

BREEDING THE WHITE-HEADED (BÖHM'S) BUFFALO WEAVER AND THE TAVETA GOLDEN WEAVER AT CHESTER ZOO

By Roger Wilkinson and Wayne McLeod

The breeding of White-headed Buffalo Weavers *Dinemellia dinemelli* and of Golden Palm Weavers *Ploceus bojeri* at Chester Zoo in 1989 was briefly reported in an earlier article in the Avicultural Magazine (Wilkinson, 1990). A further account of these breedings was requested and in researching the scientific literature for the present article it became apparent that the Ploceid weavers obtained from two different sources as Golden Palm Weavers *Ploceus bojeri* in 1988 did not fit the written descriptions of that species. The birds have now been identified as Taveta Golden Weavers *Ploceus castaneiceps*. Close examination of the males shows that, instead of having the uniformly orange head of Golden Palm Weavers, they all have yellow faces with chestnut-orange colour on the nape connecting with a similarly coloured bib on the upper chest. The females are also streakier than described for the Golden Palm Weaver which supports their re-identification as Taveta Golden Weavers (Hall and Moreau, 1970; Mackworth-Praed and Grant, 1980; Williams and Arlott, 1980) and which was confirmed by reference to skins at the Liverpool Museum.

This account is limited in detail by the fact that observations of both species were restricted by their choosing to breed in inaccessible areas in the free-flight of our Tropical House. The Tropical House is a large, high, barn-sized building 240 feet long x 200 feet wide and 40 feet high, which includes several water areas and waterfalls and is thickly planted with palms, bananas, figs and many other tropical plants and flowers. It is heated throughout the year. Artificial lighting is provided only to a series of aviaries on an elevated gallery on one side of the house and to the reptile areas on the opposite lower floor. When opened in 1964 this was the largest indoor tropical house in the country and although now showing its age it is still one of our favourite areas of the Zoo. Around 30 species of birds are housed in the free flight area of this house including Touracos (previously Schalow's Touraco *Tauraco schalowi*, presently White-cheeked Touraco *Tauraco leucotis*), Celebes Quail Doves *Gallicolumba tristigmata*, Pink-necked Green Pigeons *Treron vernans*, Red-backed Mousebirds *Colius castono-*

tus and various softbills including Fairy Bluebirds *Irena puella*, White-rumped Shamas *Copsychus malabaricus*, various Tanagers and a number of species of African Starlings.

With such a variety of birds a large variety of food is offered and both the Taveta Golden Weavers and the White-headed Buffalo Weavers take mixed seed and fruit as well as live food. Mixed seed includes white millet, canary mixture and wheat - the latter being taken by the larger Buffalo Weaver. The fruit eaten includes banana, grape, apple and orange. The Taveta Golden Weavers are particularly fond of feeding from halved oranges. When feeding young, live food was essential for both species which accepted locusts, morio worms, mealworms and waxmoth larvae.

White-headed Buffalo Weavers *Dinemellia dinemelli* were obtained in 1988 from two sources; four unsexed birds in July and a further six birds including two sexed pairs in August. These birds occur in the wild in eastern Africa from Sudan north to Tanzania and probably arrived in shipments then being sent to the U.K. from Tanzania. White-headed Buffalo Weavers are striking birds, essentially white with black back, mantle, wings and loreal face patch and orange rump, upper and under tail coverts. When displaying they raise their wings to display large white patches and in flight the orange rump is most conspicuous. The black rather than dusty brown back, mantle and wings and lack of white edging to the scapulars indicate that these birds belong to the race *Dinemellia dinemelli boehmi* sometimes referred to as Böhm's Buffalo Weaver (Rutgers and Norris 1977). This fits with their reported origin as this is the race occurring in Tanzania which was again confirmed by comparison with museum specimens.

The White-headed Buffalo Weavers are very sociable and extremely active as they perform wing-raising displays whilst vocalising as they approach one another. A large nest was built in the crown of a tall palm - too high to be inspected. This was largely built of lengths of fresh or dry vegetation, especially (much to the distress of the zoo gardeners) the thorny green fronds of *Asparagus fern* *Asparagus sprengeri* and *Asparagus setaceus plumosus*. The preference for these thorny fronds is not unexpected since in the wild their untidy nests are built from thorny twigs (Mackworth-Praed and Grant 1980). The communal nest structure measured several feet across and included three separate nest chambers. Unfortunately, the White-headed Buffalo Weavers were not all individually colour-marked and it was not possible to ascertain which individuals were building and which were entering the next chambers.

Several nesting attempts were made before the first chick fledged on 20 October 1989. The fledgling closely resembled the adults differing only in having darker eyes and a generally duller paler orange colouring where the adults are reddish orange. A chick that hatched in early May 1990 did not survive but another which hatched in October 1990 fledged successfully. The birds again nested throughout the spring/summer 1991, with chicks being hatched in April, June, July and August. At least three different birds were seen queuing near the nest with live food, indicating that co-operative breeding may be a feature of the social organisation of these Buffalo Weavers. An extended breeding season has been previously recorded in the wild with nesting from November to March. However, at Chester survival has been poor with most being lost before or shortly after fledging.

Two pairs of Pied Imperial Pigeons *Ducula bicolor* kept in the Tropical House began nest building activities in winter 1991/spring 1992. These steal material from the White-headed Buffalo Weaver nest and no full nest structure has been built by these weavers since this plundering began. The Pied Imperial Pigeons have so far thwarted our attempts to catch them up for transfer to another enclosure.

Taveta Golden Weavers *Ploceus castaneiceps* were obtained at the same time from the same sources as the White-headed Buffalo Weavers and also originate from East Africa. The males are especially attractive being a bright golden yellow, duller on their backs, but with a brighter chestnut-orange collar on the nape and necklace on the upper chest. Unlike many other ploceine weavers the males have no non-breeding dress and are perennially in full colour. In contrast the females are rather dull streaky brownish above and yellowish below. The bills of the females are horn-coloured with a darker upper mandible whereas those of the males are all black. Previously little known in aviculture, the Taveta Golden Weaver is not mentioned by Restall (1975) nor Rutgers and Norris (1977) although both have individual entries for the sympatric Golden Palm Weaver *Ploceus bojeri* and the similar Golden Weaver *Ploceus subaureus*.

Four pairs of Taveta Golden Weavers were obtained in July 1988, a further pair in August and a single male in October. Only the males build nests often in inaccessible positions at the ends of Palm fronds, especially those overhanging water areas. Other nests were built in Rubber Trees *Ficus elastica* and Weeping Fig *Ficus benjamini*, and low down in Umbrella Bog plants *Cyperus*

alternifolius by the side of one of the water areas. Their preference for strips of fresh green material which they tear off from the leaves of living palms again caused some consternation amongst the gardeners especially as so many nests were started only to be deserted before completion or rejected by the fussy females. The first chick was fledged on 31 July 1989 only to drown in the water below its nest. A later chick which fledged on 13 October survived without falling into the water. Two chicks fledged from a different nest in November, although one of these also fell directly into the water below the nest and was found drowned. This appears strange for a species which elected to nest in palms above water. However this is not their normal habit. In the wild Taveta Golden Weavers build exclusively in swampy vegetation, usually bullrushes, rather than the palms or bushes used by the ecologically segregated but sympatric Golden Palm Weaver (Hall and Moreau 1970). Clearly this preference is not inflexible as shown by the birds at Chester Zoo nesting in palms and other trees as well as in lower vegetation. Two more chicks fledged successfully in December 1989. The chicks resembled the female but were generally darker and more streaky, altogether more sparrow-like, and had darker bills. Only the breeding female was seen to carry live food to the nest or to feed the fledged chicks. The birds bred again in 1990 with a chick successfully fledged in March, and two more hatched in May (another of which found its way directly into the water). At that time the colony consisted of six males and only one female. Since the loss of that female in 1991 no further breeding has been possible. Five males continue to weave nests suspending these from the palm fronds in the false hope of attracting a female. The observed seasonal scatter of nesting activity with no obviously defined breeding season may perhaps be expected from a species in which, unusually for ploceid weavers, the males have no non-breeding dress. Mackworth-Praed and Grant (1980) give no breeding dates for the Taveta Golden Weaver commenting that notes are not reliable because of past confusion with similar species. However, Brown and Britton (1980) report nesting activity in the wild from October to May.

As reported above the White-headed Buffalo Weaver *Dinemella dinemelli boehmi* and the Taveta Golden Weaver *Ploceus castaneiceps* were first bred at Chester Zoo in 1989. These are both believed to be first breeding successes. Anyone knowing of previous breedings in Great Britain is asked to contact the Honorary Secretary.

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ANALYSIS OF THE RELATIONSHIP BETWEEN EGG ORDER (1 - 15) AND EGG QUALITY AS DETERMINED BY HATCHING AND FLEDGING RATES IN SIBERIAN, FLORIDA SANDHILL, WHITE-NAPED AND RED-CROWNED CRANES.

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ABSTRACT:

The fertile eggs of four species of Cranes currently or formerly at the International Crane Foundation (Siberian, Florida Sandhill, White-naped and Red-crowned) were studied to learn about the relationship between egg order and egg quality. The sample included 294 eggs. Indices of egg quality included the hatching rate, the fledging rate, and the hatching x fledging rate for each egg. Eggs that were not incubated full-term were not used in the analysis of hatching or fledging rates and chicks that were euthanised due to factors not indicative of egg quality were not used in the analysis of fledging rates. A significant negative relation was found between egg order and the fledging rate. Hatching rates and hatching x fledging rates (a measure of overall egg quality) were not significantly related with egg order. Therefore, inducing cranes to lay supernumerary eggs does not appear to result in reduced reproductive potential as the number of eggs laid in a year increases.

INTRODUCTION

Breeding large numbers of endangered animals is frequently desirable in captive breeding programmes. Zoos have increased the productivity of captive cranes by removing the eggs, termed "multiple clutching" (Koga 1961). Although the effects of multiple clutching on egg size have been studied (Putnam and Russman unpublished), no study has examined the effects of this technique on egg quality of cranes. If multiple clutching results in diminishing returns of fledged chicks per egg laid as the number of eggs laid in the season increases, then inducing females to lay eggs past a certain point may not be advisable. However, this possible reduction in fledged chicks should be weighed against the potential lifetime total of chicks for each female. If a female produces an overall high number of chicks, this is good for conservation. I examined the effects of multiple clutching on egg quality as



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