The Identities of Two Clutches of Calyptorhynchid Eggs from Western Victoria

Leo Joseph

1 Angas Street, Kent Town, S.A. 5067
Present address: Department of Zoology, University of Queensland, Qld. 4072

Received 14-5-1989, accepted 1-11-1989 EMU 91, 51-53

This note concerns the identities of two clutches of calyptorhynchid eggs held in the Australian Museum (AM), Sydney. Resolution of the eggs' identities is of some biological interest as will be explained.

The eggs

AM 048540 is a single egg from Edenhope (37°01′S, 141°19′E) in far western Victoria dated 17 April 1922. Data registered with the egg indicate that it was originally in the collection of H. Collins, an Edenhope egg collector who amassed a large collection. It eventually passed into the MacGillivray collection with which it was donated to the AM collection. The egg's collectors, C. and H. Wynniat, not H. Collins, were in search of beehives and evidently took no special interest in the egg beyond collecting and passing it, one presumes, to Collins. They did, however, record seeing a cockatoo leaving the hollow and settling nearby. AM 048539 is a clutch of two eggs from Balmoral (37°13′S, 141°51′E) at the western edge of the Grampians (also in western Victoria). It was collected by R. Ritchie on 30 November 1899 and similarly passed first into the MacGillivray collection and then the AM collection.

The problem

Western Victoria is inhabited by the south-eastern Australian subspecies of the Yellow-tailed Black-Cockatoo *Calyptorhynchus funereus xanthanotus* (see Saunders 1979) and an endangered endemic subspecies of the Red-tailed Black-Cockatoo *C. banksii graptogyne* (see Joseph 1982, nomenclature follows Schodde 1988). However, the eggs are all registered as being of the Glossy Black-Cockatoo *C. lathami* and Edenhope and Balmoral are both very unlikely places for *C. lathami* to have occurred when the three eggs were collected. This bird's present-day range is south-eastern Australia from south-eastern Queensland to far eastern Victoria with an isolated population to the west on Kangaroo Island, South Australia (Blakers *et al.* 1984). That it formerly occurred between these regions has been documented. For example, Baird (1986) and Joseph (1989) summarised sightings in the Mount Lofty Ranges where a local population probably became extinct late in the 19th century; occasional later sightings there were probably of birds wandering from Kangaroo Island. Also, Baird (1985) documented fossil material, dated to more than 15 000 years BP, from Green Waterhole Cave near Mount Gambier in lower south-eastern South Australia. However, all recent records of the species from western Victoria and south-eastern South Australia have been withdrawn or shown to be erroneous (see, for example, Lendon 1946; Parker 1982). Baird (1986) assigned an egg collected in June 1899 at Tarwin, east of Melbourne, to *C. lathami* and I concur with this.

Concerning the Balmoral eggs, one further notes that the normal clutch size of both *C. banksii* and *C. lathami* is one, but *C. funereus* lays one or, more commonly, two (e.g. Forshaw 1981).

One may therefore reasonably ask whether the eggs have been misidentified and are of either of the other two calyptorhynchids known in the area, i.e. *C. funereus* or *C. banksii*. At this point their biological significance emerges. Neither *C. funereus* nor *C. banksii* would be expected to have eggs in April (when the Edenhope egg was collected), except in upper south-western Western Australia where *C. banksii* is known to breed in both the spring-summer and autumn-winter (Saunders 1977). The Edenhope egg, if of *C. banksii*, would thus constitute the only evidence that *C. b. graptogyne* may also breed in autumn. Similarly, it would be of interest to know that *C. funereus* may breed in autumn. April, however, is a month that one would expect *C. lathami* to have eggs. Furthermore, *C. b. graptogyne* is only known to breed in the Naracoorte-Edenhope-Casterton area and it is only rarely recorded in the western Grampians near Balmoral (Parker 1982; Joseph

1982). Reliably identified eggs from Balmoral, clutch size notwithstanding, could therefore indicate a decline in this subspecies' breeding range. *C. funereus,* on the other hand, has been recorded breeding in the Grampians area (J. McLean pers. comm.).

Comparisons of measurements of the eggs with those of series of other calyptorhynchid eggs have been made in the hope of clarifying the identity of the three problematic eggs. Figure 1 shows the results of this analysis.

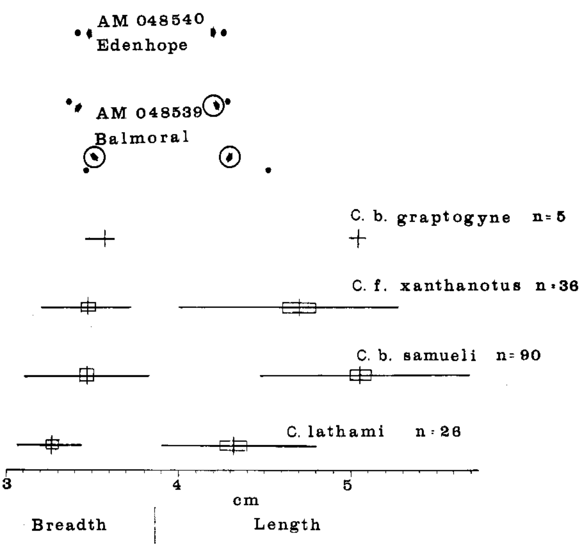

Figure 1 Measurements of the three problematic eggs discussed here and series of eggs of the indicated *Calyptorhynchus* taxa. The three problematic eggs are indicated by closed circles, the length and breadth of each egg being shown on one line. Sources: Parker (1982); Baird (1986); South Australian Museum egg collection, data files of S.A. Parker (S.A. Museum) and D.A. Saunders' (CSIRO) catalogue of eggs measured in Australian museums and in the field (DAS). Vertical lines: means; horizontal lines: ranges; bars: 95% confidence limits. Confidence limits are not shown for *C. b. graptogyne* because of the small sample size. (Note: In order to reduce variation in how these different sources may have taken their measurements, the analysis was repeated with data from the DAS catalogue alone. This reduced the sample sizes of *C. lathami* and *C. b. graptogyne* to 15 and three respectively but did not change the other sample sizes or the pattern that is illustrated here.)

The breadth measurements are equivocal, the length measurements much less so. Of the three problematic eggs, the lengths of two are outside, and that of the third barely within, the range of 90 eggs of *C. b. samueli* from upper south-western Western Australia and central Australia. They are all well outside the length of five reliably identified *C. b. graptogyne* eggs. Indeed, on the basis of the measurements alone, the eggs are most strongly suggested to be of *C. lathami*, as registered. But they could reasonably be of *C. f. xanthanotus*, a solution that sits more easily with known distributions since European settlement and, for the Balmoral eggs, known laying dates and clutch sizes. In conclusion, the balance of the data relating to measurements, date of collection and clutch size suggests that the eggs' identities are at present questionable but possibly of *C. f. xanthanotus*. This conclusion is perhaps most easily defended for the Balmoral eggs collected in November, the date of the Edenhope egg (April) being compatible either with *C. funereus* breeding at an unexceptional locality at an exceptional time or the reverse applying, somewhat more dramatically, for *C. lathami*.

Finally, the reason why the two clutches were registered as C. *lathami* is most likely another example of the great confusion that has characterised knowledge of these cockatoos in south-eastern Australia. For example, Parker (1982) established that an egg of *C. b. graptogyne* from north of Naracoorte had originally been assigned to *C. lathami* largely because its collector knew that the red-tailed calyptorhynchids in that area fed in the locally common species of the genus Allocasuarina (Bulloak *A. luehmannii*), this genus being virtually the sole food source of *C. lathami*. (We now know that *C. b. graptogyne* feeds on this tree's cones — Joseph 1982.) The collector identified the egg accordingly but incorrectly. Perhaps MacGillivray had also learnt that some calyptorhynchids in the area fed on *Allocasuarina* and, on seeing the relatively small size of the eggs in question, confidently assigned them to *C. lathami*.

Acknowledgements

Denis Saunders commented on a draft and kindly allowed me to use the data that he has gathered on calyptorhynchid eggs from the field and from the collections in Australian museums. Walter Boles of the Australian Museum made available the registered data accompanying the three eggs discussed here and S.A. Parker of the South Australian Museum allowed me to use unpublished measurements of a *C. b. graptogyne* egg and to measure other eggs in his care.

References

Baird, R. 1985. Avian fossils from Quaternary deposits in

"Green Waterhole Cave" south-eastern Australia. Records of the Australian Museum 37, 353-370.
Baird, R. 1986. Historical records of the Glossy Black-Cockatoo *Calyptorhynchus lathami* and Red-tailed Black-Cockatoo *C. magnificus* in south-eastern Australia. South Australian Ornithologist 30, 38-45.
Blakers, M., Davies, S.J.J.F. & Reilly, P.N. 1984. The Atlas of Australian Birds. RAOU and Melbourne University Press, Melbourne.
Forshaw, J. 1981. Australian Parrots, 2nd edn. Lansdowne, Melbourne.
Joseph, L. 1982. The Red-tailed Black-Cockatoo in south-eastern Australia. Emu 82, 42-45.
Joseph, L. 1989. The Glossy Black-Cockatoo in the South Mount Lofty Ranges. South Australian Ornithologist 30, 202-204.
Lendon, A.H. 1946. Identification of the Glossy Black-Cockatoo (*Calyptorhynchus lathami*) in South Australia. South Australian Ornithologist 18, 7.
Parker, S.A. 1982. The records of the Glossy Black-Cockatoo from the South-East of South Australia. South Australian Ornithologist 28, 209-210.
Saunders, D.A. 1977. Red-tailed Black-Cockatoo breeding twice a year in the south-west of Western Australia. Emu 77, 107-110.
Saunders, D.A. 1979. Distribution and taxonomy of the White-tailed and Yellow-tailed Black-Cockatoos, *Calyptorhynchus* spp. Emu 79, 215-227.
Schodde, R. 1988. New subspecies of Australian birds. Canberra Bird Notes 13, 119-122.

Coping With an Erratic Nectar Source – Eastern Spinebills *Acanthorhynchus tenuirostris* at New England National Park

Hugh A. Ford
Department of Zoology, University of New England, Armidale, N.S.W. 2351

Received 8-1-1990, accepted 11-4-1990 EMU 91, 53-56

Australian honeyeaters frequently congregate in areas of prolific flowering of nectar-producing trees and shrubs (Keast 1968; Ford & Paton 1985). On occasion the amount of nectar produced greatly exceeds the requirements of the honeyeaters (Ford 1979; Pyke 1983). At other times nectar is depleted very rapidly to uneconomical levels (Ford 1979; Ford & Paton 1982; Paton 1985). Therefore, the local availability of nectar has the potential to influence the survival of individuals, the size of populations and the level of competition between species. So far, most researchers have emphasised how seasonal changes in the abundance of nectar affect the behaviour, abundance and species composition of honeyeaters (e.g. Ford 1979; Pyke 1983; Paton 1985), though changes within a day have also been examined (e.g. Collins & Briffa 1983a). However, there are also day-to-day changes in the quantity of nectar available and the ways in which birds respond to these have received little attention.

In New England National Park, *Banksia spinulosa* flowers regularly and prolifically every winter, when large numbers of Eastern Spinebills *Acanthorhynchus tenuirostris* invade the area (Ford & Pursey 1982; McFarland 1986b). There is a close correlation between the density of nectar-producing inflorescences and the abundance of Eastern Spinebills (r = 0.62-0.85) and most other species of honeyeater (r = 0.60-0.86 for all honeyeaters — McFarland 1986b). However, there is no consistent relationship between abundance of the honeyeaters and productivity of nectar (r = 0.27 for Eastern Spinebills, r = 0.07-0.37 for six other species — McFarland 1986b). This could have been partly because the production of each inflorescence varies greatly from day to day, as a result of changes in the weather (McFarland 1985). Productivity is correlated with minimum temperature, so that little nectar is secreted after nights colder than -2°C, and nectar may be washed out of inflorescences during heavy rain. This means that there are days when the total energy demand of nectar-feeding birds greatly exceeds the energy produced from