

intermediates) as shown in the model (Fig. 3).

The asymmetry in the intermediate zone observed by Burton & Martin (1976) would also be predicted. The zone of black-backs and intermediates would be expected to be about eight times wider than the zone of white-backs and intermediates (if selection were not operating across the intermediate zone (Fig. 3). In the transect from stations 33 – 38, the zone of black-backs and intermediates was at least three times as wide as the zone of white backs and intermediates. (The end point of the zone of black-backs and intermediates was not observed by Burton & Martin (1976)).

Burton & Martin's (1976) results agree fairly closely with those predicted from an epistatic system of duplicate genes with cumulative effects (Stansfield 1969). Deviations from expected frequencies are explained in terms of a gradual change in the direction

of selection across the 'hybrid' zone, with no need to invoke either asymmetrical selection or an invasion of black-backs, for which there is little evidence.

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APPARENT BAITING BEHAVIOUR BY A BLACK KITE

On 22 June 1979 Larry Haydon and I were observing birds from the bank of the Lennard River at the camping-ground of Windjana Gorge National Park in the West Kimberley of north-western Western Australia. Our attention was drawn to the extraordinary antics of a Black Kite *Milvus migrans* which allowed us to approach to within a few metres. The bird picked up a scrap of bread from the ground with its talons, carried it into the air and dropped it into the river, which was only about 10m wide.

The Kite then flew to a eucalypt branch overhanging the water. The floating bread attracted several dozen small fish and freshwater crayfish (cherabins *Macrobrachium* sp about 20cm long). While they were feeding on the bread, the Kite dived from its perch and appeared to attempt to catch them by striking into the water with its talons.

This performance was repeated several times over an hour. During the time we watched, the bird was unsuccessful, repeatedly returning to its perch with no prey. On two later occasions, it returned to the ground and collected and dropped more bread. On a still later occasion, it succeeded in capturing a large cherabin, but one that had surfaced away from the bread. The crayfish was carried to the bird's perch and eaten.

Black Kites are well-known as scavengers and feed largely on carrion; also on small mammals, insects and reptiles. I can find no published account of this species 'fishing' in any manner in Australia or elsewhere. The bird we observed fishing appeared clumsy but was successful at least once.

The apparent use of a bait to attract the fish is even more unusual. This bird had evidently not only acquired a taste for live aquatic animals. It had apparently learned of their attraction to bread and exploited this knowledge by deliberately dropping scraps onto the water, thus attracting them to the surface and within striking range. Is it possible that this habit was learned by the bird observing human picnickers throwing bread-scraps into the river?

Boswall (1977, *Avicult. Mag.* 83: 146-159, 220-228; 1978 *Avicult. Mag.* 84: 162-166) has reviewed the few other cases where avian species are known to employ bait. One Green Heron *Butorides virescens* in Florida used pellets of fish food and three others bread scraps to lure fish within range of their bills. Yet another bird of this species, in Kenya, baited fish also with bread left lying about by visitors. A captive Sun Bittern *Eurypyga helias* in Britain baited fish with mealworms. A Pied Kingfisher *Ceryle lugubris* was seen by two observers on different

dates at precisely the same African location to bait fish in a similar manner to the Black Kite that is the subject of the above note. A case of apparent baiting with insects by a Squacco Heron *Ardeola*

ralloides had been reported.

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26 June 1980

MOULT OF JUVENILE CURLEW SANDPIPERS IN SOUTHERN AUSTRALIA

Curlew Sandpipers *Calidris ferruginea* breed in the palaearctic (Vaurie 1965) and migrate to South Africa, Australia and New Zealand, where adults undergo a complete moult. The birds arrive between August and November or December (Thomas 1970; Thomas & Dartnall 1971; Pringle & Cooper 1975; Elliot *et al.* 1976). Thomas & Dartnall described the sequence and timing of flight moult in adults visiting Tasmania and Elliot *et al.*, the timing of primary moult in adults visiting South Africa. Moult usually begins in September or October and ends in January or February. Then the birds accumulate fat before leaving for the breeding grounds in March and April. Some, however, remain in southern Australia (and southern Africa) throughout the southern winter and are assumed to be immature (Thomas 1970).

In South Africa juveniles arrived in September and October about two weeks after the first influx of adults (Elliot *et al.* 1976). These birds did not have a complete moult nor did they deposit fat in February and March. They accounted for over 90% of birds that overwintered. Some second-year birds overwintered for a second year and the rest of the overwintering population was assumed to be second-year birds. In some areas juveniles began a partial moult of primaries in February, usually replacing the outer three to five (Elliot *et al.* 1976), but elsewhere they replaced no primaries (Pearson 1975; Waltner 1976). Thomas & Dartnall (1971) recorded no juveniles in their samples from Tasmania.

We scored the moult of 259 Curlew Sandpipers, including 177 juveniles, caught between March 1976 and April 1977 at Werribee Spit, near Melbourne, Vic., and found a similar pattern of moult in juveniles to that in South Africa. Juveniles arrived later than adults with comparatively new primaries which contrasted with the old, very worn feathers of the adults. By January their primaries were worn and contrasted with the now new primaries of the adults. Most juveniles (about 80%) began a partial moult of their primaries from January to March, replacing a variable number of outer primaries. Figure 1 shows the timing of this moult in relation to the timing of primary moult in adults. The moult usually began on the fifth, sixth or seventh primary (31/39 birds, 79%)

and proceeded outwards to the tenth. One bird began with the second primary, another with the fourth and six (15%) with the first, but two of these arrested the moult after replacing eight primaries. These six birds may have been adults that had begun their moult much later than other adults or arrested it, perhaps because they were ill or injured. We classed them as juveniles because they had no signs of breeding plumage nor any reserves of fat. Six other birds arrested their primary moult and four of thirty-one juveniles caught after March had replaced no primaries (Fig 1). Moult of primaries in the two wings was usually symmetrical (31/39 birds) and most birds had or would have completed this partial moult by the end of April.

Feathers in other tracts were also replaced and these moults were also usually incomplete. Most juveniles started moulting rectrices and tertaries in late November and December. Moult of rectrices usually began with the first or second (innermost feathers) and proceeded outwards but many omitted the fifth, fourth and fifth or third, fourth and fifth feathers. Others arrested the moult and only a few individuals (about 20%) replaced all rectrices. In February and March about half the birds moulted some secondaries, usually beginning with feathers midway through the tract and proceeding inwards. Again, some birds omitted feathers within this sequence and others arrested the moult.

Most juveniles had extensive body moult during November, December and January, a small amount in February and March and none in April and May. They did not develop breeding plumage nor gain weight in March and April (Fig. 2).

Juveniles of many palaearctic waders have similar partial moults of flight-feathers, e.g. the Ruff *Philomachus pugnax*, Common Sandpiper *Tringa hypoleucos*, Marsh Sandpiper *T. stagnatilis* and Wood Sandpiper *T. glareola* in South Africa (Tree 1974; Pearson 1975) and Red-necked Stint *Calidris ruficollis* in southern Australia (Paton & Wykes 1978) and this characteristic may be useful in ageing other palaearctic waders that visit Australia.