

# Successful Breeding of the Long-tailed Cissa at the Houston Zoo

(*Cissa chinensis*)

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Among the 100 or so species presently assigned to the family Corvidae (Austin, 1961) occur some of the world's most familiar birds such as the rook and common jay of Eurasia and the American crow and blue jay of North America. Many of the corvid species are also highly desirable zoological and avicultural subjects because of their beauty of plumage, graceful shape and bold, active behavior. Near the top of this category is *Cissa chinensis*, and whether popularly called Long-tailed Cissa, Green Magpie or Green Hunting Cissa (Goodwin, 1976), this species has great appeal as a result of its silken, bright green plumage with distinctive markings of chestnut-red, white and



Photo by C. Eckhart, Houston Zoo

The Long-tailed Cissa's (*Cissa chinensis*) green plumage is dependent upon an adequate amount of carotenoids in their diet. If this is lacking, the bird's color changes to light blue in captivity.

black, red-orange beak and legs, graceful graduated tail, and typically corvid curiosity which keeps it on the move in an aviary. If the bird rates a ten on those characteristics, it must be assigned a much lower rating for its voice which is unmusical and harsh, but certainly not as unpleasant or as persistent as the voices of many psittacines. One must also remember cissas are corvids, and this translates into aggression toward similar-sized or smaller birds and the trait of robbing other nests of eggs and young. Obviously not the ideal candidate for a mixed-species aviary or exhibit, the Long-tailed Cissa has so many positive attributes that no one should resent having to give the species its own space in a zoo or private avicultural collection.

Obviously its attractiveness was a factor in the species' reaching the London Zoo as early as 1861 (Rutgers and Norris, 1977). Since its arrival there meant the species underwent a long and slow sea journey from the

Far East in a period when avicultural knowledge was still in its stone age, the species also obviously has other corvid characteristics — namely, hardiness and adaptability. If the specimens reaching the London Zoo were not already blue upon arrival, the green in their plumage undoubtedly later changed to light blue, for the cissa's green plumage is dependent upon an adequate amount of carotenoids in the diet and this was not fully understood until more recent times. Even Jean Delacour (1936) simply states that "the colour is light green which, in captivity, changes to blue." I can personally remember dealers' price lists immediately after World War II when live animals were still shipped by sea transport listing the species as "blue hunting cissas." The time the birds had spent on carotenoid-poor diets in trappers' facilities and on the long sea voyage had been long enough to transform them from green to blue.

The Long-tailed Cissa ranges from

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Jumna Valley of the lower Indian Himalayas eastward to northern Laos and south China and southward to Malaysia, Sumatra and northwest Bornea (King and Dickinson, 1975). Goodwin (1976) divides the species into four confusingly similar subspecies over this area. Without access to museum skins or exact knowledge of the trapping location, assignment of the birds which have arrived in the United States to a specific subspecies is almost impossible since there are intergrades. Although the Short-tailed Cissa or Green Magpie (*Cissa thalassina*) is also imported, it does not have the distinct wing markings of the Long-tailed and is easily identified as a separate species. ISIS (1987) listed ten (5.5) *chinensis* in five zoos (which did not include five (2.3) at the Houston Zoo) and listed eight (1.3.4) *thalassina* in three zoos. From personal knowledge I know that a number of specimens of both species since 1987 have been added to both zoo and private avicultural collections.

Despite its long history as an avicultural subject and the great advances in aviculture since 1861,

the Long-tailed Cissa evidently had never been successfully raised in captivity in North America until two chicks fledged on May 10, 1988 at the Houston Zoo. Interestingly enough, although there have been a number of importations of the species in the last five years, both members of the zoo's breeding pair were quite mature by avian standards, especially the male which is a known 16-plus years of age! Former Houston zoo Curator of Birds, Robert Berry, says of the male, "It was one of those single goodies I inherited when I joined the zoo — even then it was an adult — and it was years before I could obtain a mate for it." In comparison with the male, the breeding female was a mere eight-plus years at the time of breeding, having been obtained as an adult import in July 1981 from Aves International.

Both breeders had also been paired with other mates, proving once again that one cannot just put two birds of the opposite sex together and expect a success. Once a mate was obtained for the old male, he and his mate had been placed in an exhibit in the zoo's Tropical Bird House. Although nest-

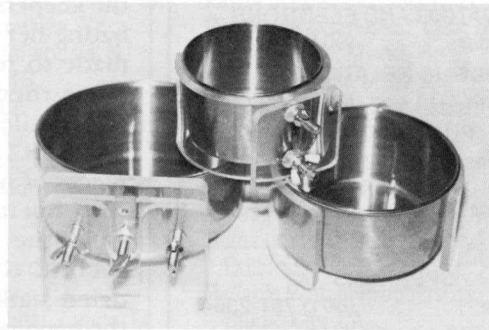
ing and laying of eggs did occur in this exhibit, all eggs produced here ended up by being broken. In the hope of getting better results than in the exhibit, the birds were moved to an off-exhibit propagation facility, but the extreme aggression of the male there toward the female necessitated the separation of the birds. From 1982 to 1986 the present breeding female was mated to a different male, and during this period several clutches were laid. One chick was actually hatched, but soon disappeared, undoubtedly from cannibalism on the part of one of the parents. From 1984 on, all eggs which were laid by this pair were infertile. In 1986 the development of severe cataracts in the male forced his euthanasia, and the present breeding pair was established in an off-exhibit outdoor aviary.

The dimensions of this aviary were 12' long by 5' wide by 8' high. Of metal frame construction, the aviary was covered in 1" by 1/2" welded wire and had a fine gravel substrate upon natural earth. For protection from the elements, one yard of the flight was covered with solid roofing,

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and bamboo screening was placed around the sides, back and keeper entry door to give the birds greater privacy. The rear of the flight was planted with 8' bamboo, and natural branches of approximately 3/4'' diameter were wired into place at various locations for perching, and sited to encourage flight exercise by the birds. Although an "outdoor" flight, this aviary, like the others in the zoo's off-exhibit propagation facility, has flexibility in cooling and heating in extremes of weather. Shade cloth and a circulating fan are used for cooling during Houston's long and intense hot season, and during periods of cold, the flights can be covered in heavy, fabric-woven polyethylene (Griffolyn) with heat provided by a gas-powered forced-air heater.

Although the female actually began laying eggs within 13 days after the birds were placed together, there would be many months of frustration before success would be achieved with the species. Not the least of the frustrations to the bird section staff was the birds' unlikely choice of a nesting site — a hanging plant basket containing a live asparagus fern. After their usurpation of the planter as a nest site, they at first added a few pine needles to the center of the plant. Since the keepers ceased to water the fern during this nesting attempt, the plant died. Unaware at the time of how the female would leave the nest at the slightest hint of an approach, the keepers felt that she was not incubating her eggs and the decision was made to remove the three eggs and place them in an incubator. Of the two fertile eggs, one hatched on July 17, 1987 and was handfed small pieces of pinkies and cat chow by forceps, but it died within a few days.

By the time the cissas nested a second time in 1987, only dead, dried stalks remained of the fern in the hanging basket. Despite the provision of plentiful nesting material, the birds simply removed the dead remains of the fern and added no material to the basket, the female laying and incubating her eggs upon the bare soil. Two chicks were seen in the nest on August 4, one soon disappearing. The other chick was removed for handraising; however, this endeavor was doomed, for the chick had ingested soil from its earthen-bottomed nest. This caused impaction from which the chick soon died.

Since the female continued to show no interest in other baskets offered as

nesting sites, it was decided to make her nest choice as disaster-proof as possible in 1988. A cloth was tightly affixed over the soil substrate in the basket to prevent a fatal recurrence of soil ingestion by chicks in the nest. With one potential problem hopefully solved, another very real problem to successful breeding now appeared — destruction of eggs by the male. This observation is from the notes of Bird Keeper Judy Kinsman: "Male made trips to nest every few seconds, finally staying. Female sat, trying to keep male from getting at freshly laid egg. Male continued probing, then pulled at female's wings and tail. As I was about to enter flight, male got the egg, carting it around until female flew to same perch and male dropped the egg to the ground."

Based upon this observation, the male was immediately removed. Fortunately, the females of most corvids do all the incubation. Even though males share in the feeding of the young, this does not present a genuine obstacle to successful breeding without the presence of the male in captive circumstances. The probability of a female corvid raising her clutch unassisted in the wild would be most unlikely, for much foraging would be required to obtain adequate food for the hungry, growing nestlings. Even if the female could find enough food alone for the young, the long periods of her foraging would excessively expose the nestlings to predation and temperature changes, especially critical during the first few days in the lives of altricial nestlings. But all this is a different matter in captivity. Enough food can be provided for her use so that it's only a matter of seconds for the female to hop off the nest, pick up food and return to the nest. The zoo had already used the stratagem of removing the egg-destroying male of another corvid, Collie's Magpie Jay (*Calocitta formosa colliei*), with full success in 1986.

After the removal of the male, the female laid two eggs and incubated them in a fashion which made the bird section staff nervous about the outcome. The slightest activity in the area near the flight would cause her to leave the nest. As a result, keeper activity in this area was kept to a minimum, and staff members not assigned to the facility, including me, stopped going into the area. After 19 days of incubation, both eggs hatched, and the female proved to be

a model parent except for continuing to leave the nest at the slightest provocation.

The normal maintenance diet for the cissas included bird of prey diet, a dog/cat chow mixture, chopped greens (endive/spinach) and chopped fruits and vegetables, including carrots, yams, tomatoes and papaya for cartenoids. Daily feedings of live food (mealworms, crickets, pinkies and occasionally anoles) are regularly provided first thing in the morning and last thing in the afternoon by the keepers. Once the chicks hatched, additional pinkies (or chopped adult mice when pinkies were in short supply) were given on a consumption basis, for the parent seemed to feed these almost exclusively to the nestlings. A vitamin/mineral powder, in addition to being sprinkled on the regular diet, was sprinkled on these. Unsurprisingly after being fed mostly on pinkies devoid of cartenoids, the young birds were bluish in color when they fledged at 22 days of age on May 10. Both birds remained with the mother until June 8. After being on the regular adult cissa diet rich in cartenoids, the birds molted into bright green plumage and are now indistinguishable from the adults in appearance. Laparoscopy revealed both birds to be males. Being of the same sex, the young birds became increasingly aggressive toward each other, making separation a necessity in early December.

Although the same procedure of removing the male after the first egg was laid was used in two later breeding attempts by the pair in 1988, neither was successful. Two chicks hatched in June, but later died. The third clutch of eggs in August was infertile. At the time of writing (mid-March 1989), the adults are again exhibiting the aggression toward keepers associated with the onset of breeding.

In addition to this good news, the zoo has another pair on exhibit which did engage in nest building (in a normal basket!) last year although no eggs were laid. This pair is again showing interest in the nest area. But the best news of all is that the Woodland Park Zoo (Gregory Toffic, pers. comm.) also bred the Long-tailed Cissa in 1988, hatching three chicks in late June. This pair was also less aberrant in their nesting habits than the breeding pair at Houston. They built a nest of twigs upon a 1' square, 4" deep, platform with a 1" by 1"

wire mesh bottom. The male also did not destroy the eggs and assisted in feeding the young after they hatched. The young Woodland Park birds were sent to the Pittsburgh Aviary where one of the young Houston birds is being sent. The other Houston bird was paired with a wild-caught female the zoo owned, and placed on breeding loan with a skilled local aviculturist. Perhaps all this bodes well for the establishment of a captive population of this beautiful species in aviculture and in zoos in the United States.

#### Acknowledgements

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this article is based. I also appreciated the help of former curator of birds Robert Berry in providing historical background on the Long-tailed Cissas at the Houston Zoo.

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