAZINE (page 1) the breeding of the Great Grey Shrike (*Lanius excubitor*) was described by Derrick England. It is believed that this may be a first success but, unfortunately owing to an oversight, the usual request for information regarding any previous breeding of this species was not included.

Any member or reader knowing of a previous breeding in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

ERRATA

March-April No. 2, 1971, "News and Views".

Page 77 line 14, for "Howe" read "Lowe".

Page 78 line 6, for "5th" April read "15th" April.

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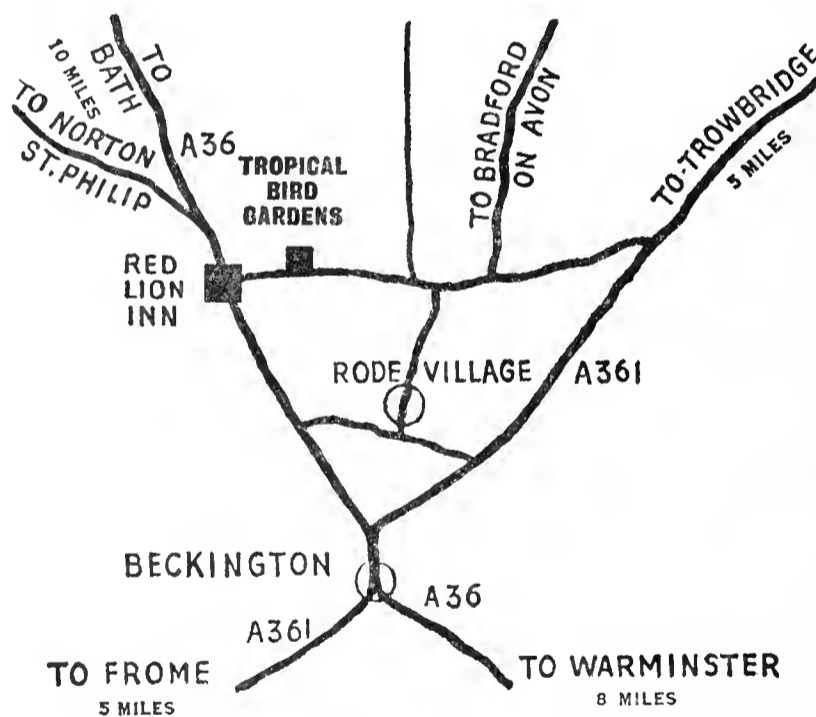
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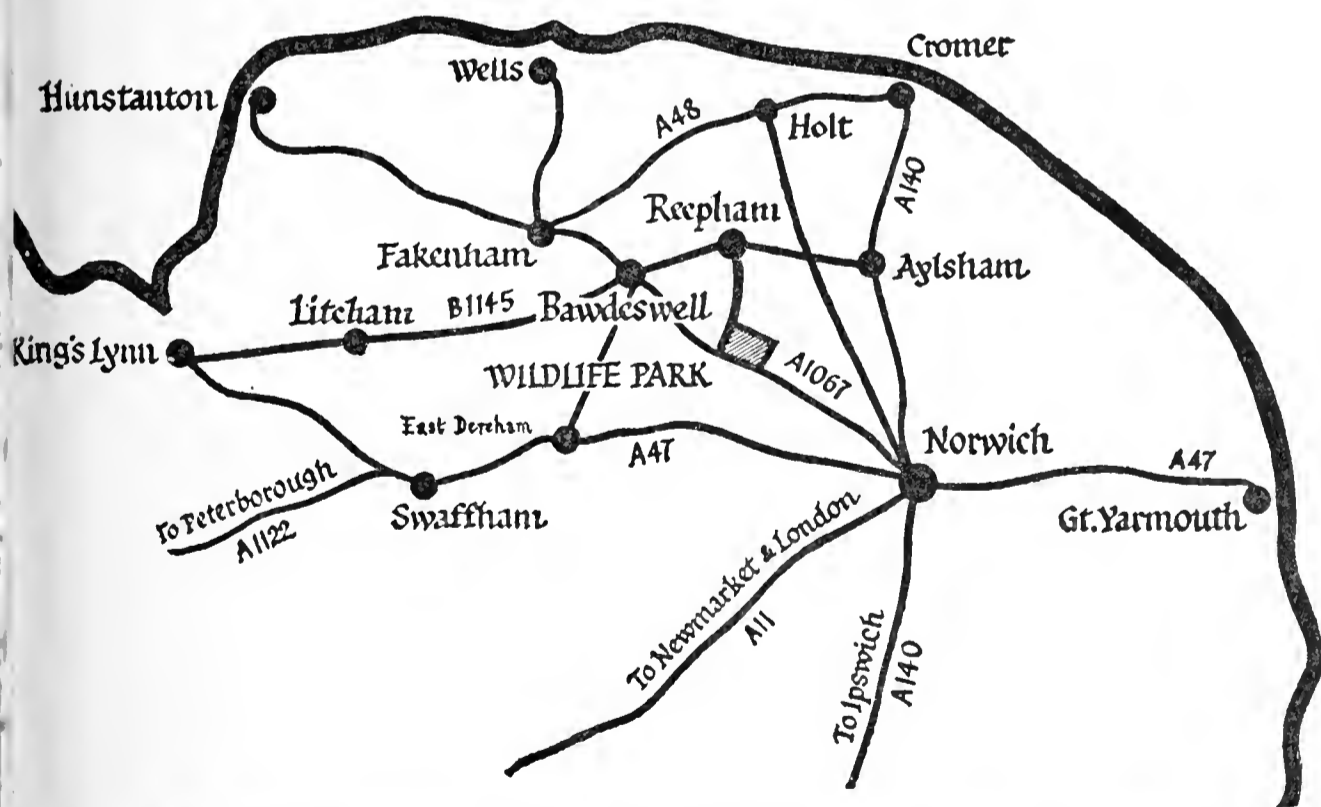
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NEW MEMBERS

The Twenty-four Candidates for membership in the March/April 1971 number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

CANDIDATES FOR MEMBERSHIP

- MRS. SYLVIA TESTER, 5 Great North Road, Chawston, Beds.
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A. B. COELHO, AV. Ilha Da Madeira, 22-5-F. Lisboa-3, Portugal.
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DONATIONS

(Colour Plate Fund)

The council wishes to thank the following Members for their donations to the Colour Plate Fund.

Mr. H. W. Clarke
Mrs. J. W. Flintoft
Mr. Lee W. Lenz
Mr. K. J. Mackie

Mr. M. F. Poe
Dr. N. P. Sholar
Mr. H. Snazle

Will members please donate their surplus books on birds to the Society for the benefit of the Colour Plate Fund.

NOTICE TO MEMBERS

We regret that it has proved impossible to publish a current List of Members in this issue. The seven-week long postal strike in this country resulted in serious delays in the receipt of subscription renewals, resignations and new Members, and the backlog from overseas is still reaching us so that any list published now would be very incomplete. We hope to issue the List in the September/October issue.

Also by reason of the postal strike, distribution of the March/April issue of the Magazine was very late, and overseas Members have had to wait a long time for replies to their letters and membership queries. We apologise for these delays and hope that all Members will by now have received their magazines and correspondence.

May we take this opportunity of reminding those who have not yet renewed their Membership, that their subscriptions were due on 1st January of this year. The new rate is £2.50 (\$7.00).

Hon. Secretary and Treasurer.

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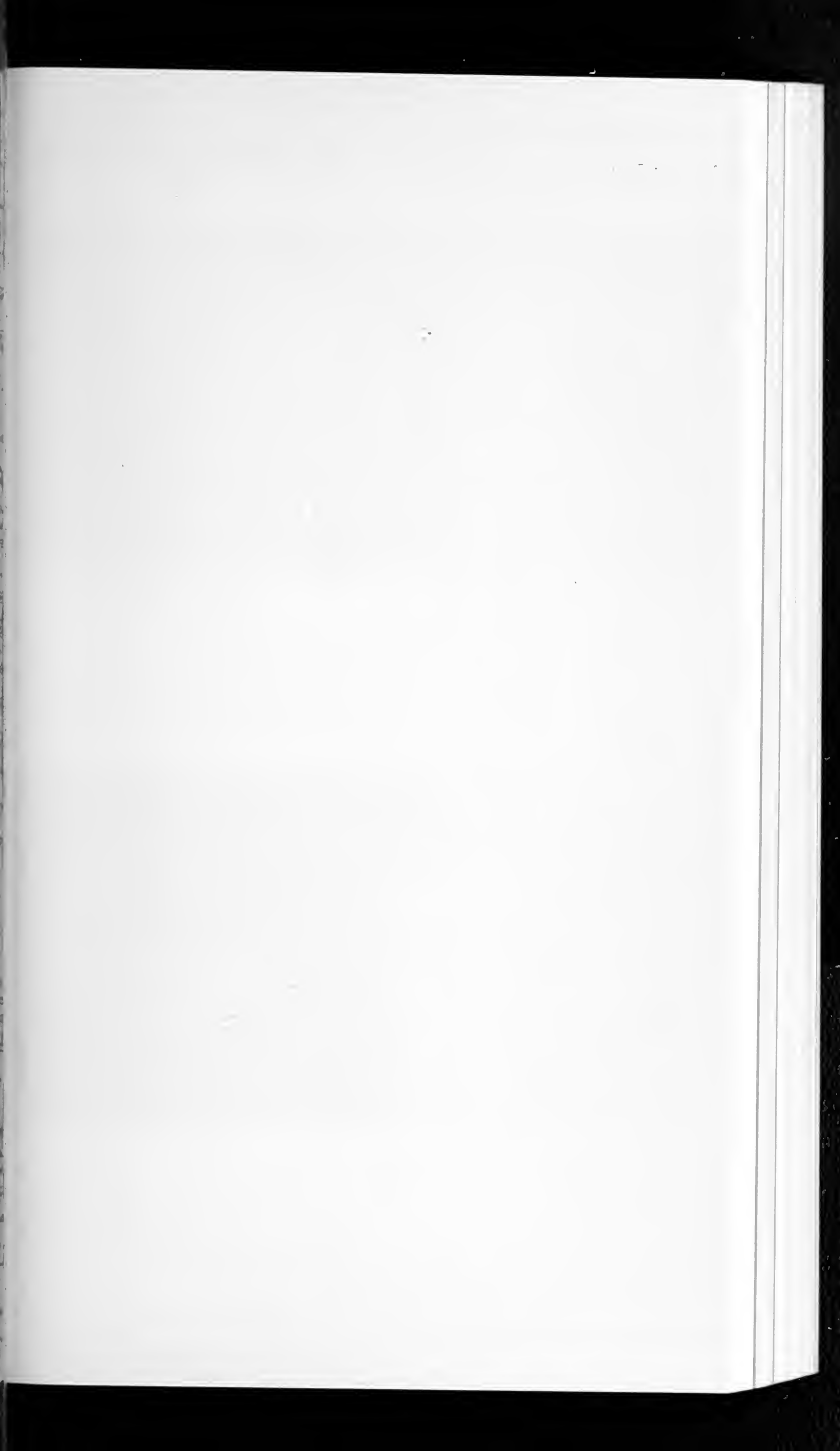
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Editor: Miss Phyllis Barclay-Smith, C.B.E., 51 Warwick Avenue, London, W.9.
Assistant Editor: Dr. C. J. O. Harrison, 14 Dawlish Avenue, Perivale, Middlesex.





Anianiau



Kauai Amakihi and
Hawaii Amakihi



Apapane



Kauai Creeper

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[C. R. Eddinger

HAWAIIAN HONEYCREEPERS

AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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JULY-AUGUST 1971

HAND-RAISING HAWAII'S ENDEMIC HONEYCREEPERS

By DR. C. ROBERT EDDINGER (University of Hawaii, Honolulu)

The Hawaiian Honeycreepers (*Drepanididae*) constitute a family of birds found only in the Hawaiian Islands. The family is composed of small birds. The largest living species, the Kauai Akaihoa (*Hemignathus procerus*), is only 7.75 inches (194 mm) in total length; the Anianiau (*Loxops parva*), one of the smallest, is 4.25 inches (106 mm) in total length.

Of the 22 full species of drepanids, eight are already extinct and eight others are currently considered to be in danger of extinction (Fisher, Simon and Vincent, 1969). The six remaining species have at least one valid race each in danger of extinction.

Before any of the drepanids became extinct, two species were confined to Nihoa and Laysan, four were distributed over some or all of the main islands without racial distinction, and five ranged over some or all of the main islands with a different race on most of the islands.

I collected nestlings and hand-raised successfully: Anianiau (*Loxops parva*), Apapane (*Himatione sanguinea*), the Kauai race of Creeper (*Loxops maculata bairdi*), and the Kauai race of Amakihi (*Loxops virens stejnegeri*). In addition, I hand-raised the Hawaii race of Amakihi (*Loxops virens virens*), collected by Dr. Andrew J. Berger. To the best of my knowledge, this is the first time that any species of drepanid has been hand-raised. I fed the nestlings Gerber's high protein cereal for baby, Deca Vi Solabies vitamin drops, egg yolks, and papayas. As the birds became independent, to the above diet I added wheat germ, honey-water mixture, oranges, grapefruit, apples, fly larvae, fly pupae, and autolyzed brewer's yeast fraction. Techniques for hand-raising passerine birds are given by Berger (1966) and Eddinger (1969).

The Anianiau is one of the smallest Hawaiian honeycreepers. The adult male has bright yellowish-green upper parts with bright yellow below, shading to white on the abdomen. The female and immatures are duller in colour, being more grey-green to olive-green. The bill is short and only slightly curved.

The Apapane, a deep crimson bird with black wings and tail, white under tail coverts, and black legs and bill, is the commonest surviving Hawaiian honeycreeper. The immatures are grey to grey-brown and pass through several intermediate stages before reaching full adult plumage.

The sexes are alike. Adults are 5.25 inches (131 mm) in total length. The bill is slender, sharp and slightly down-curved—well adapted for nectar—and insect-feeding.

The Kauai race of Creeper (length about 4.5 inches or 112 mm) is brownish-grey above and creamy-white to white below. The sexes are alike. The bill is pointed and only slightly decurved.

The Amakihi is the second most common living honeycreeper. The Amakihi is a small (4.5 inches or 112 mm) drepanid, mainly olive-green above, yellowish, or creamy-grey below. A dark loreal mark joins the eye and the curved dark bill. The Kauai race has a bill longer, heavier, and more curved than races from the other islands.

The birds adjusted well to aviary conditions and enabled me to observe at close hand, some behavioral characteristics that were more difficult to observe in the field, such as sunbathing, water bathing, and maintenance activities. The Hawaii Amakihi have been in our aviaries for 3½ years now. Our indoor aviaries were inadequate to induce breeding activity.

Naether (1969) very adequately explains the importance of understanding the needs of birds held in captivity. While he is concerned largely with adult birds captured in the field, his recommendations may be equally applied to hand-raised birds. The advantage of hand-raised birds is, of course, that they are very tame throughout their period of captivity and do not undergo the traumatic shock that often results when adult birds are captured and held in aviaries.

Travel funds for this study were provided in part by grants from the Chapman Memorial Fund, the Eastern Bird-Banding Association, and by National Science Foundation Grant GB-5612, awarded to Andrew J. Berger.

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* * *

BREEDING OF THE PERFECT OR PLAIN LORIKEET

(*Trichoglossus euteles*)

By KENNETH RUSSELL (Wisbech, Cambs., England)

Some six years ago, whilst visiting the pet shop owned by Mr. Trevor Flatt of King's Lynn, I saw two Lorikeets that were quite unknown to me which I purchased. From the description given in Bates & Busenbark's "Parrots and related birds" I identified them as Perfect Lorikeets, confirmed by the colour plate which I later saw in Mivart's "Monograph of the Lories". Though not as brilliantly coloured as many of the family, they are nevertheless quite attractive in my opinion, and the two I purchased quickly settled down in an outdoor aviary and became very tame, coming to the wire for a piece of fruit from my fingers as soon as they saw me approach.

Ten and a half inches in length, the sexes are very much alike, the upper parts being a uniform grass-green. The head is a yellowish-olive, and in the case of my pair the hen's is smaller and more brightly coloured. The breast and abdomen is yellowish green. I notice that in Mivart's description he adds that the breast feathers have green margins which form more or less distinct transverse bands but in the case of my birds this is not so, the overall colouring being quite even. The underside of the wings is yellowish, edged with black, with the typical deeper yellow bar seen in many of the *Trichoglossus* species. The bills are orange and the feet grey.

They were given a box-type parakeet nest hung inside a shelter shed with a partially open front, into which they retired to roost each night. The box was filled with a six inch layer of decayed wood and sawdust—rather more than I would normally use for parakeets, in order to absorb the copious droppings associated with lorikeets.

After four years I was still uncertain of their sex, but last year I was convinced I had two hens as both birds appeared to be in a laying condition and ultimately eggs were laid—I believe by both birds. I recalled that my friend, Mr. R. Kyme, of Kirton, had purchased some Perfects imported by John Wilson of Norwich and on telephoning him was told that he thought his two were cocks. An exchange was arranged, and the newcomer was obviously a larger-headed bird than the hen which remained with me. Unfortunately the latter would not tolerate her potential mate and attacked him so persistently that I had to confine her within a cage in the flight. Ultimately however they called a truce and after a few days were flying together.

Both birds indulge in a display of rolling the body, neck and head in a circular motion, whilst the long tongue is projected from the mouth accompanied by hissing sounds. The cock's display before the hen is characterized by stretching his body in an upright position with bill

pressed into the throat feathers, whilst beating his wings rapidly in the manner of a covert pheasant. It is then that the yellow underwing bar is seen. The cock began feeding the hen but I never saw them mate. I often wonder if the lories and lorikeets copulate in the nesting box, as one can regularly hear strange cries and thumping sounds coming from the nest long after dark, though of course this is pure speculation, and although these nocturnal sounds are also heard in the nests of Massena Lorikeets and Red Lories in my collection I have seen the last-named mating in the flight.

Both cock and hen Perfects now made frequent visits to the box in the daylight and by 31st March the first egg was laid. After this I made no further inspection as the hen would leave the nest on close approach. The cock perched mostly in the vicinity of the box and sometimes entered to feed his mate.

On 23rd April young were heard being fed. The diet given was nectar feed made from one pint of boiled water, to which one dessertspoon of honey, one dessertspoon of Nestles Milk, a few drops of Vitave Syrup and Farex were added. Apple was given, but not used much whilst feeding the young. Some sunflower seed, and bread soaked in sweetened milk was also taken.

On 27th May I noticed that the nest-box appeared very damp in one corner, so fearing that it was becoming badly soiled with droppings I opened the inspection door and to my great surprise saw three well-grown young. I had hitherto believed that the clutch of all lorikeets never exceeded two eggs. They were all badly plucked and in a wet condition so I added a further layer of dry sawdust to the nest. I also removed one of the youngsters to give it a chance to feather more quickly, and in 24 hours it was taking the nectar-feed on its own.

The other two young continued to develop well and on leaving the nest were strong fliers though devoid of feathers on back and breast. Now, on 27th June they are independent of their parents and almost fully feathered. They are duller in plumage than the adults with a dark-coloured bill. The only reference I have about the species in Aviculture is in AVICULTURAL MAGAZINE, New Series, Volume 2, November 1903, where Mrs. Johnston refers to a specimen in her collection that had a Weber's Lorikeet for companion.

As described above the Perfect or Plain Parikeet *Trichoglossus eutele* has been bred by Kenneth Russell. It is believed that this may be a first success and any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

SOME ASPECTS OF BEHAVIOUR AND REPRODUCTION IN CAPTIVE BARN OWLS

(*Tyto alba alba*)

JEFFREY TROLLOPE (Hounslow, Middlesex, England)

INTRODUCTION

Until this last decade the breeding in captivity of this handsome medium-sized owl was a comparatively rare event. Prestwich (1955) records a number of breedings, the first in 1867 and the most recent prior to the publication of his book, in 1954, at Paignton Zoological Gardens. Since then it has been bred fairly frequently. However, published records giving details of breeding seem to be very few.

This paper consists of breeding information, with observations on the behaviour of adults and the behaviour and development of the young.

Birds Studied and Methods

A pair of Barn Owls hatched in 1969, were purchased from the Zoological Society of London in November of that year. These birds were released in a planted aviary, 12 ft. × 8 ft. × 8 ft. high, which was built to house small passerines, quail, etc. and made of 2 in. × 1 in. wooden battens and $\frac{1}{2}$ in. galvanized wire mesh. Observations were made on this pair of owls and their six young from two broods, which were studied until separated from the parents. Two of the young birds were observed when transferred to another aviary.

Watches were carried out from a nearby shed, periods of observation included daylight, dusk and after dark. Living in an urban area surrounded by houses and street lighting, I found the night watches were possible and sometimes surprisingly easy. The white ventral plumage of the birds is an advantage, leg rings helped with the identification of individuals. The study of the adults and one pair of "young" is being continued in 1971.

Breeding

During the first two months after reception the female was sluggish, even after dark. The male was very active, at dusk he would fly from the top of a small apex roof, the roosting site and drop from a perch to a batten near the aviary floor. This would be repeated some 20 to 25 times, what appeared to be "killing practice". The exact spot in the batten was struck with the feet every time, with a return to the same area on the perch. This routine preceded any other activity, such as flying from perch to perch, or walking and running on the ground.

In early February the "wild shriek" call was heard every night. The male became active and diurnal activity was increased, the male walking and running on the floor and taking food to the roost.

The female began to spend most of the day on a board under the apex roof. I tacked up some hardboard around this, making a crude box measuring 17 in. × 14 in. × 15 in, open at one end. Sometimes the male roosted with her in this box, which became covered with disgorged pellets. The first egg was laid on the 14th March.

TABLE I
DETAILS OF BREEDING

Brood No.	No. of Eggs Laid	Dates Laid	No. Hatched and Dates	No. Self-supporting and Dates†	Date separated from Parents
1*	7	1st 14.3.70 Last 4.4.70 (approx.)	3 1 18.4.70 1 23.4.70 (approx.) 1 2.5.70 (approx.)	3 17.6.70 25.6.70 9.7.70	3 14.7.70
2	8	1st 11.6.70 Then every second day	3 1 15.7.70 1 23.7.70 1 25.7.70	3 14.9.70 22.9.70 23.9.70	2 18.10.70 1 29.10.70

* Nest-box not visited daily.

† Date young bird was first seen to feed itself.

Incubation with both clutches commenced when the first egg was laid. Except for a brief exercise flight the female was not seen to leave the box from the 14th March until the 25th August. In most cases I had to lift her out of the box to ring, examine or photograph the chicks. She returned as soon as I had left the aviary. When the aviary was entered she would hiss and bill-snap, striking at my hand when lifted from the box. Whether in the box or on the apex roof, the male would fly to a perch before the aviary was entered, he would then give a threat display with hisses and bill-snaps.

Three broken eggs were found on the aviary floor from the first clutch of seven eggs, no trace could be found of the fourth. With the second clutch of eight, four eggs were broken and one was found on the floor showing a slight dent. This egg contained a developed chick near hatching.

I suspected broken eggs were removed by the parents, as a 2 in. ring at the open end of the box, made an accidental "kick out" unlikely. This theory was supported on one occasion when during a night watch the male flew from the box with a piece of broken egg shell in his bill.

DEVELOPMENT OF CHICKS

Day 1.

Chick has very scanty white down; pink skin. Surprisingly active, scrambling across box and moving rudimentary wings. Giving a vocalization which sounded like "chirric-chirric, chi, chirric" that could be heard before aviary was entered.

8-10 days

Nearly covered in down, eyes beginning to open, a slit showing. Hissing at observer, with heads raised.

10-12 days

Bill-snapping at observer, eyes nearly open.

12-14 days

Eyes fully open, iris pale blue, down very thick. Striking at observer with feet. "New" vocalization—(Gecker-gik-gik, gik-gik).

14-16 days

"Snoring" note first heard from chicks, self preening of breast down.

18-20 days

Primary quills showing, outline of "facial disc".

25-27 days

Primary feathers showing and tail feathers, "facial disc" well defined. Iris now brown as adults.

30-38 days

Wings and nearly all dorsal feathers through. Brown eye "shadowing" as with adults.

48-54 days

Chicks left nest-box, returned to box themselves.

56-62 days

Fully feathered and flying, allo-preening between young birds. Soliciting food from adult male. Still roosting in nest-box during day.

61-68 days

Chicks seen to feed themselves. Allo-preening with adult male. Still returning to nest-box, but not every day.

The preceding list shows what would appear to be the more important stages in growth and development. One of the most interesting aspects was the activity shown and strong vocalization at day 1. This was confirmed with four chicks, one in the first brood, and each of the second brood of three.

I thought the "drive" and ability to return to the nest box during the 48-54 day period was noteworthy. The box was 5 ft. 6 in. from the aviary floor, with 18 in. between the box entrance and the side of the aviary. The young birds, unable to fly and without a convenient perch, accomplished this difficult manoeuvre by "walking" up the wire with wings flapping, until opposite the entrance, then jumping from the wire into the box. When they failed and dropped to the floor, another attempt

would be made almost immediately. The largest number of unsuccessful consecutive attempts recorded was five. The pattern for leaving the nest-box, in order of age and at dusk, or soon after nightfall, was the same in both broods. One or two days before leaving the wings of the eldest chick could often be seen hanging over the edge of the box entrance. Before leaving the box, the chicks would look out, making complex lateral-lateral and circular "focusing" or "orientation" movements of the head. After this "observation" period, the chick would drop to the aviary floor and carry out an apparently exploratory walk around the aviary, looking in the direction of any movement or noise, or the adult male if he were out of the box.

On the night of leaving and sometimes the following night, they would return to the box, or try to, within half an hour. After this no return was seen during the night, although they did go back during the morning and all three would be in the box about 8.0 a.m.

When fully fledged they would often run rapidly around the aviary, stopping suddenly for wing-flapping exercises, with jumps into the air. "Killing practice" would be carried out on roots, stumps and food, striking with one or both feet.

Play

During this period of development an activity was observed in both broods, which may be described as play. The actor would run across the aviary and push with its head, or facial disc region, into the facial disc of another chick, who would then push back, sometimes one or both losing balance. The actor would then run across the aviary, followed by the reactor. During the chase the third chick would often become involved, with the roles of actor and reactor changing rapidly. On one occasion the pushing developed into "bill fencing", the actor gripping with its bill, the bill of the reactor. The actor would then turn its head to the side and down and so twisting down the head of the other chick.

Food and Feeding

Since acquiring these birds, I have generally overfed them. Their diet has been rats and mice. Large rats are cut up before feeding. The average daily amount for the adult pair is about 10 mice or young rats, or 2-3 adult rats, without a "fast day". When the young hatched, the "ration" was increased to 20-25 mice or 5-6 large rats. Usually food items had been kept in a deep freeze and thawed for 24 hours before feeding.

Beginning in early January, there was evidence of "food storage". Mice and portions of rat were found wedged in the forks of branches, the position suggesting they had not been dropped in by accident. Once an albino mouse was found fixed in the $\frac{1}{2}$ in. wire mesh.

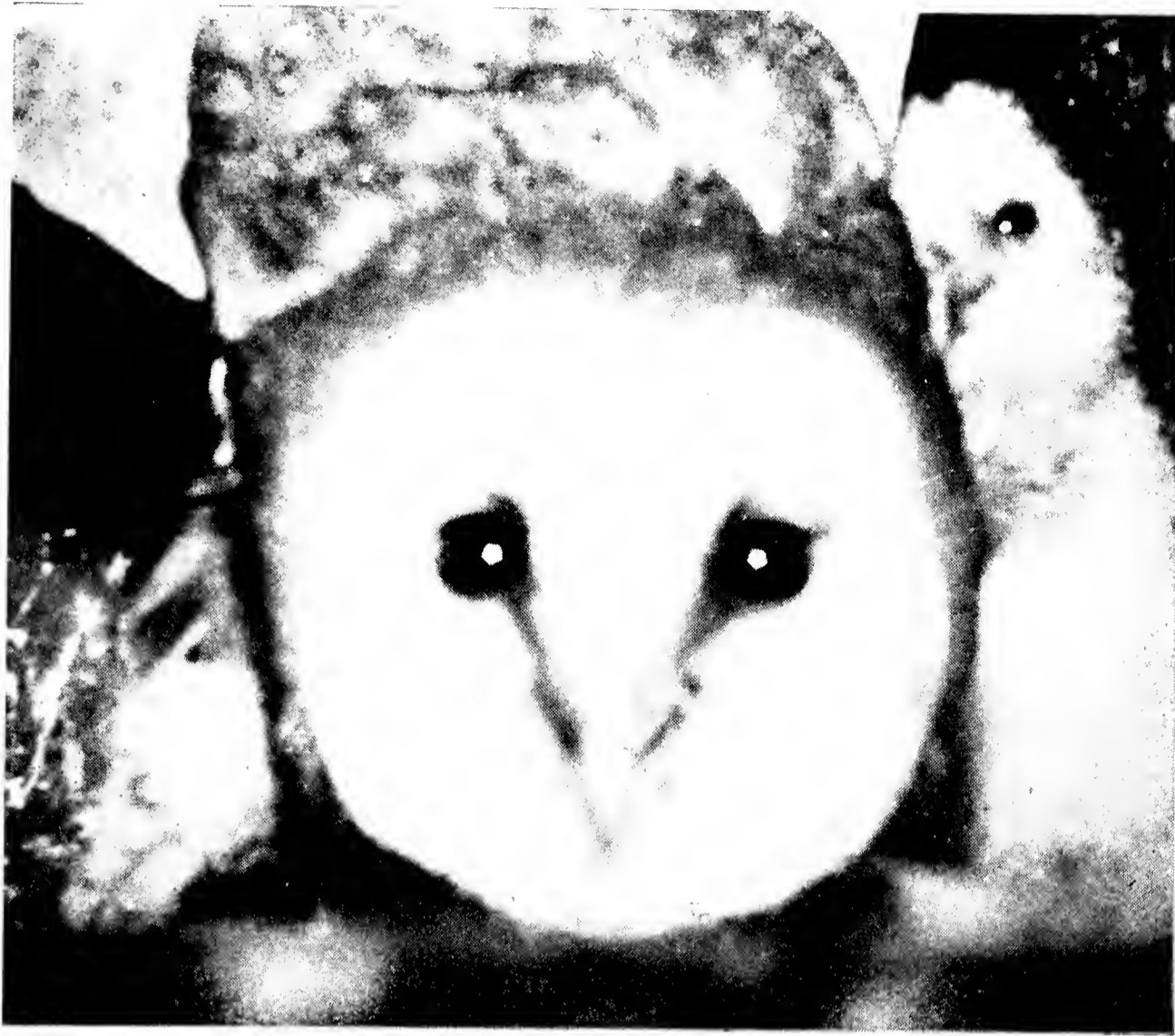
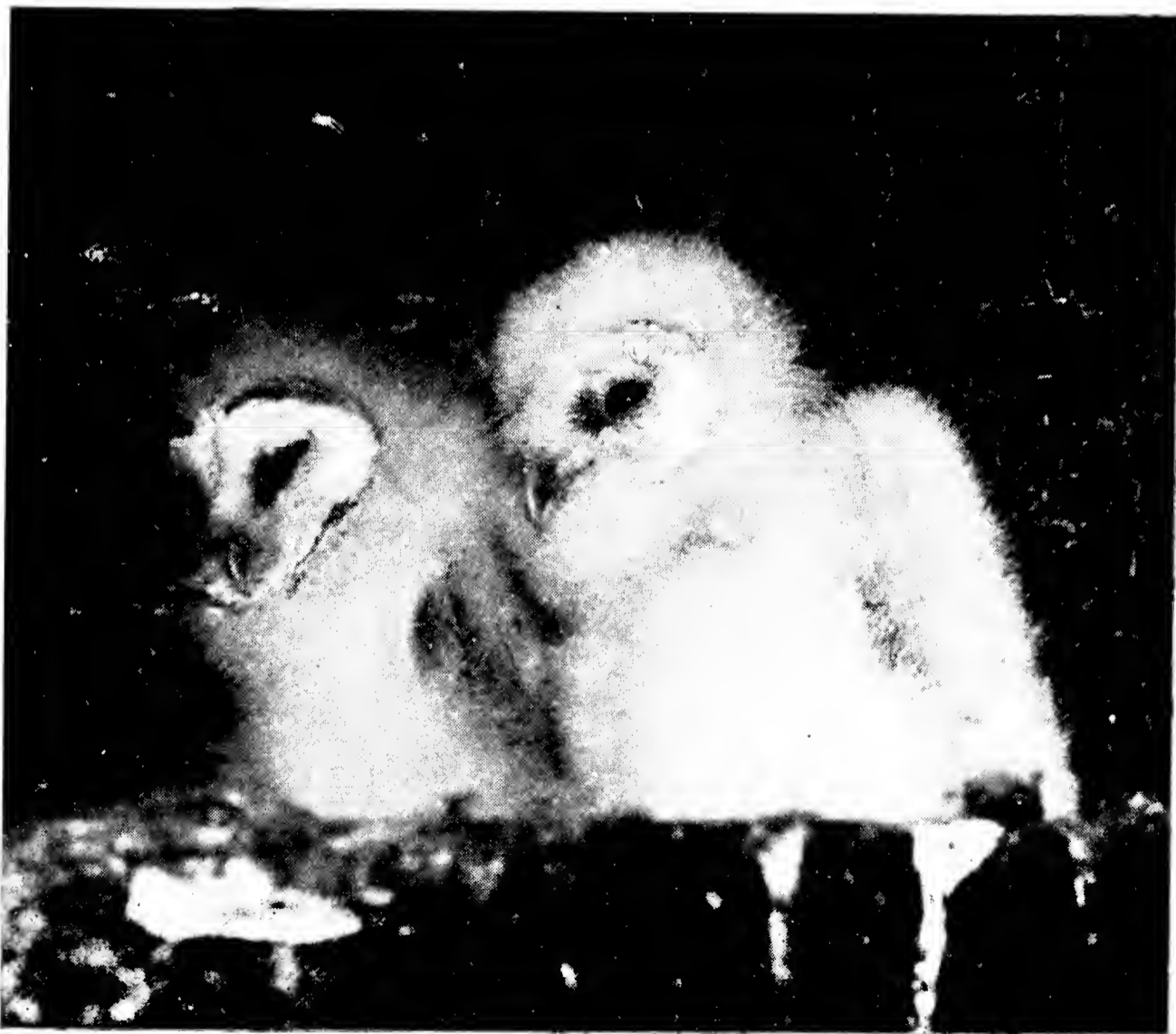


PLATE 1. Adult female Barn Owl and young bird 16 days.



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PLATE 2. Young birds, 34 and 26 days.

[Jeffrey Trollope



PLATE. 3. Barn Owl threat display—head forward.



Copyright]

PLATE. 4. Barn Owl threat display—head lowered.

[Jeffrey Trollope

After the nest-box was made, uneaten mice and rat portions were found inside it every day. The male took food to the box at any time during the day or night. Once incubation commenced, the male would fly down and pick up a food item soon after the food was placed in the aviary; this would usually be between 7.30 p.m. and 9.0 p.m. The male would continue to take food to the box until the feeding site was cleared. Uneaten food from the previous days feeding was removed by the male. This was ascertained by giving white mice and rats or coloured mice on alternate days as often as possible. The time spent in the box by the male on these feeding visits varied from 2-17 minutes. Factors such as whether the young had hatched, or their age, seemed to have no effect on the length of the visit. Occasionally the male would fly to the box without food, during this sometimes prolonged feeding period.

The method for carrying food to the nest was for the food item to be picked up in the bill, then gripped in one foot and usually mandibulated, before being carried to the box. When the adults and independent young fed, the food was gripped in one foot on the floor of the aviary, or stood on with both feet and pulled to pieces in the manner of some diurnal birds of prey. Even very small mice which could easily have been swallowed whole, were dealt with in this fashion. Only twice so far have I seen prey swallowed. Both instances concerned young birds, the amount swallowed was about a third of an adult mouse, after the rest of the body had been dismembered and eaten.

When the first brood were out of the nest, but not independent, the male took little notice of their food soliciting. Often he would have food in his bill and when a chick approached him, he would ignore it and fly in the box with the food. The soliciting method was for the chick to walk rapidly along a perch to the male, giving a vocalization. When near the male, a crouching position would be adopted, the head slightly raised and the bill opened. Sometimes the male would jump over the chick's head, landing on its other side, flying back to the box before it could turn and resume soliciting.

Drinking and Bathing

Drinking has been seen six times so far. The bird perches on the rim of the water bowl and dips the bill just below the water surface. The head is then raised to the same level as in the "normal" perched posture.

Bathing was observed once, and that was during daylight. The bird stood on the rim on the water bowl, then very carefully stepped into the bowl. Fluffing out its feathers and making rapid dipping movements with the bill into the water. The whole ventral surface becoming wet and an area of the wings. This bathing was followed by a preening period which lasted nearly half an hour.

Voice

The most noticeable vocalisation is the "whistling-hiss" call, which is widely described in the literature as a "wild shriek", "scream", "screech", etc. To me it sounds a combination of the hiss that accompanies threat displays and a whistle. The call lasts some 2-3 seconds and is usually a single call. An "extended" form of this call has been heard, which appears to be three calls "run together."

During observations, only the male has given this call and it does not seem to evoke any response from the female, or a pair of independent young housed in a nearby aviary. Although lacking confirmation at this stage of the study, I am inclined to think that it is only the male birds who give this call. Sometimes the male would give a very loud "gek-gek-gek", the female would respond with the same note. Other adult vocalizations are a loud "swee-hoo, swee-hoo" and snoring notes which cannot be distinguished from the snoring notes of the young.

Curious "finch-like" twittering notes have often been heard when both adults and young are in the nest box. The "whistling-hiss" call is not given by the young males until they are about 14 weeks old.

Bill-snapping has only been recorded during threat displays, or when the birds are disturbed in any way. Six days after the first brood was separated from the parents, I entered their enclosure to change the water bowl. All three owls dropped to the floor, giving the head-lowered threat and hissing. After a few seconds, the birds gave a very rapid bill snapping which had a "grating" sound, very different from the "normal" bill snap. This peculiar form of bill-snapping has not been recorded before or since the incident described.

It has been noted that the threat hiss gets progressively louder and alters in "tone", according to the amount of pressure to which the birds are subjected. The time spent in the aviary and distance between the observer and birds, or bird/man contact are three factors involved. For example, when I inspected the chicks, the female hissing would increase in volume and alter in "tone" until it became a hissing-scream, rather than a hiss.

Displays

Threat displays are given whenever the aviary is entered, unless the visit is of brief duration, e.g. less than one minute. Two forms of threat display can be described. In the first form, the head forward threat, the gaze is directed at the source of disturbance. The wings are fully extended and lowered, this posture is accompanied by hisses and bill snaps and is given soon after the aviary is entered. In the second form, the head is lowered so that the top of the head and nape are exposed to the observer, the head is swung from side to side, the wings are extended, but they are not "lowered" or "drooped". Hisses and bill snaps are also given.

This form of display is seen when the birds are under pressure, e.g. approached by observer. As can be seen in Plate 3, with the wings extended and lowered, the dark spots on the primaries and secondaries are exposed to the observer. It is possible that these dark spots may have an "intimidation" signal value, within the context of the full head forward threat display.

An incomplete "food presentation" display was seen on one occasion. The male had a mouse in his bill and moved the head and body in a lateral-lateral sway. The head/body movement was alternate, head left, body right, and so on. These movements were interspersed with circular movements of the head. His gaze was directed at the female, who was facing him, but no presentation was made and he dropped the mouse.

Allo-Preening

This occurs frequently in young and adult birds, whether perched or on the ground. The actor will walk towards the reactor, who often raises the head, presenting the facial disc. Then the actor usually preens the feathers of the facial disc, nape and head, also around the bill, the reactor turning the head to facilitate the preening.



FIG. 1

- A. Extent of head circling in "Food Presentation" display.
- B. Head circling in "Orientation" or "Focusing" movements.

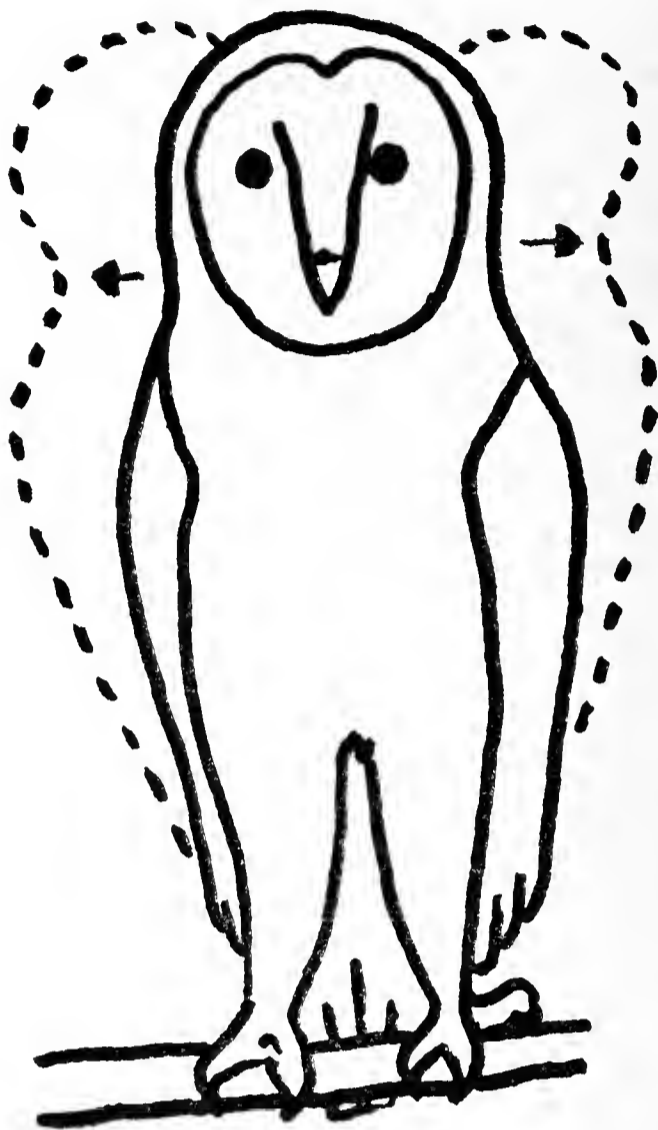


FIG. 2

Lateral-Lateral movements seen in "Food Presentation" display and orientation movements.

DISCUSSION

There are some aspects of the behaviour observed which require further comment. The "orientation" or "focusing" movements made by the young birds before leaving the nest box are also made regularly by adults in the early morning, before roosting and at dusk after leaving the roost. During these orientation periods a third movement is made; this is the lateral-lateral head lowered motion, which is also seen in the head lowered threat display. The circular and lateral-lateral movements were present in the food presentation display differing only in that the head is "swung" in a larger circle during the "orientation" movements, than in the display (see Figs. 1 and 2). To summarize, it would appear that similar and sometimes apparently identical movements, are made in widely different situations.

In the play behaviour of the young birds there appears to be two notable points. Firstly, the behaviour gives the impression of "inefficient aggression" and once included an overt aggression act?—bill fencing. Secondly, some of the preliminary movements are suggestive of a very

“vigorous” and very “exaggerated” form of allo-preening, which judging by this study, is a frequent occurrence in Barn owls, see also Harrison (1969).

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SUMMARY

Behaviour and reproduction in captive Barn owls is described, with notes on growth and development. Some aspects of the behaviour observed are discussed.

ACKNOWLEDGEMENTS

I would like to thank Dr. N. G. Blurton Jones for comments on the first draft, Mrs. Jane Watts for typing and Mr. Jerry Dick for the line drawings.

ADDENDUM

At the time of writing (March 18th, 1971) the female of the original pair is incubating 6 eggs. The female of the pair hatched in 1970 is covering 4 eggs and one chick. The first egg of this clutch was laid on 9th February, when the male bird was 9 months of age and the female 6 months. As with last year's clutches, the eggs were laid every second day.

* * *

BREEDING HANGING PARAKEETS

(*Loriculus* Species)

By E. NØRGAARD-OLESEN (Janderup, Denmark)

Captive breeding of these beautiful birds does not occur very often. The first recorded breeding seems to be that of *Loriculus philippinensis chrysonotus*, a race of the Philippine Hanging Parakeet, at the London Zoo in 1871. The Vernal Hanging Parakeet, *L. vernalis*, was bred in Germany in 1907, and in 1908 the Blue-crowned Hanging Parakeet, *L. galgulus*, was also bred there. Subsequent to these I can find no records of breedings until 1960, when *L. vernalis* was bred in Denmark, and in the same year Chester Zoo bred a hybrid of *L. galgulus* (male) × *L. beryllinus*. In 1964 and 1965 *L. philippinensis* was bred at Tampa, U.S.A. In 1966 *L. vernalis* was bred in Calcutta and Denmark, and *L. galgulus* in Los Angeles. In 1967 *L. p. philippinensis* was bred in Bern, Switzerland; and again in 1968, when *L. pusillus* was bred at Wassenaar, Holland, and *L. galgulus* in Denmark.

In 1966 some *L. philippinensis* were imported to Denmark, and I succeeded in obtaining ten of them. Unfortunately five of these died during the first month, the post-mortem showing death from pneumonia caused by a fungus; a disease often found in fruit and nectar eating birds. A further bird, a female, died in 1969, and I was left with a pair of *L. p. philippinensis* and a pair of what I consider to be *L. p. bournsi*. The male of this latter pair died in the autumn of 1970.

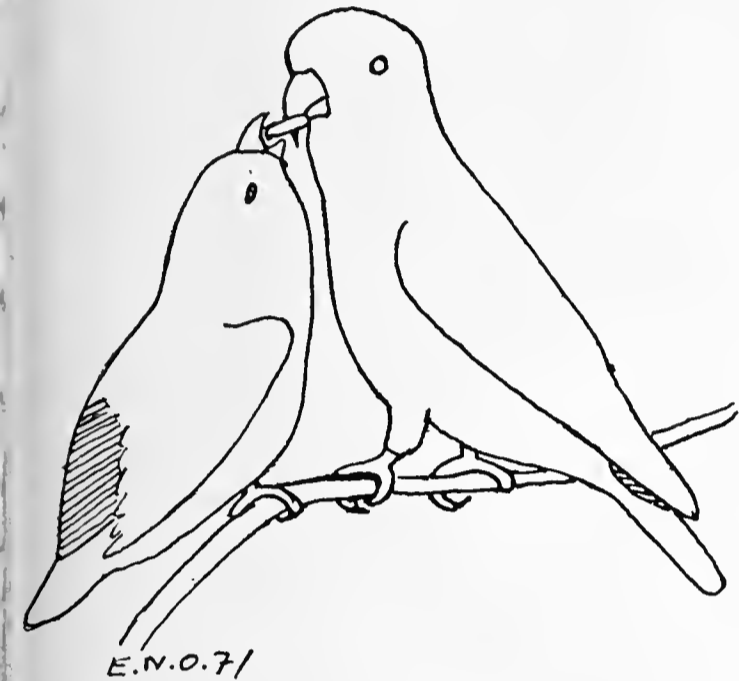
In 1970 both of these pairs showed interest in the nest-boxes, and by June there were 6 eggs from *L. p. philippinensis* and 3 from *L. p. bournsi*. Most of these were unfortunately clear, but one young one left the nest on the 2nd August at an age of 37 days. Like the young of *L. vernalis* and *L. galgulus* it was green in colour except for the rump, which was dark red, but it showed the characteristic long upper mandible of the species. Two months later the chin and cheeks had become light blue, and the front red, like that of the hen.

A pair of *L. galgulus*, consisting of the old cock and a young one bred in 1968, nested in 1969, but I was unable to discover the nest. I was sure that they had young but these never left the nest. This year (1970) I found the nest on the ground in the outdoor flight, just inside the netting and concealed in the 30 cm. high grass. Some years ago a pair of *L. vernalis* had made a nest on the floor of the indoor aviary although there were several nest-boxes available. The nest of *L. galgulus* in the grass contained three eggs, one of which hatched; but the young one only survived a few days.

I was fortunate enough to see the cock of this pair feed the hen in the nest, and subsequently the hen feeding the young. During the nesting

period the cock feeds the hen by regurgitating a whitish, wormlike mass; and the young are fed in the same way. Another characteristic of these birds is that the female, at least, carries pieces of leaf, about half a centimeter in diameter, to the nest by holding them in the feathers of the back, just as do some of the lovebirds, *Agapornis* species.

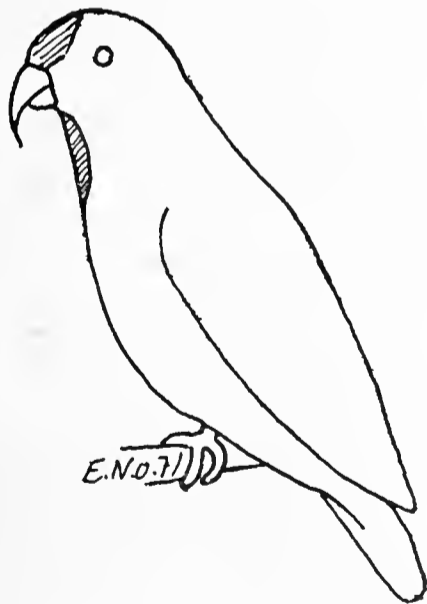
In addition to the above I bred two *L. vernalis* from one nest in 1970, and another Danish aviculturist also bred two young ones.



I. *L. vernalis* feeding young.



II. *L. galgulus*.



III. *L. philippinensis*

(The hatching indicates red colour, except on the head of *L. galgulus*, where it indicates blue.)

THE SUNBATHING OF THE ROADRUNNER

By C. J. O. HARRISON (Perivale, Middlesex, England).

One of the pleasures of aviculture is the insight which it gives us into the behaviour of some birds during their more relaxed moments, which may be difficult to observe in the wild.

It has recently been possible to watch the Roadrunner, *Geococcyx californianus*, at the London Zoo. This large, terrestrial cuckoo of western North America has long strong legs, a long slender tail, and a rather heavy head and bill. Its feathers are brown, glossed with green and bordered with creamy-white, and there is bare blue skin around the eyes. In repose the bird fluffs up like a football, with the tail drooping, and the large head, looking hammer-shaped with the heavy bill and the backward pointing sleeked blunt crest, resting low on the shoulders. When active it becomes sleeked and lively, with head and neck extended forwards and tail straight out behind. It runs with long deliberate strides and tends to stop abruptly, the tail and crest being simultaneously cocked up at a sharp angle at the moment it pauses, as though both were controlled by a single hidden string. At other times the tail tends to swing a little as though it were only loosely attached.

The Roadrunner's most striking posture is that adopted when it is sunbathing. A bird of hot arid regions, it may feel a greater need for the sun than some other species and seems to respond very quickly to such sunshine as we get. The posture is shown well in the accompanying plate, taken by David Holyoak.

The feathers of mantle and wings, which usually cover the body like a smooth rounded shield, open up. The wings are opened away from the body on the upper side, apparently by a movement of the humeral joint. The lower mantle feathers are erected up and possibly a little forwards, beyond the vertical position, pushing up the other mantle feathers above them. The effect is as though the back of the bird had opened up like a box; and revealed within is an unexpectedly small and slender body, covered in thin, hairy-looking feathering which may be fluffed a little, while the raised mantle feathers reveal the feather bases and bare skin at the upper edge. The general effect would be rather pathetic were it not for the birds' evident satisfaction in the sunlight, and the sudden change to a more substantial roundness as it relaxes to normal posture again makes one wonder what other species may be are concealing beneath shapely mass of plumage.

* * *



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[D Holyoak

Roadrunner in sun-bathing posture at London Zoo



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Superb Tanager x Yellow-browed Tanager

[Johan Ingles

NOTES ON THE BREEDING OF *TANGARA* HYBRIDS

By JOHAN INGELS (Destelbergen, Belgium)

In the family of Thraupidae, hybrids between species of the genus *Tangara* are rather rare.

The first possible *Tangara* hybrid was described in 1886 by Sclater as the Gould's Tanager (*Tangara gouldi*) from a single skin, a so-called "Rio-preparation" which the British Museum of Natural History received from South Brazil. It is accepted that this species can be a hybrid between a Blue-breasted Tanager (*T. cyanoventris*) and an Orange-breasted Tanager (*T. desmaresti*). But the Gould's Tanager may also be a local form of the Orange-breasted Tanager.

The second possible *Tangara* hybrid was described in 1927 by Berlioz as the Arnault's Tanager (*Tangara arnaulti*). At first, this hybrid was only known from a single bird, which lived in the aviaries of Dr. Arnault (France). This bird arrived in France with a shipment of living birds from South America, and the skin is still conserved in the "Musée Nationale d'Histoire Naturelle" in Paris (France). However, a second male specimen was discovered among some Southern Yellow Tanagers (*T. cayana chloroptera*), collected in the province of Corrientes (Argentina), by Partridge in 1962 while he worked there for the Museo Argentino de Ciencias Naturales. It is accepted that both birds are hybrids between the Chestnut-backed Tanager (*T. preciosa*) and the Southern Yellow Tanager (*T. cayana chloroptera*).

In recent avicultural literature there is only one report of the breeding in captivity of *Tangara* hybrids. In 1967 Mr. T. Zucca, from Rivoli (Torino, Italy), bred two hybrids from a male Blue-throated Tanager (*T. cyanicollis*) and a female Golden-masked Tanager (*T. nigrocincta*).

This present article is a record of the breeding of two other hybrids which were bred in 1969 and 1970 by Mrs. Y. Claessens-Claes at Heusden (Limburg, Belgium). These hybrids, between a male Superb Tanager (*T. fastuosa*) and a female Yellow-browed Tanager (*T. guttata chrysophrys*), are still alive and at present both birds are in my aviaries and are in a fine general condition.

After the winter of 1968-69, the parent birds (at that time still of unknown sex) were put together in a roomy cage of about 4 ft × 2 ft. × 3 ft. high, which was placed in a sunny verandah. After some preliminary quarrelling both birds settled down and became very tame. During the first half of July, the birds built a nest with dried grass in an iron nest-basket. On 23rd and 24th July, two eggs were laid by the Yellow-browed Tanager which proved to be a female, and after an incubation period of 15 days, two young hatched on successive days.

The young were fed by both parents, mainly with spiders, ant pupae, mealworm pupae, gooseberries and red currants. As the parent birds were very tame, they fed their young even in presence of men. The young were ringed on the fifth day and after a period of 14 days they both left the nest. But one of the young birds died a few days later when it was startled and struck the cage wiring and was mortally wounded. When 19 days old, the remaining young started to eat from an apple and at the age of 30 days, it was independent.

That year a second clutch of two eggs was lost when the parent birds threw the eggs out of the nest after 10 days of incubation. Both eggs were fertilized.

During the breeding season of 1970, the parent birds had a new clutch of two eggs. One egg was broken during incubation, but another hybrid was reared from the second egg. When this second young one was independent the female died without apparent reason.

The colour patterns of both hybrids are alike; they have a coarsely spotted turquoise-blue look. However, there is a slight difference between both hybrids; the younger one is more yellowish, while the older one has a more bluish appearance. This different colouring can be caused by a difference in sex, as we believe that the hybrids are of opposite sex. The older hybrid has a more bold "male-like" attitude and was seen feeding the younger one on several occasions. The older one could be a male, showing the influence of the bluish colour pattern of a Superb Tanager, while the younger one could be a female, with the influence of the yellowish-green colour of a Yellow-browed Tanager in its colour pattern. The older hybrid is the same size as the parent birds, the younger one is slightly smaller. The old birds are of equal size, as the male *T. fastuosa* is a small bird, whereas normally Yellow-browed Tanagers are a little smaller than Superb Tanagers.

The forehead and chin of the hybrids are black, as in the case of a *T. fastuosa*, but the black lores of a *T. guttata* are lacking. The rest of the head is shining light turquoise-blue. The head feathers have a black centre and a very broad light turquoise-blue edge, which gives the head a slightly scaled appearance. The feathers of the mantle are black with a small edge of yellowish-green, which gives the mantle a nice spotted look. The rump and upper tail-coverts are yellowish-green. The tail feathers are black, edged with greenish-blue. The primary flight feathers are edged with greenish-blue, but the inner secondary flight feathers are edged with turquoise-blue, so that the edges of the flight feathers slowly change from greenish-blue to turquoise-blue. The outer secondary flight feathers, which are edged with orange in the case of a *T. fastuosa*, are now edged with light turquoise-blue with a tinge of orange. The greater and middle wing-coverts are black edged with greenish-turquoise blue. The small wing-coverts are light turquoise-blue, like those of a *T. fastuosa*. The flanks are greyish-green and blue

The breast has a coarsely spotted appearance, as the small feathers are black edged with pale violet-blue. The abdomen is greyish-green, becoming greyish-white at the vent. The under tail-coverts are yellowish-green with lighter edges. The legs are bluish-grey, and the upper mandible is black, while the lower mandible has a grey patch at both sides of the base, like the bill of a *T. guttata chrysophrys*.

The whole look of these delicately coloured hybrids shows very clearly the influence of the spotted pattern of the female *T. guttata chrysophrys*.

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* * *

PUBLISHED ACCOUNTS OF BREEDING EUROPEAN BIRDS IN AVIARIES IN BRITAIN

By C. J. O. HARRISON (Perivale, Middlesex, England)

One of the questions that arises after a successful aviary breeding is the inevitable query "has this species been bred in captivity before?" This is not as easy to establish as it might seem at first. Reasonable records with any details seem only to have been available since about 1884 when the publication of the AVICULTURE MAGAZINE began. Publication on the subject tends to be rather sporadic, and often lacking in adequate data. The following list was originally prepared as a publication for A.S.P.E.B.A. but since it is of interest to aviculturists in general it has been suggested that it should be included here.

In compiling the following list I have rejected all bald statements that "such-and-such a species has been bred" and the list consists mainly of those species for which some sort of permanent account of the breeding exists. This does not absolutely prove that breeding has occurred, but merely lists those instances in which it is reasonable to accept that it is probably a true account of what happened.

The abbreviation "A.M." refers to the AVICULTURE MAGAZINE. The abbreviation "B.N." refers to Bird Notes, not the publication of the Royal Society for the Protection of Birds which later used this title, but the publication of the Foreign Bird Club between 1906 and 1925.

I have not included the waterfowl in this list since they are adequately documented elsewhere, and the list may also be incomplete where information on breedings in Zoological Gardens is concerned.

Since this list is concerned with published records with data, it will not be a complete list of all species, although relatively few will have been missed. I have personal knowledge of the following breedings of species for which there are no adequate published accounts and which do not therefore come within the scope of the list—Yellowhammer, *Emberiza citrinella* (P. Wayre 1965; A. Wood 1965), Mistle Thrush, *Turdus viscivorus* (P. Wayre, 1970), Tree Pipit, *Anthus trivialis* (W. Painter 1965), Skylark, *Alauda arvensis* (F. Astles, 1965, 1966; P. Wayre, 1969, 1970), Wren, *Troglodytes troglodytes* (J. Dowling, 1966), Common Partridge, *Perdix perdix* (P. Wayre, 1969).

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[Bred again in 1906, 1907].

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(3) 3 (1911-12): 28-34. H. S. Hepburn (per A. A. Prestwich). *A.M.*
52 (1946): 224-225. [Bred 1937-1939].

CROSSBILL, *Loxia curvirostra*. A. Silver (per J. L. Bonhote). *A.M.*
(3) 2 (1910-11): 109-117.

GOLDFINCH, *Carduelis carduelis*. R. Suggitt. *B.N.* (2) 1 (1910)
146-147.

GREENFINCH, *Carduelis chloris*. J. Sergeant. *A.M.* 1 (1895)
122-124.

SISKIN, *Carduelis spinus*. A. F. Moody. *A.M.* (5) 3 (1938): 172.

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- LINNET, *Acanthis cannabina*. W. H. Potter. *A.M.* (4) 13 (1935): 57.
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A VISIT TO NORTH-WESTERN INDIA

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The state of Gujarat in north-western India is situated between the Gulf of Cambay and the Gulf of Kutch. The ornithology of the area is perhaps best known through the work (*The Birds of Saurashtra*) of Raol Shri Dharmakumarsinhji; also through Dr Salim Ali's paper "The Birds of Gujarat" published in the *Journal* of the Bombay Natural History Society.

Early in January, 1971, I went at the kind invitation of H. H. the Maharaja Jamsaheb of Nawanagar to stay at Jamnagar, the city formerly known as Nawanagar. Here a very extensive collection of mammals, birds and reptiles is kept. It is composed mainly of indigenous species, but there is also a large collection of exotic birds, mostly Psittacidae. The park surrounding the Maharaja's palace is very much an oasis in a comparatively treeless area and consequently many birds are attracted to it; it happens also to be a sanctuary for the Cobra and some of the smaller native mammals. Just outside the walled park a part of the collection is kept and this is open, free of charge, to the public every day. Plans have been made for the building of very large aviaries and other bird and mammal accommodation where native species now seriously endangered can be propagated and the park itself will be made proof against such predators as Jackals, the local roving domestic dogs and the wild cats, so that many more species can be kept free; also there will be a continuing programme of tree and shrub planting so as to ensure that as the surrounding country becomes more and more built on and the few remaining trees destroyed, this reserve will remain in perpetuity.

The palace where I stayed is a vast building started in 1907 and completed in 1915 during the reign of the famous Kumar Shri Ranjitsinhji, familiarly known as "Ranji" and, of course, renowned as one of the world's greatest cricketers, but also venerated in Jamnagar as a far-sighted planner and for his part in bringing prosperity to the area by the building of docks, a railway, the making of water reservoirs for irrigation and of roads and many fine buildings within the city. He entertained on a lavish scale and the palace was built for the accommodation of guests, being still used for that purpose. The Maharaja's palace stands about $\frac{1}{4}$ mile distant within the walled park. The birds most in evidence around both palaces are the Ring-necked Parrakeets which nest wherever they can gain access under the eaves. The Rock Pigeon, *Columba livia intermedia*, a dark-rumped race, is also common and so is the House Crow, *Corvus splendens*, with the Jungle Crow in smaller numbers. The House Sparrows and pigeons often came inside through the open windows, the sparrows sometimes coming at meal times to pick up crumbs around the

chairs and the pigeons prospecting for a nesting ledge. In the park the Black Kites were nearly always about and one pair had its nest in a tree near the other palace with a nest of the Black Ibis (*Pseudibis papillosa*) some thirty feet above it in the same tree. Koels (*Eudynamys scolopacea*) were always about in the low trees, behaving, as it seemed, in secretive and conspiratorial ways, as well they might, for they are clever enough to outwit the House Crows and are brood parasitic mainly on them, their young being blackish like the crows' own offspring. The Indian Coucal (*Centropus sinensis*) was often to be seen; so was the Wandering Tree Pie (*Dendrocitta vagabunda*), and there were always the Common Babblers in parties of ten or so, searching for food among the fallen leaves. There were two Pied Hornbills in the park, but these had been released there some two years previously and were more often heard than seen. The metallic and monotonous call of the Coppersmith or Crimson-breasted Barbet was often to be heard and I once saw a Yellow-fronted Pied Woodpecker (*Picoides mahrattensis*).

Another of the birds nesting in February was the Purple Sunbird (*Cinnyris asiatica*), the males of which are not purple, but a steely Prussian blue in the breeding plumage, much like the female (grey above and creamy-white below) in the eclipse. It sometimes chooses to build near to human habitation and I found an old nest attached to a hanging wire inside an open-fronted building near the palace and watched a female making her nest quite in the open within an open-topped pen built to house Ratels, attaching it to a dead stalk of a plant at about five feet from the ground. Another had her nest attached to a plant that was growing up through some scrap metal lying against the wall of a pavilion and no more than four feet from the ground; also quite near to where some men were working each day. The nest being built was worked on by its owner even while I stood close by and all were, of course, of the typical pattern which gives them the appearance of being merely some plant debris tangled with cobwebs and caught up on a twig. In the evenings large numbers of Common Mynas and Rosy Pastors come in to roost close by the palace, a large tree within the quadrangle being a favourite place, but whether the two species roost together in the same tree I did not find out and perhaps the mynas rested on ledges of the building. Small parties of Cattle Egrets pass over on their way to roost and at one place in the park the Fork-tailed Drongos gather on some overhead wires where for a time they are active in the pursuit of insects and then, when it is almost dark they go into the trees. One evening there were twenty-three of them, most going into one group of trees and a few into another, but whether it is usual for these drongos to roost more or less communally or whether they do so here because there are few suitable roosting places outside the park is not known. This species (*Dicrurus macrocercus*) is also called King Crow, not because it is black but because it is a match for crows in spite of its smaller size. It is said to

mimic the calls of other birds and those of some mammals, and so fearless is it in defence of its nest that other birds such as doves build their nests close by, thus benefitting from this protection. Out in the country this drongo was often to be seen perched on the backs of goats and it is a very agile and acrobatic flier in pursuit of insects.

Common Peafowl, the Indian Roller, Hoopoe, Green Bee-eater, White-breasted Kingfisher, Red-vented Bulbul, Silverbill, Brown-backed Robin and Pied Wagtail were all among the birds to be seen about the park. The Silver-bills, also known as White-throated Munias, were sometimes in parties of up to ten. Twice I saw the Kashmir Redstart (*Phoenicurus ochrurus phoenicuroides*) and sometimes saw Collared Doves, Palm or Little Brown doves (*Streptopelia senegalensis cambayensis*) and the Dwarf Turtle Dove (*S. tranquebarica*). There were, of course, others not definitely identified including a Tailor-bird, which is quite likely for it is common in suitable habitat. One night on the road just outside the park a Stone Curlew was seen in the lights of the car and once a Nightjar on a road. Sometimes Demoiselle Cranes could be heard flying over at night and sometimes the cries of *Athene brama*, the Spotted Owlet, which, like the Little Owl which it rather resembles, is sometimes active by day. One that I saw near the palace may have been of a family that had been hand-reared and still came sometimes for food, though in the main fending for themselves. Pellets that I saw near a grove of trees in the park may have been from this owl, though they seemed large for it. The Mottled Wood Owl (*Strix ocellata*) is in this part of India, but whether ever known to be in the park I could not say. Vultures were often circling overhead, among them the White Scavenging Vulture (*Neophron percnopterus ginginianus*) the species being also known as the Egyptian Vulture. Of the kites and vultures the pigeons and parakeets took no notice, but sometimes there came what looked to be a species of small eagle and then there was panic. One day we went to a farm some miles off and as we drew near we saw at least a hundred vultures around a dead ox. The birds were all *Gyps bengalensis*, the White-backed Vulture, and there was some additional competition for the carcass in that a dog was trying to keep the birds away but it did not succeed in injuring any of them and as soon as its attention was diverted from any one place the nearest vultures rushed in to snatch what they could. At length a second dog came and there was much snarling and showing of teeth, but at last the first dog grew tired and ungraciously withdrew to rest in the shade whereupon the second went for its meal. This one paid no attention to the vultures and immediately they realized this they piled in on one another so that even the dog was almost lost to sight. It was like a rugby football scrum, only worse because there were many more participants. We had a smelly ringside view, but the birds took no notice of us, so ravenous were they.

In a tree near the farm buildings were some sleeping Fruit Bats (Flying Foxes) and on the way to the farm we went off the road to look at a lake

and saw two real foxes—small greyish-brown animals with dark tips to their bushy tails. They were in dry stony country and in such areas there were many birds that were, I think, the Short-toed Lark (*Calandrella cinerea*), a common winter visitor to this area. There must of course have been many small seeds lying in the dust, but to all appearances there was no food in this dry, brown and barren terrain. I saw a pair of the Ashy-crowned Finch Lark (*Eremopterix grisea*) here and another pair at another similar place. There was also a small crested lark that might have been Syke's Crested Lark; there was a similar one on the air-field at Kuwait and in the Gujarati countryside I saw a few others. This is *Galerida deva* and is said to be a versatile mimic and songster, so a favourite cage bird, but I did not see any so kept.

On the lake there were three crocodiles sunning themselves, but these, like so much else, are becoming scarcer, the skins being in demand. A Skimmer, two Caspian Terns, Spotbill, Teal and some Cormorants were there and on other lakes visited at various times during my stay there were Darters, Great White Egret or Heron (*Egretta alba*) and perhaps the smaller one (*intermedia*), Pelicans—we saw the Rosy on the coast, but the Spot-billed is hereabouts too—Shovelers, Pintail, Garganey and Pochard were seen and the most spectacular sight of all was the enormous flocks of Demoiselle Cranes, sometimes resting on the banks or islands and sometimes in great skeins in the sky. A favourite feeding place for these cranes is the fields where the ground-nuts have been harvested, for evidently some of the crop is left in the soil. At one lake we went to find an almost white Demoiselle Crane that the Jamsaheb had previously seen and as we went in a helicopter we had a fairly close view when at length we found it. It was evidently not an albino, for it was not a pure white and the head was a little darker than the rest of the body. For a time it flew with a normally coloured one, so it was possible to make a comparison in the same lighting conditions.

The eastern race of *Grus grus*, the Eastern Common or Lilford's Crane is also in this area during the winter and some were seen at another place. In areas of rocky undulating country the Great Horned Owl (*Bubo b. bengalensis*) breeds, having its nest under rocks or overhanging ledges. I was shown two nests containing young, one with three and two eggs containing well formed dead chicks and one with two chicks which had been tethered by the legs with thin wire. The wire tie was already too tight and if left on any longer would have resulted in gangrene of the legs. It is easy for people to find the nests, for the higher rocks are evidently used by the birds as vantage points and the tell-tale white faeces are conspicuous, showing that a nest is probably near by. I went later to one of the nests and found that one chick had wandered off to rest in the shade of a large Euphorbia bush growing a few yards distant. Pellets from the vicinity of both nests contained fur and lower jaw bones of some small rodent, but no sign of bird remains.

Going along a road one day I was particularly pleased to see a Black-winged Kite and I saw several others at different times. The distribution of this species, *Elanus caeruleus*, is very extensive, but curiously enough Portugal is the only place in Europe where it lives and breeds. Seeing it again reminded me of a very interesting and enjoyable holiday in Portugal when I went with Derrick England and others in the rather faint hope of finding and photographing this Portuguese rarity—and succeeding certainly beyond my expectations, for we found a nest and excellent photographs and film were obtained. A species of harrier (Marsh, I think) was sometimes seen and once we had a fine view of a Tawny eagle. In the hope of seeing the Great Indian Bustard (*Ardeotis nigriceps*) I went with three companions to Bhatia, near the coast to the south-westward. It was a long and dusty search, but at length we saw a male in a cotton field. At the sight of the jeep in which we travelled the bird moved off and finally flew to settle a mile or so away. Later in the day we found another, a female, also in a field of cotton, and sexable, of course, by its much smaller size. Its pale neck against the green of the low cotton plants made it visible from afar and we managed to get a much closer view of this one, but, sad to say, a bustard that allows a close approach is not likely to survive for long. It may already be too late to save this bird from extinction and the orthodox methods of protection would require an army of incorruptible guards. An unconventional method, much more likely to succeed, was outlined to me by the Jamsaheb whose scheme was to let it be known among the villagers that a reward would be paid to any village in whose area a bustard was seen and a much larger reward in the case of a successful breeding. It would be necessary to guard against an excess of zeal, of course, but it is the only possible plan with a chance of success, and the people in remote areas where the birds are still existing are quite intelligent enough to know how to guard against disturbance of them. We also saw two little groups of Blackbuck totalling nine animals, and as soon as we were visible to them they raced away at a great speed, as well they might, for they are chased and shot from landrovers. Even thirty years ago it would have been possible to see Blackbuck by the dozen where now there are none or very few. Quite near to the road to Bhatia at one place some Demoiselle Cranes were feeding and taking no notice of the traffic, so presumably this was a place where they are not shot at. Near them were two Sarus Cranes and another was seen, also by the road, some distance further on. The Sarus is not persecuted, I believe, because of some superstition regarding it and its fidelity to its mate. Early in the morning as we were going along there were in two places one or two rails by the road that were, I think, the Blue-breasted Banded Rail (*Rallus striatus*) and while driving over the vast semi-desert area in the course of looking for the bustards, sandgrouse were disturbed, but it was not possible to identify them; two or three of the handsome Indian Courser (*Cursorius coromandelicus*) were seen. In the busy main

street of Bhatia there was a Brown-backed Robin, a bird that I saw in several different habitats. We stayed for the night at a Government rest house some miles from the town at an ancient village and on arrival there were greeted with evident delight by two or three extremely bold and agile mice who clearly connected visitors with food and who cavorted around and under the table during our meal. I was less pleased to see them, particularly when I found that my bed, in the same room, had a sort of mini-mosquito net, not long enough to tuck in. I must say I sleep better when not overrun by mice during the night, but curiously enough after the meal we saw and heard no more of them. Outside early the next morning there was a Spotted Owlet sitting under the eaves and Ring-necked Parrakeets prospecting there for possible nesting sites. On the way home we saw in thin woodland a Bluebull or Nilghai and we diverged from the road to look at two lakes, one with a flock of Demoiselle Cranes on the shore and what appeared to be a White Stork in the distance and at the other where we stopped for lunch there was a single tern—the Indian River Tern, *Sterna aurantia*, I thought, and a Little Cormorant, *Phalacrocorax niger*, but nowhere did we sight any more bustards.

The Red-wattled Lapwing (*Vanellus indicus*) was quite commonly seen, in semi-desert, on the rocky banks of streams and even in the black mud of the docks, and it is quite approachable; the Yellow-wattled (*V. malabaricus*) was much less common.

There were often shrikes sitting on the wires by the roadside, the Indian Grey Shrike (*Lanius excubitor lahtora*) among them. Around the high dam some miles to the southward of Jamnagar there were Dusky Crag Martins (*Hirundo concolor*), the high wall evidently forming the crag; there were always Swallows about here and also Rock Pigeons, and in a bush overhanging a nearby stream were nests of weavers, but I did not see any of the owners. Coming back from this area one day we had a good view of a pair of Pied Kingfishers (*Ceryle rudis*): it may have been their nesting time, for they were mating. On another occasion one was hovering and diving into the lake, but without any success that we saw. Pied Chats were sometimes seen out in the country and sometimes small parties of Rosy Pastors; once a quail leading its chicks across a lane—the Rock Bush Quail, I think. Stonechats and a pale wheatear—perhaps the Isabelline (*Oenanthe isabellina*)—also seen, the former being the race *Saxicola torquata indica*.

We went for a few days camping in the Barda Hills at Keleshwi, a place where Ranji had a large house and where he entertained guests for the Leopard shooting. The house is now in ruins and the formerly splendid garden overgrown. There is, close by, a hamlet with a temple some 4000 years old which was restored by Ranji. There may still be Leopards in the more remote and thickly wooded parts of these hills and perhaps the Sambur Deer. The drive leading to this place from the main road was several miles long and rough going in places in spite of

being made up for our visit. The camping was not what one understands by that epitome of life at its most uncomfortable, for the tents were large, lined with a wallpaper patterned cloth, a carpet on the ground, a bedstead and an annexe with washstand and so on; also—the greatest luxury of all—a small tent, one to each dwelling tent, containing a modern lavatory, the cistern being refilled by one of the numerous servants in attendance. Meals were taken either on a terrace near the temple or in a dining tent and it was altogether a delightful place, so quiet and peaceful. A very fine male Elephant belonging to the Jamsaheb came too, taking three days for the journey at a speed of about twenty miles per day; this same animal later took part in the general election, walking sedately about the streets of Jamnagar with large cloth placards on either side and taking no notice of all the noisy traffic around it. On special occasions it was gaily decorated with crayon patterns on its massive forehead. One evening there came from Jamnagar some thirty or more dancers to perform some of the graceful traditional dances in the courtyard in front of the temple. A stream, quite low in February, but a torrent during the rainy (monsoon) season, flowed by the hamlet and here there was a Kingfisher (*Alcedo atthis*) in attendance on the numerous small fish in a pool by the bridge. There were two White-breasted Waterhens (*Amaurornis phoenicurus*), Magpie Robins, Pied Chats, a Tickell's Flycatcher, a male Paradise Flycatcher, a Blue-headed Wagtail (*Motacilla flava beema*) and the ubiquitous Brown-backed Robin. There were Purple Sunbirds, an unidentified warbler; also, sitting quietly under the bushes by a pool a small heron or bittern, only visible by its dark hunched silhouette. A mongoose made its way along the stream bed and a Brahminy Kite flew over, seeming to us as it did so to drop a stone or something into a bush. One morning there was a Rufous-backed Shrike (*Lanius schach*) sitting outside my tent. In the old days a road led from the house to a square two-storied tower further up the hill from which the Leopards were shot, so a car could drive there, but now the road is overgrown and only the walls of the tower remain, occupied, when I visited it, by two Spotted Owlets. There were high lamp-posts which illuminated a raised concrete platform on which a goat would be tethered as bait. In spite of this highly organized shooting, the Leopards would then have been in less danger of extinction than they are now, for they would also have been undisturbed in these hills and protected, even if for the wrong reasons.

We went to Ahmedabad by the Jamsaheb's private plane and first flew low over the shallow waters to the north-eastward of Jamnagar and there we saw a number of Lesser Flamingos—a small number as flamingos go—and some Rosy Pelicans, White Storks and very many waterfowl and waders, we passed over the southern part of the Little Rann of Kutch, but did not see any of the wild asses that still survive there. Unfortunately it was too dark to see much of the spacious aviaries in the Ahmedabad zoo where White Ibises and other water birds were breeding, but we did

see the performing domestic pigeons flying as directed by their keeper and returning to their loft. This zoo is very efficiently managed by Mr Reuben David and the animal accommodation that we saw was excellent. New Delhi is a fine and well planned city, its splendid buildings being well set off by large gardens with trees and the spacious tree-lined streets. Here in the hotel garden I saw what I feel sure was the large Pied Wagtail *M. maderaspatensis* and in the zoo the two large lakes are a resting place for thousands of wild duck, mostly Shoveler, but also some Pintail, Gadwall and Pochard. In the trees wild Painted Storks were nesting and there were some Night Herons, but whether nesting or not I could not see. Pied and White-breasted Kingfishers, Green Bee-eaters, Pied Mynas and many other wild birds were about the gardens which are very much a sanctuary for them.

We went on to Bombay and visited the market there in which birds are kept in as deplorable conditions as in so many other such markets. There were cages full of Indian house sparrows which are bought and released by people who believe that this will be accounted to their credit in the hereafter, but it evidently does not occur to them that the sparrows would not be caught in the first place but for them, for nobody keeps sparrows as cage birds. There was a cage full of Red-headed Buntings, nearly all males, but it may be that the catchers do not keep the duller coloured females. There were also Plum-headed Parrakeets, Alexandrine Parrakeets, including some nestlings and one that was a pretty bluish-green and another a yellowish-green colour. There was a pair of the Golden Langur or Langoor, *Presbytis geei* from Assam. These dealers sometimes have the Vernal Hanging Parrot (*Loriculus vernalis*) and the blue-throated form of *Chloropsis aurifrons*, the Golden-fronted fruitsucker or chloropsis, whereas the one that is most often in the shops here has a black throat with a mauve stripe on either side—and a slightly larger bird if I remember rightly. Another interesting bird they sometimes have is the Black-gorgetted Laughing Thrush, sometimes called the Collared, and much like the Necklaced. Whistler (A Popular Handbook of Indian Birds) says: "In the Eastern Himalayas the Black-gorgetted Laughing-Thrush (*Garrulax pectoralis*), an olive-brown and fulvous bird with a marked black gorget band, is remarkable in having a smaller counterpart, the Necklaced Laughing-Thrush (*Garrulax moniliger*). Both are common in the same localities, often joining in a mixed flock". We went to see the birds in our member Mr Sane's shop; also those at his house where he was breeding Splendid Grass Parrakeets and Gouldian finches. I was particularly interested to see the Rufous-throated Hill Partridge, (*Arborophila rufogularis*), Wreathed Hornbill and small insectivorous birds such as Yuhina, Ixulus and orioles including the Maroon. There was not, unfortunately, time for a visit to the Bombay zoo, but we did look at the museum where some of the bird exhibits are particularly well and realistically arranged, that of the Lammergeyer especially.

At the old palace within the city of Jamnagar, a rambling complex of buildings of great historic interest, there is at the end of a raised terrace an open-fronted recess and here along the rafters of the roof the Indian House Swifts have a number of nests and the birds were constantly flying to and from them. This swift is *Apus affinis* and the nests, composed of feathers and other soft materials stuck together with the birds' saliva, were so close together as to be touching one another and it seems remarkable that the owners could find their own among the rows all looking so alike. In the outskirts of the city the mosquitoes are troublesome in the evening and at night, but in the city one is never bitten by them—perhaps thanks to the swifts. Around the city wherever there were large pools of water there would be Black-winged Stilts; they were also in the city around the sides of a very large lake.

A few miles to the northward is a place of perhaps a thousand acres, only a few feet above sea-level and formerly an island, I think, reached only by a raised roadway, and here in the old days there were large numbers of the Grey Partridge or Francolin (*Francolinus pondicerianus*) and other game birds kept for the shooting, being fed daily with a truckload of grain. Now the surrounding area is silted up and perhaps Rozi, as the place is called, is only an island in the rainy season. There are still francolin there in small numbers and some small mammals as well as a fine herd of Spotted Deer which come every evening to take food put down for them and to drink at a large pond. The most that I saw was 42 with some excellent stags among them. The Jackals have now got into the area and are sometimes to be seen coming in from the mudflats where, at low water, they go in search of crabs and other food. Much of the area is covered with high bushes and some small trees and at the seaward side there is an ancient temple with some dwelling houses around it and a lighthouse. The House Swifts live here too, in an old tower, and there are parrakeets about as well as many other birds, especially about the pond. I saw a White-eared Bulbul here. The sea along this part of the Gulf of Kutch is so shallow that cargo ships must anchor some four miles off and barges take the merchandise to and from the port of Bedi, salt from the extensive salt pans nearby being one of the main exports.

At low water there is a huge expanse of mudflats teeming with mudfish or mudskippers (*Periophthalmus*) and the feeding place of numerous waders as well as the Painted stork, Great White Egret, Spoonbill, White Ibis and many others. The Brown-headed and Slender-billed Gulls are about this coast and so is the Gull-billed Tern. There are usually in winter many flamingos both Greater and Lesser, but for some reason they were absent this last winter. Further to the north-eastward the Mangrove trees have more chance to grow, for there they are evidently not so much taken for firewood as they are around Rozi. We flew by helicopter around this area and could see in the Mangrove trees the nests with eggs of the Grey Herons (*Ardea cinerea*). We also saw among very many other birds

between fifteen and twenty Crab Plovers (*Dromas ardeola*) and two Black-necked storks on another flight further south. Inland over the flat dry country we saw one Macqueen's Bustard which rose up to pass fairly near us. Unfortunately the birds, like the women and children in the remoter villages are very afraid of the helicopter and do their best to flee from it: the birds are afraid of the aeroplane too, of course, and it is not so manoeuvrable for following them. On the homeward journey I travelled to Bombay by train and at one station late in the evening saw many of the Common Mynas roosting on the roof girders over the platform and not many feet above the heads of passengers, so evidently they have found a comfortable lodging place that the Starling in London has yet to discover. By mid-March when I came away the weather at Jamnagar was becoming very hot and so it continues until the coming of the rains in June, when, no doubt, the countryside is quickly transformed from the dry and dusty browns of winter to the green tints of spring.

* * *

NEWS FROM THE BERLIN ZOO

By DR. HEINZ-GEORG KLÖS

The breeding season of 1971 promises to be much better than the previous one, probably due to the short winter and the fine weather in spring and summer. Among the hatches worth mentioning are the following:

Three Bar-headed Geese (*Anser indicus*), two Lesser Snow Geese (*Anser c. coerulescens*), two Pacific Brent Geese (*Branta bernicla orientalis*), and above all, two Hawaiian Geese (*Branta sandvicensis*)—the first after a long period of failures. Furthermore we bred and raised three Cereopsis Geese (*Cereopsis novae-hollandiae*) and our Trumpeter Swans (*Cygnus c. buccinator*) for the first time laid two eggs. A female Andean Condor (*Vultur gryphus*) hatched after an incubation period of 58 days, and is now being hand-reared. Three European Eagle Owls (*Bubo bubo*) and three Snowy Owls (*Nyctea scandiaca*) are developing very well under the care of their parents. We purchased 10 of the rare Black Lory (*Chalcopsitta atra*), a pair of Red Birds of Paradise (*Paradisaea rubra*), and a pair of Wilson's Bird of Paradise (*Diphyllodes respublica*) from New Guinea. Other rare newcomers were four Red-headed Manakins (*Pipra rubrocapilla*), three Yellow-winged Caciques (*Cassiculus melanicterus*), and four Yellow-breasted Toucans (*Baillonicus bailloni*).

* * *

COUNCIL MEETING

A Council Meeting was held on 7th May, 1971, at the Windsor Hotel, Lancaster Gate, London, W.2.

The following members were present:

Miss Phyllis Barclay-Smith (Vice-President) in the Chair.

Mr. J. O. D'Eath, Mr. M. D. England, Dr. C. J. O. Harrison, Mr. L. W. Hill, Professor J. R. Hodges, Mr. F. E. B. Johnson, Dr. S. B. Kendall, Mr. K. A. Norris, Mr. D. H. S. Risdon, Mrs. P. V. Upton.

Mr. H. J. Horswell (Hon. Secretary), Mrs. M. Haynes (Assistant Hon. Secretary).

THE SOCIETY'S MEDAL

The Society's Medal was awarded to:

Mr. R. T. Kyme for breeding Weber's Lorikeet, *Trichoglossus haematodus weberi*, in 1970.

Mrs. K. M. Scamell for breeding the Lemon-rumped Tanager, *Ramphocelus icteronotus*, in 1970.

Mr. H. Murray for breeding the Fawn-naped Tanager, *Tangara ruficervix leucotis*, in 1970.

CERTIFICATE OF MERIT

The Society's Certificate of Merit was awarded to:

The Norfolk Wildlife Park, for breeding the Alpine Chough, *Pyrrhcorax gracula gracula*, in 1970.

The Jersey Zoological Park, for breeding the Grey Touraco, *Corythaixoides concolor concolor*, in 1970, and the Mexican Green Jay, *Cyanocorax yncas*, in 1970.

ELECTIONS

Mr. P. J. Olney, Curator of Birds at London Zoo, was elected to serve as a Council Member.

H. J. HORSWELL,
Hon. Secretary.

* * *

BRITISH AVICULTURISTS' CLUB

The one hundred and sixth Meeting of the Club was held at the Windsor Hotel, Lancaster Gate, London, W.2, on Friday, 7th May, 1971, following a dinner at 7.30 p.m.

Chairman: K. A. Norris.

Members of the Club present: J. Bailey, D. E. Balcon, *Miss P. Barclay-Smith, M. Bishop, A. W. Bolton, W. J. Bourne, R. A. Chester, M. D. Coulter, R. G. Crowe, J. D'Eath, E. H. Down, M. F. Draper, Mrs. W. Duggan, *M. D. England, Miss R. Ezra, R. H. Grantham, I. G. Hale, J. Hancock, C. J. O. Harrison, R. T. Harvey, Mrs. M. Haynes, *Dr. E. Hindle, L. W. Hill, J. R. Hodges, H. Horswell, D. J. Houseman, P. Howe, C. Jackson, M. B. Johnson, B. F. Jones, H. G. Kenyon, S. B. Kendall, R. T. Kyme, R. U. Lambert, Miss R. H. Low, L. J. S. Marler, R. F. Marshall, *P. H. Maxwell, F. Meaden, C. Minjoodt, M. J. O'Connor, P. Olney, W. Page, Mrs. A. B. Partridge, B. Sayers, E. O. Squire, Mrs. S. Tester, J. Trollope, Mrs. R. Upton, A. M. Wood.

Members of the Club present, 49; guests 32.

* Denotes Founder Member.

A particularly well-attended Meeting which was enjoyed by everyone, despite the crowded conditions.

The Club was privileged to be given the first showing of a new film entitled "The Penguin Millionaire" by Mr. Len Hill who gave a most interesting and, as always, highly entertaining talk about the birds and mammals of Grand and Steeple Jason Islands. Mr. Hill related how he came to acquire these two beautiful islands in the South Atlantic and gave a very amusing description of an eventful return journey, caring for a group of penguins which he brought back to England.

Members were very pleased to welcome the Chairman's guest, Mr. Joseph Forshaw, visiting this country from Australia, whose illustrated monograph of the entire Psittacine family is soon to be published. Mr. Forshaw brought with him a few proof pages to give members a preview of this very important publication.

Please Note

The next meeting will be held on **Saturday, 25th September** at Birdland, Bourton-on-the-Water, by kind invitation of Mr. Len Hill. A buffet lunch will be available at 12.45 p.m. *tickets for which must be purchased in advance* from the Hon. Secretary. In the afternoon films will be shown in the lecture room. Details will shortly be sent to all members of the Club.

MARY HAYNES,
Hon. Secretary.

NEWS AND VIEWS

Dr. S. Dillon Ripley has been awarded the Gold Medal of the Zoological Society of Antwerp, Belgium, for his contributions in ornithology, ecology, and international conservation.

* * *

The California Condor Survey, 1970, proved a little disappointing. Probably on account of the poor weather only 28 sightings were recorded. The figures for the previous five years are: 1965, 38: 1966, 51: 1967, 46: 1968, 52: and 1969, 53.

* * *

Fifty-seven Whooping Cranes arrived at the Aransas National Wildlife Refuge, Texas, last autumn. They consisted of 51 adults and six young birds—an increase of one on the 1969 totals of 48 and 8 respectively.

There are now 14 Cranes at the Patuxent Wildlife Research Center, Maryland: 12 of them from eggs collected in the wild.

* * *

Some years ago it was suggested that artificial insemination in captivity-held stocks of some endangered pheasant species might help increase numbers, but the idea was deemed to be impracticable. Now Professor Tom J. Cade, Research Director, Cornell Laboratory of Ornithology, Ithaca, New York, has announced the successful hatching of a Red-tailed Hawk from an artificially inseminated egg.

* * *

In *The Ostrich*, 1970, p. 252, Walter J. Lawson, Pretoria, describes the unsuccessful nesting of a pair of Lemon-breasted Canaries *Serinus citrinipectus* in one of his aviaries in 1969. He says it has been bred on a number of occasions and was, in fact, bred in captivity before it was described as a species new to science in 1960.

* * *

Guilding's Amazona Parrot *Amazona guildingii*, of St. Vincent, West Indies, is listed as an endangered species. It is believed to be decreasing in number but reliable estimates of population are not available. There are certainly *very* few in captivity. There are but three in the U.S.A., held by the zoos of Brookfield, Bronx, and Houston. In a co-operative breeding effort Brookfield has now lent its bird to Houston. Both birds are quite young and it is believed they may be of opposite sex. Time alone will tell.

In the autumn of 1961 a pair of Corncrakes that had been hand-reared by our Member, H. F. Gruber, was presented by him to the Royal Zoological Society of Scotland. The following year six eggs were laid and six young ones were duly hatched, Unfortunately, disturbance caused the death of four and only two were fully reared—the first record of Corncrakes breeding in a Zoological Park. In 1963 and 1964 further young, some by home-bred birds, were reared. But now the last survivor of the little colony has died.

* * *

Longevity. Dr. Herbert Schifter records the death of a Long-tailed Whydah or Widow Bird *Euplectes progne* in the Schonbrunn Zoo, Vienna, after nearly 18 years in captivity. The bird, a male, already adult when it was imported on 23rd July, 1951, died on 24th June, 1969. This is almost on parity with the case cited by B. G. Donnelly, Port Elizabeth Museum, South Africa (*The Ostrich*, 1965, p. 145), of a Yellow-backed Bishop *Euplectes capensis*. Brought in as a nestling in February, 1945, it lived for 8 years and ten months, dying through inadvertent exposure on 15th December, 1963.

* * *

We have become accustomed, and indeed expect, to see pictures in the daily press of birds' nests decorated with things fanciful, especially with items such as mottos, wrappings, etc. off Christmas crackers and such like. But nesting birds do use many seemingly weird and wonderful materials. Junior members of the Royal Society for the Protection of Birds have carefully observed nesting birds and have found nests that have contained such oddments as sweet papers, parts of potato crisp packets, string, cellophane tape, pieces of polythene, cine film, and even thin wire, electric cable, and various other items.

* * *

In 1946, the late Sydney Porter caused quite an avicultural sensation by breeding the Kea *Nestor notabilis*. Since then there have been several other successful breeders, notably the San Diego Zoo where a pair produced 20 young between 1958 and 1962. But even they have been eclipsed by a very prolific pair at present living in the Zoologischer Garten, Zurich, where 24 young have been hatched of which 21 have been successfully reared. Christian R. Schmidt gives a very full and informative breeding account in the *International Zoo Year Book*, 11, 137-140. Incidentally, the Zurich Zoo established a longevity record—a female received in September, 1929, died on 21st September, 1960, just a few days more than 31 years.

* * *

The Royal Zoological Society of Scotland received its first penguins, one or two Gentoo and Rockhopper, and four King, in 1914. Since when it has had innumerable breeding successes. But since 1963 there were no new arrivals until this year when twelve Rockhopper were received from Len Hill in exchange for six Gentoo. The 1970 breeding results in the Gentoo colony were again satisfactory. A total of 53 eggs were laid in 23 of the 24 nests supplied. Seventeen chicks were hatched, of which 13 were successfully reared. Of the remaining 36 eggs, ten were broken, two of which proved fertile: the other 26 were laid in nests occupied only by female birds.

Eleven King eggs were laid, but only two young were hatched, both being successfully reared.

The 1970 census shows 76 Gentoo and 36 King Penguins.

* * *

The Osprey—Britain's rarest breeding bird—returned to Loch Garten, Inverness-shire, in 1959. Since then they have been protected by the R.S.P.B. by every possible means—barbed wire, guarding wardens, electric warning devices, etc., but despite these precautions the birds have suffered vicissitudes—eggs broken or stolen by vandals, attempts to cut down or burn the tree in which the eyrie was situated. But no less than 23 young have been successfully reared in this R.S.P.B. Reserve. This year two youths managed to climb the 40-foot pine tree and stole the three eggs, they were caught and charged with the offence. Five other pairs are nesting in Scotland and it is hoped they will breed successfully. In addition, eggs have been stolen from four Golden Eagles' eyries in the Highlands. Other countries have their protection troubles too! Since 1967 the Ornithological Society of Gothenberg, Sweden, has been protecting a pair of Peregrine Falcons. Prior to then nests had been robbed of eggs or young for a period of some ten years, but since the protection began seven young ones have grown to maturity, and only one has been stolen.

A.A.P.

* * *

REVIEWS

PORTRAITS OF TROPICAL BIRDS. By JOHN S. DUNNING.
Wynnewood Pa., U.S.A.: Livingston Publishing Company, 1971.
No price quoted.

Bird photography has made tremendous progress during the last few years. A complete representation of a bird's shape and plumage cannot be expected in a photograph, but the faithful reproduction of colour, particularly of the soft parts (bill, face and legs) and of certain attitudes can be excellent and often constitutes a remarkably accurate record. It is, however, difficult to photograph many species in the wild as it is usually impossible to get close enough to the subject and to obtain the necessary conditions of light. Therefore the author adopted the same system used by Mr. C. Greenwalt in photographing Hummingbirds. He caught various tropical American birds in mist nets, placed them in enclosures well decorated with the plants and flowers of their natural habitats, photographed them and then released them.

The coloured plates are exceptionally good and well reproduced. They represent 70 species, chosen from the most beautiful of the continent. The Hummingbirds and Tanagers are particularly interesting. To give an idea of Mr. Dunning's ingenuity is the case of the Colourful Puff-leg Hummingbird (*Eriocnemis mirabilis*) which was unknown until he caught it in the Andes of Colombia, while the Scarlet and White Tanager (*Erythrothlypis salmoni*) is one of the rarest birds represented in Museum collections.

As most of the species represented in this book are popular and most desirable birds for aviculture it will no doubt prove to be of great interest to our members.

J. D.

* * *

PHEASANTS, INCLUDING THEIR CARE IN THE AVIARY.

By H. A. GERRITS. London: Blandford Press, 1971 (2nd Edition).
Price £2 net.

This book on pheasant-keeping starts out with chapters on general information, feeding, housing and breeding of pheasants in captivity. This is followed by a section which deals with the various groups and species of pheasants, including peafowl, monals and tragopans. As the author is at pains to point out, not every species is included but I do not think any that are likely to come into the hands of pheasant keepers in England have been omitted.

The book is illustrated with 6 colour plates, each depicting several species. These are adequate rather than superlative but give a good, if not always flattering, idea of what the birds look like. There are also a large number of black and white drawings and photographs. The latter

include fine photographs of Temminck's Tragopan, Grey Peacock Pheasant and Argus Pheasant in display.

The information appears to be sound, although there are some doubtful statements here and there on certain species in the wild, unless the author has knowledge not generally available. The usual, indeed almost obligatory, praise of modern "scientific" foodstuffs are given and, again as usual, the "mysterious concoctions or 'custards' mentioned in some of the older books" are scathingly condemned. However, sceptical old reactionaries will not fail to notice that, balanced though the modern foods may be, the author advises that they should always be supplemented by plenty of fresh greenfood and, in the case of the most valuable species, by such things as minced meat, egg yolk and insects.

The style is reminiscent of the English of the Dutch bulb catalogues. The author appears either to be unaware of the different meanings of such words as "species", "breed", "genus" and so on, or, which is perhaps more likely, he has been ill-served in this respect by his translator. All in all the book, although it may not have the absolute and balanced perfection of the admired modern pheasant foods, is for the most part, like some of the condemned concoctions and custards, wholesome and nourishing.

D. G.

A GUIDE TO THE BIRDS OF SOUTH AMERICA

Earlier this year we reviewed a copy of this work from the Livingston Publishing Company, U.S.A. We are pleased to learn that Oliver and Boyd are now publishing this work in the United Kingdom and the Commonwealth, and it is available from them at £7.

C.J.O.H.

* * *

CORRESPONDENCE

SEXING AMAZON PARROTS

We have imported a number of Double Yellow-headed Amazon Parrots, and Peter van Dijk and I examined them for possible clue as to sex. We did the width of pelvic bone test and came to the conclusion that the birds with the flatter heads must be the females, and the birds with a more rounded head the males. We were strengthened in this opinion by comparisons with the African Grey Parrot, in which one of the differences between the sexes is the flatter head of the female. Our opinion is the opposite to that expressed by Mr. Smith concerning the sexing of these birds in his article on breeding them.

It may also be of interest that we have imported Spectacled Amazon Parrots and have succeeded in sexing these birds. We first did the width of pelvic bone test, and when we thought we had a pair we put them in a cage together and noted two differences. The female is larger than the male; and the bare area around the eyes is grey in the male and white in the female.

L. P. H. A. van LENT.

PAPENDYK II,

GEFFEN, HOLLAND.

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NEW MEMBERS

The Five Candidates for membership in the May/June 1971 number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

CANDIDATES FOR MEMBERSHIP

- C. ATKINS, 50 Sherwood Drive, Spalding, Lincs.
FLEMMING BARSLUND, Ostre Boulevard 29, DK 4930, Maribo, Denmark.
ANDREW MARTIN FIELDING, c/o 24 Latimer Road, Norwich, Norfolk.
C. ISLES, 55 Ryot Street, Warrnambool, Victoria, Australia, 3280.
J. KREUGER, Box 45, Airkenvale, Townsville 4814, Queensland, Australia.
DUANE SEPT, 9749-154 Street, Edmonton 51, Alberta, Canada.
SOUTH COAST FINCH SOCIETY, 390 E. 22nd Street, Newport Beach, California 92660, U.S.A.
G. M. SPARROW, M.B.E., Shawlands, Potten End, Berkhamsted, Herts.
DAVID STAMPS, Curator of Birds, Penscynor Bird Gardens, Penscynor House, Cifrew, Neath, South Wales.
DR. J. TROSSEN, 25 Rue de Strassen, Luxemburge-Merl, Grand Duchy of Luxembourg.
MR. WHITTING, 112 Kiln Road, Thundersley, Essex.

CHANGE OF ADDRESS

- I. A. AIRD, to 79 Southway, Totteridge, London, N.20.
R. BRADLEY, to 9-9a St. Judes Road, Englefield Green, Surrey.
M. ELLIS, to c/o T. J. Barnley, Box 332, Kitale, Kenya.
INSTITUTE COSTA, to c/o Spedition Weichelt, Airport-Office, Frachthof 1, 6 Frankfurt/Main Airport, West Germany.
A. V. JONES, to 7 Hall Street, Penycae, Wrexham, North Wales.
CARL KNOX, to 4200 S.W. 5th Avenue, Gainesville, Florida, 32601, U.S.A.
J. D. LINDSAY, to 32 Richborough Road, Cricklewood, London, N.W.2.
MAJOR M. H. MAGNUSSEN, to Qrts. 483 Harrington Drive, Fort Belvoir, VA 2206D, U.S.A.
D. P. SHEARING, to 17 Lockhart Road, Cobham, Surrey.
SOUTH AUSTRALIAN ORNITHOLOGICAL ASSOC., to c/o South Australian Museum, North Terrace, Adelaide 5000, South Australia.
MR. VAN LENT, to Papendijk 11, Cfeffen, Holland.
C. M. VINCE, to The White House, 544 Hanworth Road, Hounslow, Middx.
DR. M. M. VRIENDS, Rigolettostraat 130, 's-Gravenhage (The Hague), Netherlands.

AMENDED ADDRESS

J. LEESE, 30 Whiteoaks Drive, Bishops Wood, Brewood, Stafford.

CORRECTED NAME

For VANDRVAER WILLY read WILLY VANDEVIJVER.

DONATIONS

(Colour Plate Fund)

The Council wishes to thank the following Members for their donations to the Colour Plate Fund.

Mr. A. Aird
Mr. M. W. Clarke

Mr. C. Atkins
Mr. Lee W. Lenze

Will members please donate their surplus books on birds to the Society for the benefit of the Colour Plate Fund.

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THE AVICULTURAL SOCIETY

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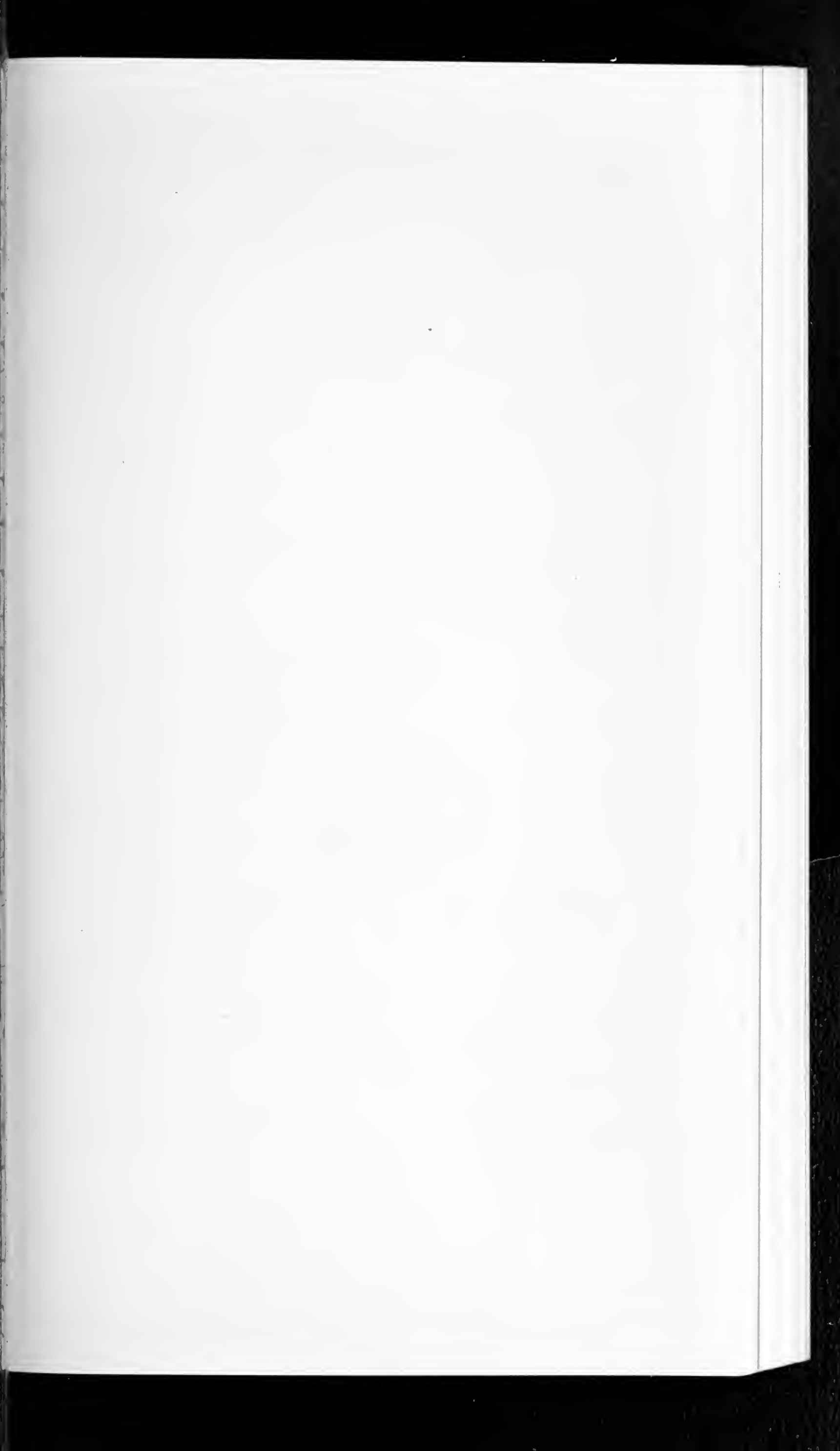
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WHITE-BREASTED KINGFISHER

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SEPTEMBER-OCTOBER 1971

THE WHITE-BREASTED KINGFISHER

Halcyon smyrnensis

AND OTHER MATTERS

By D. M. REID-HENRY (Woodford Green, Essex, England)

There is a statue in the grounds of Colombo Museum that used to puzzle me as a small boy. Its expression used to change. I have never concerned myself as to the identity of the gentleman there honoured although doubtless a plaque is fixed to the pedestal to acquaint the passer-by with that information. The thing that aroused my interest in this statue was that a Kingfisher regularly perched on the bronze pate. This was a suitable place for him to take stock of his surroundings and to watch for the grasshopper, beetle or small lizard that he caught from that stand. It also served very well as an execution block. Kingfishers do not kill by biting their prey as does sometimes a Bee-eater; they have the habit of whacking their victim into a state of insensibility against any handy surface on which they happen to perch, before swallowing it whole, or what remains after the punishment.

It came home to me after many years when I again visited Ceylon that the answer to my boyish puzzling about the gentleman's changes of expression lay solely with the agglomeration of excrement and pieces of broken beetle that were so liberally spread over his stoical features. Nelson in Trafalgar Square probably suffers the same indignity from his attendant pigeons; but then, he being so much higher in the heavens, will get the benefit from England's certain wind and rainfall throughout the year whereas the gentleman in Colombo has to wait in the main for the monsoon rains before he gets his wash. By that time his face-pack is baked solid.

Kingfishers are interesting people: they are the soul of contrast. Their colours are usually brilliant but their shapes are oddly bizarre. They are extremely particular about their appearance, yet their nesting habits are qualid to a degree. Their bodies are powerful and their flight usually swift but their feet are tiny and placed so far apart that being short of hank they appear unable to indulge the habit which most birds have, of perching comfortably on one foot. However, I must beware of saying they never do so because they can stand on one foot easily enough to scratch their heads with the other, and to stretch wing tail and leg together! Incidentally is it not strange that this latter stretching habit is

common to all birds of whatever family, or diversity of kind and character. The stately eagle, proverbially foolish ostrich, the tiny hummers, (even I believe, the portly penguin) they all do it. But I wonder about the poor Kiwi, and other lowly birds who only have the most rudimentary of wings and tail?

We have suggested that Kingfishers are not the most sensitive of birds in their toleration of dirty nesting arrangements, but the young have the remarkable adaptation of retaining their growing feathers in the safety of the sheaths until just before they are ready to leave the sordid burrow which was their nursery. Then they emerge in shining splendour all at once and the danger of soiling is thus eliminated. It is perhaps as well that the young do remain out of sight, for they are an unattractive brood of animated gargoyles before their feathers finally appear. Anyone who has had the task (and privilege!) of hand-rearing a family of baby Kingfishers will know just how ugly they can look. But appearances apart, there are numerous problems attached to the responsibility. True fish-eaters are perhaps the most difficult to rear if the aim is to give the natural diet, for this means the provision of a large quantity of freshly caught aquatic creatures such as crustaceans as well as tiny fish. (A large breeding colony of the common guppy might be a very useful stand-by!) But there are many ways of lightening the burden. A purchase of herrings, or better still whitebait, from the local fishmonger regularly, will fill the bill. These can be cut into slivers and easily fed from tweezers; but depending on the age and developed state of the birds, there might be difficulty in inducing them to gape. Strips of sheep's heart and pieces of liver can also be used, this being the easiest method. Care should however be taken to warm the offering a little beforehand, and the addition of *small bone fragments must be included*, with a very small amount of Cod Liver Oil.

The so-called "Wood" Kingfishers are in the main capable of eating anything living within their ability to catch it. Thus, the little geckoes or wall-lizards that are to be found in every house in the warmer parts of the world are very useful as rearing material for birds such as the White-breasted Kingfisher *Halcyon smyrnensis*. Half an hour in the morning out with a butterfly net will produce enough grasshoppers to add "second course" and ensure a varied diet.

The genus *Halcyon* comprises many species from the Old World, and that of which I write has a large geographical range which extends from Asia Minor to the eastern limits of the continent of Asia itself. There are a number of races with which we need not concern ourselves here. It is a bird which is equally at home *fishing* from the side of a lake, or catching lizards in dry savannah type of country. It will sit and gorge itself on emerging termites as they prepare to fly on nuptial adventure, but then everything, even tigers, will avidly take such nourishment! I am told by some of my African friends that these flying termites are very good

eating. I am prepared to take their word for it and although I have not tried the delicacy myself, there is no doubt that the food value in these insects is very high indeed.

However, having reared a nestful of these colourful interesting creatures to maturity, and having lavished much care and affection on them they repay one's attention but poorly by human standards. I am sorry to say they do not become reconciled to an aviary life very easily, and once they are capable of independent life they show a disappointing reluctance to continue or enlarge human acquaintance. There are exceptions to this code of conduct, and I have known individuals who became completely attached to their foster parents, for as long as the close ties were maintained but when the wider horizons of semi-liberty were appreciated, a gap in the association appeared, and they soon acquired that restlessness which no longer tolerated the confinement of an aviary. They were released. Quite right too! There is no more unedifying sight than an aviary inmate who spends his life "wanting out" as the Scotsman puts it. Such restless birds do little to further the cause of aviculture. Such a case as I now relate illustrates this point very clearly. Some years ago an obviously newly imported White-breasted Kingfisher was shown in a small show-cage at the National Exhibition of Cage Birds at Olympia, London. I watched it for a long time during which it spent its energies in constantly clinging to the wire cage-front and thrusting its bill through in vain attempts at escape until the base of the beak began to show wear and started bleeding. The comments of the public were caustic and ultimately the bird was taken away. It should never have been put on show at all!

On the other hand I remember well another individual of this species who lived in the old tropical bird house at London Zoo for years and never appeared in the least disapproving of its lot. The only thing wrong with this bird was that its beak was grossly overgrown.

When Kingfishers are at home in the wild their beaks suffer a great deal of wear from a variety of causes. The habit of hammering their prey against a rock or branch inevitably causes the excess growth to shale away to some extent, but the annual job of excavating a nesting burrow gets rid of all but the good foundation of horn; and when the task is finished, as much as half an inch or more has been abraded away. In captivity they are deprived of much opportunity to rid themselves naturally of excess growth of both beak and claws as well. So it is incumbent upon the aviculturist to provide artificial means for the birds either to do the job themselves; or periodically to catch up the overlaid creature and carefully pare away or file the beak to its proper proportions. I find that a little observation will disclose a favourite perch or block in the aviary. Then a piece of sandpaper can be bound into position so that when the bird "feaks" its beak after a feed, the growth is naturally taken care of, and the beak keeps in good order.

I once possessed a Pekin Robin, or Red-billed Leothrix, who developed an under-mandible that was too long, and obviously caused the lively little creature some annoyance. On that occasion I adopted the sand-paper-round-the-perch idea and in a very short time the bird had deliberately rubbed down its beak into proper shape again. I maintain that this use of abrasive perches will in most cases completely obviate the disagreeable job of catching up birds that don't want to be caught. It does away with all the concomitant distress a nervous little bird is bound to experience from the attentions of a loving hand wielding file and clippers.

The White-breasted Kingfisher is a common bird in India and Ceylon and probably elsewhere in its range too. It advertises its presence not only by perching on exposed statues, walls or dead trees where its brilliance commands notice; but at times its loud, whimsying call is heard and directs the eye to its place of occupation. This is a love call used in the breeding season, and apart from this there is a loud cackling call used in flight which reminds the European visitor of a Green Woodpecker *Picus viridis*.

The nesting of this species is similar to that of the family in general, but they are much less particular about the site than some. I know instances of mud walls of native houses being used. These efforts are usually wasted because the owner of the house may feel his structure was not intended to have holes in the walls. He may very likely be a Buddhist so he will not actively harm the birds, but he contrives to render their purpose ineffective, and the Kingfishers are made to select another site for their home.

During my tour of military duty in Ceylon at the end of the last war, I had regular occasion to visit Police detachments in places other than headquarters in Colombo. On one such trip to Kandy I found a fallen tree by the side of the road with a huge bolus of soil around the roots. Into this a pair of these Kingfishers had dug a tunnel and nesting was proceeding in a chamber at the end. Another pair used a cavity in the wall of our vehicle compound in Calcutta and raised their offspring in sound of all that went on in the fitter's workshop. My father in his "Guide to the Birds of Ceylon" (Oxford University Press) refers to a pair kept in an aviary which raised a young bird in a wooden nest-box intended for some other birds.

The eggs vary in number from three to six and are, to begin with, the usual glossy white associated with Kingfishers. They soon however become soiled and stained.

It is a thing to wonder at that the people who live in England have in the vast majority *never* seen a Kingfisher!—and their chances of doing so are becoming slimmer every year. We pollute our rivers with filth. We spread poison on our lands which are needed to feed our own exploding population and we spend vast sums on telling the world that this Utopia-

in-Embryo can lead the way to a better life for all. One wonders, in the face of so many disappointments in human affairs, whether this purely conjectural outlook can compare with the promise inside the temporarily soiled shell of a Kingfisher's egg, which does stand a fair chance of glories to come. The real tragedy seems to me that most people in the "civilised" world do not care if they ever see the Kingfisher: their eyes are well occupied with a television screen, and their pleasure is attended to when the Bingo man's cry goes out "Eyes down". They obey instinctively, and think not at all about the rivers of the countryside where once a flash of vivid blue and a thin high piping note made other, more circumspect eyes look up! Seldom now is that note heard in places where once it could be guaranteed for a modicum of patience.

The Kingfisher fouls his nest, but that is incidental to the true purpose for which the tunnel and chamber were dug. Not so the human being who fouls the environment of all living things in the name of "progress" or "development" or whatever other alibi he chooses in his selfish greed.

I think again of all the generations of White-breasted Kingfishers who have sat on the head of the statue in Colombo. There's is no conscious protest when they bespatter it with ordure. But intended insult to humanity or not, I concede they have a point! There are signs, welcome signs, that mankind is becoming aware of some of the damage he foolishly works upon this world, and it is to be hoped he will devote strenuous efforts to remedy the faults for which he stands to blame.

* * *

BREEDING THE WATTLED STARLING

(*Creatophora carunculata*)

By P. B. BROWN (Harewood Bird Garden, Leeds, England)

The Wattled Starling is one of the more interesting, and certainly one of the most unusual members of the 110 odd species of Starling. Coming from East and South Eastern Africa, it is often referred to as the locust bird owing to its fondness for locusts and its habit of following the locust swarms in great flocks, stopping to breed, regardless of the time of year, only when the locusts breed, the young being fed on baby hoppers when they emerge from the ground. If the locusts suddenly decide to migrate, the attendant Wattled Starlings have been known to leave eggs and young alike in the nests and move on with the locusts.

Perhaps the most unusual feature about the Wattled Starling is the seasonal change in the headdress of the male, a habit quite unique in the Starling family. The male and female closely resemble each other during the non-breeding season, having an overall plumage of light mouse grey, paler under the lower belly and vent. The flight feathers are black with a brown tinge and the wing coverts are creamy-white in colour in the male only. During the breeding season, these white wing coverts extend somewhat towards the back and the male loses the feathers on his head, exposing yellow flesh on the crown through the eye to the bill. The skin of the forehead is black. Extending from the base of the lower mandible and upper throat is a pendular lobe of black skin forming the wattle. This wattle varies in length depending on the age of the bird. With young birds, the wattle is hardly formed, being only a few millimeters long, and it is only as the bird gets older that the wattle attains any size. The wattle of our breeding male reaches halfway down his chest, but he is now at least eight years old.

It was whilst I was assistant to the late W. R. Partridge at Evesham that I first became acquainted with these birds. The pair was purchased in 1963 and whilst I was with him we managed to get them to build a nest and lay eggs, but that was as far as it went. For the next three years after I left there, they got one stage further and hatched young, but deserted them at around 10 days old and let them die.

In 1969 when I came to Harewood to start the Bird Garden, I persuaded Mr. Partridge to part with the pair so that I could continue with the challenge. They were put in an aviary 24 ft. square by an average of 10 ft. high, with a shelter built onto the outside.

In the spring of 1970 I managed to obtain a second pair of the Starlings. As the Wattled is a highly gregarious Starling, I hoped the second pair might give the necessary breeding stimulus required. The four birds have always lived as a group and apart from the occasional

pickering have never fought. During this year the old pair built a circular nest of twigs, etc., approximately 5 ft. above ground in the thick top of a deciduous bush in the centre of the aviary. The hen laid and, in due course, hatched and brought one youngster out of the nest. The young was well grown but left the nest too early and was promptly returned to the nest, but was out again next morning. The youngster could not fly very well and spent most of its time sitting on the ground under the bush. Just a week after first leaving the nest a heavy downpour in the night put paid to our hopes and the bird was found dead in the morning.

In 1971 both pairs of Starlings built nests out of the old nest which had lasted the winter. It was renovated and added to until the ball of twigs was about 18 inches in diameter. The entrance to one nest faced north and the other east, and both entrances were well towards the top of the nest, somewhat higher than would be in the case of a magpie's nest which this structure resembled.

The first eggs were laid in April and after incubation of one week they were found on the floor beside the nest. Shortly after these eggs were discarded the older hen laid again and must have hatched young by mid-June, for by 26th June strong calls for food could be heard from the nest indicating young a week or more old. I was not prepared to interfere with the nest in any way for the entrance was quite narrow and went along a short tunnel before dropping into the nest, so unfortunately one could not see into the nest.

On 2nd July two young appeared out of the nest, one a fine strong bird and the other a very small under-developed youngster, which was immediately replaced but refused to stay in and was found dead two days later. The other youngster never looked back, spending all its time either in the nest bush or on the higher branches which the adults used. About two weeks after first leaving the nest, the youngster was seen to be eating live food for itself and hence we could call it independent. At the end of July when both pairs of adults were incubating again there were some signs of aggression by the parents towards the youngster so it was removed and taken indoors where it will be kept until next spring.

The egg is very pale blue, covered sparsely with minute brown spots about the size of a pinhead. The shell is quite thin and holding a fresh egg up to the light one can see the yolk. The full clutch is three eggs.

The basic diet of our Wattled Starlings is a proprietary soft food, minced beef, apple, and a daily supply of maggots and mealworms. Three feedings of live food daily when young in the nest.

As described above the Wattled Starling *Creatophora carrunculata* has been bred at Harewood Bird Garden. It is believed this may be a first success. Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

NOTES ON THE REDDISH HERMIT HUMMINGBIRD

By A. J. MOBBS (Walsall, Staffs, England.)

The Reddish Hermit, *Phaethornis ruber*, is found in Guiana, Venezuela, Colombia, Bolivia and Brazil. Those imported into Britain always seem to come from Brazil.

This hummingbird is the smallest of the Hermits, and is in fact one of the smallest members of the family Trochilidae, weighing only 1.9 to 2.4 grams. The male has crown and centre of back coppery green, rump and under parts rufous, with a V shaped patch of black on the lower breast. The tail, which is graduated, is coppery, outer feathers tipped with cinnamon, centre pair tipped white or buff. The female is often paler on the under parts and the black V on the lower breast is not so pronounced. The female I owned had much longer central tail feathers than the male (which is still with me), but as this male is a young bird, these feathers could grow longer when it next moults.

In August 1968, I purchased two Reddish Hermits (one for a friend). I was rather dubious as to how long these birds would survive, because as most hummingbird enthusiasts are aware, Hermits have always been considered impossible to keep alive for any length of time in confinement.

These two birds were being fed Super Hydramin and sugar at the time of purchase, therefore I kept them on this diet for the first fortnight, after which I slowly persuaded them to take the diet I usually feed to hummingbirds; namely Stimulite nectar paste and honey.

Although supplied with an abundance of fruit-flies, neither of these Hermits showed any interest in them until they had been with me about a month. Once they did start to show interest in the flies however, they soon became adept at catching them; picking them off any surface with the tip of the bill, then carrying them around for a second or two before tossing them in the air and catching them with gaping bill.

Both these birds drank a small amount of water each day. This they took from their bathing saucers as I did not supply water especially for drinking purposes.

After my friend had collected his bird, I caged mine in a box cage, 48 in. long by 16 in. deep by 16 in. high. It lived in this cage until its death 2½ years later.

As this species is so tiny, its metabolism is naturally rapid and also as this particular species seems to have an acute sense of taste, even such a small thing as changing the brand of honey one uses, can affect it.

After having this hummer for 20 months, I decided to purchase two more Reddish Hermits, mainly to prove to myself that my success with the original bird had not been a fluke. Much to my surprise these two new birds were most pugnacious towards each other and because of this,

I reluctantly parted with one of them. The remaining bird I housed in a cage next to my original bird, with a glass partition separating them. This second bird I kept on Super Hydramin and sugar for some months, but eventually I tired of mixing a special nectar just for one bird, and slowly I persuaded it to accept my normal diet. Like the original Hermit, this second bird did not show interest in fruit-flies until it had been with me about a month.

Like all *Phaethornis*, and indeed *Glaucis*, *Threnetes* and *Eutoxeres*; *P. ruber* moves its tail up and down when on the alert. This tail movement becomes more pronounced when the bird becomes excited for some reason or just before the commencement of a display. Sometimes if the bird becomes exceptionally agitated, it wags its tail sideways as well as up and down.

The normal song of the male Reddish Hermit consists of one note repeated over and over thus: "Sweep, sweep, sweep, swee-e-ep, swee-e-e-e-p, swee-e-e-e-p". This song is repeated many times during the day, but can be heard most often at daybreak. This species will also sing during the moult; most species are usually silent during this period. A "Diong, diong" note is also included in this non-display song. When the bird utters this note, the neck is stretched out and arched, the bill is opened wide and the head is bobbed after each note is uttered.

On occasions the Hermit will utter a high pitched "Sweep" when showing aggression to other hummers; this is the only time this particular note is heard. It is particularly piercing and can be heard from some distance away. My male Frilled Coquette, *Lophornis magnifica*, is housed in the cage next to the Reddish Hermit now that the original Hermit is dead, and if the Coquette flies near to the glass partition, the Reddish Hermit becomes most agitated and utters this note repeatedly until the Coquette moves away.

I have always considered the display of the Frilled Coquette and the Wire-crested Thorntail, *Popelairia popelairii*, to be outstanding, but the display of the male Reddish Hermit really has to be seen to be believed. As this display does not seem to follow a set pattern, I shall describe each phase separately.

(a) The Hermit commences to sing its usual song, the tail movements, however, are much more pronounced and the song builds up to a crescendo just before the bird takes to the wing.

Once airborne, the display starts in earnest; the tail is fanned and held erect, the minute feet are held up in front of the body, thus displaying the down-like vent feathers. The wings beat very much faster than in normal flight, making a loud drone. The black breast patch is held away from the body, but I have not been able to decide whether in fact the fast beating wings cause these feathers to stand out, or whether the bird itself puffs them out.

The bird moves its body from side to side in front of the object of display; as this can go on for nearly a minute at a time, I find it quite remarkable as it must tax the bird somewhat. During this sequence, the Hermit makes a subdued twittering noise.

- (b) The neck is stretched out in front of the body; bill is held open showing the black and yellow bottom mandible. The tail is held horizontally and is moved from side to side instead of in the usual up and down manner. As the tail is moved, so the body is also; the head is only moved slightly however. This is the most fantastic sequence of the display as the body is flung from side to side in a most exaggerated manner. Each time the bird moves its body, it utters the "Dionging" note already mentioned in the normal song. As each note is uttered, so the body is flung from side to side in perfect rhythm.
- (c) The Hermit flies in much the same manner as in sequence (a), the wing beats however, are not quite so rapid and instead of the bird remaining in one position and moving its body from side to side, it flies to and fro along a perch, almost touching it with its vent. This goes on for approximately 20 seconds after which the Hermit alights on the perch, brings the tail down under the perch and goes through the actions of mating. Sometimes during this procedure, the bird will hang its tongue out.
- (d) The bird fans its tail to the utmost; bill is opened wide and the tongue protrudes approximately one inch. The bird then arches its body, bringing its neck down and its tail down until they almost meet. As it does this, the body is swivelled round in almost a complete circle. I find this particular sequence rather difficult to describe, but if the reader holds his hand out, then opens and closes it, moving it from the wrist as he does so, he will not only get the action of this particular sequence, but will also hear the slapping noise made by the birds' wings.

The usual sequence of the complete display is normally (a), (b), (c), and (d). However, once the Hermit has commenced displaying, sequence (a) is often omitted and only (b), (c) and (d) repeated.

Female Reddish Hermits also have a song which is very much like the male's except that the female never seems to use the "Diong, diong" note, so often used by the male. The female has no actual display, she will, however, sing while perched and will often protrude her tongue at such times.

In the wild, Hermits take large quantities of insects from rough surfaces. As it is not possible for me to emulate conditions found in the wild, I find the birds' top mandible soon becomes overgrown and about every three months or so, I have to trim this, otherwise the Hermit would find it most difficult to take flies.



right]

Reddish Hermit Humming Bird (male)

[A. J. Mobbs



Copyright]

Gold Coast Touraco Chick (6 weeks old)

[Jersey Zoo

Claws also need trimming, but not so regularly as the bill. I find both does rather nerve racking, as when trimming the bill, one has to ensure that the tongue is protruding, and with the minute claws, one has to guess how much to clip off as of course it is impossible to see the vein. I find with claw trimming, a little and often in the best policy.

* * *

BREEDING THE GOLD-COAST TOURACO AT THE JERSEY ZOO-PARK

(*Turacus persa persa*)

By D. G. ROLES (Deputy Curator of Birds)

Two of the oldest and most beautiful avian residents in the collection, two Gold Coast Touracos, have succeeded in rearing to adulthood one very fine specimen.

The birds arrived in Jersey in the Spring of 1960 after spending three years at Paignton Zoo. They were originally collected by Gerald Durrell on his 1957 British Cameroon expedition, "Peety" the male being taken as a nestling and his mate being obtained as a fully grown female.

Prior to July 1969 the birds were kept with other large softbills in a very large aviary, and though the female laid many eggs, all were infertile and for the most part were not even incubated; she often had trouble sitting the egg (37 × 30 mm. average) and frequently had to be placed in a hospital cage where she was helped by the additional heat.

However since July 1969 the pair have been housed in the Tropical Bird House, in a large flight cage with a window in one side. This was furnished "naturally" and contained a large nesting platform high up in the corner of the cage.

Three months after the move and after three more infertile eggs, the male Touraco, after 12 years in captivity and after laying dozens of infertile eggs, finally produced a fertile egg on the 16th October, 1969.

On the 5th November 1969 it was seen that the shell of the egg was pierced. It was assumed the egg was infertile and had merely been pierced by a claw of one of the birds, however, it was seen on close examination to have been pierced from the inside and to contain a live, moving chick—a most enthralling though totally unexpected discovery. The male started brooding as soon as the cage had been serviced. At 5.30 that afternoon he came off to bathe then returned to his duties, though the female had taken his place by 4.30 and she continued to brood throughout the remainder of the day and that night. The following morning the female was seen flying about carrying the dead

chick in her bill. The chick was immediately removed and examined and yielded the following data: weight 18 grams, overall length 3.9 in. The pink flesh was sparsely covered with black down and the chick had greyish-pink legs. Bare skin around the eyes, bill and on the crown. Lower mandible pink, upper mandible pink with blackish frontal half. The feet and legs were well developed with noticeable claws, there were also tiny white claws on the alula. The inner membrane of the shell which was still attached to the chick was quite dry, due probably to the cracking of the shell after piercing by the chick. This may have constricted the chick, preventing sufficient movement to enable it to free itself. Still attached to the chick's abdomen were the remains of the yolk sac containing enough yolk to keep the chick in the egg for a further 12 hours minimum. The yolk smelt strongly and had been in a dead state for some hours. Cause of death appears to have been due to exhaustion caused by constriction of the rapidly drying inner membrane and perhaps also to squashing by the cock. Quite one third of the shell was cracked (externally) and pressed down against the chick.

After this very disappointing setback the female laid seven more eggs, three were infertile, the others smashed.

The next egg, laid on the 10th June 1970 was found to be fertile, but was squashed on the 20th June, then finally on the 7th July the successful egg was laid.

The egg hatched on the 28th July, the chick freeing itself at approximately 12.30 p.m., the female promptly eating the entire eggshell. The chick was first seen to be fed two hours later by the male, who then commenced to brood it. When he left the nest at 5.30 p.m., the female approached to take over brooding, but appeared rather disturbed to find the chick there and threatened it with raised wings. It was quite a long time before she could bring herself to cover it, but by 8.30 p.m. she was in place. The chick's appearance matched that of the one described above. The chick progressed quite well, the adults proving themselves to be very good parents despite their inexperience. The rearing diet for the chick appeared to be composed entirely of raisins, grapes, bananas and mealworms, all of which were coated in a multi-vitamin solution. A large variety of fruit was constantly available to the birds; mealworms were offered five times a day, approximately 25 were taken at a time. It was interesting to note that although the female would take them from the male, she would never pick them up, consequently all "live food" was fed by the male. At 13 days old, the chick was covered with thick black down and had very short $\frac{3}{8}$ in. pin feathers showing on wings and tail. The skin of the face was white, the eyes, legs and tip of the bill were black, the basal half of the bill being whitish. The lining of the mouth was bright pink. At 21 days old the chick left the nest for the first time, it was very agile, though it could not yet fly properly. The plumage was entirely black, but showed a purple gloss on the wings and tail. The

imson in the flight feathers first started to appear when the chick was 35 days old, the nodules could also be seen starting to form in the skin around the eye, which was becoming lighter. At 43 days old the green feathers of the adult could be seen emerging through the juvenile plumage. The skin around the eye had also become reddish in colour, the eye and bill skin remained very dark. The chick had been seen feeding itself and could now be considered to be self-supporting though it still continued to beg food from the parents. By 7th November the appearance of the young one was very similar to that of the adults. The area of green plumage was not quite as large, neither were the bill or eye colouring the same as the adults, and the skin around the eye was still a very dull red; but it had moulted out half of its juvenile flight feathers, and had grown the beautiful purple wing coverts. On the 20th November the chick was removed from its parents' cage, primarily to prevent interference on its part with an egg which the female had laid in the nest a few days before (the juvenile frequently roosted, and spent a large part of the day sitting on the side of the nest), and also to facilitate treatment for a bacteria (*Salmonella typhimurium*) which had been isolated in a faeces sample of the chick. The treatment (Chloramphenicol) to which the young bird was subjected was completely successful, and the chick is now a fine specimen in full adult plumage.

On the 22nd of June this year our Gold Coast Touracos successfully hatched their second chick which is growing into a fine healthy bird and now sprouting the adult feathers over its neck and back.

As described above the Gold-Coast Touraco (*Turacus persa*) has been bred at the Jersey Zoo Park. It is believed this may be a first success. Any member knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

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BREEDING THE SPOTLESS STARLING (*Sturnus unicolor*)

By K. R. SEMPLE (Egham, Surrey, England)

I received a pair of Spotless Starlings, *Sturnus unicolor*, from Spain just over a year ago. In Spain this replaces the Common Starling, *S. vulgaris* as a breeding bird. In the breeding season the male is glossy jet black all over, without pale spots. Two or three of the long feathers on the nape appear to be raised at times as a little crest. The bill is yellow and legs and feet are a light grey. The female is duller, greyish-black with arrow-shaped white spots on the ends of the feathers. The bill, legs and feet are similar in colour to those of the male. After the autumn moult both sexes have pale tips to feathers, but although the male undergoes subtractive moult in spring, in which it loses the pale tips, the female retains these pale marks during the breeding season.

Their aviary consists of a flight 14 ft. \times 7 ft. \times 9 ft. high at the centre. A shelter 6 ft. \times 4 ft. \times 5 ft. is attached. The aviary flight is planted with creepers—various honeysuckles and ivy. The aviary was shared with a pair of Bourke's Parakeets, a cock White-cheeked Touraco, a hen Fair Bluebird, a cock Ring Ousel, and several native finches.

The starlings were kept in the aviary from the time when I received them. The aviary shelter is heated during the winter months, for the foreign birds, and the window from shelter to flight is closed every night from the time when the heat goes on in the autumn until the spring. Sometimes the starlings come in at night but at other times they stay out in the flight, as do some of the foreign birds. I never force them to go in since there is a polyethylene frame which is fitted on the front of the flight from the beginning of the cold weather until the spring.

The birds are fed on a soft-bill mixture which I make up myself; with maggots which are given all the year round; and mealworms in smaller quantities. The last are increased when the birds are breeding.

In May the starlings went to nest. I had put a nest-log in the flight. It was about 2 ft. long and 18 ins. round. It was intended for a pair of Bourke's Parakeets which shared the flight, but when I realised what was happening I took these out and had to work furiously to erect another flight for them.

On Monday 17th May at about six in the morning I saw the starlings chasing each other around. I did not take much notice at first since I had not seen any mating take place; but on 21st May I saw the hen come out of the log, and taking a look inside I saw two eggs. On 24th May I found that two more had been laid, making four in all. The eggs were a uniform turquoise in colour.

The hen was the only one that I saw on the eggs, and if she had been off them for a while the cock would chase her back again. The starlings

did not appear to react to the other birds in the aviary unless these tried to settle on the nest-log, when they were driven off. I did not disturb the hen during incubation, but on 3rd June when I came home from work and went into the garden I noticed that the starlings were flying around continually, so I looked into the log and was pleased to see that there were chicks.

I increased the supply of mealworms and maggots. They preferred the mealworms and fed them to the young before beginning on the maggots. They were also taking worms from the ground. There are a pair of White-breasted Rails in the same flight and these are provided with a big bath. They are continually in and out of the water, and the moistened earth around provides plenty of worms. In order to prevent the young getting rickets I used powdered calcium phosphate on the maggots. I also fed minced meat.

On 11th June the young had their eyes open; on 15th June their wings were well feathered; on 23rd the first young one emerged from the nest, and on the 25th another two also came out. I never found a trace of the fourth egg or a fourth youngster. All was going well, but on 27th June my wife and I went out for the day, and when we came home that night we found one young one dead, and another was weak and died in the night. What went wrong I don't know, but the young were on the floor of the aviary hidden in vegetation and may have failed to attract the parents' attention.

The third young one had mercifully survived and had the parents' full attention. It was also fed occasionally by the cock Ring Ousel, *Turdus torquatus*, in the aviary. By the end of the first week in July it was flying well and beginning to feed itself.

In comparison with the young of the Common Starling, those of the Spotless Starling appear a darker, drab brownish grey, with pale throat and some white streaking on the breast. The bodies of the two that died were presented to the Bird Section of the British Museum (Natural History).

As described above, Mr. K. R. Semple has bred the Spotless Starling, *Sturnus unicolor*. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

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BREEDING THE ABYSSINIAN GROUND THRUSH AT THE WINGED WORLD

(*Geokichla piaggiae piaggiae*)

By BRYAN S. WARD (Heysham, Lancashire, England)

A pair of Abyssinian Ground Thrushes were purchased in May 1967, and housed in one of our glass-fronted compartments with various other birds. No attempts at breeding were made during the remainder of that year, and none over the following twelve months.

In May 1969 they showed signs of wanting to nest and laid two eggs in a wicker nest-basket that we had provided, but after six days both eggs had disappeared. They made half-hearted and spasmodic attempts at building in various places over the following months, but no more eggs were laid.

During 1970 they again made several attempts at nest-building and ultimately made a nest of dried grasses etc. on a forked horizontal branch. The nest never looked really secure and was found on the floor one morning with both eggs broken. Some weeks later the cock attacked the hen very badly, and she was removed to recover from her wounds, which has left her with a small bare patch on her head where the feathers have never grown. After three or four months had elapsed we reintroduced them to each other in another compartment where they settled down quite amicably.

Early this year (1971) they showed signs of wanting to nest again by trying to build on the branch of a rubber tree (*Ficus elastica*). A basket was fixed onto the branch in which they showed immediate interest and then commenced to build. On this occasion two eggs were laid, these duly hatched after being incubated for fifteen days. Unfortunately both youngsters died at about twelve days old.

They again laid two eggs in May, of which one hatched and no sign of the other egg was found. This was also incubated for fifteen days and left the nest eighteen days from the date of hatching.

Whilst the eggs were being incubated the cock did his share of sitting, but when they hatched the hen very rarely left the nest and was herself fed by the cock. He was seen to feed the young himself after a period of approximately ten days. The young bird has the typical mottled markings of immature thrushes and the white wing bars and eye ring, so noticeable in the adult birds, is quite pronounced.

As described above the Abyssinian Ground-Thrush (*Geokichla piaggiae*) has been bred at Winged World, Heysham, Lancashire. It is believed this may be a first success. Any member knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.



ENCOUNTERS WITH THE WESTERN
MOURNING DOVE

By PROFESSOR CARL NAETHER (Encino, California)

My very first and wholly unexpected meeting with the Western Mourning Dove (*Zenaidura macroura marginella*) came many years ago in midwestern Iowa. Sojourning during vacation from the university at my brother's parsonage, which stood all alone on a hill at Castle Grove in rich farming country, I heard for the first time in my life the supposedly doleful call of one of America's ubiquitous and most beloved denizens of the countryside—the Mourning Dove, often colloquially called the Morning Dove. But to me the long-drawn-out, oft-repeated, and tender *coah-cooo-cooo-coo* rang clear and friendly in the hot and humid air of the July afternoon. The caller, a male of the species, was perched on a telegraph wire, the direct rays of the sun shimmering the purplish, red-iridescent upper side of his neck. He must have been singing to his mate on a nest somewhere near, for he was alone, no rival being visible or audible. I keenly enjoyed his smooth penetrating calls—the only bird sounds to enliven the otherwise still and lonely countryside.

Since taking up permanent residence in Southern California, I have become a steady observer, admirer, and friend of this very modestly, mainly brown coloured dove. Daily, almost throughout the year, one or more Mourning Doves will visit the rear-garden to feed and to drink in company with some domestic pigeons that thrive there. These wild doves have become an essential part of the garden scene—natural and unafraid, always welcomed, and only rarely disturbed by neighbour's prowling cats. Early last April they built their home in the thick, protective leafage of an immense old sycamore, at least ten feet off the ground. Like most wild pigeons' nests, it is a frail affair of sticks and straws; still, it serves its purpose quite admirably, the luscious greenery of the sycamore keeping it almost totally hidden from hungry crows and Blue Jays that regularly patrol the neighbourhood gardens in search of food. I am reliably informed that our Mourning Dove will set its nest also on tops of tree stumps, in overgrown hedges, even on the bare ground in regions where shrubs and trees are not available. In desert regions the cholla cactus frequently harbours the Mourning Dove's nest, and very securely too. Working in my avocado grove some years ago, I discovered a Mourning Dove brooding a pair of shiny white eggs on a low platform of sticks, only three feet off the ground but well hidden amidst the long, deep-green avocado leaves that almost enclosed the nest. According to some authorities, this dove, upon leaving the nest, should have dropped immediately to the ground, there to thrash about in more or less violent contortions meant to distract the intruder's, my, attention. However, in this particular situation, the dove flew swiftly away and completely out

of my view, returning to her nest only after almost ten minutes. Incidentally, it is asserted that the decoying actions of the Mourning Dove are a more or less typical behaviour trait of ground-nesting species of birds; and it is therefore assumed that this dove was originally and wholly also a ground nester.

Mourning Doves are prolific producers of eggs and young, nesting here usually from March well into September. In some regions of this country they appear to nest every month of the year! Each pair covets its own nesting territory, which the male guards jealously and defends vigorously. However, in Southern California the Mourning Dove is no match for the highly aggressive Chinese Spotted Dove (*Spilopelia chinensis chinensis*), a somewhat larger dove, introduced into Southern California quite some years ago. In point of fact, the latter has driven the former completely from many parts of California.

Mourning Dove nests which have not been disturbed during the off-season are frequently used again, the male usually carrying a few sticks and straws to reinforce the old fragile structure, with the female arranging the "furniture" to suit her taste and convenience. New nests are usually completed and old ones repaired within a week or ten days. Young Mourning Doves fledge at the age of from fourteen to sixteen days. Though usually fat at this age, they are yet quite delicate, remaining in the vicinity of the nest for a week or so before venturing on short flights. During this period of their life, the old male is in full charge of their maintenance, the female brooding another clutch of eggs.

As is well known, small seeds of many different wild grasses provide the principal diet for the Mourning Doves which thus destroy enormous quantities of obnoxious weed seeds. One investigator discovered no fewer than 6,400 seeds of the disagreeable foxtail in a Mourning Dove's stomach, and another, 7,500 seeds of the yellow wood sorrel! Why, then, in the light of this pronounced usefulness to agriculture in general, the Mourning Dove is hunted and classified as a game-bird is not easy to understand. I can always tell when the fall hunting season commences, for then whole flocks of Mourning Doves line the telegraph wires in the suburbs of our San Fernando Valley, where hunting is prohibited, thus affording these birds some refuge during this perilous time of their lives.

Keenly enjoyable to me is the flight of our Western Mourning Dove. Every day I see at least one pair of these graceful birds winging their lofty way high above the tallest trees in our Valley, swiftly disappearing from my view. Their sharp flight seems much more rapid than that of the domestic racing pigeon, and much less laborious. With their pointed, not fan-shaped, tails which distinguish them from any other dove, offering no air resistance, they dash through the heavens as if they owned them—and they do to some extent!

In captivity, the Mourning Dove adjusts readily to artificial conditions, becoming not only quite tame in a reasonably short time, but proceeding



[photo]

Mourning Dove Nestlings

[Hugh M. Halliday



to nest and to rear young successfully. For these reasons it is a favourite with many beginners in the dove hobby. Being classed as game bird, it may be kept only with the aid of an official game-bird permit. The Mourning Dove has been frequently crossed with the Common as well as with the White Ringneck (Barbary) dove, the young at times displaying surprising beauty of plumage. Thus in my own aviary, a cross between an ordinary female Ringneck and a male Mourning Dove resulted in a youngster boasting a plumage of lustrous silver-grey. Pure-white hybrids also have made their appearance on occasion.

* * *

KEEPING DIPPERS

By FRANK MEADEN (Cheshunt, Hertfordshire, England)

The first young Dippers (*Cinclus cinclus*) that I received came from a nest which had been accidentally destroyed by campers. Fortunately for me they were about five days old when arriving into my hands. Having previously successfully reared some Kingfishers to maturity by hand, (the worst job I ever attempted), I had few, in fact almost no, qualms about their future diet.

These nestlings were kept warm by the normal type of infra-red heater frequently used with the young of many kinds of livestock. Initially their feeds consisted of mealworms, fly maggots and pupae, European Flour Moth larvae, earwigs, woodlice, spiders and daily supplies of finely chopped vegetable matter.

This vegetable matter was varied—lettuce, dandelion, cabbage, watercress, comfrey, spinach, etc. So many insects fed on by birds and given to their young contain a high percentage of vegetable matter in raw or partly digested state that it has become a standard procedure of mine to include such food when rearing any kind of young birds by hand.

With the knowledge that many small crustaceans must be taken by dippers in the wild and provide additional minerals and protein, we added powdered cuttlefish to the maggots; and also used finely pulped or minced raw fish which we added to invalid and baby food mixtures produced by Glaxo Laboratories, these being then additionally moistened with milk.

We did not remove the coarser bones from the fish which we prepared, but the whole was completely ground to pulp (any surplus being dropped into our dog's supper). A little bone-meal was added to the food as the young birds increased in size. We hoped that the fish-bones, bone-meal, and the cuttlefish, in their ground state, would constitute an adequate substitute for the bone and shell material eaten in the wild.

Extra cod liver oil, as provided for babies, was mixed in the food in very small quantities (and by this, I mean only drops). This cod liver oil

was also added to mealworms; just a few drops being added prior to killing the worms for feeding to the young Dippers. If added prematurely, the oil kills the mealworm too soon. Presumably the fine film thus formed over the worm suffocates it. Although they were killed before use, I have always endeavoured to ensure that such worms are well-fed themselves prior to the time when they are offered to nestlings or adult birds, thus enhancing their nutritional value. Too frequently one hears of aviculturists storing livefood (maggots in fridges, mealworms etc. in tins and jars) without giving them suitable food. After a week or so of living on their own fat with no nourishment or moisture they must deteriorate alarmingly in food value and usefulness for one's stock.

With the growth of the young Dippers, their appetites seemed enormous, we started using raw and lightly steamed cod's roe, the hard roe composed of a mass of tiny eggs, in bulk. There seemed to be no preference shown by the birds when canned hard roe was offered as well. The roe was mixed with the softfood, and they must finally have been accepting a third of their food intake in fish and fish roe.

The plumage at this time was, I feel sure, equal to that of a wildling of this species. Allowing for the fact that odd faeces which were not passed whilst the young were being fed were not removed in time and subsequently marked some feathers, they were in extremely fine condition. Certain factors, however, invited further experiments.

None of the birds which we had, when feeding themselves, ever hesitated in taking our own softfood (Avi-Vite). The mixture we were using was, however, vastly different from the standard mixture, as it contained much raw fish, fish roe, bone-meal, cut up mealworms, grated cheese, etc. In adult life their food still contained a wide variety of extra items from those previously listed, but this is still the only bird which has not completely satisfied me as to its suitability for aviary life.

In all cases, after six to eight months, during which time they had been allowed a bath twenty-four hours a day, they tended to look permanently wet; yet if allowed a bath for limited periods during each or alternate days, they would then appear unhappy after about the same length of time. This term "unhappy" is not used sentimentally, but to describe their general appearance. Not sick, but in slightly off-peak form. Experienced bird keepers will know what I mean.

No birds of the first or subsequent broods to be kept were ever lost, however, each was eventually liberated in natural surroundings whilst in good health and plumage and well able to fend for itself. They were released during the summer months. None were retained in captivity long enough to see their first adult moult completed.

The obvious conclusion is that the cause of the plumage trouble is dietetical. Water should in no way have affected them, even from the household taps, but we did try rainwater with no obvious resulting difference. Had there been pumped running water, I can see no reason to expect different results, but a natural stream may well solve the problem.

There must be other birdkeepers somewhere with experience in keeping or studying these birds, perhaps even with theories (or facts) explaining my failures with this species. It is the only bird which, during well over forty years of keeping them, has provided me with such a problem; all others, from Goldcrest to Golden Eagle, having all been kept in good condition. So I feel that it could hardly be through lack of conscientiousness, or through careless animal husbandry. Any criticisms of my methods, or any suggestions would be welcome.

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THE WHITE-BREASTED GOULDIAN FINCH IN THE YELLOW-HEAD COLOUR PHASE

By F. C. BARNICOAT (Johannesburg, Transvaal, South Africa)

I first reported my successful breeding of White-breasted Gouldian Finches in 1966 in an article published in this magazine the following year (Vol. 73, No. 4). Since then I have managed to maintain a small stock of the new mutation, and in spite of much bad luck a limited number of White-breasted Gouldians has been bred every year, my stud of Gouldians now having reached the 14th generation.

The production of a white-breasted bird in the yellow head colour phase has engaged my attention for five years. Although theoretically this form might well have appeared earlier, it was not until 1970 that I was lucky enough to breed two White-breasted Yellow-headed Gouldians, both males.

The hereditary factor for the white breast is the simple recessive type and consequently the sex of the mutant is of no significance for colour inheritance. The only possible matings to be considered with this mutation and their theoretical expectations are:

1. White-breasted mutant (of either sex) \times normal giving 100% normal split mutants.
2. White-breasted mutant \times White-breasted mutant giving 100% White-breasted mutants.
3. White-breasted mutant \times normal split mutant giving 50% White-breasted mutants and 50% normal split mutants.
4. Normal split mutant \times normal split mutant giving 25% White-breasted mutants, 50% normal split mutants and 25% normals.
5. Normal split mutant \times normal giving 50% normal split mutants and 50% normals.

Breeding would be greatly facilitated if the normal split mutants were visibly distinguishable from the normals, but five years breeding experience has shown that this is not the case. One might well have thought that the split White-breasted Gouldians would show up by perhaps having a

slightly paler breast than normal birds. However, some of my splits have the deepest purple chests and have sometimes beaten normal birds on the show bench.

With matings 4 and 5 above there is only one way to establish which are splits and which normals and that is to test mate every bird. With the Zebra Finch, for example, this is a comparatively easy matter; but with the Gouldian Finch it is otherwise. In the case of this species only one generation can be produced per year, so a Gouldian will be at least two years old before its genetic make-up has been proved by its throwing a white-breasted offspring, or not, when mated with a split or a white-breasted bird.

At the best of times the Gouldian Finch proves a vulnerable property. They must have comparatively soft or thin bones and be prone to taking fright at night, because broken necks and skulls far outstrip all other causes of death in a species susceptible to several ills and having a comparatively high mortality rate. Then too I have found Gouldians rather fussy about the mate they accept and even more cantankerous about accepting a change of mate. In fact I now suspect that the pair bond in this species is a good deal tighter than the general behaviour of male and female towards each other would lead one to believe, and my experience makes me wonder whether a controlled experiment in aviaries might not even show that the Gouldian pairs for life. Man-made pairs of Gouldians often waste the entire breeding season. Anyway, I found it all too difficult to prove the genetic make-up of many possible split mutants, and when at long last the desired information had been gained, the bird would not be reconciled to a White-breasted mate or would succumb to some sling or arrow of outrageous fortune! I am therefore pessimistic about the value of matings 4 and 5 above. With the first three matings given there can be no doubt about what is being produced and these are the only matings that are normally worth considering.

The yellow head colour is caused by a gene defect that makes a Gouldian Finch unable to transform the yellow carotinoids in its food into the red. Consequently in a Red-headed Gouldian the red head-feathers become yellow as does the red tip to the beak. In the case of the Black-headed Gouldian with this gene defect, there are no red feathers so only the yellow tip of the beak distinguishes it from the normal form. The hereditary factor involved is also simple recessive and the usual pattern, as given above for the white-breasted mutation, also applies here. To get the attractive Yellow-headed Gouldian, however, it is necessary to breed the yellow form of the Red-headed bird.

When I found the white-breasted form reproducing in both red and black head colour phases in 1966, it was obvious that sooner or later the White-breasted Gouldian could be produced in the yellow head colour phase. To this end I selected the best Yellow-headed Gouldian hen I had as the mate for a White-breasted Red-headed cock, and the latter's

sister, also a White-breasted Red-headed Gouldian, was mated to a Yellow-headed cock from a different strain. Both pairs bred successfully and all the offspring were fine looking Red-headed Gouldians which could be relied upon to carry the factor for white breast from one parent and for yellow head from the other. Furthermore new blood had been introduced into the White-breasted stud from two different sources. In 1968 I was able to put together two pairs of these Red-headed splits, from which 17 were bred and were remarkably true to the Mendelian ratios, four were White-breasted Gouldians in the red or black head colour phase and three were Yellow-headed Gouldians. The latter, in view of the inheritance laws, were only possible carriers of the factor for white breast, and in 1969 I set out to test-mate all three. I was only lucky enough to prove the existence of the factor for white breast in one of these Yellow-headed birds and he died at the start of the 1970 breeding season. But while a complete blank was drawn here, one of the white-breasted hens proved that she was indeed a carrier of the factor for yellow head colour when she produced a Yellow-headed baby, her mate being a Red-headed cock definitely masking yellow. This Yellow-headed Gouldian could be guaranteed to carry the factor for white breast, and I was now obviously approaching close to my aim. In fact I had been rather unlucky not to get the white breast and yellow head to coincide in the same bird in the 1969 season. In 1970, however, White-breasted Yellow-headed Gouldian cocks were thrown from two different pairs.

Every fancier who has seen these birds has remarked that the yellow head colour is a trifle lighter than in the normal bird, and closer to true yellow. This may, however, only be a feature of these individuals. Perhaps the difference in the tone of yellow on the head will from now on provide me with as much interest as the blue neck-band does in my White-breasted Gouldians. This neck-band shows up much more vividly against the white breast, and it varies considerably in width and in shade of blue, ranging from sky-blue to almost cobalt. The wider the blue band the more attractive is the bird, and I should imagine that by selective breeding it may prove possible to enhance this feature in time.

I benched the first White-breasted Yellow-headed Gouldian on the biggest show of the 1971 season, the Pretoria Cage Bird Club's Diamond Jubilee Show, held in July. It was awarded Best Foreign Wild Bird and, even with the general absence of the more exotic softbills in this country, this major award was rather a tribute to the beauty and high standard of this new mutation in the Gouldian Finch. While I do not consider the White-breasted Gouldian Finch more beautiful than the original gem of nature, it is a very interesting and attractive variation and, unlike the other Gouldian Finch mutations that have hitherto occurred, it seems to possess the stamina to spread widely and eventually come within the compass of everyday aviculture.

REFERENCE

KLAUS IMMELMANN, 1965, Australian Finches.

NEWS AND VIEWS

G. D. Fisher, Director-Secretary, The Royal Zoological Society of Scotland, for the past fourteen years, has now retired.

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Fortunate indeed are owners of Archibald Thorburn's paintings. At Christie's sale on 13th July a signed and dated 1928 "A Wood Pigeon in a Fir Tree" was sold for 440 guineas.

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It has recently been announced in the House of Commons that during the past five years an estimated 60,000 birds have died as the result of oil slicks around Great Britain.

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Since 1967 the pair of Snowy Owls in the R.S.P.B. reserve in the Shetlands have successfully reared 13 young ones, but none has returned. Four more young have recently been hatched.

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In 1970 the Zoological Gardens, Cologne, recorded two noteworthy breeding successes. Lady Ross's Violet Plantain-eater *Musophaga rossae rossae* fully reared a young one, and the Pukeko *Porphyrio melanotis stanleyi* also successfully reared one young.

* * *

The small Squabmoor Reservoir, East Devon, has been put out of action because seagulls have dropped so much rubbish into it. Effective means have to be found of deterring the gulls from depositing droppings, feathers, bits of garbage, etc., from a local council refuse tip.

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"If I were a rich man" and many years younger I would probably succumb to the temptation to buy the Blood Pheasants recently offered for sale: £375 for a pair of wild-caught birds may sound exorbitant but it compares quite favourably with the prices now asked for some Australian parrakeets. Hand-reared offspring at £525 a pair would, however, take some considerable thought.

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The Wildfowl Trust has been successful in hatching nine of the ten eggs laid by a White-winged Wood Duck *Cairina scutulata*. This is a very rare duck in captivity and has only once been bred successfully, by D. G. Schuyf, Holland, in 1936. Seven eggs were laid, entrusted to a domestic fowl; six hatched; five ducklings, three male, two female were reared (*L'Oiseau*, 1937, 171-172).

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A Member asks the origin of lory and lorikeet. Lory is a name of considerable antiquity and is apparently derived from the Malayan *Lūri*, signifying parrot. According to Alfred Newton the name appears to have been made known first by Nieuhoff, *Voyages par mer et par terre à différents lieux des Indes*, 1682-92.

Lorikeet, the diminutive of the foregoing, was seemingly used for the first time in 1772.

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Some residents in Los Angeles regard it as a mixed blessing that there are now at least thirty parrots, mostly Yellow-headed Amazona, flying wild in the City and its environs. First observed in 1955 their origin is not known. It is possible they first migrated from Mexico, but guesses are that some were released by parrot smugglers when the conditions got too hot, or that they were house pets that escaped or were released during fires and floods.

* * *

Miss Rosemary Low is enjoying the splendid experience of looking after four Hawk-headed Parrots (I refuse to call them Red-fan Parrots) for G. A. Smith, until such time as he has room for them. In a recent letter Miss Low says: "They really are most fascinating birds. I am sure that they are nearer to conures than parrots, as their behaviour is pure conure. They are most obliging about food and like *Pyrrhurras*, sample everything that is offered them. They are all young and steady, one being a real baby with no tail, and down on the breast with the new feathers coming through. They all sleep together at night in a hole in the wall (blocked-up ventilation brick) which just might have been made for them!"

* * *

Karl-L. Schulmann, Braunshardt, W. Germany, writes that he has successfully established two male Quito Tyrian Metal-tailed Humming Birds *Metallura tyriantina quitensis*. They arrived five months ago and after moulting are in splendid condition.

The food consists of a mixture of 20 g. Nectamil 2 (a baby food produced by Milupa Pauli Gmb H, Friedrichsdorf/Tns., W. Germany) in 400 ml. water, with 20 g. cane sugar, 20 g. glucose-monohydrat, 3 drops Multibionta (vitamiconcentrate), 1 drop vitamin-B-concentrate, 5 g. supplements. Experiments showed that the protein requirement is greater for species living in deeper areas. Karl Schulmann would be pleased to correspond with anyone interested in this very difficult humming bird.

* * *

Mention of Keas in the last number of the Magazine is a reminder that before the War the late Dr. Derscheid had a pair in his very extensive collection at Sterrebeek, of which John Yealland was the curator. 13th March is a date imprinted on the memory of some of the older Members of the Society, for on that day in 1944 Jean Marie Eugène Derscheid, the

father of our present Hon. Fellow Jean-Pierre, was shot, after thirty months' imprisonment in Germany, as a political prisoner. Dr. Derscheid was in the very forefront of the Resistance Movement and took a major part in the Escape Service. Many British and American servicemen have particular cause to be very grateful to Dr. Derscheid for his incalculable help. And at how great a cost to himself.

* * *

Interim reports. Whipsnade Park Zoo: three young Rosy or Ruddy Flamingos *Phoenicopterus ruber ruber* hatched. Jersey Wildlife Preservation Trust: Salle's Amazona Parrot, 15th May, one young one thinking of leaving the nest-box. Bernard C. Sayers: reared to maturity, Kestrel 2, Barn Owl 5, Great Eagle-Owl × Kenya Eagle-Owl 1, Ring-necked Parrakeet 3.

R. T. Kyme: "My Weber's Lorikeets are now sitting again, after two more unsuccessful attempts, since my success last summer. The young pair, and I am more or less certain they are a true pair, are displaying and I'm hoping that one day they will repeat their parents' performance and breed for me.

My Perfects are feeding, but I exchanged one with K. Russell of Outwell, last summer. He has now been successful in breeding with his pair.

My Green-naped Lorikeets are displaying and mating and my White-winged Parakeets are also feeding and mating. Have just had two lovely Lutino Ring-necks leave the nest, bred by a young pair, the male has not yet got his ring."

* * *

Neil O'Connor: "My Salmon-crested Cockatoos have bred this year. The young bird was first heard on 8th June, so it is now nearly five weeks old. I have not inspected the nest-box but the sounds seem to indicate that there is only one chick. Unless it has been bred elsewhere this year, I believe this may be the first occasion on which the Salmon-crested has been bred in captivity.

My Citron-crested laid one egg which hatched on 5th July, but owing to considerable disturbance in very close proximity of their aviary on the same day, the chick was, I think, accidentally killed by the parent birds who were very likely frenzied by all the unusual noise immediately outside their aviary. The chick was ejected from the nest-box by the parents and found dead on the aviary floor underneath the box."

* * *

Ralph C. Small, Brookfield, Illinois. "After ten years of working with Hyacinthine Macaws I have an 18 days old young one. I think this could possibly be a world first. The only other young one I have heard of was a Hyacinthine × Blue and Yellow in Salt Lake City, Utah, in 1969

or 1970. The female arrived at the Brookfield Zoo in 1949, at the time presumed to be immature. She laid her first egg in 1967 when mated to a Scarlet Macaw. The male, imported in 1956, was purchased by the Zoo in 1968. The pair hatched an egg in June, 1969, but the young one lived only about $2\frac{1}{2}$ days—I do not think it was ever fed.

When Brookfield decided to dispense with the parrot-house in 1970, I purchased the pair. On 30th March, 1971, a chick hatched. The parents did not care for it and as it was already getting cold I “pulled” it. It weighed at birth 18.6 grams and at 18 days it is now 315.5 grams.”

* * *

Listeners to the early morning B.B.C. West Country regional news were told that a pair of rare birds had nested on Lundy Island but had deserted their nest on account of repeated disturbance by visitors. They were described as “Lesser Bearded Stockwells”. The B.B.C. later admitted that they had been hoaxed, there being no such species.

Some years ago, an eager young newspaper man reported the shooting of a Remington’s Owl. This caused considerable speculation, especially as the Natural History Museum denied any knowledge of the existence of a bird so named. And then, the marksman, who had casually mentioned the event in his local inn and who had no idea that his “kill” had invoked so much interest, announced that the only possible connection with the name was that he had shot the owl with a Remington rifle.

I once had a flock of about 30 Araucana bantams, originally from Chile. At one time this breed was very popular in the U.S., where it was known as the “Easter Egg Chicken” because it has the unique peculiarity of laying pale blue eggs. All domestic breeds when first they start laying eggs are prone to produce a few “cockneys” or “cock eggs”—a very small egg with no yolk. And Araucanas are no exception. One year I accumulated about half-a-dozen eggs, varying in size from that of a sparrow to a starling, and out of perverse inquisitiveness I sent them to the Natural History Museum for identification. They were *not*, however, deceived and quickly sent me the relevant information. I have sometimes wondered what the answer might have been had I sent the eggs under a fictitious name and had not the then Assistant-Keeper of the Department known that I had a flock of the producers!

* * *

Tailpiece. The U.S. Government Agencies concerned with pollution are introducing a warning sign “Woodsy Owl”, whose slogan is: “Give a hoot, don’t pollute”.

A. A. P.

CORRESPONDENCE

AN OFFICIAL DECISION ON NAMES OF PARROT GENERA

Following an enquiry on the subject by one of our members it occurred to me that others might be interested to know of an opinion published last year by the International Commission on Zoological Nomenclature on the names of two parrot genera. The genera which had previously been known as *Eclectus* and *Lorius* were at one time changed by Mathews and Iredale to *Larius* and *Domicella* respectively, for technical nomenclatural reason. These changes were not accepted as correct by all taxonomists, and there had been some confusion as to the more acceptable names for these genera. Recently an appeal has been made to the Commission who have validated the earlier names in place of the later ones; and *Eclectus* and *Lorius* will normally occur in scientific names in future in place of the other two.

22 ST. MARGARET'S CLOSE,
BERKHAMSTED,
HERTS.

C. J. O. HARRISON.

PARROTS AND ENGLISH NAMES OF BIRDS

I read with much interest the paper by G. A. Smith, in the May-June issue, on the use of the foot in feeding among parrots. Such surveys of the occurrence of a particular behavioural trait are exceedingly useful. Especially interesting are the findings that the non-prehensile foot seems to be correlated with sexual dimorphism, small size and seed-eating. It is easy to see how the size of a bird and its food preferences might well be correlated with use or non-use of the foot in feeding; the correlation with presence or absence of sexual dimorphism would seem to be somewhat more obscure. I wonder if the author might comment on the possible significance of this apparent correlation.

There is a minor factual error on p. 97; *Amazona albifrons* and *A. xantholora* are *not* allopatric, and cannot be considered conspecific, as both are found in the Yucatan Peninsula of Mexico and adjacent British Honduras.

Further to the question of English names of birds, especially of parrots, discussed in several letters in recent issues, I may say that the confusing English "synonymy" of so many species is precisely what has led ornithologists, notably Eisenmann and Meyer de Schauensee, to attempt to select a single English name and standardize it, an effort with which I am deeply sympathetic. I am presently engaged in the task of attempting to make uniform the names of birds, *both* English and Latin, in a forthcoming work on avian biology in which individual chapters are being written by specialists all over the world. It is a formidable undertaking, and the work of Eisenmann and Meyer de Schauensee is thereby all the more appreciated. It is certain that some of the selections of names will seem to some people to be arbitrary, capricious, unnecessary or inappropriate. This is inevitable in view of the magnitude of the job. But it must not be forgotten that most of these are birds for which the English name is *not* the "vernacular" name, as is suggested by the heading of Smith's letter in the March-April issue. The true *vernacular* names are in Spanish, Portuguese, and various Indian languages, and only in English-speaking countries can the English name be considered a vernacular. True, long use by aviculturists has turned some names of birds into quasi-vernaculars in English—but aviculturists have been no less responsible for confusion in names than have the authors chided by Smith (in this connection, see my letter in *AVICULTURAL MAGAZINE*, 64, 1958: 153-154).

To cite an example from Mr. Smith's own article and letter, the name "White-fronted Parrot" is not a coinage of "Meyer de Schauensee and other recent authors" as stated by Smith, but has been used consistently in the standard literature in English on Neotropical birds for over half a century, for *Amazona albifrons*. Mr. Smith has a point in stating that "White-capped Parrot" and "White-crowned Parrot" are unnecessarily confusing ("when is a cap a crown?"). But surely there can be no confusion in what is meant by a "front" in ornithological usage? As an ornithologist working extensively on Neotropical birds, I would have

been baffled by "Spectacled Amazon" had not Mr. Smith appended the scientific name. Granted that other parrots may have "white fronts", and that "Spectacled" is a perfectly good descriptive name for *Amazona albifrons*, it must also be pointed out that *Amazona xantholora* (which, as pointed out above, is a good species) is also a "spectacled Amazon". It is too much to ask that an English name not only describe an attribute of the species, but also that this attribute be *restricted* to that species.

I agree that Meyer de Schauensee has gone somewhat too far in applying new English names in his recent works, but I do not agree that a name, however widely used in aviculture, should take precedence over a name (and a perfectly appropriate one, at that) that has become standardized in the regional ornithological literature.

Dr. Eisenmann is the Chairman of the American Ornithologists' Union Committee on Classification and Nomenclature, of which I am also a member. This committee has the duty of preparing the next edition of the A.O.U. Check-list of North American Birds, and has voted to extend its geographic coverage to include Middle America, through Panama. I am sure that Dr. Eisenmann would welcome suggestions for the improvement of English nomenclature for Middle American birds, if some of the ones currently used seem inappropriate. That I do not reject out of hand the names used by aviculturists is indicated by the fact that the statement on p. 212 of Meyer de Schauensee's "Species of Birds of South America" that aviculturists usually call *Ramphastos dicoloris* "Green-billed Toucan" rather than "Red-breasted Toucan" was inserted at my instance. As it happens, in this case I *prefer* the aviculturists' name!

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DEPARTMENT OF THE CARNEGIE INSTITUTE,
4400 FORBES AVE.,
PITTSBURGH, PA. 15213, U.S.A.

KENNETH C. PARKES,
Curator of Birds.

COLD HARDINESS IN THE KEA AND THICK-BILLED PARROT

I was a little surprised to read the article by G. Michael Flieg in the May-June number of the Magazine, 106-107. I had ample opportunity of watching these birds throughout the winter 1970-71, and my experience differs considerably from that of Michael Flieg.

The Thick-billed was so miserable that on really cold days it would'nt even come out to eat. The Keas were a little happier. I have often wondered why some people like to see their livestock suffer through the kind of winters we have here. It is quite surprising that they do not disclose how many birds or mammals they lose each year. due to bad and freezing weather. Most of these deaths could be avoided by the provision of proper buildings and aviaries, and by plain common sense.

The highest mountain in the Thick-billed range is a little over 13,000 feet. When the weather gets bad in the mountains they descend to the valleys where it is warmer. The Kea does stay mostly in the mountains, and some observers even contend that they rear young all the year round. They live in deep holes where the body heat keeps them warm and they come out only to feed.

At the Brookfield Zoo the runs occupied by the Thick-billed and the Keas did not face north! They both faced west. Wind gusts of 58 miles per hour occurred only a few times during the year. One of the Keas, a hen, stayed in the hanging barrel most of the time and would not allow the other two in. The two other barrels were on the ground and they did not like them on account of the rats which went in and out of them.

None of the three baby Keas lived and the odd female was killed by the pair. Nearly all species of birds and mammals are having difficulty trying to survive and I think that everyone should do all possible to see how many can be reared and not to take chances that might cause death.

BROOKFIELD,
ILLINOIS, U.S.A.

RALPH C. SMALL.

SEXING PARROTS

I am not as sanguine as to the value of the 'pelvic bone test' for sexing parrots as Mr van Lent—letter in the July/Aug. magazine.

Over the past three years I have examined over two hundred dead parrots, of many different species. Before the carcass is opened I measure the distance separating the distal extremities of the pubic bones—the pelvic bone test. With such supple bones and palpated as they are through feathers and skin accurate measurement is difficult. My own readings are taken with a graduated cone-shaped device placed over the area between the bones. Later, during the autopsy, the true sex of the parrot is made clear.

It has been my experience that the pelvises of females are very much the same as those of males—unless they have active ovaries, which is not usual with freshly imported birds, composed as such consignments often are, with a large proportion of immatures.

Lovebirds (*Agapornis*), Cockatiels and Budgerigars—species that in captivity have the potential for year-round breeding—are the most accurately sexed by this method. Where hens, kept in colonies, have about 80% of their number with wider pelvises than males. Isolated birds, such as hen budgerigars kept as cage pets, generally cannot be distinguished from males by this method. It would also seem, like domesticated poultry, that when 'out-of-lay' these bones contract back to a male-like level.

Measurements made on live birds substantiate my doubts as to the value of this 'test'. Thus, two months before they successfully bred, two male Black-headed Caiques (*Pionites melanocephala*) had pelvic space measurements of 4 mm and 2 mm. (4 mm is very wide for any male parrot of this general body size.) Whereas of the females one had the bones actually touching and the other a space of 2 mm. There can be no doubt as to the correct identity of the birds measured.

I have noticed that with breeding pairs of Amazona parrots—therefore of true sexual determination—that males are visibly larger and bolder-looking. With dead Amazon parrots the ones with the wider lower bill measurements are usually male and those with narrower bills females, however there is much 'overlap' and such measurements can be only indicative. Boosey (AVICULTURAL MAGAZINE, Vol. 55, p. 113, 1949), says that Blue-faced Amazons (*A. a. aestiva*) may probably be sexed by the red or yellow feathering at the leading edge of the wing. This is not borne out from examination of post-mortem material. The colouring is irrelevant.

With African Grey parrots (*Psittacus erythacus*) I can find no measureable differences between the two sexes in dead specimens. When alive males—observed in breeding and therefore true pairs—sit almost as fluffed out as a frightened owlet, with beligerance, whereas hens remain sleek. For myself I cannot notice anything differential about the flatness of the head or the shape of the orbit.

Lastly I am perplexed as to what Mr. van Lent means by 'Spectacled Amazon'. The reference may be to Pretre's Amazon (*A. pretrei*) which has, most confusingly, been given the vernacular name of "Red-spectacled Parrot" by de Schauensee. Confusing because it hasn't a red spectacle. Whereas the Spectacled Amazon (*A. albifrons*) has a complete red 'spectacle' surrounding the orbit. *A. albifrons* is sexually dimorphic, males have the primary wing-coverts bright red. The female lacks these. A coloured plate of both sexes may be found, as a frontispiece, in Condor 51 : 2. And good descriptions may be found in E. R. Blake's "Birds of Mexico", and in F. E. Smithe's "The Birds of Tikal". From a size point, though it may be incidental, my own male weighs just 10% more than the female.

158, BROADWAY,
PETERBOROUGH.

G. A. SMITH.

I am always happy to read articles about the sexing of identically plumaged birds, as I think that I probably hold the record for trying to breed from either two cocks or two hens, although all the usual tests have been applied.

It might be of interest in a light hearted sort of way if I give some factual information about these birds. The betting odds are two to one against being right—not great odds or margin for error one would have thought. Some people can not only guess at the sex of birds correctly, but can even pick winning racehorses. This latter faculty also eludes me.

I really started keeping birds in a fairly large way after the war when knowledgeable people were thin on the ground. As one might say we spelt the word expert with a capital E then.

My first excursion into the parrakeet world was in 1946, when I purchased an immature pair of Cockatiels, and a pair of Peach-faced Lovebirds from Mr. Ted Vane. Now Ted Vane was a good man with parrakeets, and was the type of man who would not sell deliberately a wrong bird. I feel that aviculture owes a great debt to him.

The Cockatiels were a true pair alright, and I still have the cock with me. He certainly looks his 25 years of age, but he seems happy enough in a quiet sort of way. He cannot fly, is nearly bald, but still eats well and walks about the floor of the heated aviary where I keep him. Unfortunately for him I have no other Cockatiel at present, but he reared about 110 youngsters and I am glad his old age is warm and comfortable.

The Lovebirds were sexed in two ways—firstly the pelvic bone test, and secondly by the theory that there was a difference between the eyes of a cock and hen lovebird. I spent hours gazing into the eyes of lovebirds, but I think that this method must have been evolved by a Frenchman. My Anglo-Saxon eyes could never see any difference.

As you may have guessed by now, the Lovebirds were two cocks, so being still filled with natural awe surrounding an Expert, (spelt with a capital E) I bought several guaranteed pairs, but still no luck. Masked Lovebirds were the same. Finally in desperation I sent to Africa and bought three guaranteed pairs of Nyassas. These turned out to be four cocks and two hens but as they sorted themselves out in a colony, the result was quite satisfactory.

The pelvic bone test was, I believe thought up by Miss Maud Knobel, a charming lady who kept a large number of parrots in cages, where presumably their sex was not very important. Indeed until after the war I believe that parrots were almost always kept in cages, and attempts to breed them were very rare.

The general idea was that hen parrots were the larger birds with bigger heads.

The pelvic bone test suffered in my opinion from one basic defect. If one knew that the birds you were handling were of the same age, and if the hens had bred or not, then it was a fair guess, but if faced with a number of birds of unknown sexual history or age, then it was of little use. To look at it in another way and in human connotation. If a man from Mars was sexing fully clothed human beings, in unisex clothing, as birds more or less are, it would not be difficult to sort out some females if included in the selection were a few "Heroines of the Soviet Union" who had each produced ten or more children, or some other equally free breeding race. These, I should imagine could quite easily be classed as females by the pelvic bone test, but I suggest that it would not be so easy sorting out the others if included in the batch were some of the charming young ladies one sees on the 8.46 in the morning, and some of the young males who endeavour to ape the female so successfully.

In 1948 I bought from Mr. Vane, a pair of young Bourke's Parrakeets. The then way of sexing young birds was by the whitish bar under the wing-whole in the cock bird, but broken in the hen. As I said, the birds were immature when I got them and as I knew nothing about Bourke's I was quite happy to see them go into the box, but even I, with my reverence for the capital E was a bit dubious when I looked inside and found the two birds sitting side by side on 20 eggs. Poor old Vane! he would not believe for a long time that his theory was wrong.

Of course many people will say that they have picked true pairs by such and such a manner and be quite serious about it, but having suffered for many years under infallible systems, I suggest that one not only needs the system, but a bit of luck as well.

Behaviour is also a most unreliable guide. In 1959 my son, then doing his National Service in Singapore, sent me five Yellow-backed Lorries. I intended

keeping one pair only, so I thought I would make sure of a true pair. I put them all together in an aviary and watched them for months. Two birds were always together feeding and preening. They were marked and put back with the others and watched again. Finally being sure that I had a pair I got rid of the others, but now, 12 years later, although the birds have been as fit as fleas all the time, and play "mothers & fathers" all the summer, I feel certain that they are two cocks. Had they been a pair they would at least have laid an egg by now.

I have three pairs of "identically plumaged" parrots, and I have had these birds for about seven years, and feel certain of their sexes.

Blue Fronted Amazon-Cock the larger bird with more blue in the face and the yellow definitely more golden than the hen. Wing butt reddish in cock, orange in hen.

Vinaceous Amazon. Blue markings on neck more bluish with cock than hen. Cock the larger bird. Wing butt red in cock, yellow orange in hen.

Pionus menstruus. Cock definite deeper blue on head, and plumage more of a golden gloss.

I have not subjected these hens to the indignity of a pelvic test.

BRACKEN,
UPPER CORNSLAND,
BRENTWOOD, ESSEX.

HERBERT MURRAY.

* * *

ERRATUM

July/August Number 1971, page 149, line 16 for "8 years" read "18 years".

* * *

The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

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NEW MEMBERS

The eleven Candidates for membership in the July/August 1971 number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

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G. WILSON, " Taormina ", 25, Bushmead Road, Eaton Socon, ST. Neots, Hunts.

CHANGES OF ADDRESS

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HUGH ELLIOT, to 31, Tompson Street, Garran, A.C.T. 2605, Australia.
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DR. T. R. LAWSON, to Dept. of Radiodiagnosis, The County Hospital, York, YO3 7PG.
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MRS. S. WICKS, to 8, Firl Road, Bexhill-on-sea, Sussex.

CHANGE OF NAME

MRS. PILKINGTON, Bell Cottage, 1 Arbrook Lane Esher, Surrey, To
MRS. P. CORNELIUS.

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From BRIG. COWAN, to Col. A. R. Waller, M.B.E., M.C., The National Trust,
Waddesdon Manor, Waddesdon, Aylesbury, Bucks.

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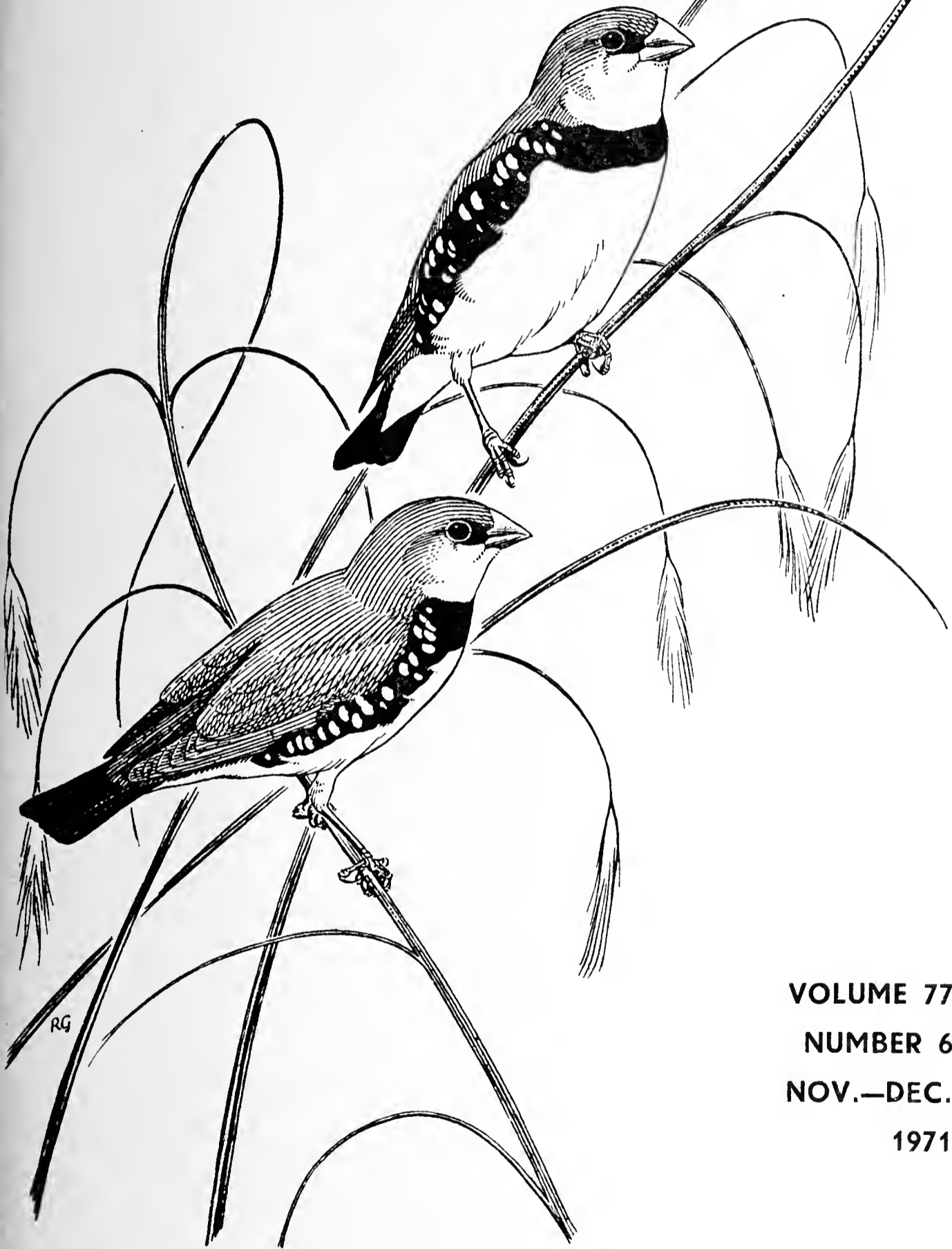
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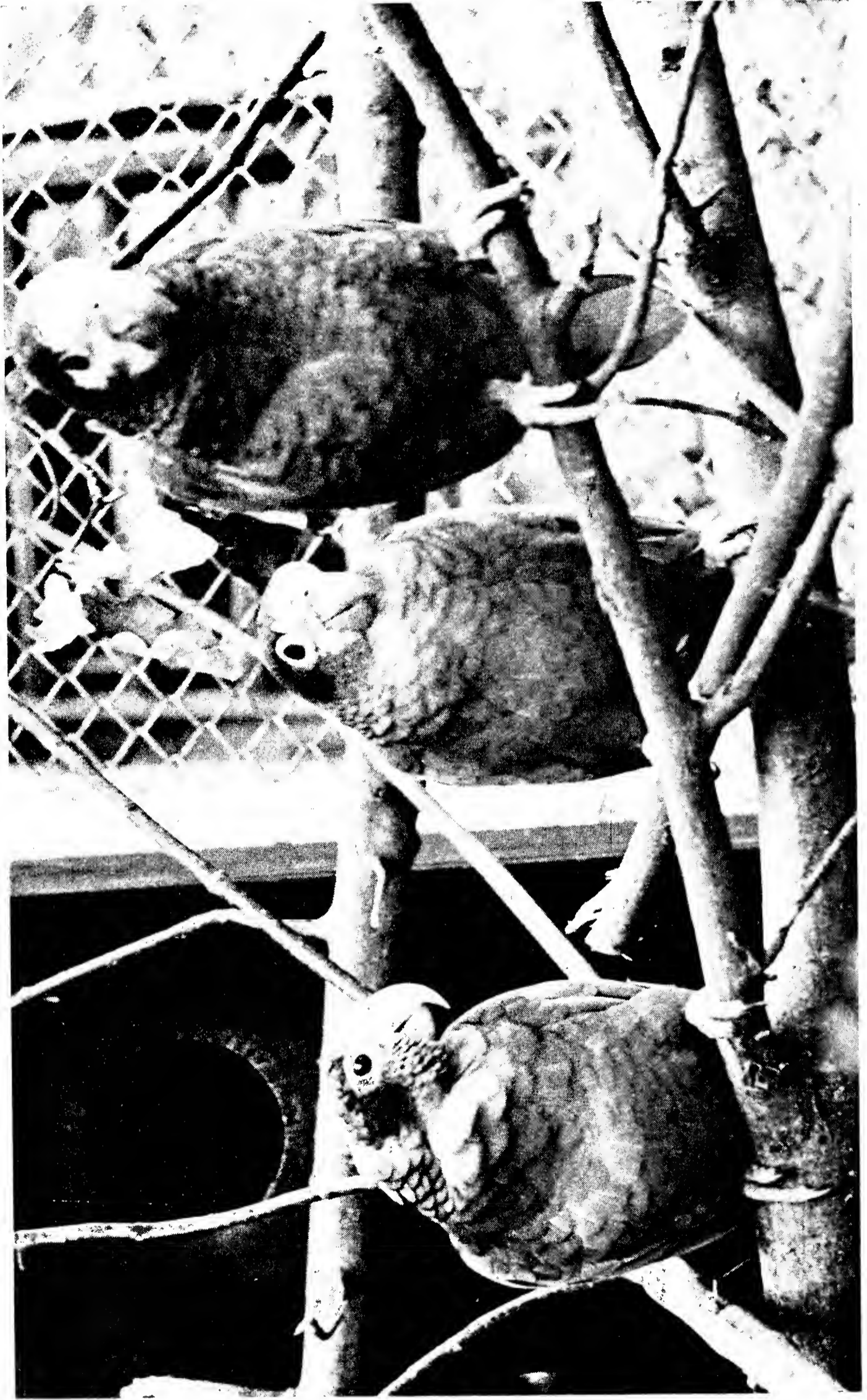
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[Phillip F. Coffey

Hispaniolan or Salles Amazon Parrot

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AVICULTURE IN LIGHT OF RESEARCH

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NOVEMBER—DECEMBER 1971

BREEDING OF THE HISPANIOLAN OR SALLES AMAZON PARROT

(*Amazona ventralis*)

By ALAN F. GATES (Parrot Section, Jersey Wildlife Preservation Trust)

In the spring of 1964 Mr. Gerald M. Durrell, Hon. Director of the Jersey Wildlife Preservation Trust, brought back from the West Indies four young specimens of *A. ventralis*. They were all housed in a fairly large cage in the tropical bird-house. Two were found to be more friendly, and the other two more independent. In May 1966 they were moved to an outside aviary which measured 8 ft long × 4 ft. wide × 6 ft. high. In the farthest corner from the door was hung a nest-box which measured 2 ft. × 9 in. × 9 in. By the November of the same year one specimen died and the post mortem results showed that death was due to carcinoma of the bowel.

Treading by two of the remaining three specimens was first observed on 14th May 1968. It was now thought that we had one male and two females; the bird which was thought to be the male had a greater area of white on the forehead than the other two. On the 26th May 1968 one of the females was observed to remain in the nest-box; she was later found to be sitting on three eggs. Incubation was done by her alone, but when by the 28th June nothing seemed to be happening it was decided to investigate, and the three eggs all proved to be infertile.

1969 Breeding Season. The second female had to be removed from the aviary as the remaining two had paired and turned aggressive towards her.

Incubation was again done by female alone and the first egg was laid on the 5th April 1969. Three eggs were laid, two were infertile and one fertile, but the chick died in the shell. It had started to cut its way through the membrane but not the shell, and died after a 30-day incubation.

1970 Breeding Season. The female again produced three eggs and incubated them, only coming off to feed. She was more aggressive than the male bird towards the keeper. Alas all three eggs proved to be infertile.

1971 Breeding Season. Treading was observed on 20th and 31st March and by the 20th April the female began to stay in the nest-box. We waited until the 29th April and decided to check the box; if the eggs were infertile like the year before we would have removed them and hoped

she would lay a second clutch. On checking the box we found three eggs, two proved infertile but one was fertile. It was decided to leave all three eggs and hope for the best.

Everything went well throughout the incubation, the female sat well and the male visited her in the nest-box at regular intervals to feed her. She rarely came off the eggs during the incubation period. On the afternoon of the 15th May 1971 I was passing the aviary and I heard the first sounds of a young parrot coming from the nest-box.

Their diet consisted of the following: Sunflower seeds, mixed Canary seed, Budgie seed, white panicum seed (stopped after four weeks), wheat, maize, omnivorous nuts, peanuts, seeding grasses and hawthorn branches, apple, orange, banana, pear, grapes, tomato, hard-boiled eggs, and brown bread soaked in nectar. All food was sprinkled with carnivorous powder daily. Cuttlefish and a small quantity of P. Universal Sluis were also given daily.

Normally out of the breeding season this pair of parrots would eat an average amount of sunflower seed for their size, but as soon as the chick hatched the male almost entirely stopped taking sunflower seed. Instead he ate a large quantity of mixed canary seed and hawthorn leaves; other favourites were hard-boiled egg-yolk, tomatoes, grapes, pear and banana.

Things went well throughout the rearing period and we heard the chick at different intervals as the days passed on. Sometimes he was not heard for a few days, and then we began to fear the worst, but the next morning his little grunting noise would be heard even stronger and we would give a sigh of relief until his next period of silence.

The female did not come out of the box until the 26th May; at 5.30 p.m. she was seen feeding, but returned after about an hour. She was not seen again until the 4th June at 8.00 a.m. and soon returned to the box. After this she was seen at various times, sometimes spending as much time as two hours out sunning herself.

On the 30th June the youngster was seen for the very first time looking out through the hole of the box with the female. It was a great moment to see the first *Amazona ventralis* ever to be bred in captivity. From then on the youngster spent quite a lot of time sitting at the entrance hole. The sun temperature at the beginning of July was way up in the 90°F, and by mid-afternoon I often saw his head hanging out of the box, beak open, panting with the heat.

At 4 p.m. on the 15th July he actually stepped out on to a branch about 2 in. from the hole, but being rather unsteady on his legs he returned after about five minutes; he was now 61 days old. It had taken two weeks for him to pick up courage to leave the nest-box, but after a week of leaving the box he would sleep outside in the open with his parents.

The male was still feeding the youngster, who was seen eating peanuts a week later. The youngster was expected to be a duller version of the adults in plumage, but instead it was almost identical. The only

difference was where the adults have white foreheads, then an area of dark blue then amazon green to the back of the head, on the youngster the area of white on the forehead was slightly larger, there was a tinge of yellow, then amazon green. Another prominent feature of the adults is the large patch of vinous-red which decorates the middle of the abdomen, on the youngster it is more orange than red.

At the time of writing this account (20th August 1971) the youngster is eating a variety of fruits and seed, a great favourite is the now red hawthorn berries which are taken in great number.

Although eating quite an amount by himself he still begs his father to feed him, and being a good father he does.

As described above the Hispaniolan or Salles Amazon Parrot (*Amazona ventralis*) has been bred at the Jersey Zoological Park. It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

BREEDING THE MALABAR STARLING

(*Sturnus malabaricus*)

By RAYMOND FRANKLIN (Chesham, Buckinghamshire, England)

I purchased a pair of grey coloured starlings from a dealer in Harrow during October 1970, and discovered that they were Malabar Starlings, *Sturnus malabaricus*. Having no knowledge of this particular species of starling, I thought they would be something different to try to breed—as this is my main interest, albeit a lot of work supplying insects, etc!

Some observers say that the sexes are alike as with most of the Sturnidae, but this is not the case. The cock is a “bolder” bird, silver-grey on the mantle, wings, breast and lower parts, a handsome chestnut brown with a white area around the vent towards the tail which tapers to a brown. As with the Pagoda Mynah the bill is half yellow and half blue to the septum; the eyes are blue and the iris white. On the forehead of the cock are two white spots—altogether quite a handsome bird. The hen is similar but the chestnut colour is not so pronounced and also there are no white spots above the forehead. According to Smythies in the *Birds of Burmah*, where it is referred to as the Ashy-headed Starling, it is “liable to be confused with Jerdon’s Starling (*Sturnus burmanicus*)”, but I would hardly have thought so as the Jerdon’s Starling is somewhat larger as well as being a different colour.

During the winter of 1970/71 they were kept in my birdroom, with an average temperature of 45°–50°, in a flight with various other softbills (Mesias, Pagoda Starlings, Blue-winged Sivas). There was very little quarrelling and the usual diet was supplied (fruit, etc., also proprietary soft food, maggots) and a drop of vitamin supplement on occasions.

They were put outside in a flight 16 ft. × 6 ft. × 8 ft. high along with a pair of Blue-winged Sivas (*Cyanoptera minla*) in March 1971. During May, a large log was hung high up in the flight. This was a hollow length of black poplar (*Populus nigra*) about 3 ft. long and 3 ft. in diameter with a 4-inch hole right through. I blocked up one end and hung it at an angle with the open end facing slightly upwards, to prevent any young falling out.

The cockbird was seen inspecting the hole and running in and out on the 3rd June. I left well alone mainly because the log is too heavy and too high up to be tempted to take a look. I tried a torch and mirror but what a performance this is! Being at work all day the nearest I got to observing the proceedings was the sight of the cock carrying *green* grass into the log. The hen seemed to be inside for quite long periods so I surmised something must be happening, but what annoyed me was that every time she heard me going to feed the other birds she would rush to the end of the log to see what was going on. Incidentally, all my other starlings behave in this peculiar fashion! At no time was copulation observed and there was very little displaying.

The second week of June was very wet and cold, and on the 9th I found the remains of three pale blue eggs on the ground partially eaten (by the cockbird?). One had a fully grown embryo. On 15th June I found two more eggs on the ground and partially eaten. I was beginning to get despondent—with any luck I might breed them one day!

During the third week of June the hen was quiet in the log for long periods so I presumed things were happening. On 9th July I could hear faint cheeping and found pieces of eggshell in the flight. Ah! at last. But all did not go as well as it might have done and on 14th July I had another minor setback. The hen went sick and could not do her share of feeding. The cock (stout fellow) did all the work while she just sat around with her head under her wing. After two days she did not seem any better so I caught her up and gave her a dose of "Sulphamezathine". This put her right and she was soon back at work. As we see everything did not go according to the rules (do we breeders have rules?). I have a large Terylene net to catch flies, etc. The birds had these, supplemented with a few mealworms, and two young were reared successfully. On 28th July out came two fine young. As is usual both parents worked like mad all the time to supply sufficient live food—and so did I!

I now have two fine young which I think are a pair and which are doing well to date (18th October 1971).

As described Raymond Franklin has bred the Malabar Starling, *Sturnus malabaricus*. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

THE STORY OF A STRANGE COUPLE

By PAUL JOURDE

(Parc Zoologique de Branféré, Le Guerno, Morbihan, France)

It is already a long time ago, perhaps five or six years, and it is necessary in the first place, in order to give the background to this story, to say a few words about Branféré, its inhabitants and the life they lead.

There are in France a large number of so-called Zoological Parks, but really a very small number, actually only three, that are worthy of this designation. The Zoo of Thoiry, not far from Paris, which attracts the largest number of visitors, something like Longleat in England, is principally based on the exhibition of the most spectacular animals, particularly the lions and antelopes of its "African Reserve". There is a very fine collection consisting mostly of large animals which appear to be

even more numerous than they actually are, for the area in which they are placed is relatively limited and the density of the animal population is exceptionally high.

The Park of Clères, universally known, particularly in England, of course, needs no description. The number and extraordinary variety of its inhabitants and more especially the rarest species of exotic birds, have made it for half a century a focus of attraction without equal; not only for true ornithologists but, perhaps even more, for the general public who cannot fail to be impressed by the beautiful surroundings and by the grace and beauty of the creatures roaming the grounds in apparent freedom.

Conditions at Branféré are rather different, perhaps half-way between Clères and Thoiry, thanks to a particularly mild climate suitable for the acclimatization of exotic animals, and also the variety of its landscape and the favourable geographical position.

Branféré incidentally has been known since the defeat by Ceasar of the local ancient Venètes, and the occupation by his army of the area; the name itself which has been used ever since, is enough to remind one, by a curious mixture of Roman and Celtic language, of the exploitation of iron ore which lasted throughout the Imperial period. After a long eclipse during the Middle Ages, Branféré was to take a new importance in the area in the 14th century, after the abolition of the Order of the Temple, long the owners of the land in that part of Brittany. Inheriting its influence and also the tribute in the fortified church of its Knights, Branféré gradually emerged from the medieval chaos by replacing its castle of the 14th century by another one much larger of the early 17th century. In the following century one of its owners for the first time became interested in nature and created a vast park where he introduced little by little a large number of exotic botanical specimens, then still exceedingly rare. One can still see today a few trees planted by him, 250 years ago, the last remaining testimony to his long and patient efforts. But it was not till some 200 years later that the present owner started to restore the park, long neglected, and gradually to reconstitute its vistas and plantations and repair ruins caused by the French Revolution which almost destroyed the grounds and the buildings as a result of the hard repressory measure taken by "Les Bleus" (revolutionary troops) in this territory of the "Chouans" (royalists insurgents).

The efforts made by the present owners were not, however, primarily from the botanical aspect, but rather for zoological interest, particularly the making of new ponds, which, up to then, had been the weak point of grounds which had certainly not been established to house exotic waterfowl, at that time unknown. This endeavour was unfortunately interrupted by the war, and the animals gathered before were practically all lost, in the absence of their protectors who were to return only after an eight years' absence. The difficult situation just after the war made it impossible to restock this park, which has exceptional possibilities, quickly,

as it is easy to enlarge and to transform according to needs. The vegetation is lush and the proximity of the Atlantic Ocean makes the climate very mild. The idea, however, of gathering there animals and birds from all parts of the world was different from those that inspired the other two big parks. Far from trying for the great and spectacular show as at Thoiry, or to collect rare and exceptional specimens as has been done at Clères, all those at Branféré were based upon climatic conditions which, owing to its mildness, permits the gathering of specimens in astonishing number in complete freedom. The aggressiveness of each species is much reduced by the relaxing air, despite the proximity of the Atlantic. Thanks to the very special conditions, a great variety of animals which, normally, would kill one another, or, at the least, fight, can live together peacefully in complete freedom, except, of course, on occasion during the breeding season. Furthermore, many full-winged birds fortunately enjoy a great area of safety, thanks to a sanctuary of many hundreds of acres established around the park. But unfortunately it is not really sufficiently large. It remains, however, that the number and variety of the creatures at liberty which enliven and decorate the lawns and parts of the park with their daily activities are the more surprising in that they behave almost abnormally compared with the conduct under generally normal conditions.

These conditions are the cause of the present story. Some five or six years ago, a certain number of Macaws along with other parrots, were let out, but their reactions and their behaviour, after a first rather normal period, proved very different from what was expected. All the Macaws set free, in that case Blue and Yellow, Green-winged and Scarlet, were undergoing the first stages of living in excellent friendship. As was expected, their number, in the second year, started going down little by little without our really understanding why. They disappeared slowly, after becoming shyer and shyer, and progressively going away, giving the impression that they became wilder every day and that nature was taking over. Such, however, was not the case and it was found out later on that a pair had been formed. It became obvious that a male Green-winged "Jerry" and a female Blue and Yellow "Jimmy" had paired up and did not tolerate any other Macaw around, terrorising them to the point that they moved away gradually and finally disappeared. This savagery got worse when, after two years, they started looking for a nesting-place at the expense of other birds, particularly that of numerous Fan-tailed Pigeons, part of whose wooden cotes they destroyed ruthlessly to take over their nests, killing or injuring the occupants which could not escape quickly enough. All to abandon those nests later and decide finally on a loft where Jimmy was going to lay and incubate a first unfertile egg. During all this time, their aggressiveness, particularly Jerry's, and ferocity, were increasing in a surprising way, except, however, towards human beings whom Jimmy continued to tolerate while she was not incubating, coming

as usual to ask regularly for little offerings of tit-bits. Discouraged, however, by the lack of success of this first effort, the two Macaws did not nest the following year, but their aggressiveness did not diminish and the terrible Jerry continued to attack all parrots kept in aviaries through his own fault, coming to attack them constantly through the wire-netting protecting them, managing sometimes to open it to force them to come out, when he attacked them with the intention to kill, and too often achieving it, until the day when things changed suddenly. In his destructive rage, last spring, Jerry, once more, attacked the wire-netting of one of the few aviaries (as I said before, they are not numerous as most birds are free), in order to let out a parrot to try to kill it. It was this time a large species, a Patagonian Conure, of the larger sub-species, but clearly smaller than an Amazon. After lengthy efforts, in the absence evidently of a human witness, of course, the Macaw succeeded in liberating one of the Conures. It was then that the miracle took place. Instead of rushing at it as he had always done before, Jerry welcomed the Conure emerging from the cage with signs of evident satisfaction. His comportment, so clearly shown for several years, changed from one moment to another: instead of trying to kill the Conure as it came out, as he always did before, he induced it to follow him, to fly away with him, which it did willingly and apparently with complete satisfaction. Their flight, interrupted by halts on branches and peaceful feeding, lasted several hours and poor Jimmy appeared to be suddenly completely forgotten; since then she was practically never noticed. Jerry and the Conure seemed abruptly to have forgotten all that was not themselves. Heart has its reasons that reason ignores. They lived and flew together as the pair of Macaws had done until then. Abandoned Jimmy wandered sadly from tree to tree, always alone, without ever attracting the attention of her previous mate who had before fought and killed for her so often. As a consolation, however, and to forget her loneliness, her affection towards human beings appeared to be reinforced; she multiplied contacts with them, coming to windows, knocking at the panes and accepting tit-bits eagerly, with a tinge of melancholy. This was going to last a long time, many months. In order to try to find out whether Jerry's affection with his last fancy was personal, or specific to these Conures, another one was let out in turn, with all caution imaginable; it immediately joined the strange couple, shared in their flights and games, but it was not the case with a third Conure: snubbed, chased by the other two and the Macaws, it soon disappeared as so many before it.

The three inseparable companions, however, carried on the same life, keeping away Jimmy definitely. Then came the worst tragedy: she disappeared for ever! What had happened? It was unfortunately only too clear: tired of its reproachful presence, Jerry had executed her, after so many others. He was not a man, or rather a parrot, to regret a near past so happy where perfect love had been carried on. He had to suppress her. So ends the great love of two Macaws which seemed to have lasted for ever.

Sanctions were soon to be taken and criminal Jerry soon left Branfère to lead the sort of life he deserved at Clères, far from the freedom and happiness he had enjoyed, happiness in crime, it is true. But was poor Jimmy's part of responsibility soon sacrificed? Whatever it was, the happy pair of Patagonian Conures, with no murder on their mind, continued to live in freedom until recently when some poacher stupidly shot one of them, which shows too clearly that it is not always good to allow so-called sportsmen an increase of means which permits them to buy cartridges which they use in such a way—*sic transit gloria mundi*.

* * *

BREEDING THE WOODLAND KINGFISHER AT THE WINGED WORLD

(*Halcyon senegalensis*)

By BRYAN S. WARD (Heysham, Lancashire, England)

The Woodland Kingfisher, which has quite a wide range in South Africa, is one of the more attractive insectivorous species. They are approximately eight and a half inches in length, having a greyish head, neck and underparts a whitish grey, and the upper parts being a greenish blue. The rest of the feathering is a bright blue with the exception of the wings and upper wing coverts which are black. The upper mandible is a bright red, whilst the lower is black. The sexes are alike.

Earlier in the year we put our two Woodland Kingfishers together for the first time in one of our larger glass fronted compartments, in the hope that we had a pair and that they would attempt to breed. They very quickly settled down together, so we assumed that at least we did have a true pair.

During the following weeks they appeared to be looking for a suitable hole for nesting. They were seen to enter an old Motmot tunnel that had been made at ground level, and also into holes that had been made by a pair of barbets in a rotten log about five feet in height.

The hen disappeared for long periods during the day and we thought that she must be laying in the rotten log, only to find ultimately that she was sitting in a plywood nest-box approximately eight inches square, with a half open front. This had been fixed near the roof of the compartment. The cock was still seen to visit the rotten log on sporadic occasions, and was never observed to assist in the incubation of the eggs at any time.

We do not know the incubation period owing to the fact that we were unaware of the time that she started to take an interest in this nest-box. After a while we heard noises coming from it, so assumed that they must have young, and then noticed mealworms being taken to the box by the

cock. We also noticed a certain amount of aggression towards the other birds in the compartment.

After a week had elapsed we started to give them half-grown locusts and day-old mice, which were quickly taken up to the nest by both parents. We continued with this method of feeding until the youngster left the nest, which was twenty-nine days after we first assumed that it had hatched. We then cut down on the amount of mice and locusts to encourage it to partake of our normal daily diet. The young bird was noticed to be eating mealworms on its own a week after leaving the nest, and strips of beef about a week later.

There was only one youngster in the nest, and we found no signs of any other eggs. The box was completely empty and quite clean and dry: The young bird is slightly smaller than its parents, and in perfect feather. The bill blackish, and colouring somewhat paler generally, with the underparts being very finely striped horizontally in black.

As described the Woodland Kingfisher *Halcyon senegalensis* has been bred at the Winged World. It is believed that this may be a first success. Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

BREEDING THE BLACK SPOTTED BARBET AT THE WINGED WORLD

(*Capito niger*)

By BRYAN S. WARD (Heysham, Lancashire, England)

The Black Spotted Barbet is a forest bird of Northern South America and its size is approximately seven inches. The crown and underparts of the male are golden yellow paling towards the belly, with black spotted flanks. Sides of the head, back and wings are black with a yellow band across the wing coverts. The female is similar to the male but the yellow underparts are heavily spotted with black.

We unfortunately lost our female last year, so when the opportunity to purchase a trio came along, we took it, and put both pairs into two of our glass fronted landscaped compartments.

The pair comprising the new cock and hen started to show an interest in a rotten log which was only two feet six inches in height. They started to tunnel downwards and continued to a depth of about twelve inches, where the tunnel must then have widened out into the nest chamber, although this could not be seen by looking into the hole.

The first indication that they were actually nesting was when we heard the young chicks in the nest, as neither of the adult birds seemed to have

een out of sight long enough to incubate any eggs. The parents seemed rather hesitant in taking food into the nest whilst we were watching, but during the thirty-four days nestling period, they were observed to take mealworms to them and latterly fruit, mainly sultanas. For the ten days prior to the youngsters leaving the nest they were given day-old mice, these they enthusiastically picked up and took into the log.

Two young barbets left the nest, one cock and one hen, the cock leaving two days after its nest mate. They both have the individual markings of their parents, but the colouring is slightly paler.

As described the Black Spotted Barbet *Capito niger* has been bred at the Winged World. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

BREEDING THE HIMALAYAN BLOOD PHEASANT

(*Ithagenis cruentus cruentus*)

By MAJOR IAIN GRAHAME

(Daws Hall Wildfowl Farm, Bures, Suffolk, England)

HISTORICAL

Jean Delacour, in *The Pheasants of the World* (1951), describes 13 different forms of Blood Pheasant, genus *Ithagenis*. These birds inhabit the high mountains of Nepal, Bhutan, Sikkim, Burma, Tibet and China. They are reputed to live at 9,000–15,000 ft. Since 1875, when a pair were sent to the London Zoo, pheasant keepers throughout the world have been trying, unsuccessfully, to keep this attractive little member of the pheasant family. All previous attempts have failed. Not only did it appear to be impossible for these birds to breed in captivity at low altitudes: it seemed they could not even be kept alive. The male of the pair sent to the London Zoo last century lived for 14 months, and this was the record until 1969–70, when F. E. B. Johnson of Bedford, England, kept a cock of a pair—the hen died shortly after arrival—alive for 17 months. Several attempts were made to introduce Blood Pheasants to the aviaries at Clères, France, earlier this century, but all failed, and Delacour wrote: “It is, therefore, extremely doubtful whether these beautiful birds will ever be kept and reared successfully in captivity far from their native haunts”.

During 1970 I made two separate visits to the Himalayas—the first from Katmandu, and the second from Darjeeling—and, as a result of a total of three months spent at altitudes that the Blood Pheasant inhabits, I was not only able to study the nominotypical race of Blood Pheasant, but also to collect wild specimens and import them to England.

HABITS

My observations of Blood Pheasants in the wild, at altitudes between 10,000 and 12,500 ft., were confined to the months of February and March, and to the area of Namche Bazaar and Thyangboche in north-eastern Nepal. The temperature varied from 12°F at night—i.e. 20° of frost—to 60°F at midday. Snow is not usual at these altitudes during this season, but 1970 was an exceptional year, and during one period at the end of February there was 2 ft. of snow that lay for almost a week. One of the more remarkable habits attributed to the Blood Pheasant is Hooker's report (*vide* Beebe): "During winter it appears to burrow under or in holes amongst the snow, for I have snared it in January in regions thickly covered with snow, at an altitude of 12,000 ft." This thoroughly incomplete and circumstantial evidence has induced many subsequent writers to include this as one of the principle habits of the genus. From my own observations during heavy snow, and from talking to Sherpas, I would not hesitate to say that there is no truth whatever in this theory. Apart from the obvious fact that the bird is hardly designed, in beak or leg, for "burrowing", there is no necessity for it to dig a hole to evade the elements. The mountains of this area contain innumerable caves and overhanging boulders—to which I myself have taken recourse on more than one occasion—and I have seen Blood Pheasants in these localities, particularly near fast-flowing streams, in heavy snow. When the weather precludes their accustomed foraging for feed, they confine themselves to places which are sheltered and where they can glean sufficient food to keep themselves alive until the weather improves.

My own observations would lend me to believe that the Blood Pheasant is nowhere common. In spite of intense searching, I only once saw two different coveys in one day. The bird has many enemies, though man (predominantly Buddhist in that region) is fortunately not one. Snow leopards, foxes and eagles are probably the main predators.

An ornithologist's reaction, on seeing Blood Pheasants for the first time, will undoubtedly be to note how unlike any other member of the pheasant family they are. They are no bigger than a French or English partridge, and their habits are much more akin to partridges than to pheasants. They were always in coveys when I saw them, usually numbering between 10 and 20, they ran a lot, and called incessantly to each other as they searched for food. That they seldom take to their wings is certain, and even when I was driving them into mist-nets they merely ran. The only time I saw them fly was when they went up to roost at the top of a 20 ft.

ree. Cocks always outnumbered hens, usually by as much as three to one. I can only presume that there is a heavy toll of hen birds to predators during the nesting season.

Variations in the plumage of cock birds are very noticeable. The red "blood" colouring on the breasts of some individuals is merely vestigial, while in others it is most pronounced. I have examined specimens of the Tibetan Blood Pheasant *Cruentus tibetanus*, in which both the breast and the face are redder than in *Cruentus cruentus*, and it is my opinion that the area where my birds were trapped is one where intergrades between these two races are found. I further feel that Delacour's boundary dividing these two subspecies should be moved approximately 150 miles further west. Another variable feature in cock birds is the number of spurs. These vary from one to three, not necessarily equal on both legs, and although one suspects that extra spurs denote an older bird, only studies of hand-reared birds will provide the answer.

I have never examined the crop of a wild bird, but the food that I saw them take included the young shoots of coniferous trees and shrubs, particularly juniper, young blades of millet, lichen, and small insects that they unearthed from the mosses that grew over the boulders.

My main impressions of the birds in their natural habitat were, first, how tame they were, and secondly, of their incessant calling (by both sexes) that invariably announced their presence. Beebe's account of how the birds "are remarkably silent" is, therefore, inaccurate.

One other observation that I made, which was of paramount importance when I later came to breed these birds in captivity was that, contrary to all previous authorities, the Blood Pheasant does not live at higher altitudes than any other member of the pheasant family. I saw Monals (*Lophophorus impeyanus*) on many occasions, and these were always almost exactly 1,000 ft. higher up the mountains than were the Blood Pheasants. Delacour has stated that the inhibiting factor with Blood Pheasants in captivity is that of disease susceptibility, on account of the high altitudes at which the birds live. Monals, as is well known, do perfectly well in captivity, and it was this observation, to which I have referred, which initially made me suspect that diet, rather than lack of resistance to disease, was the vital factor in keeping and breeding them in captivity.

CAPTIVITY

My second expedition to the Himalayas, in December 1970, afforded me excellent opportunities to study and experiment on the feeding of freshly trapped Blood Pheasants. Indian Airlines were on strike, so I and the birds were stranded for almost three weeks at Darjeeling (7,500 ft.). Eight cocks and nine hens were kept in an aviary at the Zoo, and a variety of food—mixed corn, grass cuttings, hard-boiled egg, apples, tomatoes and bamboo leaves—placed in their pen. It took the birds two days to get used to the apples (which had to be cut in two, as they seemed averse

to the skins), but thereafter the food which they preferred above all else was, first, the grass, and secondly, the fruit. Like the Koklass (genus *Pucrasia*), they are primarily vegetarians.

The following drugs were given to them in their water during their transit stay in India:

- * (i) Entramin: 1 teaspoonful per 2½ gallons.
- (ii) Occrycetin (Oxytetracycline): 1 teaspoonful per gallon.
- (iii) Vimeral (Vitamins A, B, D, E): 2 teaspoonsful per gallon.

On their arrival in this country, these drugs were continued: Entramin for 3 days, Occrycetin for 1 week, Vimeral for 3 weeks. Large quantities of grass mowings were given them in addition to the natural grass in their pens. I continued to feed them apples, introduced them to mealworms (to which they showed very little interest), and also gradually accustomed them to my normal pheasant diet, 50% wheat and 50% specially compounded pellets with a protein level of 24%. For the first month in England they existed almost entirely on a ration of grass and apples, and remained in excellent condition. One female died on day 18, and the post-mortem examination showed liver damage to be the cause of death.

The birds were then distributed as follows in my aviaries:

- (i) "A"-type *Aviaries*. Three pairs were isolated (visually) in three separate aviaries, where their only communication with other Blood Pheasants was by voice.
- (ii) "B"-type *Aviaries*. Three pairs were kept in neighbouring aviaries, where they could see their companion pairs on either side.
- (iii) "C"-type *Aviaries*. Two pairs (ringed with distinctive colours) were given the run of three contiguous aviaries, each 33 ft. × 7 ft., in which loopholes were left for the birds to pass through to the adjoining aviaries if they so wished.

These experiments proved of great interest in the spring of 1971. In the "A"-type aviaries, one hen laid three eggs and then deserted her nest. The birds in "B"-type aviaries tried incessantly to get through to their companions on either side. The birds remained in good condition and displayed, but no eggs were laid. In the "C"-type aviaries, each of the two pairs established its own territory in the two outside aviaries, grazing these till the grass was like a lawn. The middle pen remained "no man's land" and the grass remained virtually untouched. These two pairs were obviously the most happy of all. Although we never saw them mate, they displayed frequently and energetically. Occasionally a cock, or cock plus hen, would sally forth into "enemy territory". These incursions merely served to increase the sexual displays, and although a lot of chasing took place (cock after cock, and also cock after hen) there was no pugnacity

- * (i) M & B.
- (ii) Willows Francis.
- (iii) Glaxo.

exhibited, such as one would certainly expect from any other pheasant in similar captive conditions. These two pairs laid a total of 15 eggs, and on more than one occasion the hens, each of which had entirely different coloured eggs, laid in each other's nests. The first egg was laid on 20th April, the last on 16th May, and the birds started to moult on 20th June.

As a result of these experiments, and of my own observations in the wild, I can record that Blood Pheasants live primarily in coveys, that polygamy and polyandry are practised within these coveys, but that loose monogamous pair-formations within coveys are the normal practise. The group, or covey, is certainly the strongest bond of all.

Blood Pheasants are delightful subjects for an aviary. Mine quickly became even tamer than Tragopans (*Tragopan satyra*) that I collected on the same expedition. They never mope or sulk at the back of their shelters as do other members of the pheasant family. They graze with the avidity of geese, and are continually running around their pens in a most active and entrancing way.

The display is similar to that of the Koklass. The feathers are puffed out, the crest is raised, and much chasing takes place. Surprisingly for such noisy birds, the display is silent. The two pairs in "C"-type aviaries afforded us the best observations of the natural display of the genus. One cock would start to chase and display to his hen. The other cock would then immediately react and, racing through to the first pair's territory, take part in the chase which increased to a crescendo, during which the two cocks would display as frequently to each other as to their hens.

Delacour states that Blood Pheasants are reputed to drink "only from running water". In their natural habitat, all water (except snow) is "running water". In captivity they drink from artificial sources exactly as does any other pheasant.

BREEDING

These notes are confined to my own observations of breeding results at Daws Hall Wildfowl Farm, England, in 1971.

Egg. 48 mm. × 33 mm., extremely variable in colour. My three hens that laid all laid entirely distinctive eggs. These varied from pale pinkish buff to deep orange buff, and the markings from minute dark specks to irregular but large dark brown blotches.

Incubation period. 27–29 days.

Chicks. Since Grönvold's coloured illustrations of chicks at varying ages in Beebe's *Pheasants* (1926) and Delacour's descriptions in his *Pheasants of the World* (1951) are both inaccurate and incomplete, I feel that a fresh description of the chick at various stages is called for.

Head and chin creamy-beige. Broad black stripe along crown from base of bill to nape, broader on top of crown, and broad black stripe from

behind and below eye to nape. Bill vivid vermilion-orange. Body brown, dark brown band down centre of back, legs reddish ochre.

On close examination, the sexes can be distinguished at 10 days, the young cocks being generally darker and showing more grey on the shoulders.

By three weeks the overall body colour has changed to a mixture of deep brown and grey, the legs are darker posteriorly, the stripes across the head still remain and the bill is still vermilion-orange. Sexes are easily distinguishable at this stage, the blue-grey feathers on the napes and shoulders of the cocks contrasting with the warm brown feathers of the hens. Already the chestnut feathers of the crest are beginning to appear in both sexes. Pronounced buff stripes have appeared on the upper breast and flanks, and the whole of the mantle is spotted and pencilled with light buff.

At six weeks of age, the bill has lost its vivid vermilion colour, and is much paler. The stripes on the head have vanished, and the young birds are now recognisable as miniature editions of their parents. Young hens are uniformly brown, while the cocks have lanceolate grey feathers as do the adults. The only red, however, in the young cocks at this age is in the throat. Grönvold's illustration (in Beebe's *Pheasants*) of a chick at six weeks clearly depicts a young hen bird, though the colouring is inaccurate.

The chicks, like their parents, are noticeably active from the moment of birth, and delight in jumping on and off the backs of their foster-mothers.

My breeding results with Blood Pheasants in 1971 are summarised as follows:

Number of eggs laid	18
Eggs broken by parents/broodies	3
Infertile	2
Died during incubation	4
Hatched	9
Died during first two days	2
Died at four weeks	1
Reared	6

My 1971 breeding results of pheasants were in fact disappointing, and comparatively few eggs were laid. This was caused by a dietary imbalance or deficiency, which has now been traced and rectified. Had this not occurred, I would have undoubtedly had more eggs, and I would suspect that Blood Pheasants, like Koklass (*Pucrasia* sps.) are prolific layers.

The rearing of the chicks presented no particular problems. The eggs were incubated under broody hens and transferred to an incubator for hatching. The young birds were then consigned to a broody Silkie hen for rearing. The only awkward moment was when my Dutch assistant, Cees Stapel, an excellent aviculturist but a very moderate entomologist, was instructed by me to collect ant eggs for the day-old chicks. He



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Blood Pheasant Eggs showing variations

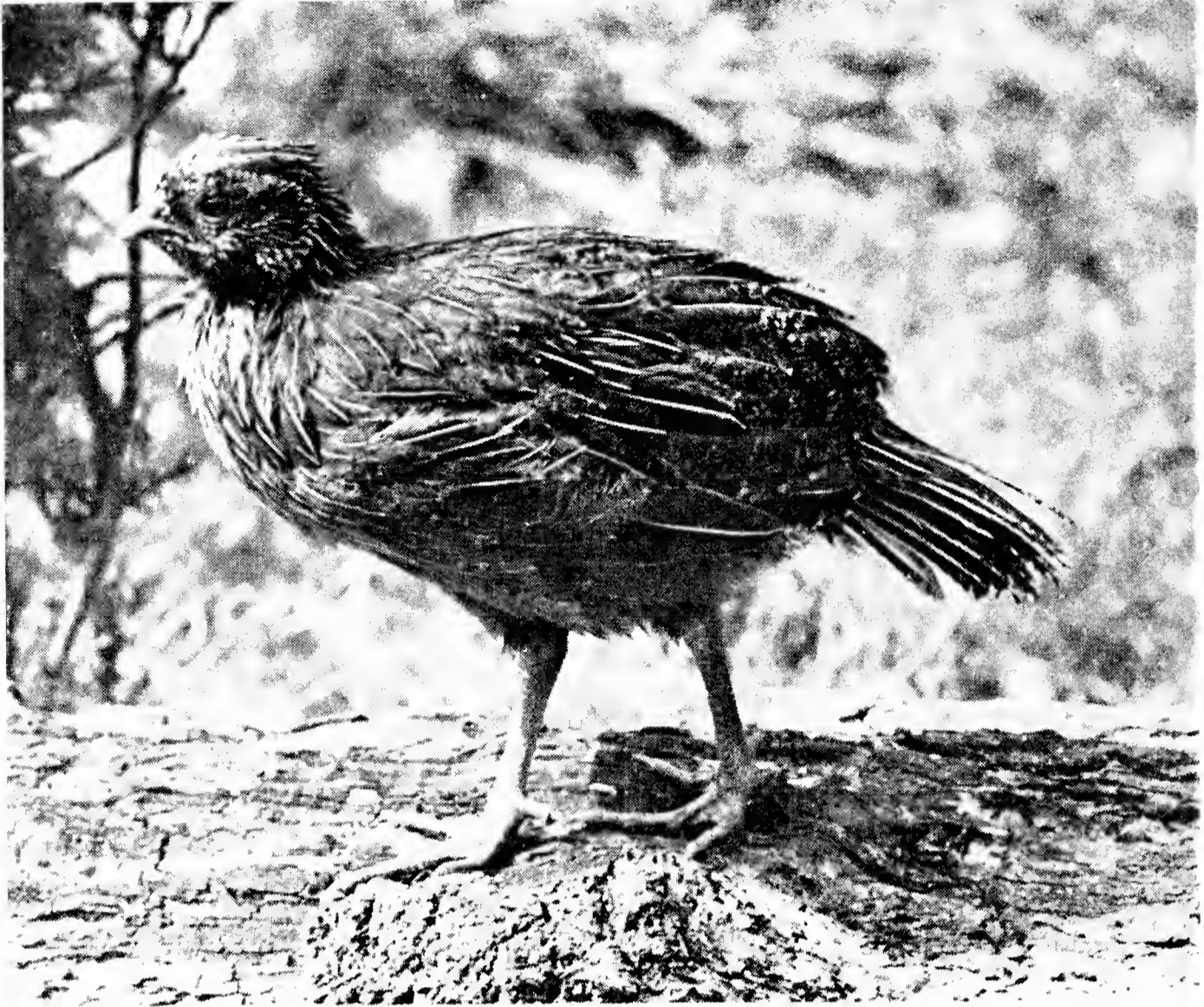
[Richard Burn



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Blood Pheasant Chick (1 week old)

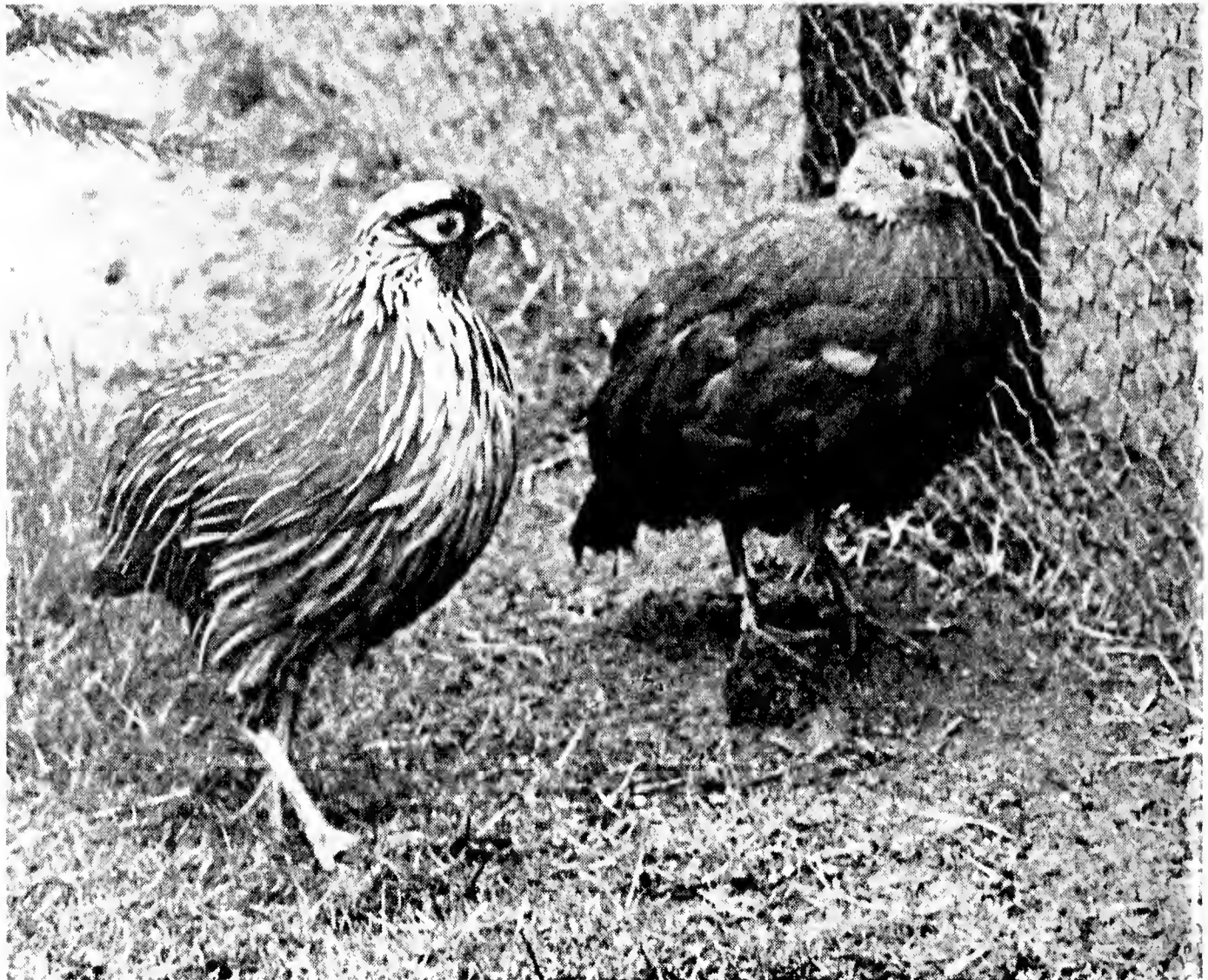
[C. P. Rose



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Young Cock Blood Pheasant at 6 weeks

[C. P. Rose



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Blood Pheasant. Adult Pair

[C. P. Rose

selected a very active nest of red ants and tipped the whole nest, eggs and "soldier ants", into the Blood Pheasant pen. "I wondered why the birds kept jumping" was his naive retort on receiving a mild admonishment.

The chicks were reared on a diet of turkey starter crumbs, hard-boiled egg yolk (first two days), mealworms and duckweed (*Lemna minor*). At two weeks of age they were put on grass, and it was noticeable, when the arcs were moved each day, how they avidly attacked the seed heads of the grasses in their small (6 ft. × 2 ft.) pens. At four weeks of age they were moved, with their foster-mother, to a permanent aviary with a shelter at one end.

In the wild, in the mountains of Nepal, I had observed how Blood Pheasants would quickly react to the presence of predatory birds and would invariably run (rather than fly) for cover at the first sign of danger. It was, therefore, of particular interest to observe the innate reaction of the young chicks to the danger call of the blackbird (*Turdus merula*). To the obvious mystification of their Silkie foster-mother, the chicks would scuttle for cover beneath a large log in their pen every time they heard this call, and remained cowering there until the Silkie called them out again.

SUMMARY

With only one successful breeding record to draw on, it would be wrong to be dogmatic. I feel, nevertheless, that the difficulties of keeping Blood Pheasants in captivity have been greatly exaggerated. Many pheasant keepers have found Koklass difficult, but we have never—admittedly I speak from only three years experience with this species—found that they pose any particular problems. The secret of successful aviculture is, surely, to study, either by observation in the wild, or through literature or, ideally, through a combination of both, the natural habits of each bird and to try and simulate these as far as possible in captivity. Blood Pheasants are primarily vegetarians, the covey instinct is strong with them, and I feel sure that if these two principles are borne in mind these attractive birds can be kept and bred successfully in captivity. That they are susceptible to disease is certainly true, and my own limited experience has shown that they have little or no resistance to *Histomoniasis* (Black-head) and avian tuberculosis. These two diseases, however, are ones to which all pheasants are extremely prone. Further research is certainly required before firm conclusions can be drawn regarding disease susceptibility of Blood Pheasants, and it is to be hoped that a captive stock of these pheasants can be maintained for this purpose.

As described above, the Himalayan Blood Pheasant (*Ithaginis cruentus*) has been bred by Major Iain Grahame. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

BLACK-HEADED CAIQUES

(Pionites melanocephala)

By GEORGE A. SMITH (Peterborough, England)

Black-headed Caiques are small South American parrots of the same body-size as Ring-necked Parrakeets (*Psittacula krameri*). Good illustrations of caiques may be found in Prestwich (1955), Rutgers (1965), Havershmidt (1968) and Bates and Busenbark (1969). A rough description of these odd-coloured parrots is that they have the back, wings and tail a clear holly green; chest and belly dirty-white; the base of the neck tan-apricot; lower cheeks, throat, thighs and undertail coverts orange; the entire top of the head, bill, legs and periorbital area skin are dull black. Total length is about 10 in. of which three are tail. Weight about 160 grams (5 oz.).

Two geographical subspecies occur: the "true" Black-headed Caique (*P. m. melanocephala*), which is found north of the Amazon river to as far east as the Guianas fits the above description; the "Pallid" Caique (*P. m. pallida*), which is also north of the Amazon but to the west of the continent, has the orange of the first race muted to lemon-yellow. Several of the Black-headed Caiques imported to this country—all of unknown geographical origin—exhibit many intermediate variations of colour between these two subspecies so that there may well be a cline, or interdiffusion, of the two races.

The only other species of caique—the White-bellied Caique (*P. leucogaster*)—may be thought of as a Black-headed Caique that has, as have so many other neotropical parrots, "lost" its black pigmentation. For the young fledglings of this species resemble, as it were, "natural hybrids" between the two species, because the legs, feet and exposed skin are black and the beak streaked with the same pigment. The head, which in the adult White-bellied Caique is bright apricot, in youngsters is dirty brown very thickly scattered with many black feathers. The albino-looking, flesh-pink feet and skin and the white bill of the adult White-bellied Caique takes almost a year to appear by the gradual absorption of the pigmentation. The head feathers become changed to apricot at the first moult.

Both species of caique, from Mr. F. Waite's and my own observation, react toward one another as if they are the same bird. Certainly I can detect no real differences in behaviour or voice. The separation of two geographically adjacent "species" on such an extremely trivial difference as the amount of melanin in the skin and tissues seems rather pretentious. Perhaps it might be better to consider all caiques as geographical races—subspecies—of the same bird, with the White-bellied as the most "advanced" species. Fig. 1 (map of distribution).

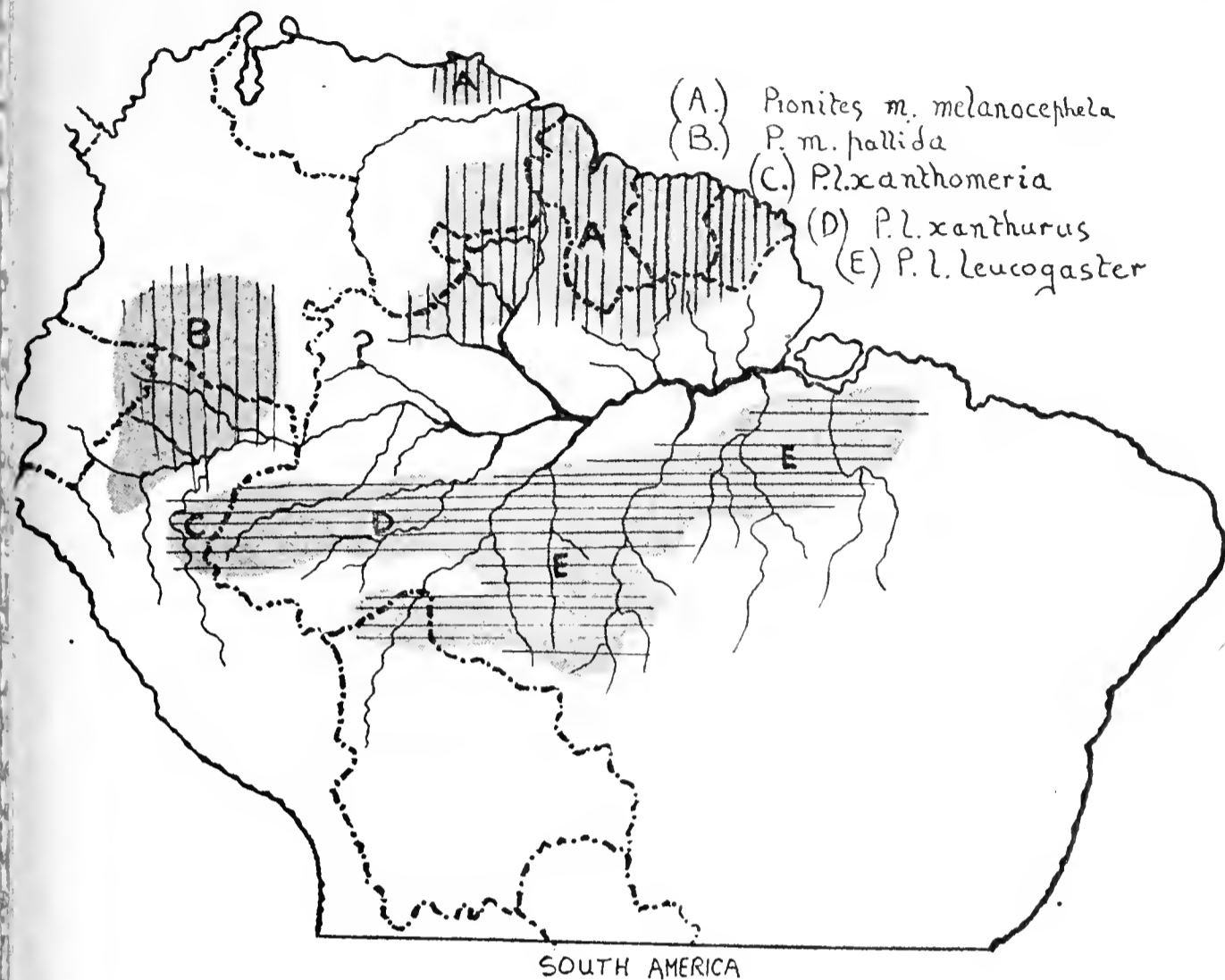


Fig. 1

Sexual Differentiation

After many bewildering months of confusion I believe that male caiques can be distinguished from females by behaviour and by the position in which they hold their body feathers. The comparison of beak dimensions (Butler, Prestwich, Bates and Busenbark) has no validity. Mrs. Williams, in correspondence, who has bred over 40 caiques during the past 13 years, remarks on the irrelevance of beak size and I have confirmed this with my own two breeding pairs. Intensity of colouring may also be of little practical value. I say this despite my having three hens of the nominate race that are so obviously paler in their orange colouring than are two males, of the same race, owned by Mr. Waite. His male caiques also have a definite yellow tinge suffusing the white of the underparts—this is not noticeable with the hens.

In late October 1970 I bought two "Pallid" Caiques from Mr. W. Duncan of Dumfries. These I wrongly accepted as a true pair. The larger bird (Havershmidt records that males weigh more than females) was a self-assured bully, treating humans with an indifference and contempt. If he bit, which he would do whenever the opportunity occurred, it was done without malice, rather as if it was the correct procedure with incautious fools. The other—from its smaller size, more drab coloration and gentle, confiding nature—was taken to be an obvious hen. "Her"

bill was so strikingly much thinner and more hooked than the other. These two male "Pallid" Caiques, for so they were, lived, except for slight bickering, as a seemingly perfect pair. Indeed so stupidly reluctant was I to abandon my opinion as to their gender, despite so much behavioural evidence to the contrary, that I kept them together until as late as early April of this year.

It is, of course, an extreme pity that the only absolute way of sexing live birds—by chromosome analysis (Hungerford *et al.*)—is too scientifically elaborate to be undertaken by anyone not having access to a good tissue-culture laboratory. Laparotomy (surgical investigation of the abdominal cavity) might be as effective. However my experience with autopsy material has shown that immature parrots, even with the benefit of a dissecting-microscope, can be difficult to sex. This, and a dislike of causing distress, forbade me using it on any of my birds.

With hindsight I now know that adult caiques are, especially if tameness allows close observation, reasonably easy to differentiate into males and females.

Males. When offered a mirror, or put in the near proximity of any strange caique, threat display, which is a slow, dignified, very upright walk punctuated by little jumps. When jumping the caique may physically leave the perch or merely "token" jump in which the caique "bounces" on the perch. The expansion of the orange-red iris gives the eyes a non-blinking, fixed, glazed look. Hardy (1963) quixotically calls this blazing of the eye "pupil flexion"—the iris is the muscle. Males, with blazing eyes, may slowly execute several slow, majestic bows, the head is dipped well below the level of the feet and then slowly raised until the bird finishes bolt upright. Every so often the head is pumped up and down which can result in food being regurgitated. The intention of feeding the other bird is obvious, males during this and at all times (unless frightened into sleekness) have the majority of the body feathers fluffed and the tail fanned out. Males often "wing-whirr" which consists of holding tightly to the perch and flying on the spot, simulating a bird caught by the feet and trying to escape by flight. This is always an aggressive or intimidatory act. Hens may "wing-whirr" on occasions, such as when her mate and another caique fight or when disturbed from the nest when both the sexes "wing-whirr" at my intrusion.

Female caiques are not aggressive towards other caiques, or only show the usual fighting and petty scraps that come when settling "peck orders". When paired off they may then become aggressive towards other females, more especially if their mate decides to flirt with the other bird. (Males are extremely aggressive one to another, when paired up—which might explain the large number of male caiques that have a toe, or toes, missing. I have not seen a male *physically* attack a female.)

Unless cold or ill hens are sleek-plumaged birds—more tidy-looking—than the rather dishevelled males. The tail feathers are so obviously

more tightly bunched. It is my opinion that flaring of the tail, puffing of the cheek, neck and body feathers of males and the narrower, pinched-looking tail and trimmer look of hens is the strongest guide to sexing *Amazona*, *Pionus* and *Pionites* parrots. Mr. Clifford Smith, in correspondence, corroborates this observation of mine with his breeding pairs of Amazons.

General Behaviour

The information given by Prestwich in his excellent article sums up practically all that is known about caiques in the wild and in captivity. I have two male and one female "Pallid" and three female "true" Black-headed Caiques. They are housed in three separate flight cages—two birds to each cage—in a well-lit, insulated but unheated, wooden shed.

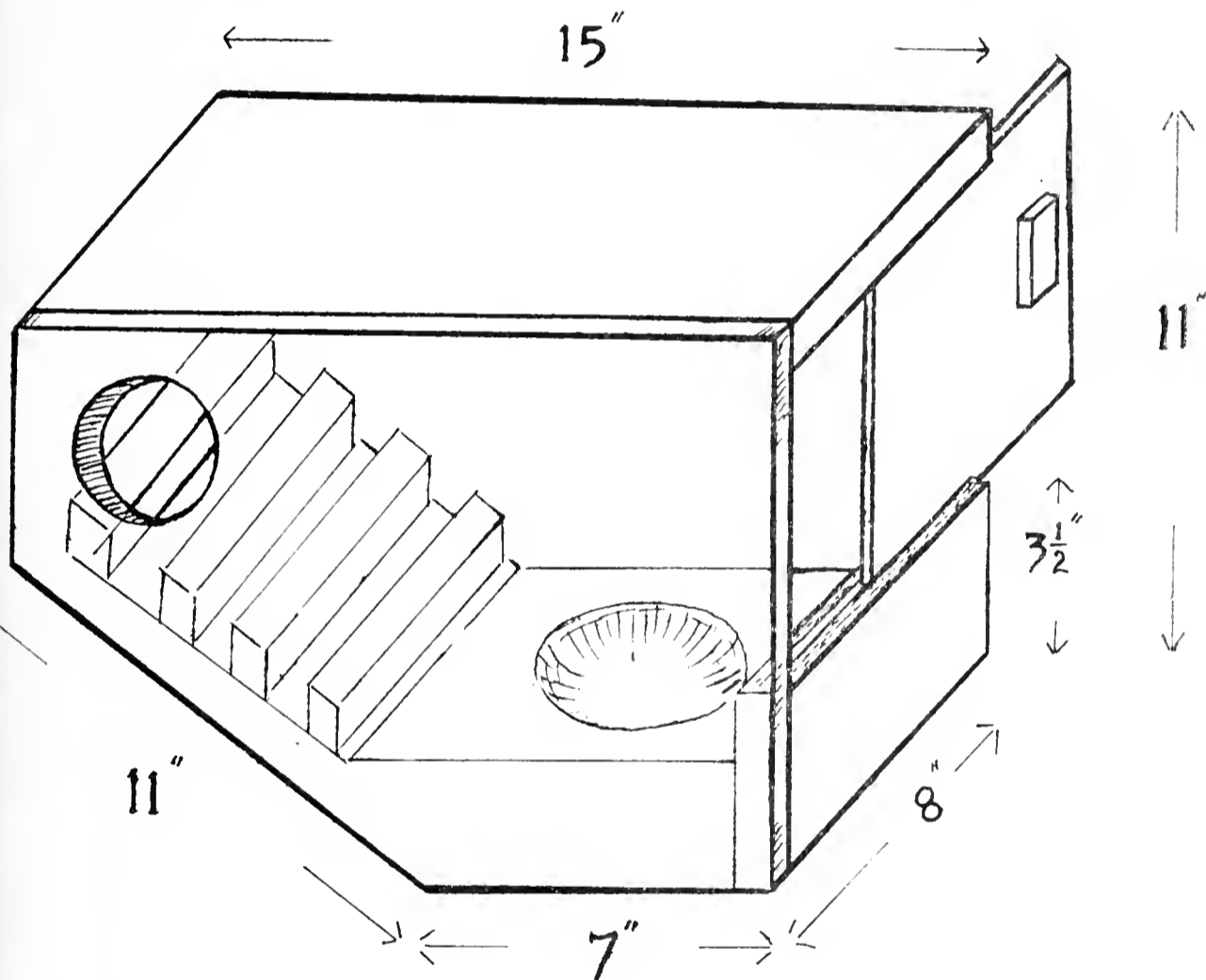


Fig. 2

The smallest cage is a 4 ft. cube and the largest is 8 ft. high, 7 ft. long, and 3 ft. deep. A distance of 3 ft., or more, separates each cage. Nesting-boxes are attached to the outside of the pens so that examination may be made from the centre feeding passage with little disturbance to the birds. Nest-boxes, built as they are from carpentry scraps, differ slightly in size. The one in which the first pair bred is illustrated in Fig. 2.

My original intention was to keep the caiques in their indoor quarters only over the winter. By then, I had hoped, observation might have had

them sorted out into potential breeding pairs, which would then have been turned out into summer flights. However the more that I checked up on any reference to the breeding of neotropical parrots, the more certain I became that the size of flight might be unimportant. More relevant, it seemed that almost all American parrots seemed preferentially to nest "indoors", in comparative darkness, rather than in the light of the open air. Therefore I restricted my breeding attempts to these three cages. Caiques are not infrequently bred, as the references in the International Zoo Year Books testify, yet, as far as my information extends, I believe that Lady Poltimore's 1936 success with ("hybrid" Black-headed \times White-bellied) caiques still remains unique to this country and, possibly, Europe.

Each one of my six birds had been bought privately during the last autumn, winter and early spring. For three weeks I also had a pair of White-bellied Caiques (*P. l. xanthomeria*) under observation. As they were youngsters, and therefore of no breeding value for this year, I loaned them out to a friend. Sadly not all my caiques are as blithely tame and indifferent to my close presence as are the two males. Generally the wilder ones take five or ten minutes to settle down after I take a seat in their shed. Work allows little free time yet I managed a minimum sum total of two or three hours of caique-watching a week. Once they started breeding, for fear of upsetting the hens, my contact was reduced to the feeding times, say 10 minutes twice a day.

Food and Feeding

As a group I find that none of my caiques will eat green food. I still offer some daily. At best it is taken up to be torn apart from some destructive urge and is certainly never eaten. Even green garden peas are ignored or bitten in two, tasted and dropped unconsumed. Sunflower and hemp seed, and precious little of the latter, form the main seed diet. When the chick hatched boiled maize was fed. This, bread and milk, and fruit—especially red-currants—formed the larger proportion of the chick's diet.

Cracked walnuts, they cannot tackle an entire nut, is the especial favourite food. Most, not all, eat peanuts. When the supply of walnuts dried up in February one pair of caiques, in protest, went on a futile hunger-strike, capitulating after the second day. Fruit is given daily. Pomegranates are favourite: being a strictly seasonal fruit they mostly made do with orange, apple and grapes (they will not eat banana). Red-currants and Siberian crabs, from the garden, reduce the summer and autumn fruit bill. Tree buds, eaten with relish by most parrots, are picked off the branches and dropped as debris.

Nothing seems to be known of the diet in the wild. By inference, and examination of the alimentary tract of an autopsy specimen, it would seem to be most probably composed of fruits and large seeds and soft-shelled nuts. For fear of them falling to some deficiency disease bread and milk are given occasionally over the winter and daily when breeding.

Likewise proprietary vitamin drops (Abidec, Parke-Davis) are added, sporadically, to the drinking water.

Caiques, when they eat fruit, swallow the juice rather than consume the pulp. When fruit is particularly juicy loose particles and droplets are thrown off the beak by rapidly flicking the head. Consequently, with caged caiques, the surroundings soon become festooned with small pieces of sticky, dried fruit. Like so many other birds, caiques also flick the head when under nervous tension. Thus a frightened caique disturbed by my near presence, and hungry following a railway journey, shook each sunflower seed in the beak as it shelled and ate it. Under normal circumstances dry seed is eaten with no such movements. Likewise a caique hovering greedily next to its feeding partner, longing, but not daring, to snatch the fruit from the rightful possessor, continually flicks the head. Much head-shaking is shown during courtship, by both sexes, and males, when challenging one another to a fight, do this pretty rigorously.

Males, I have not heard it from females, as they eat succulent foods, or when they drink—if they are very thirsty—utter a low, self-satisfied, whine. And it may be given, in anticipation, when putting fresh fruit into the cage.

The head is not raised to swallow fluid. When drinking water, or sipping fruit juice, the tongue moves, piston-like, lapping within the partly-open bill. In many ways, including colouring pattern, the movements of the birds, their shape, and in this lapping, caiques remind me of lorries.

Some parrots, for example Ringnecks and Lorikeets, seem not to mind another individual sharing a foot-held meal. Caiques are more selfish. An angry "squar" of annoyance is scolded at any adjacent caique—even if it is its mate and whom it may be feeding at the time—to make it keep its distance.

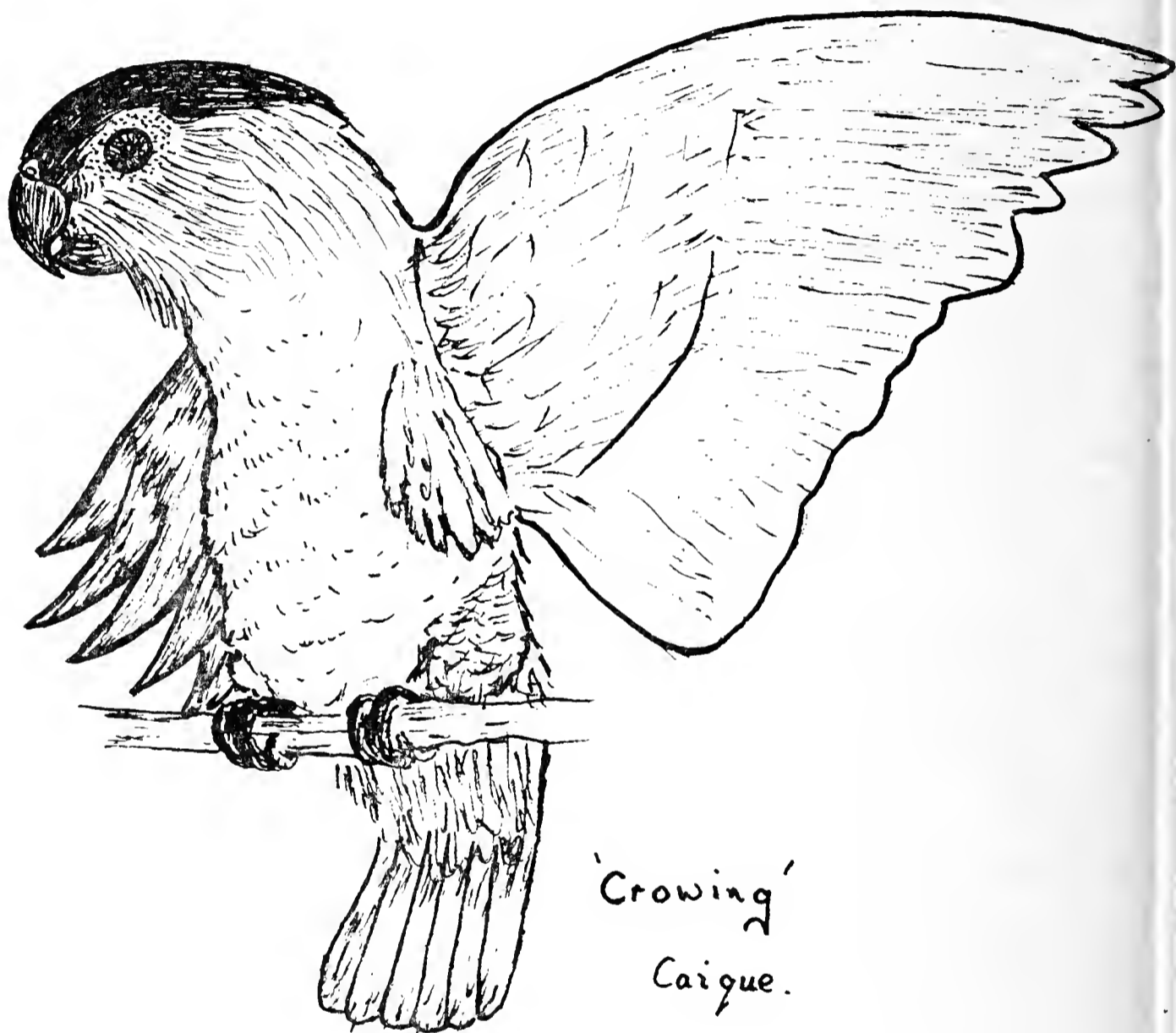
Caiques are extremely prehensile-footed (Smith 1971). I have not seen them stand on a food item to stop it moving. One male, when eating peanuts, separates the kernel into two halves; retaining one half in an upright foot it pares out the centre of the beak-held portion with rasps of the lower jaw. Then dropping the now boat-shaped, scooped-out half, takes the foot-held half from the foot and then eats that.

Voice

Caiques are most vociferous birds. Rather than go through the tedium of describing different noises and my interpretation of their function, I will limit myself to the three mentioned by Dorothy Snyder in her "Birds of Guyana".

Crowing: This is performed by both sexes when they are resting. The caique lifts the wings to momentarily poise them above the head. The raising of the wings reveals a patch of henna-coloured elongated flank feathers normally concealed by the folded wings. This signal marking,

despite the variations of body colour in the different "forms", is always of this rich orange-red. When the wings reach their summit the caique gives a "piping toot", which can be a single or a double "pipe". The wings are then closed. Crowing seems to be a contact, or "whereabouts" call. For all caiques within earshot tend to reply with similar crowings. Two birds of a pair may alternately crow, or even crow together. The noise is repeated at several minute intervals. A "low intensity" version also exists, in which the wings are not raised from the body, or just "taken" lifted and dropped—rather like a shrugging of the shoulders.



Screaming: This is a most unpleasant noise. Miss Snyder describes them as "Heeyah-heeyah" and "wheech-wheech-wheech". Just as young children sometimes take extreme delight in competitively screaming, pausing for a while after each burst as if savouring the very echoes, so do Caiques. This seems to be done without any purpose save exuberance; I suppose that "Heeyah-heeyah" is roughly indicative of what it sounds like. A far worse shrieking is that done in mobbing. If I carry a net or paper bag or start cleaning them out, introduce another species of bird or whistle a rapid, and poor, imitation of a cuckoo, then all start

screaming. It would have to be a very dull-eared predator to withstand such an onslaught of sound for long. "Wheech-wheech-wheech" is only part of the noise, warning "skwarks" are part of the din. Males "wing-whirr" while making this noise, hens remain sleek and frightened-looking.

The Nest-box

Like conures, and the smaller macaws, caiques roost within a cavity at night and they prefer a dimly lit box to one that is well exposed to the light. The pair of male "Pallid" Caiques that were housed together during December and January in my work-room deserted the nest-box provided, next to the window, and made a nest on the floor, in the very darkest corner of that ill-lit room under some scraps of timber and plywood leaning against the wall. The floor of the nest was made springy with a mattress of wood parings.

It may not be generally realized just how many parrots, other than the well-recorded Lovebirds, Hanging-parrots and Quaker Parrakeets (*Agapornis*, *Loriculus* and *Myiopsitta*), actively construct a nest. Mrs. Johnstone (1907), writing of the breeding of the lorikeet named after her (*Psitteuteles johnstoniae*), describes how the birds half-filled nest-boxes with "scraps and bits of twig and fibre". During a telephone conversation Miss Chamberlain told me that her Chattering Lories (*Domicella garrula*) built a nest, within their box, from bark peelings stripped from a vine growing in a greenhouse they were occupying.

Roseate Cockatoos (*Cacatua roseicapillus*) have been several times recorded as collecting nest material; e.g. Suckley (1961) writes, "the male alone built the nest from pieces of willow about 6 in. long, taking them into the tree". And H. Diekmann (1961) says of Leadbeater's Cockatoos (*C. leadbeateri*) that once they have taken possession of a box they "steadily carry dried leaves and shavings into it".

Most (certainly all those that I've bred) Australian parrakeets carry nesting material—pieces of chickweed and blades of grass—into the nest-box, even if they may be removed later. This cannot be wholly incidental for it is unusual for grass-parrakeets (*Neophema*) and Manycolours (*Psephotus varius*) to carry green-stuff in the beak. Holmes-Watkins (1952) substantiated by Forshaw (1969) writes that Splendid Grass-Parrakeets (*N. splendida*) "like lovebirds tear off strips of green leaf and tuck them behind the wings and in the rump feathers".

Keas (*Nestor notabilis*) build quite substantial nests (Jackson 1963). Such a list of the use of nesting material by parrots might be continued for many species, for which I have references.

Male Caiques (hens to a far lesser degree) strip parings from the inside of the nesting chamber to form an inch-thick mat for the bottom of the box. Yet should a detritus of "sand, soil and twigs" be put within, this is scraped out by the birds (Mrs. Williams). This year by experiment

I have given, as a nest-box filler, for all my parrots, including the caiques, a small fistful of dry wood shavings—avoiding the usually recommended damp, decaying vegetation. These wood shavings were chewed up by the birds into smaller fragments. The pair of hens that are kept together have barely touched their nesting litter.

Chewing the wood of the box takes place in the day but mostly by night. When the cocks are chewing they interrupt their carpentry with a characteristic "nest-box call". When the caiques were inside the house, in the work-room, this noise and the gnawing were sufficiently loud to awaken me every night and persistent enough to keep me from falling off to sleep again.

The roosting chamber is never defaecated in. Caiques, even when they are not provided with a roosting box, still practise this nocturnal continence, voiding a large cumulative stool after they leave the roost in the morning. Breeding males guard their box against other males and the females against other females and therefore they generally sleep in pairs. Several non-breeding hens, or one cock and several hens, may roost within the same cavity with only slight squabbling between the birds.

Bathing

Caiques bathe several times a week. They do this exactly like a Blackbird. The head is dunked under while the bird stands in the water and flutters water over itself. This is strongly mimetic, if one pair bathe then it is usual for all the rest to follow suit.

Caiques also foliage-bathe, which consists of rubbing themselves on rain-soaked branches, and they have a unique habit of chewing off a piece of bark from a twig and rubbing themselves on the resulting moist, exposed, wood surface. I am not certain as to whether such a moist area stimulates the caique to rain-bathe or whether they peel off the bark that they may sap-bathe. Caiques, mostly seen in isolated individuals, will rub themselves on perfectly dry projecting twigs. In this rubbing, which has a cat-like quality, the cheeks, sides of the neck and the belly are involved. Usually alternate sides of the birds are rubbed in sequence. Because of this habit, caiques, especially if housed outside with natural wood perches, often have a dirty soiled look to the feathers concerned. Miss R. M. Low, in correspondence, has said that this sap-bathing, seen in her own caiques, reminds her of anting, so engrossed do the birds seem in their actions. Tasting the sap and experimentally rubbing it in a wound gives no acrid taste or sensation.

Preening

A preening caique often stimulates another adjacent bird to walk over to preen the first bird. This second bird will often take over the area being preened by the first bird, whereupon the first bird leaves off. Should the allo-preened area be lower than the head of the first bird then

the preening position then assumed by the second bird—head bowed—often stimulates the first to then preen the head of the second bird. All areas of the body may be preened by another, yet attention mostly seems to be settled on the head. Two caiques may simultaneously preen one another, like mutually grooming horses. Preening is not exclusive to mated birds; all caiques preen one another quite irrespective of sex—it is a social rather than a sexual act. Caiques in a high state of nervous tension visibly simmer down in excitement when preening or being preened.

Breeding

Initially, as I have said, my perplexity as to how to sex caiques was aggravated because I would persist in putting emphasis on such irrelevant items as colour and bill size. Several people had told me that captive caiques may often be seen to physically pair with one another. Yet I had to wait until the 8th April of this year before I saw, on the same day, but on different occasions, my two males feeding one another and then attempting to copulate. All doubts gone and now satisfied that they were indeed two males I put the smaller "hen" bird into the smallest pen which then contained two hens. (I should explain that this particular male spent much of his time clinging to the wire of his original cage facing, and obviously wanting to make closer acquaintance with these two birds.) One of the hens always held her beak slightly ajar, despite being able to close it firm. It was this caique that attracted the male's attention. Once inside the new cage he pursued this hen and repeatedly regurgitated food trying to get her to accept being fed. The intimidatory walk and eye-blazing was mostly in abeyance. Eventually within 15 minutes the hen, reluctantly it seemed, took food from him and after another few minutes they were actively preening one another. The second hen in the cage, though not directly attacked, became increasingly frightened, so I removed her. Some hens in breeding condition have this gaping lower jaw; certainly I can now identify it in three of my four hens, but have not noticed it in males. Females with "normal" bills seem frightened of a male's attentions. This gaping of the bill may well be, of course, an artifact due to incorrect feeding, or some management factor. It is certainly not due to overgrowth of the beak.

A nest-box was given to this pair of "Pallid" Caiques on 15th April. Immediately the male, after only some very slight reconnoitring accompanied by low whistling noises and not a little wing-whirring, entered the box. Once within he began to chew and made the same nest-box noises as had kept me previously awake at night. Gradually over the days the wood-parings from his activities covered the concave bottom to the box. As later with my second pair, chewing was restricted to the pieces of softwood purposely nailed inside the box just for that purpose. Insubstantially built as the boxes are, being largely plywood, the birds

never marked the finer wood's surface as if its frailty was fully "understood" by the birds. When males are in the box they make almost the same, if not the identical, feeding noise, when regurgitating or feeding their hen, as when they eat fruit. Outside the nest-box males—before egg-laying commenced—very often regurgitate food. When they do so it is always accompanied by a "te-de-dah" low whistling noise. This feeding sound has a strong attraction for the females who, as they hear it, come scurrying up to take the food offering. Paired birds are seldom far apart and often sit with their tails crossed. Once they are sexually paired off hens seem each day slightly more puffed in their feathering than the day before. So that before they actually lay it is possible to be momentarily confused as to which is the male and which the female. As their fluffiness increases so does their aggressiveness towards other hens.

Copulation has been seen on several occasions. Like conures one foot is placed on the back of the female while the other foot retains its grip on the perch throughout the pairing. Mating may take place from either side of the hen; once started there is no changing of sides as with lovebirds (Dilger 1960). Copulation is a prolonged process and may continue for 10 minutes and it seems, from its thrusting action, to be more mammalian than avian. Very, very many attempts are made for each successful pairing. No overt courtship precedes this. However a male was seen preening his partner's head in a most unusually vigorous fashion and then followed this by mating. Usually the male—paired birds always sit adjacent to one another—gingerly places his near-side foot on the small of the female's back. Often the female takes a side-step and so puts a temporary end to the male's efforts, or, on occasion, a hen may raise her foot to ward the male off. Another avoidance action is for the female to slip under the front of the male's body—which is easily done for caiques stand almost as vertical as a penguin—to rest on his other side.

With both of my breeding pairs of caiques I have seen, on four separate occasions, a male mounted by a female. In each instance it was because a hen persistently refused to be trod by the male though she would stand teasingly adjacent. Following a series of frustrated attempts at copulation the males deftly put themselves (by holding the body horizontal and easing themselves) under the females, which results in the hen mounting the male. Though active this was never quite such a vigorous pairing as when the roles are reversed. Each time the male, after a few minutes, eased himself out and then tried to mount the female, but always unsuccessfully. Likewise hens sometimes feed males. When regurgitating a male invariably accompanies it with his "te-de-dah" noise. Hens, when they feed males are silent, likewise they keep their plumage sleek and not fluffed as males do when they feed females. Hen parrots not uncommonly feed males. Brockway (1969) says of budgerigars that "under appropriate conditions all behaviour patterns except sperm emission, incubation, feeding of young less than seven days of age and 'egg laying' may be

performed by either males or females." And this is probably true of the vast majority of parrots. In caiques (as with these others?) it is exceptional rather than invariable for a female to behave as a male. The following two examples may show that with caiques a hen may sometimes feed her mate as a displacement activity when his attention is distracted from her.

A female not daring to approach her mate for fear that he would lunge at her while he was engrossed in eating peanuts—to which she is indifferent—after a few minutes regurgitated and fed the cock. Another hen regurgitated food, and swallowed it back without attempting to feed her spouse, when he was eating orange and not paying attention to her.

One most obvious aspect of caique feeding caique is that the feeding bird firmly grasps the upper beak of the recipient at right angles and the food is pushed, by the tongue, into the side of the bill. All the many other parrots, save conures and macaws, that I've seen cross-feed one another or their chicks do so by approaching the two beaks head on—like feeding finches. Feeding in this side-beak "conure fashion" seems to be more messy than the "orthodox" way for the hen very soon acquires a dirty face from spillage and, following each feeding, portions of the meal can be seen adhering to the upper mandible.

Sequence of Nesting of the First Pair

14th April 1971.—Male seen, for first time, to pair with female. The other male whose hen is not interested in nesting because the log then provided was not suitable for nesting in, has a musical 'ow'; this noise is always accompanied by a head flick.

12th May 1971.—For some days the pair has been dueting. She whistles a "da" and he immediately synchronises with a "de" note, as if the noise was uttered by a single bird, no appreciable interval separating the notes. "Da" is a rising note, "de" a falling one. Minor squabbling when the male offers his head for preening to the female and she won't comply; he gives the same noise as if she were trying to steal food off him. When the male challenges, the male on the other side of the passageway "threat walks", as described before, but makes progress towards his rival by "helicopter flying"—flying up unnecessarily high and dropping down on the perch, each flight taking it nearer the second male. When the belly feathers are fluffed the colour is noticeably darker because of the shadow at the base of each feather. The hen, often sitting fluffed now, utters a short note of "za" very often.

25th May 1971.—Hen often in box. If not, when I make my appearance, she hurries over and pops inside with the male in pursuit. Such a lack of circumspection about revealing the whereabouts of the nest is characteristic of parrots in general. When not in the nest the caiques are always found sitting at the furthest point away from it.

28th May 1971.—At mid-day the hen was found on the floor of the cage with her feet contracted, the toes bunched, otherwise she seemed fully

conscious. Believing that she was going to lay, and palpating an egg, I injected her with calcium borogluconate as treatment for egg-binding. While she lay on the floor the male remained close to her side and made continual attempts to copulate with her. Five minutes following the injection—as so often happens with calcium injected egg-bound hens—she was seemingly normal and climbed back into the nest. A few hours later I found she had laid her first egg of a clutch of three, average size of which was 29.5 mm. by 23.5 mm., weight average 9 grams (an egg to body ratio of about 1 : 16), incubation beginning with the first egg. Three seems to be the general number (Mrs. Williams). Lady Poltimore's bird laid four and my second pair two. (These second eggs were lighter, longer eggs and measured 30.5 mm by 20 mm.) The laying interval between successive eggs the usual two days.

From the very beginning and throughout incubation hen caiques very often utter a persistent series of slightly hoarse-sounding "squee, squee, squee . . ." which is given whether the male is in the box or outside. Though not a loud noise I could distinctly hear it from a 20-yard distance. The relationship between this brooding noise and that made by the chick is interesting. When I first heard the chick, at three days old, it was as a thin "peep, peep". It was in fact the same sound as that made by an incubating hen but given through a smaller instrument. For as the chick grew the tone changed continually with its ever-increasing size so that by eight weeks the noise that it made precisely duplicated that made by incubating hens. Indeed the male behaved, from seven weeks onward, towards the nest-box as he had during the incubation. For he flew on the wire adjacent to the box when I fed them and would enter and peer out at me through the entrance hole. A practice that he had abandoned shortly after the chick had hatched.

When the alarm note of "weyak" is given by another caique the wheedling noise of the incubating hen stops and she may look out of the box. Males often sit inside with the hen, snuggled by her side, though not on the eggs, for some of the day. They continue roosting at night within the box throughout the whole of the reproductive period. After fledging the chick shares the box with the parents at night.

Caiques normally roost very early in the evening—at least an hour before sun-down. Breeding males retire much later than this and as with *Pyrrhura* Conures, may often be seen within the box but with the head peering out. Hens bathe regularly during incubation though with more frequency towards the end of the period. A single chick hatched from both clutches. The remaining eggs were fertile and contained full-term chicks that I assume failed to hatch because of the dry conditions inside the shed. Incubation is 27 ± 1 day.

Caique chicks are typical of neotropical parrots in that the bill has the characteristic bulbous swelling at the base of the upper, and to a slighter degree the lower, bill (Figs. 4 and 3). They have massive muscular napes

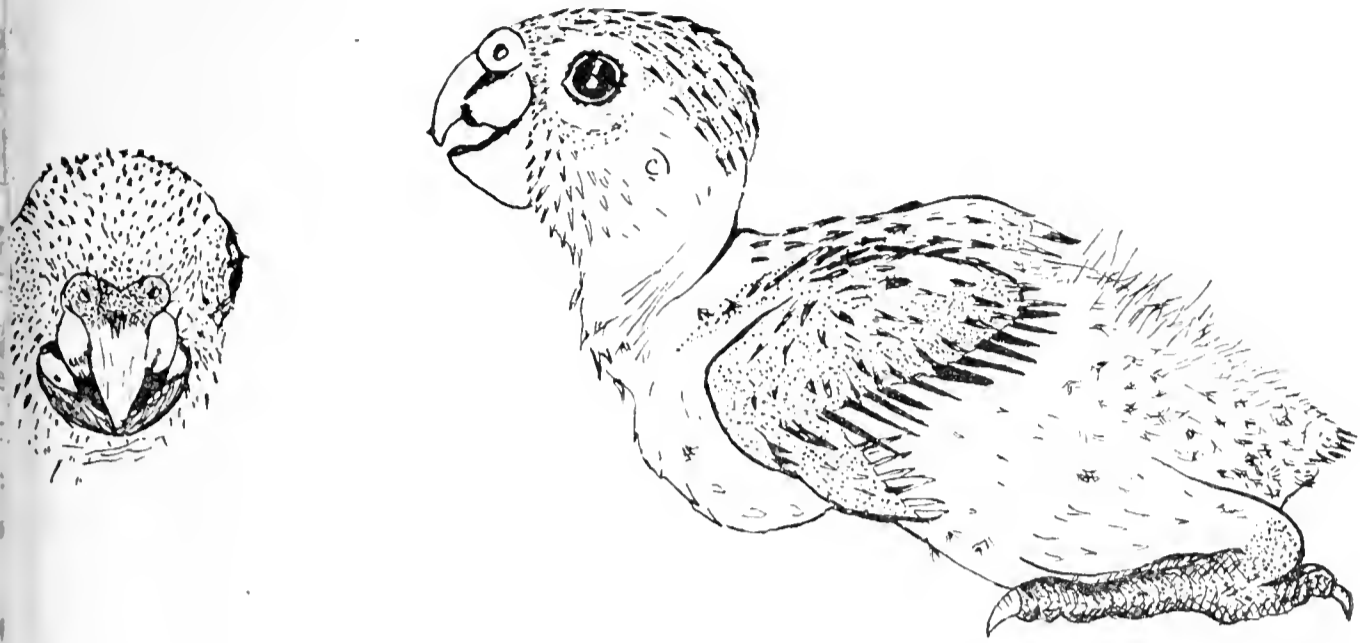


Fig. 3. 37-day old chick showing swollen base of bill.

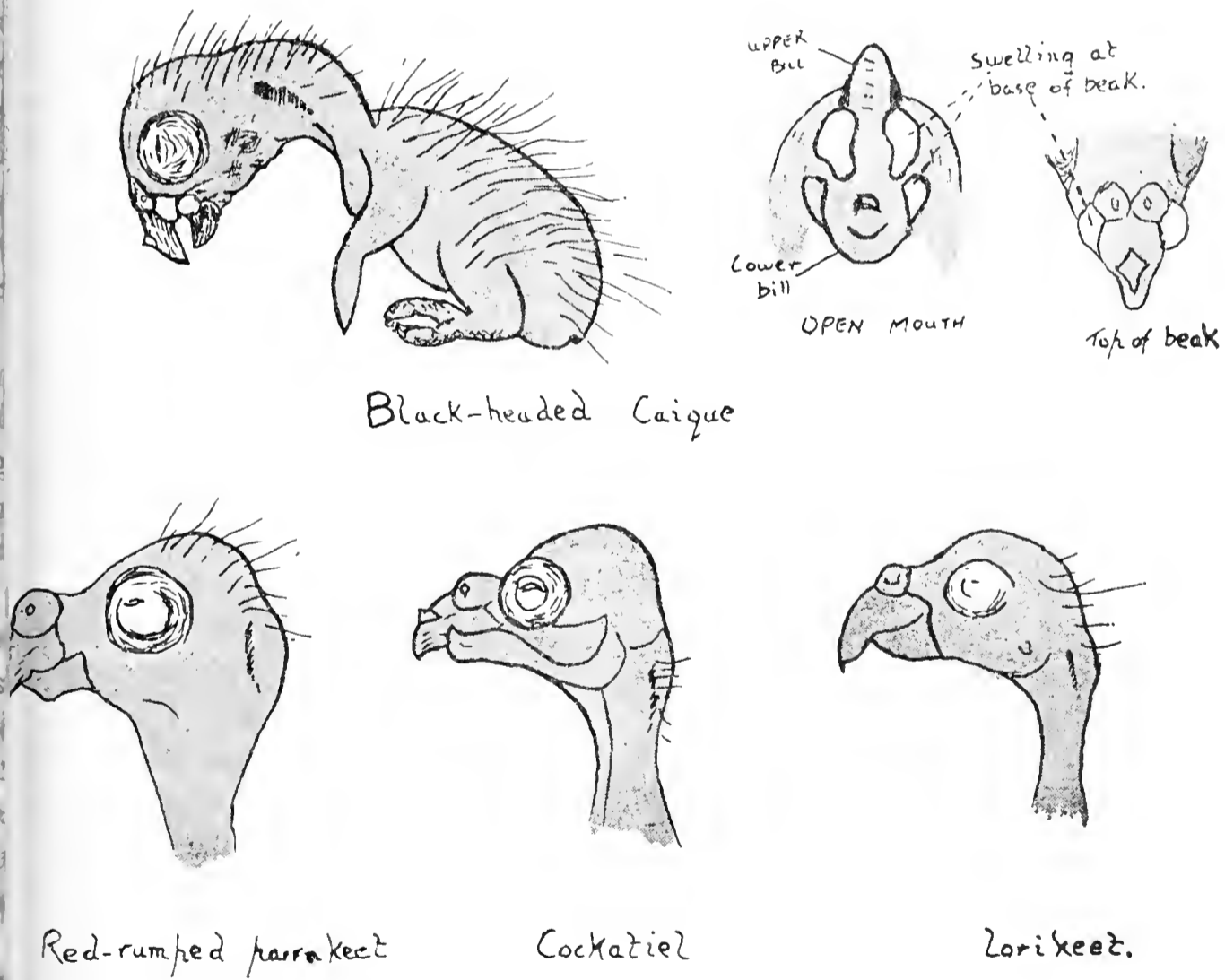


Fig. 4. New-hatched Parrot chicks

to the neck when hatched—because a chick being fed, like an adult bird, vigorously bobs the head up and down to stimulate the feeding bird. The body is clothed with a white, not too thickly distributed, filamentous down. (Development almost exactly duplicates that of the hybrid macaw chick photographed and hand-raised by Mr. Ralph Small, illustrated in the second edition of Bates and Busenbark.) The newly hatched chick cannot raise its head from the ground. Body growth is steady so that in a fortnight it was as big, and almost as rotund, as a golf-ball. It must have possessed considerable powers of cold tolerance, for the hen, once it reached this stage, spent large amounts of time out of the nest and the chick, when I examined it, which I did almost daily, often seemed dreadfully cold to the touch. Never at any stage did I see it with other than a tightly packed crop. Distinct from Australian parrots, nothing recognizable as food could be made out through the transparency of the skin, a milky white firm-feeling mass filling the crop. After a fortnight I could feel portions of hulled seed. I could never see grit in the crop, nor could I find any in the chick's rather watery faeces when I examined these, nor have I noticed the parents collect such. It being a general observation of mine that usually once parrot chicks hatch, the male spends much time on the floor searching after grit. This is necessary because parrot chicks are fed on part-digested grain and the grit is needed in the gizzard to triturate the food. Even day-old chicks of other parrots most often have grit inside them. Though the chick had very watery faeces the nest-box remained perfectly dry throughout the rearing. From five weeks onward a fresh pile of soiled nest material lay on the floor under the nest hole each day and I believe that the parents scraped it out with the feet because most of it was too dust-fine to have been picked up by the beak.

At 20 days the caique chick's eyes were perceptible as mere slits. A curiously pale, absolutely helpless chick, gross with fatness. The appearance, even at this stage, is rather foetal or embryonic. At 25 days old a faint blueness of the skin on the wings indicated where feather formation was taking place, and at four weeks the pin feathers could be seen in the wings. Growth of body and feathers seemed more rapid at this point onwards yet the chick was 28 days old before I saw it holding its head off the ground. At five weeks it resembled a porcupine and at 39 days I could see the first colour—the green of the wings. At six weeks it was clearly identifiable as a Black-headed Caique and it weighed 124 grams (4 oz.). It first looked out of the box when 52 days old and left its security and the nest after 73 days (Waite's hybrid Black-headed/White-bellied caique took 71 days), after hanging suspended head downwards from the nest hole for several days previous. It was first noticed feeding itself, on bread and milk, a fortnight later, though the parents still fed it. By now (late September) the parents had recommenced spending long periods in the nest-box and the male was feeding the female, probably

indicating that they are going to nest again. The annual moult took place throughout the breeding period of the first chick.

Description of Chick

The weight, 124 grams, at which it left the nest was exactly the weight at six weeks of age—a month previous. It seemed about a quarter smaller than the parents. The beak horn-coloured, save for the black, streaky base to the upper mandible, periorbital skin pale grey, iris dark mahogany brown, thighs green-streaked and all the yellow body feathers noticeably paler than the adults. The most obvious difference between it and the old birds is that the chest and belly are pale yellow and not dirty white.

Once the chick hatched the male almost ignored the female *outside* the box. Hardy (1963) saw much the same thing with wild Orange-fronted Conures (*Aratinga canicularis*). From the 10th day onwards the male fed the chick directly, until then, in the usual sequence, he fed the hen in the box and she then fed the chick.

Classification

Caiques are short-tailed conures. D'Arcy Thompson (1899) showed the similarity of the skull in this "group" of birds. However, Peters (1937) and de Schauensee (1966) ignore this evidence and but slightly modify the classification of Count Salvadori (1891), for they place them between *Touit* parrotlets and *Pionopsitta*.

Throughout the above article I have purposely stressed the conure-like affinities. Red-capped Parrots (*Pionopsitta pileata*) which I have kept seem to display no resemblance of behaviour or anatomy, the only similarity is the brevity of the tail. Redcaps are extremely fond of green food, indeed the enormous length of bowel would seem to suggest that vegetable matter might form the chief diet. They also roost on a perch and not in a cavity, the faeces falling where they sleep. They have none of the conure screaming harshness of voice. To my ears they sounded a bit like guinea fowl. Conures and caiques are "extrovert", Redcaps are "introvert"—being submissive, mild-natured and absolutely inoffensive with other birds. Scratching of the head is over the wing, caiques and conures scratch under. When threatened or frightened Red-capped Parrots sway the body laterally like *Amazona* parrots, and exhale air in a mild hiss as they rock with the wings lifted away from the body. Caiques and conures move the head in such circumstances vertically up and down, and they do not hiss.

Acknowledgments

I would like to thank Mrs. Betty Williams for replying at length to my correspondence; Mr. Frank Waite and Mr. Clifford Smith for allowing me to examine their collections of birds, and more especially

their nestling parrots; and Miss Rosemary Low who so kindly volunteered to look after some of my birds when my slender accommodation finally burst at the seams with caiques.

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BREEDING THE RUFIOUS-BACKED SHRIKE

(Lanius schach)

By M. D. ENGLAND (Neatishead, Norfolk, England)

An account of the partially successful breeding of my pair of Indian Rufous-backed Shrikes has been published before (England, 1969). On that occasion one youngster was reared, partly by the parents and partly by hand-feeding. Despite imperfect feet it is still alive and well and is believed to be a female because it is an indefatigable, though inexpert, nest-builder and because it has lived for two years with a known female of the same species, which also builds nests, without any further progress towards breeding. Their association, both in aviaries and cages, has been amicable (which is unlikely had they both been males), any slight difference of opinion being settled by the use of submissive or conciliatory bowing by the dominated bird—accompanied by a rapid staccato clucking by both—which instantly puts an end to any aggressive behaviour between birds of this species.

In the following year two young were reared to a fortnight old by the original pair. However, in the very early hours of a June morning, during my absence abroad, a lot of noise from the aviary brought my wife into the garden to find both young birds on the ground, one of them dead. She hand-reared the survivor but it unfortunately died later from an infection.

This (1971) spring the parents were moved to a larger aviary, 22 ft. × 4 ft. × 7 ft., with an "escape" door at one end, the intention being to allow the male his liberty when the female commenced incubating if, as on previous occasions, he refused to take anything but mealworms to the nest. In the event this proved unnecessary.

Some forked twigs (in fact those used as a nest-site by my Great Grey Shrikes in the previous year) were put up close to the roof of the flight, with fresh holly tied round as screens. It was sheltered from above against rain and sun. A neat nest was built of sticks and coarse grasses, lined with finer grasses and roots, with some glass wool which I use in preference to natural wool under the impression that it is less likely to get twisted round toes; it is certainly a good insulator. No actual courtship was noted, though such sexual activity as was seen was initiated, as recorded before, by the female, who begged (ineffectually) for food with fluttering wings and crouched in a soliciting posture. With binoculars from a bedroom window it could be seen that on 30th April, when incubation commenced, there were at least three eggs. Partly to avoid interfering, and partly for fear of being scalped by a very brave pair of birds, I did not enter the aviary for a closer inspection. That night, and for several nights thereafter, there was a sharp frost.

Despite my getting used to the alarming way in which shrikes leave their eggs for long periods, there appeared to be several occasions when

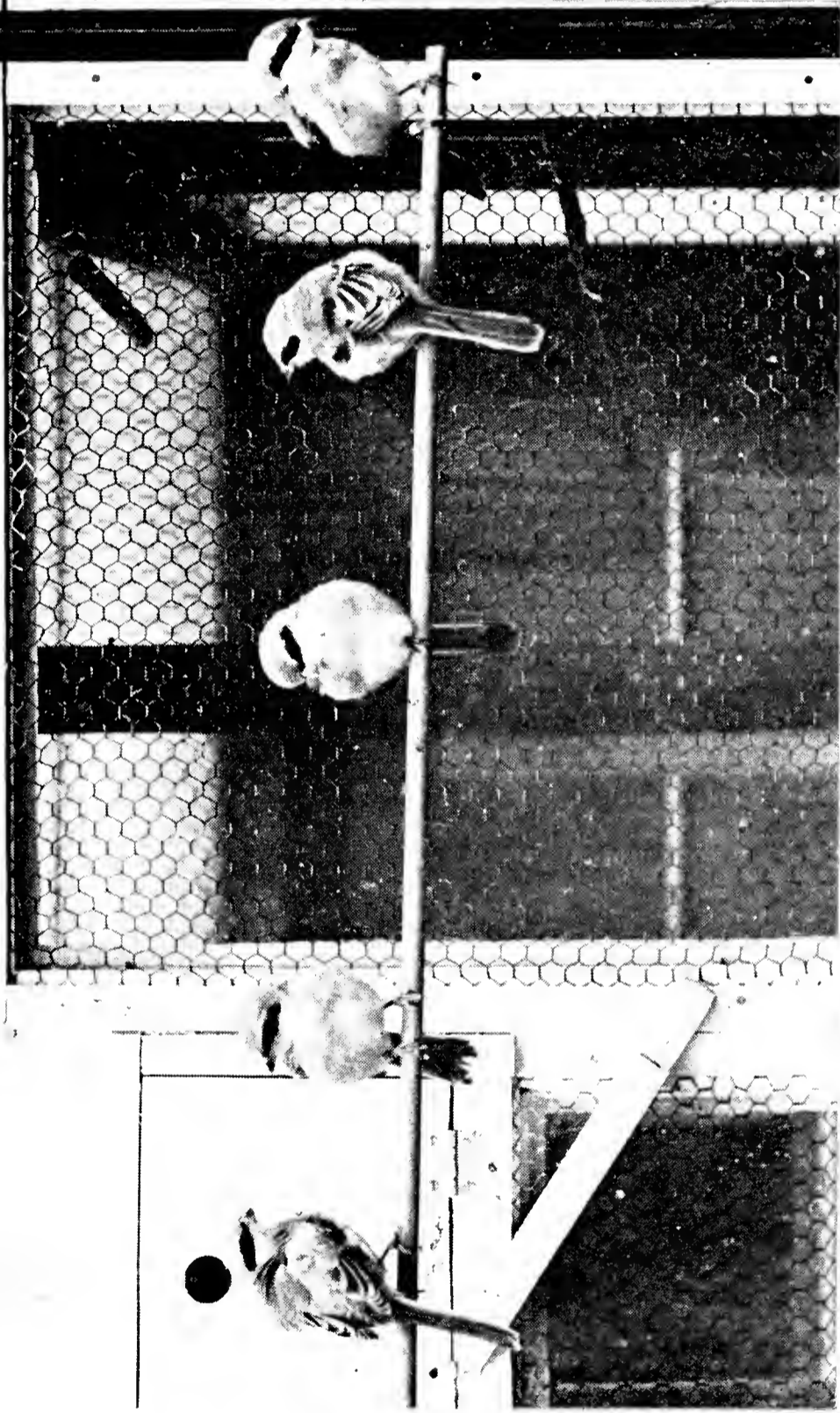
these eggs must have become very cold. However, on 18th May an eggshell was seen impaled on a favourite thorn—hatching had started. Incubation was entirely by the female and lasted 18 days.

Their normal winter diet of diced ox heart rolled in Vionate, middlings and bone flour, with occasional locusts and maggots (augmented with powdered cuttle prior to and during laying) had been continued through the incubation period until a day or two before hatching when mealworms fed on white bread and rolled in Vionate were added.

As on previous occasions the young were fed entirely on mealworms for the first few days. Practically all food was taken to the nest by the male and passed to the female, who in turn fed the young. She left the nest at almost no other time than to defaecate until the young were nearly a week old, when she started collecting food herself. This year the parents took meat and small locusts to the nest as well as mealworms, though the last predominated. Food scattered on the floor of the flight was taken much more readily than that in dishes in the shelter, although this is, of course, a wasteful method of feeding since both mealworms and locusts escape. Only one item at a time is taken to the nest, unlike so many insect-feeding birds which carry a loaded beakful. It seems worth recording that to shrikes (or at least to those species which I have kept) there appears to be a minimum size of creature which they regard as edible. Thus half-grown maggots, newly-hatched locusts and very small mealworms are left untouched even when a bird is desperately hungry.

By the time the young were a fortnight old, pieces of ox heart about 1 cm. square, straight from the refrigerator, were being thrust down their throats by the parents in between mealworms and locusts. Feeding was by fits and starts, intense activity alternating with periods of complete rest. Right up to when the young left the nest the female spent much of her time either brooding or standing guard over them, while the male attempted to attack through the wire-netting any living creature—from sparrows to man—which ventured anywhere near the aviary. The adjacent aviary had to be left empty because any occupant was driven remorselessly back and forth until it collapsed exhausted.

This more varied diet than the parents had been willing to use on previous occasions led to hope of more successful rearing, without deformities, although the five perfect youngsters which left the nest during the afternoon of 3rd June (at 16 days old) were more than we had dared to hope for. Quite indescribable was the pandemonium caused by seven shrikes in one small aviary all shouting loudly at once, the parents chasing excitedly from one end to the other to ward off imagined enemies, the youngsters crashing from side to side and often hanging from the roof. Most unexpectedly, the parents led their brood back to the nest to roost for the first night, which is interesting in view of our previous experience of a young Great Grey Shrike *Lanius excubitor* using a nest as a roosting place (England, 1970). This habit was soon discouraged by the female



[M. D. England

RUFIOUS-BACKED SHRIKES

The five members of the first brood at 39 days old.

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[M. D. England

RUFOUS-BACKED SHRIKES

Three of the first brood aged ten weeks.

when nest-building recommenced; thereafter they found perches where they usually huddled together for warmth.

Three of the chicks were removed for hand-rearing, although the parents continued to care for the remaining two, which were able to fly the full length of the aviary within two days and were entering the shelter on the third day, at which time also at least one of them was pecking mealworms from a dish.

Two days after the first brood flew, the parents started building a second nest about 12 in. from the first. Unfortunately its position was such that it was not possible to see clearly into it from the window above, although this time I had the opportunity to watch carefully the roles of the sexes in nest-building. The site was chosen by the female, who also commenced the actual building of the nest by laying rough grasses and thin twigs in position. On the next day the male was collecting material and carrying it to the female who, although she also did some collecting, was now spending much of her time on the site arranging the jointly-gathered material while she shuffled round and round forming the shape of the cup. Attempted coition was observed on this day, having followed some rather acrimonious exchanges and chasing of the female by the male (she was not the initiator on this occasion), the act only being accomplished after happy relations had been restored by much submissive bowing and clucking.

I noticed her picking up pebbles and mandibulating them as though trying to crush them. On the off-chance that she was seeking calcium I threw down some crushed—though not powdered—cuttle which she immediately started swallowing. During the next two or three days she consumed—while I watched—at least a heaped dessertspoonful of this. She commenced incubation of her second clutch on 13th June and, rather unusually, sat steadily from the start, coming off infrequently and briefly to feed, with the usual longer period in the evenings when she had a thorough preen.

Meanwhile the male continued most assiduously to care for the two of the first brood which had been left with him, feeding them long after they were really capable of looking after themselves. One of them persisted in visiting the new nest and begging food from the sitting female, who angrily chased it off. This became such a nuisance that they were removed to an adjacent aviary when they were 27 days old. At first they would eat only mealworms, unlike the hand-reared members of the family which were by then eating almost everything put in front of them, from chunks of meat to full-grown locusts. Like all our other shrikes, they had commenced ejecting pellets of undigested food immediately after leaving the nest. I have no evidence that young shrikes bring up pellets while still in the nest, although three species (*L. clamator*, *schach* and *excubitor*) have done so after being removed from the nest prematurely for hand-rearing.

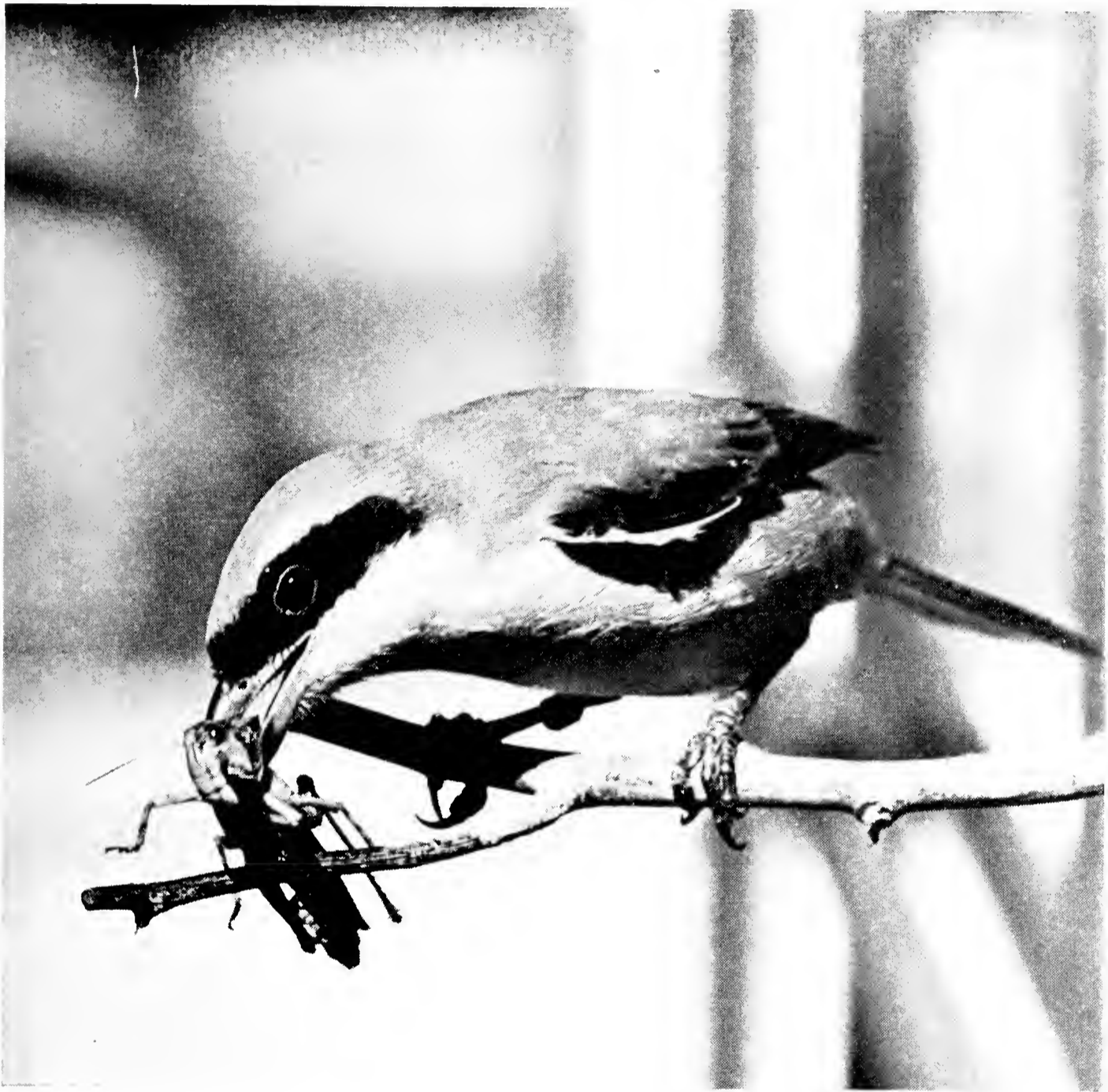
Young Rufous-backed Shrikes are of a generally light brown colour on the upper parts, shading to greyish-brown on the head. The area which will become the broad black band through the eye is already dark grey-brown and rapidly becomes darker. The under parts are light in colour, almost white, with very faint light brown barring on the sides of the breast. In a remarkably short time—at about ten weeks old—they have assumed adult plumage.

The second clutch of eggs was infertile, which is not altogether surprising in view of the almost indecent haste with which they had appeared. Two days after they were due to hatch they were on the ground, smashed; the birds had despaired at the same time as I. It is interesting that infertile eggs are lifted from the nest and dropped on the ground, whereas the shells of those which have hatched are taken and impaled on thorns or deposited carefully in a crevice.

The nest was immediately repaired and incubation of a third clutch began on 8th July. On the eighteenth day two eggshells appeared on thorns and shortly afterwards intense feeding activity started again by the male. As before, for the first week he passed to the female all the food which he took to the nest and she fed the chicks. On the sixteenth day after hatching one youngster left the nest, followed by two more on the following day. Despite unpleasant weather the three were reared without incident by the parents, who thus produced eight healthy young, free from ricketts, polyneuritis and all the other deficiency diseases which had dogged their efforts in previous years. From about three weeks old they had fed the second brood very largely on ox-heart rolled in bone-flour, middlings and Vionate, despite the fact that mealworms were always available. The young began picking up food for themselves at about 25 days old, although the parents fed them for long after this; by this time the first brood had assumed adult plumage—that is at the age of about three months.

Like their parents and other birds of the same species which we have, this year's young are great songsters. One of the first brood started to sing at 26 days old, followed within a day or two by his brothers and sisters; we were awakened by their dawn chorus almost daily from immediately below our bedroom window. Only the males sing during the breeding season—and then only just prior to nesting—while both sexes do so intermittently at other times of year. The song varies from a loud rather raucous repetitive "shouting" of various brief phrases, including a great deal of mimicry, to a quiet warbling which sometimes persists for long periods without a break.

At an early age the young birds acquire the adults' habit of carrying around twigs and leaves and either impaling them or taking them to a spot where they appear to build embryonic nests. They also carry stones and dump them in their food dishes or wedge them in crevices. Some of

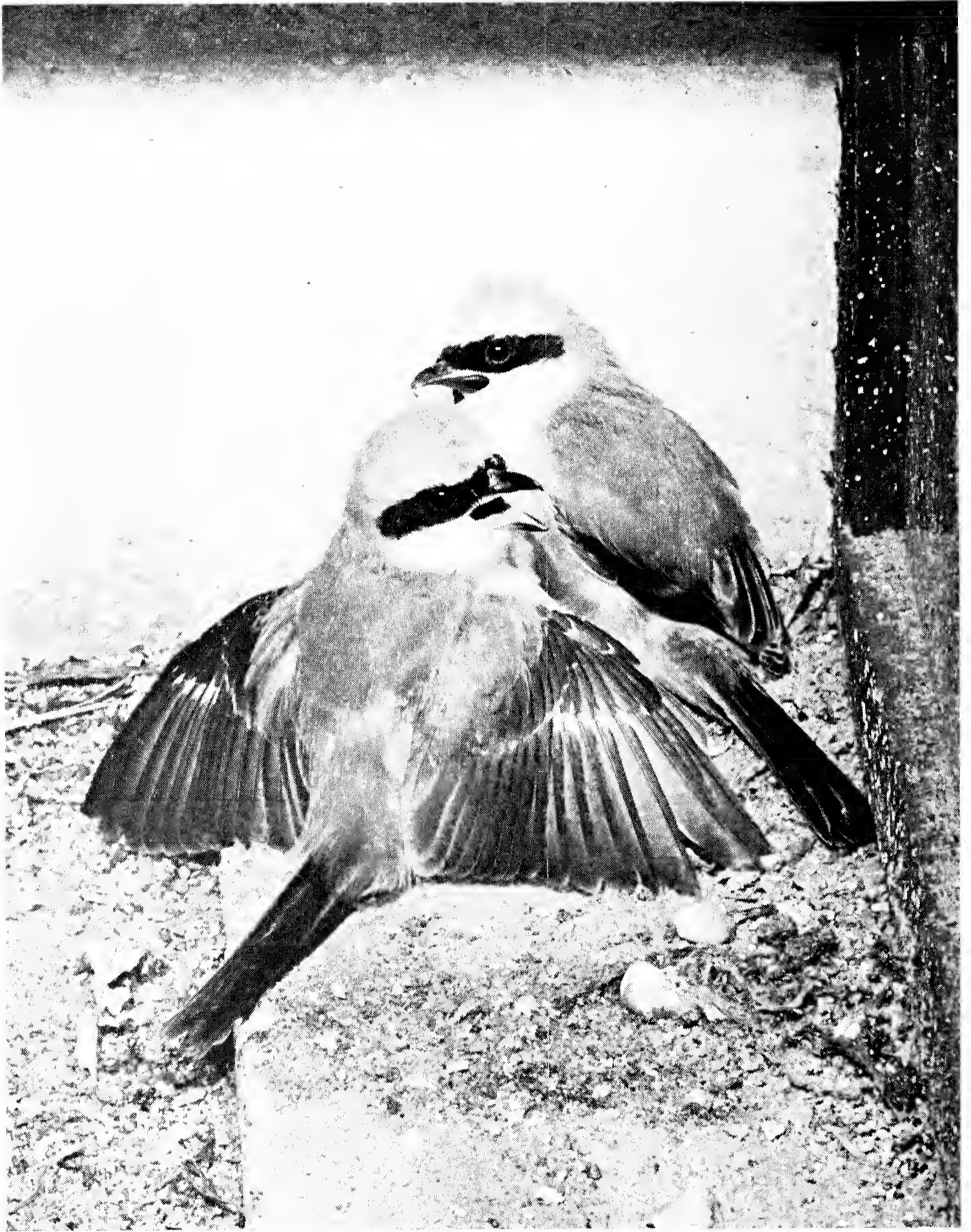


Copyright]

[M. D. England

RUFOUS-BACKED SHRIKE

Three months old, impaling a locust on a thorn.



Copyright]

[M. D. England

Rufous-backed Shrikes sunbathing in a warm corner
of the aviary.

these stones are considerably heavier than the birds and are so large that it is remarkable that they are able to pick them up, let alone carry them.

All the species of shrike which we have owned have been great "characters" and they are some of the most interesting and amusing birds to keep. They are mostly very hardy, become very tame and are not difficult to keep in health once the technique has been mastered. Although some people may be rather alarmed by the mention of such things as the large number of locusts which ours appear to consume, except while breeding or when we happen to have a glut of locusts, they live healthily for weeks on end on little else but "treated" ox-heart.

(As I write, 24th August, the female is incubating her *fourth* clutch!)

SUMMARY

The successful breeding in captivity of Rufous-backed Shrikes is described, eight young having been reared in two broods. The incubation periods were 18 and 18 days, the young left the nest at 16 and 16/17 days and fed themselves at about 25 days, although the parents continued to feed them for some time longer. Adult plumage was assumed in about three months.

As described above the Rufous-backed Shrike *Lanius schach* has been bred by M. D. England. It is believed this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

REFERENCES

- ENGLAND, M. D. 1970. The Rufous-backed Shrike. *Avicult. Mag.* **76**, 61.
ENGLAND, M. D. 1971. Breeding the Great Grey Shrike. *Avicult. Mag.* **77**, 1.

* * *

COUNCIL MEETING

A Council Meeting was held on 26th October, 1971, at 32 Bruton Place, London, W.1.

The following members were present:

Miss Phyllis Barclay-Smith (Vice-President), in the Chair.

Mr. J. O. D'Eath, Mr. M. D. England, Mr. D. Goodwin, Dr. C. J. O. Harrison, Professor J. R. Hodges, Mr. F. E. B. Johnson, Dr. S. B. Kendall, Mr. D. H. S. Risdon.

Mr. H. J. Horswell (Hon. Secretary), Mrs. M. Haynes (Assistant Hon. Secretary).

AWARDS

The Society's Medal was awarded to:

Mr. John Bunker for breeding the Ornate Lorikeet *Trichoglossus ornatus* in 1970.

ELECTIONS

Mr. William Conway was elected an Honorary Fellow.

H. J. HORSWELL,
Hon. Secretary.

* * *

BRITISH AVICULTURISTS' CLUB

The one hundred and seventh Meeting of the Club was held on 25th September, 1971, at Birdland, Bourton-on-the-Water, by kind invitation of Mr. Len Hill.

Seventy-five members and their guests attended and much enjoyed the opportunity of seeing many rare and interesting birds in a beautifully landscaped setting. We would like to thank our host and his family for their hospitality and for providing such a delicious buffet lunch; our thanks are also due to Mr. Mike Kendall of the B.B.C. for showing some interesting films during the afternoon.

The Club much appreciates Mr. Hill's generosity in donating the proceeds from the sale of lunch tickets to the International Council for Bird Preservation, British Section.

MARY HAYNES,
Hon. Secretary.

NEWS AND VIEWS

Mrs. M. J. McEwen, Whangarei, New Zealand, has kindly sent me a colour photograph of the yellow mutation of the New Caledonia Parrot Finch that she and her husband bred last year.

* * *

For the third successive year the Red-masked Conure has been bred in the Chester Zoo. Other species bred include Derbyan, Crimson-winged and Barraband's Parrakeets, Nanday Conure, and a Grand Eclectus Parrot. A recent hatching is that of a Common Rhea chick, removed for hand-rearing.

* * *

F. C. Astles has reared five hybrid Lovebirds, two and three, Peach-faced \times Masked, from his own aviary-bred stock. There is usually little to recommend the hybridization of lovebirds. The resultant young are, in the main, inferior to their parents as to colour, appearing "washed out", and lacking clear demarcation. Fred Astles, however, describes his hybrids as "beautiful, so gay and strong".

* * *

Not many of the common names of British birds have escaped usage among persons at one time or another. At the present time there are at least 20, with additional variants. Readily called to mind are such names as Heron, Swan, Eagle, Peregrine, Merlin, Sparrowhawk, Partridge, Crane, Ruff and Reeve, Nightingale, Martin, Starling, Raven, Rook, Crow, Coot, Sparrow, Wren, etc.

* * *

In the last number of the Magazine I had the pleasure of recording the fact that the Hyacinthine Macaw had been bred in Illinois, U.S.A. In a recent letter Ralph Small informs me that his wife has successfully hand-reared it, that it is now 145 days old and weighs 1,171 grams. It is called "Primo", is very affectionate and follows Mrs. Tina Small like a puppy.

* * *

The British Bird Breeders' Association's B. P. Meade Trophy for the year's most outstanding breeding achievement has been awarded to R. Tout, for breeding the Common Buzzard *Buteo buteo*. Last year three eggs were laid, but were soon deserted. On the present occasion there were four eggs, all of which were hatched and the young successfully reared. In addition, R. Tout bred two Little Owls, two Barn Owls and three Kestrels.

* * *

During any particular year I receive dozens of enquiries on every possible topic connected with birds. A recent enquiry, the first of its kind for several years, concerns the signs used to indicate male and female. They are used both botanically and zoologically, and are derived from

planetary symbols. ♂ Mars; shield and spear of the Roman god of war: ♀ Venus; mirror, emblem of the Roman goddess of beauty.

* * *

Ralph Zackrisson, Sweden, has successfully reared a Pretty Warbling Finch *Poospiza ornata*. Three eggs were laid and all hatched, but two of the chicks were thrown out of the nest when only a few days old. Since then the breeding male has died. In addition, Ralph Zackrisson has bred the Grey-headed Social Weaver *Pseudonigrita arnaudi*, a possible "world first". Two of the young birds very unfortunately died, but the third is now several weeks old and thriving.

* * *

The Moorhen is generally considered to be a poor flyer. It certainly appears to take wing with difficulty, but it is capable of sustained flight, especially at night, when it is more often heard than seen. I have never had such an experience. I have, however, on several occasions seen it perch in bushes and once, when surprised in long grass, a bird flew up and perched momentarily on a branch of a tree, fully thirty feet from the ground.

* * *

Interest in penguins in captivity during the past year has been greatly stimulated, mainly by the efforts of Len Hill. There is some doubt as to the origin of the name. Several theories have been advanced but possibly the most likely is that it is a corruption of a Newfoundland name "pin-wing", meaning a bird that has been pinioned. On page 107 I ridiculed the idea of a "Rookery of Penguins". I notice that the Oxford Dictionary admits the rather uneuphonious "Penguinery" for a colony of penguins.

* * *

Pied examples of the Raven are not unknown and wholly white birds have been recorded. For instance, John Caius, *De Rariorum Animalium atque Stirpium Historia* (1570) (*teste* Evans, A. H. *Turner on Birds* (1903)). wrote: "In the year 1548, in the month of August, I saw two white Ravens from the same nest, and handled them at the very place in Cumberland of our Britain, bred on the property of a lord of that county, and trained for bird-catching just like hawks. For they had been taught both to sit quietly on the arm of the falconer, and when loosed to fly as quickly as possible to his call and sign even from a distance. Nothing unlucky followed them, as in the case of those white Swallows, about which Alexander Myndius wrote according to Aelian. For he who notes a white Raven notes the colour; as he does who notes a white Bear and a black Fox; both of which I have seen here in Britain from Muscovy."

* * *

Longevity. The September Bulletin of the London Natural History Society, Ornithology Section, records that a Swift ringed at Beddington in

1961, when at least two years old, was found dead in Westmorland in June, 1971. This means that it must have been quite 12 years old.

R. Liversidge, Alexander McGregor Memorial Museum, Kimberley, South Africa, writes in *The Ostrich*, 1971, 143: "On 1 January 1954 at Bedford in the eastern Cape, a Yellow-eye Canary *Serinus mozambicus* of unknown age was found with a twisted and broken wing. The bird was rescued, taken into captivity and the wing cut off at the joint. It survived the amputation but in 1959 lost the use of one eye through the activities of a Fiscal Shrike *Lanius collaris* which attacked it in its cage. In June 1970 the second eye became opaque and by July the bird was blind, although it still seemed in fair shape. It was then at least 16.5 years old."

* * *

Department of useless items. It is believed that the first bird to be shot with a gun was a Moorhen in 1533. It was realised that the weapon had possibilities and so it was tried on larger birds, Great Bustard, Crane, Heron, Bittern. Gradually it superseded the cross-bow.

Dr. William Turner, writing of the Bittern in 1544, says: "It has very long claws, for that which serves in birds the purpose of a heel exceeds an inch and a half in length, on which account our countrymen use it to pick their teeth, and mount it in silver."

Francis Willughby (1635-72) died at the early age of 37. He left his manuscripts in an imperfect state. They were arranged and completed by John Ray and published as "The ornithology of Francis Willughby," in 1678. Among the items recorded is that the "Fair Ladies of York" at one time wore the blown-eggs of Hedge Sparrows as ear-rings.

* * *

Mrs. "Chastleton" Howard has successfully bred the Queen of Bavaria's Conure, two young reared.

The first success in Europe was obtained by G. T. Turner, of Liverpool, in 1939. Two young ones were hatched; one died early through eating nesting material, but the other left the nest on 20th September, and was still flourishing on 24th February, 1940. Mrs. Effie Clark had a near-success in 1947: "reared one young one, which they were enticing out of the nest, then a rat killed it." The female died, but the male nested in 1949 with a female loaned to Mrs. Clark by the late Duke of Bedford. Three young ones were hatched at the end of September; one died on the 5th November, 1949, and the other two were reared. The one that died was exhibited as a mounted specimen, destined to the British Museum (Natural History), at the B.A.C. Meeting, 8th March, 1950. Mrs. Clark continued to breed this Conure and in 1952 reared two.

* * *

P. B. Brown, Harewood Bird Garden, reports: "We have succeeded in rearing three species of starling—Spreo, Black-collared and Wattled. The Wattled, we believe, may have been bred successfully by us for the

first time in this country. The Black-collared are the same pair that bred for the first time in the aviaries of the late W. R. Partridge.

“ Swainson’s Lorikeets reared one young one, as did a pair of Barn Owls, rescued by the R.S.P.C.A. as youngsters from a bridge that was about to be demolished. Our yellow Golden and Amherst’s Pheasants which we keep at liberty in the garden reared many young. In the tropical house, two hybrid Pekin Robin–Silver-eared Mesia were reared. Sun Bitterns hatched a fine youngster and then at 10 days old killed it and threw it out of the nest. They are now sitting again in a nest at the top of a 20 ft. tree. Scarlet Tanagers are sitting and Zosterops have had two nests destroyed by the public. The Snowy Owls, that last year (at one year old) reared three young, were put off this year by a boy who went round the back of the aviary with a long cane which he pushed through the wire-netting and lifted the hen up and down off her eggs. She scrambled them after this and they were, of course, all fertile.

“ The very handsome White-crested Touracos laid in a nest on the floor but only sat at night, and so nothing came of these. We had hoped our penguins might lay this year as there was a great deal of copulation going on and our 12 birds sorted themselves out into pairs which had their own small territories and fought off intruders, but no eggs appeared. Perhaps they will go next year when they are more settled, as five of these birds were only obtained in the spring.

“ Some of our more interesting recent arrivals are:

- 2 Golden-fronted Woodpeckers
- 2 Red-collared Whydahs
- 1 Grey-backed Trumpeter
- 2 Cuvier’s Toucans
- 2 Giant Hornbills
- 5 Assorted Hummingbirds
- 2 Cedar Waxwings
- 2 Zanzibar Red Bishops
- 1 Banded Pitta
- 3 Rose-coloured Starlings
- 9 Vermilion Cardinals.”

* * *

Twenty-one years have passed since “ News and Views ” first appeared above the initials “ A. A. P.” “ The Bird of Time has but a little way to fly ” and so, perforce, the compilation must now be left to another. In valediction it is fervently hoped that the notes have provided interest, information, and sometimes even amusement. And so, with very appreciative thanks to those who have troubled to read them, for the last time “ A. A. P.”

* * *

REVIEWS

HOW TO RAISE AND TRAIN PIGEONS. By WILLIAM H. ALLEN JR.
Oak Tree Press Co. Inc., 1971 (10th printing). Distributed in the
U.K. by Ward Lock Ltd., London. Price £1.50.

This is an attractively got-up guide to the keeping and breeding of domestic pigeons. The publisher's blurb says that "Basically, this is a handbook". As compared with Levi's classic recent monograph on this subject, it is, however, a condensed handbook. Most of the better known breeds, and some of the rarer ones, are listed and described, although not, of course, in such detail as by Levi.

The book is illustrated with 21 full colour photographs and a great many black and white photographs. These are excellent in themselves but the captions to them do not seem on a par with the text and in three cases are misleading. Perhaps this is due to the modern habit of employing professional caption-writers instead of letting the author write the captions to the pictures illustrating his work.

In view of its size (very convenient for carrying about and reading in trains) and price, this book seems excellent value and can be recommended to all thinking of taking up fancy or flying pigeons. As some writers of this kind of book tend to gloss over difficulties I was pleased that, in his chapter on "Settling Racing Homers", the author accurately describes what is *likely* to happen when one attempts to do so and how to succeed in spite of it.

D. G.

Note. The misleading captions are on pages 8, 9 and 35.

ENCHANTING ENCOUNTERS WITH BIRDS. By CARL NAETHER.
Salt Lake City, Utah: Allen Publishing Co., 1971. (No price given.)

This conveniently small and well-printed book consists of nine chapters, each describing the author's experience with some species of bird in the wild or in captivity, and a final chapter, entitled "How Long Do Birds Live in Captivity", in which aviculture is defended. It is illustrated with photographs by the author.

Enchanting though the encounters with the various species were for the author, I did not feel, in reading them, that he managed to convey this enchantment, in spite of, or perhaps because of, an enthusiasm that is very evident in the writing. The defence of aviculture, forthright though it is, made me as an aviculturist uneasily remember that old prayer, "Lord, protect me from my friends, my enemies I can deal with myself".

There are some interesting behavioural observations here and there but one feels that most of them could have advantageously been given with more detail.

D. G.

CORRESPONDENCE

TANGARA HYBRIDS

I have just read with great interest "Notes on the breeding of Tangara Hybrids" in the July-August copy of the AVICULTURAL MAGAZINE.

I thought it might be of interest to you, to know I have bred two Hybrids this year between a cock Superb and a hen Blue-headed.

I had what I thought were four cock Tanagers in a small greenhouse, with a flight. A Superb, Blue-headed, Silver-throated and Golden-naped. I was very surprised towards the end of May to find a small cup-shaped nest, about 5 ft. from the ground, in a creeper just inside the greenhouse. I was even more surprised to find an egg had been laid, it was the 27th of May, a second egg was laid the following day. The Blue-headed Tanager flew off the nest when I entered the greenhouse the following morning. Both eggs hatched out on 9th June and both left the nest on the 23rd. The Blue-headed seemed to be always with the Superb, so I presumed he was the other parent. I never saw the young fed while in the nest, so could not tell that way. Fortunately I was in the greenhouse when the first young one left the nest, immediately the Silver-throated attacked it, so I removed both the Silver-throated and the Golden-naped. Both young ones seemed strong and were soon flying around, both parents feeding them. They were fed on meal-worms and gentles, pear, apple, grapes, a little banana, grated cheese, and sponge cake soaked in nectar. They are now strong healthy birds, very much alike in colouring, resembling the Superb more than the Blue-headed, but so far without the bright yellow on the rump. I noticed to-day one or two very bright blue feathers showing on the breast of both of them.

2B WEST STREET,
BLABY, NEAR LEICESTER.

OLIVE MERRY.

From a German aviculturist, Mr. Th. Kleefisch, of Bonn-Duisdorf, I learned that he has bred the following species, verified by colour transparencies which he sent me: *Tangara arthus goodsoni*, *Tangara icterocephala*, and hybrids ♂ *Cyanerpes caeruleus* (*chocoanus*?) × ♀ *Chlorophanes spiza*. *Tangara arthus* has, as far as I can find, only been bred in Wassenaar, Holland, and it is a very fine achievement.

The breeding of the hybrids, a male and a female, of the honeycreepers is, I think, of very great interest to science in view of the fact that the single skin of *Chlorophanes purpurascens* Sclater, pictured in the Catalogue of Birds, vol. XI, is now believed to be a hybrid of *Cyanerpes cyaneus* × *Chlorophanes spiza*.

Unfortunately the breeding was not discovered in due time to get a good report. Mating was not observed, and only the female fed the young. Only by studying the young was it possible to say which of two possibilities, *Cyanerpes caeruleus* or *Dacnis cayana*, was the father. The female especially shows the characteristics of *Cyanerpes*, the greenish legs and the rusty colouring of the cheeks and chin. The Hybrids are the size of *Chlorophanes spiza*.

In the International Zoo Yearbook, vol. XI, is a report of a hybrid bred in Dallas, U.S.A., between *Chlorophanes spiza* and *Cyanerpes cyaneus*.

6851 JANDERUP,
VESTJ., DENMARK.

E. NØRGAARD-OLESEN.

SEXING PARROTS

May I make a brief (because I intend to write at greater length in another context), reply to two of the points raised by Dr. Parkes' letter in the Sept./Oct. AVICULTURAL MAGAZINE.

Whether a male parrot is a different colour from the female seems, to me, to depend on two main factors: the permanence of the pair-bond and the regularity of the food supply. For parrots that keep together just for the duration of the breeding season—flocks of such birds are composed of individuals not of twos—have sexual dimorphism well-marked. The display of the male is elaborate and quite distinctive and separate from that of the female. Whereas those parrots that, at all times of the year, remain as paired couples are generally identically

coloured. During courtship, though the male is the more active, the sexes have an almost identical behaviour. The analogy taken here is waterfowl. Ducks and geese. Ducks, as a rule, keep in pairs only during the spring and males and females are distinct. Geese have the sexes alike and maintain pairs the year round.

Parrots that live in areas of irregular and infrequent rainfall, or that raise their young on the seeds of haphazardly fruiting trees—such as figs—must be able to synchronize breeding not with the seasons but with a rapid increase in food supplies. Breeding must, in such circumstances, be achieved as quickly as possible while the temporary abundance of food lasts. Anything that helps to reduce the interval between the “decision” to breed and the laying of the eggs will be of strong selective advantage. D. Goodwin (Bull. Brit. Orn. Cl. 80 : 45–52), has shown that considerable benefit for precipitate breeding will accrue if the sexes are visually separate. All of the sexually dimorphic Australian “broadtails” and the only sexually distinct Amazon parrots live in areas of low, and infrequent rainfall.

The correlation between the inability to use the foot for feeding and sexual dimorphism is therefore because of a diet of small seeds and an irregular abundance of food.

Dr. Parkes pleads a good case but I am still not convinced that the Yellow-lored and the Spectacled Amazon Parrots *A. xantholora* and *A. albifrons* are other than the same bird. The Yellow-Lored Parrot has a very restricted range, being found only in “Yucatan, especially the eastern and central parts, and Cozumel Island”. The Spectacled has an enormous range from near the U.S.A./Mexico border to Costa Rica. Where the two Amazons meet is an area where both may be found. Elsewhere when two or more Amazon parrots are found inhabiting the same area then they differ markedly in voice, habitat preference, and colour and size. But these two are practically identical in all of these respects. In my opinion, this echoes such well-known cases as, say, Carrion and Hooded Crows *Corvus c. corone* and *C. c. cornix* where a “hybrid zone” is found between the two subspecies. Field, or “captive cross-breeding investigations are, I believe, required before a positive case can be made for either point of view.

158 BROADWAY,
PETERBOROUGH, PE1 4DG.

GEO. A. SMITH.

STRETCHING ATTITUDES IN HUMMINGBIRDS

With reference to D. M. Reid-Henry's article which appeared in the Sept.–Oct. edition of this magazine. I would like to point out the habit of stretching wing, tail and leg together, is not common to hummingbirds.

These birds do have a number of stretching attitudes, and although the sequence may vary, a newly awakened bird usually goes through the following procedure: the neck is arched and the wings are raised but not opened. Then either one or both wings are opened fully and stretched down alongside the body (not to the rear as with most birds); at the same time the tail may be fanned. At no time are the legs stretched.

Mr. Reid-Henry mentions that he believes Kingfishers may be unable to indulge the habit which most birds have, of perching comfortably on one foot. Many aviculturists believe the same with regard to hummingbirds. However, I can vouch the following genera indulge in this habit: Coronets (*Boissonneaua*), Pufflegs (*Eriocnemis*), Sylphs (*Agelaiocercus*), Trainbearers (*Lesbia*), Speckled (*Adelomyia*), Thornbills (*Ramphomicron*), Metal-tails (*Metallura*) and Raquet-tailed Coquettes (*Discosura*).

THE FLAT,
135A BLOXWICH ROAD,
WALSALL, WS2 8BT.

A. J. MOBBS.

The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

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 1965 FARROW, GEORGE; 21 Gunnergate Lane, Marton in Cleveland, Nr. Middlesborough, Yorks.
 1959 FAVA, Dr. CHARLES, M.D.; 65 Cathedral Street, Sliema, Malta.
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 1968 FRITH, CLIFFORD B.; c/o Bird Room, British Museum (Natural History), Cromwell Road, London, S.W.7.
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- 1970 GOUGH, ALBERT J.; Broadmere, Broadmere Common, Henfield, Sussex.
- 1969 GOURLAY, Miss MARY P., O.B.E.; Queries, 51 Brackendale Road, Camberley, Surrey.
- 1960 GRACE, CYRIL F.; Castle Hill House, Castle Hill, Dudley, Worcs.
- 1967 GRAHAME, Major IAIN of Claverhouse; Daw's Hall, Lamarsh, Bures, Suffolk.
- 1953 GRANTHAM, R. H.; 13 St. Wilfrid's Road, New Barnet, Herts.
- 1932 GREED, R. E.; Director, Bristol, Clifton & West of England Zoological Society, Bristol 8.
- 1962 GREEN, JOHN ALWYN; Woodhey Bird Farm, Haddon Lane, Ness, Neston, Wirral, Cheshire.
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- 1966 GREENWOLD, GERALD, Jr.; St. Michael's Dairy, Spring Lane, Eight Ash Green, Colchester, Essex.
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- 1953 GRIFFITHS, A. V., F.Z.S., M.R.C.V.S.; Dol-llan, Llandyssul, Cards.
- 1969 GRIGGS, W.; 64 Bailey Bridge Road, Braintree, Essex.
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- 1951 GRUBER, H. F., F.R.Z.S.(Scot.); Woodlea House, 9 Church Hill, Edinburgh 10.
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- 1951 HAITH, JOHN E.; Park Street, Cleethorpes, Lincs.
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- 1962 HAYES, E. E.; 309 Cason Street, Belmont, N.C. 28012, U.S.A.
- 1970 HEAD, The Rt. Hon. Viscountess DOROTHEA; Throop Manor, Bishopstone, Salisbury, Wiltshire.
- 1947 HEATH, R. E., B.A., M.B.O.U.; Greenway Bank, Biddulph, Stoke-on-Trent.
- 1955 HEDIGER, Professor Dr. H.; Zoologischer Garten, 8044 Zürich, Switzerland.
- 1970 HEINZEL, HERMANN; 53 Bonn, Adenouerallee 150-164, Germany.
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- 1969 HESS, ROY K.; Star Pine Aviary, 937 Busch Drive, Vista, California 92083, U.S.A.
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- 1971 HIGGINS, Jnr.; Meadville, Mo., U.S.A. 64659.
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- 1968 HILL, LESLIE JOSEPH; P.O. Box 378, Cape Town, Republic of South Africa.
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- 1969 HINKLE, ALFRED D.; P.O. Box 63, Alpine, California 92001, U.S.A.
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- 1970 HORNETT, JOHN M.; 189 Asoke Road, Bangkok, G.P.O. Box 2087, Thailand.

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- 1947 HODGES, Professor J. R., D.Sc., Ph.D.; Craignair, Cuckoo Hill, Pinner,
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- 1948 IRVING, G. J.; 23 The Lilacs, Baybarrow Road, Egremont, Cumberland.
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- 1968 KING, G. J.; Norton, Bury St. Edmunds, Suffolk.
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- 1967 PILKINGTON, RODERICK E.; Lady Somerset Lodge, Main Road, Smalley,
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