SOME NOTES ON THE PERPLEXING COX'S SANDPIPER

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INTRODUCTION

Cox's Sandpiper *Calidris paramelanotos* was described by Parker (1982) from two South Australian specimens. The first was collected by H.J. Eckert and myself at Mosquito Point, Lake Alexandrina, on 16 February 1975, but was originally identified as an unusual Pectoral Sandpiper *C. melanotos* (Cox 1976). The second, the type of *paramelanotos,* was collected by me at Price Saltfields, Upper Yorke Peninsula, on 5 March 1977. There are earlier sightings of a "new" sandpiper from Victoria (Smith 1984b). Marchant *et al.* (1986) said that these "are now generally believed to have been this species", but the identity of many is in doubt because some were originally described as *melanotos* or Dunlin *C. alpina.*

All records of *paramelanotos* are from south-eastern Australia and Marchant *et al.* (1986) have pointed out that "Since breeding is completely unknown, it is yet possible that this 'species' may be a stereotyped hybrid;" and "Since all other calidrids breed at between 42° and 83°N, it must be presumed that this species nests somewhere in this zone, probably in the USSR."

This article discusses the putative records and details my further, recent South Australian sightings in an attempt to clarify the characteristics of *paramelanotos* because later published descriptions and illustrations of the bird contain errors, no doubt at least in part caused by the earlier descriptions ascribed to it. With the errors eliminated, a clearer understanding of its relationships to other congeneric sandpipers emerges.

The short but turbid history of *paramelanotos* is also complicated because "a dispute exists over both identity and variation of characters of this newly recognised and named bird" (Simpson & Day 1984).

NOMENCLATURE

The dispute over the naming of *paramelanotos* unfortunately continues. Mitchell (1987a) for example said "the name Cox's Sandpiper is unacceptable to F.T.H. Smith. . .", and a Bird List for Werribee Sewage Farm compiled by Smith (1987) has a footnote stating that, "The naming of this new sandpiper is not acceptable to the compiler of this list and is the subject of an on-going dispute with the South Australian Museum."

I hope this article will assist the resolution of the dispute, although I must make it clear that I have taken no part in the naming of the specimens, either to the vernacular or scientific name.

A chronology can elucidate the dispute:

Smith (1969, 1970, 1972a, 1972b) documented his Victorian sightings of *alpina.* The first specimen of *paramelanotos* was collected in South Australia in 1975 and originally identified by the British Museum (Natural History) as *melanotos* (P.R. Colston, pers. comm. to S.A. Parker 1975), and described by me as "an unusual specimen" of the latter (Cox 1976). When the second specimen was collected in 1977 it was realised that both birds could be an undescribed species, although it was believed unwise to name them pending clearer evidence of their taxonomic relationships. In an effort to identify the specimens both were sent to museums in the United States of America and England. They were not positively identified, but R.L. Zusi, National Museum of Natural History — Smithsonian Institution, said (pers. comm. to S.A. Parker, 24 March 1978) that both specimens "are not members of any known species. . . .They are either hybrids or a new species. . .They are in fact intermediate between *Calidris melanotos* and [the Curlew Sandpiper] *C. ferruginea,* suggesting hybrid. . ." Thus it became widely known they were in the South Australian Museum collection, and that their similarity to some published descriptions of Victorian sightings of *alpina* cast doubt on the validity of many records of that species. Smith (1981) retracted his *alpina* records, but a later composite description of his sightings included an editorial comment referring to the name "*perplexa*" (Smith 1982). Parker (1982) later described the two specimens and named them Cox's Sandpiper *Calidris paramelanotos.* Smith (1984a) questioned this action and contended that he and Parker had previously agreed

that the birds should be named False Dunlin *Calidris "perplexa"*, and he later tabled 21 Victorian sightings of a "Sandpiper New to Science" (Smith 1984b).

A holotype was not described by Smith (1982, 1984a, 1984b), and thus *"perplexa"* is a *nomen nudum* and should not be perpetuated in future literature. Further argument concerning the rightful nomenclator is here considered irrelevant because Smith could not have properly named a new species without a type specimen, and even if he and Parker had discussion about differently naming the specimens I collected, at no time did Smith inform me of his wish to name them. Later in reply to a letter from me Smith (pers. comm. 25 February 1985) acknowledged my interest and right to participate in any naming.

While some ornithologists seem to eschew the use of personalized vernaculars such as Parker (1982) bestowed on *paramelanotos,* Dunlin is the name of a distinctive sandpiper that is not the closest relative of *paramelanotos,* and any resemblance is only superficial. Thus False Dunlin is also not a particularly apt name, except perhaps to perpetuate memories of early errors of identification.

EARLIER PUTATIVE RECORDS

Victoria

I have seen photographs of *paramelanotos* from Victoria (*per* D.W. Eades) and acknowledge that there is a steadily accumulating number of verifiable records from that State. It is also highly probable that some of Smith's earlier sightings of *melanotos* (Smith 1968) and *alpina* (Smith 1969, 1970, 1972a, 1972b) are referable to *paramelanotos,* although it is unlikely that all can now be authenticated.

Smith (1984b) said, "I have seen and handled the two South Australian Museum skins described by Parker and they appear, in all respects, to be similar to the birds noted in Table 1". That table listed 21 sightings of the "new" sandpiper in Victoria between 1955 and 1982, and included in it are Smith's previously published sightings of two *melanotos* and seven *alpina.*

There seems little doubt that two of those tabled sightings are of birds originally identified as *melanotos,* because they were not listed by Smith (1969) in an article about *alpina* sighted near Melbourne on given dates between 1955 and 1968, although birds described elsewhere (Smith 1968) and identified as *melanotos* with unusual characteristics were seen on two of the tabled dates: A *melanotos* seen on 20 February 1966 at Werribee Sewage Farm ". . .appeared to have a wholly dark bill," while another on 20 March 1966 at Laverton Saltworks was ". . .paler than the others, with the breast streaking not so heavy, but sharply divided from the underparts. The back was paler and not so darkly mottled. The legs were grey-green, and the longish, slightly decurved, bill was entirely dark." These descriptions indicate that it is highly probable they are referable to *paramelanotos.*

The tabled sighting dated 10 September 1967 at Laverton Saltworks was first identified by Smith (1969) as *alpina,* and his description resembles that species rather than *paramelanotos:* He observed that, "Standing with the bird were three Curlew Sandpipers, in non-breeding plumage, thus allowing fine comparison views. The strange wader, although closely resembling the Curlew Sandpipers, stood out by its somewhat smaller size, shorter legs, slightly shorter bill, darker breast and more greyish upper parts." Smith (1969) also described another *alpina* as having "shorter legs" than *ferruginea,* when in fact *paramelanotos* does not have shorter legs (Fig. 1) and is slightly larger than *ferruginea.*

The five remaining tabled sightings that were originally described as *alpina* are difficult to assess because Smith (1970) did not publish a full description, or individual descriptions, although a composite description of three birds (Smith 1972b) indicates that they could have been *paramelanotos.*

Thus the tabled sightings of the "new" sandpiper contain records of birds that Smith originally identified as *melanotos* during the period he identified others as *alpina,* and these are two species that an experienced observer should have little difficulty in differentiating in the field. This aspect indicates that the birds in Smith's (1984b) table must have varied greatly in appearance, contrary to his statement that they appeared to be "in all respects" similar to the two specimens of *paramelanotos.*

In conclusion, because of the above doubts, the absence of proper original descriptions, and the fact that *alpina* has been recorded in New Zealand (Habraken 1980) and north Queensland (Roberts 1983) and therefore could feasibly occur in southern Australia, it would be prudent to regard all of the pre-1972 sightings in Smith's (1984b)

table as unconfirmed. The remaining tabled sightings from 1973 to 1982 cannot yet be assessed because the birds have not been individually described.

New South Wales

An unusual wader captured on 21 March 1981 at Stockton, New South Wales, was described by Lane *et al.* (1981) to be "most probably a hybrid" between *ferruginea* and the Sharp-tailed Sandpiper *C. acuminata.*

The published description and photographs of the bird show that it was closely similar to the type of *paramelanotos;* although after examining a specimen from the South Australian Museum, Lane *et al.* said, "Although alike in a number of aspects it was not identical with the one described here." They said that on their bird "about one third of the mantle and back were similar to the Curlew Sandpiper (summer) breeding plumage with the remainder (of these parts) still in non-breeding plumage. The tertials were typical of a "Sharpie" [*C. acuminata*], being long with buff edges."

It is uncertain whether the tertials of the captured bird were of nuptial plumage, but even so, the tertials of both *paramelanotos* specimens are similarly coloured to those of *acuminata* and *melanotos* and this feature is therefore not a diagnostic character of *acuminata.* Cramp & Simmons (1983) said the tertials of adult breeding *acuminata* are "black with broad pink-cinnamon to rufous-cinnamon fringes," and those of *melanotos* are "black, rather evenly fringed rufous-cinnamon."

Judging from the photographs of the Stockton bird, its head and neck were heavily streaked with dark markings that extended to the sides of the throat and on to the breast, and there was little trace of a pale supercilium behind the eye. These characteristics are typical of *melanotos* and like those of both *paramelanotos* specimens, while *acuminata* and *ferruginea* are not so heavily streaked. Also, the wing and bill measurements of the Stockton "hybrid" lie between the measurements of both *paramelanotos* specimens (Fig. 1).

At the time Lane *et al.* (1981) captured the "hybrid", *paramelanotos* had not been described, and in the field they were disadvantaged by being able to compare it only with *acuminata* and *ferruginea.* Nevertheless, from the plumage characters of the bird shown in the photographs, there is reason to believe that if it was a hybrid it was from parental *ferruginea* and *melanotos* rather than *acuminata.* I agree with Marchant *et al.* (1986) in regarding it as an example of *paramelanotos,* that may yet prove to be hybrid.

SOUTH AUSTRALIAN RECORDS

Specimens

As suggested by Parker (1982), both specimens of *paramelanotos* are much alike except that the male holotype (South Australian Museum B30775) has larger dimensions than the paratype (B28843). Parker said that the latter bird was a "putative adult female" although during preparation I sexed it as a male (Cox 1976). On this point I concede that a mistake could have been made because there was some unavoidable delay between its collection and preparation and this resulted in some internal decay. But I do not fully agree with a statement written on a later label of this specimen that ". . .measurements of bird are of ad (female)" because the nature of any sexual dimorphism in *paramelanotos* cannot be assessed whilst the sex of only one specimen is known. Also, if *melanotos* and *ferruginea* are the closest relatives of *paramelanotos,* as they seem to be, measurements cannot be used to determine sex because while the male *melanotos* is larger than the female the reverse is the case in *ferruginea* (Fig. 1). Therefore, until measurements from more specimens of known sex are obtained, B28843 should be properly regarded as of unknown sex.

Parker (1982) noted that B28843 had its tail in moult, but otherwise said both *paramelanotos* specimens were in basic (non-breeding) plumage. I observe that both were in fact moulting into nuptial plumage. Their primaries were also new with little apparent wear.

Comparisons with melanotos *and* acuminata

Some of the characteristics of both *paramelanotos* specimens resemble important *melanotos* characteristics which differentiate that species from *acuminata.*

As Parker (1982) noted, *paramelanotos* resembles *melanotos* in primary shaft pigmentation. In detail, the upper surfaces of all shafts are brownish except the tenth, which is whitish. Other features of *paramelanotos* that resemble those of *melanotos* are: the white tips of the inner primary coverts are about 1 mm in width; the heavily streaked breast is composed of similarly patterned feathers, although in *paramelanotos* the dark central streaks are paler and the feathers have a more rufous tinge; and the rectrices have rounded tips except the longer central pair, which are pointed. On the other hand, all primary shafts

of *acuminata* are whitish shading to greyish near the base; its breast feathers are differently patterned; its inner primary coverts have white tips that are 2 mm or greater in width (see Prater *et al.* 1977); and all its rectrices are pointed.

Comparisons with ferruginea *and* melanotos

While many morphological features of *paramelanotos* indicate that it is closely-related to *melanotos,* other features suggest an affinity to *ferruginea.*

Both *paramelanotos* specimens have older feathers of non-breeding plumage and new nuptial plumage feathers. Some of their mantle feathers and scapulars are illustrated in Figure 2, which compares them with feathers of *ferruginea* and *melanotos.*

The nuptial plumage mantle feathers of *ferruginea* have brighter orange-rufous fringes than those of *melanotos* and *paramelanotos,* which have pale rufous only near the bases of their otherwise greyish fringes.

The nuptial plumage scapulars are more distinctly marked. Those of *ferruginea* are blackish with deep rufous notches at the sides and greyish notches at the tip; those of *melanotos* are blackish with rather even pale rufous margins that merge with the greyish near the tip; and those of *paramelanotos* are blackish with much broader grey areas near the tip but with less rufous fringing on the sides. The three different types of feather patterning seem distinct except that some scapulars of *paramelanotos* show variation, as illustrated in Figure 2. These scapulars have irregularly shaped blackish central areas, which might seem intermediate between the patterning of *ferruginea* and *melanotos* (as believed by R.L. Zusi, pers. comm. to S.A. Parker 1978), but the larger grey areas near the tips are not the same as *melanotos* or *ferruginea* (all specimens used for Figure 2 have thin white fringes to the tips of the scapulars and thus the extent of grey is not influenced by feather wear). Also, while the blackish central areas of these scapulars are asymmetrical in shape, the opposite feathers of the other shoulder are mirror images and thus on the bird they appear symmetrical. The irregularly patterned side of each feather is overlaid by another feather.

The "hybrid" captured by Lane *et al.* (1981) was noted by them to have some feathering of its "mantle and back" similar to nuptial plumage *ferruginea,* and I believe, from a comparison of their photographs of the bird with both *paramelanotos* specimens, that all three birds had similarly patterned scapulars.

The non-breeding plumage mantle feathers and scapulars of *ferruginea* are pale grey with black shafts and thin whitish fringes; those of *paramelanotos* are grey-brown with black shafts and whitish fringes; and those of *melanotos* are blackish-brown in the centre and near the shaft, shading to brownish-grey, with thin whitish fringes.

The central rump feathers of both *paramelanotos* specimens are blackish-brown with rusty fringes and the central uppertail coverts are whitish marked with heavy blackish-brown bars and chevrons. This feather colouration could also suggest intermediacy between *melanotos,* which has the same feathers blackish, and *ferruginea,* on which they are white though with an occasional dark bar.

More notably, in life the bills of both *paramelanotos* specimens were black with only the extreme base (about 2 mm) of the lower mandible yellowish. Also they are absolutely longer (Fig. 1) and more decurved than the bills of *melanotos,* which are blackish-brown shading to a yellowish base on both mandibles. The bills of the *paramelanotos* specimens thus more resemble the wholly black, longer and more decurved bills of *ferruginea.* In life the legs of both specimens were also darker than the yellowish colour of *melanotos,* but were dark olive-brown rather than the black of *ferruginea.*

Measurements

Figure 1 (measurements of adult birds from Prater *et al.* 1977, except *paramelanotos* from Lane *et al.* 1981 and Parker 1982) compares the wing, tarsus and culmen measurements of *paramelanotos* with those of *ferruginea, melanotos* and *acuminata.* It shows that *paramelanotos* has a longer wing and a slightly longer tarsus than the average *ferruginea,* and is only slightly shorter-billed. Also, both specimens have longer legs than the average *melanotos.* Nevertheless, all measurements of *paramelanotos* fall within the range of variation of *ferruginea* or *melanotos,* or are intermediate between the two.

It should be added that *alpina* (average wing-length of races varies from 111.6 to 125.1 and tarsus from 22.4 to 27 — Prater *et al.* 1977) is shorter-winged and shorter-legged than *paramelanotos* and has dissimilar plumage features.

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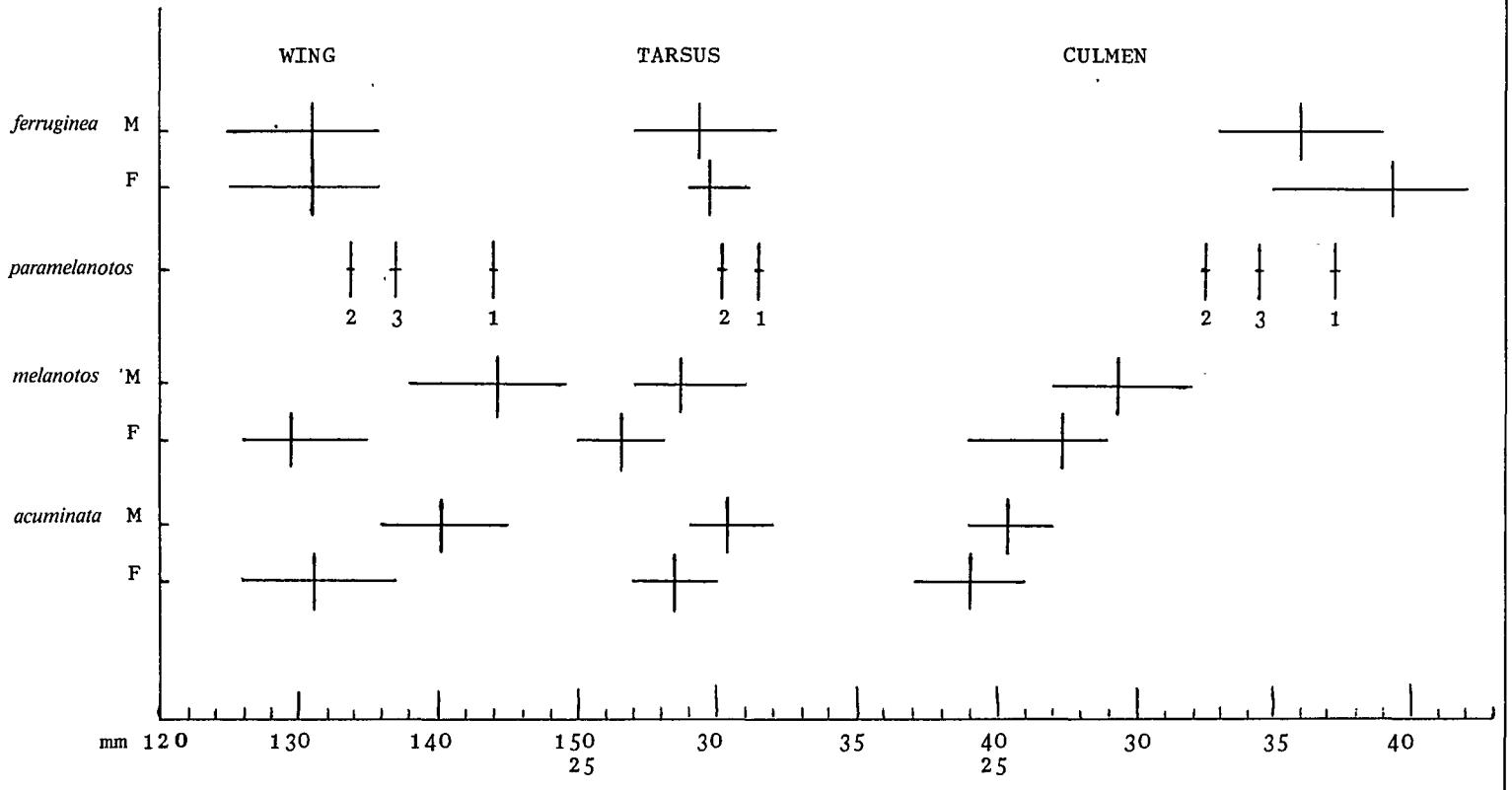

Figure 1. Measurements (mean and range) of four calidrid sandpipers. Dimensions of the three *paramelanotos* are given separately: 1 = holotype, Price Saltfields; 2 = paratype, Mosquito Point; 3 = bird captured, Stockton. Measurements of *ferruginea, melanotos* and *acuminata* are taken from Prater *et al.* (1977) and are for adults. M - male; F - female. Sample sizes used by Prater *et al.* (1977) for these data range from 13 to 37.

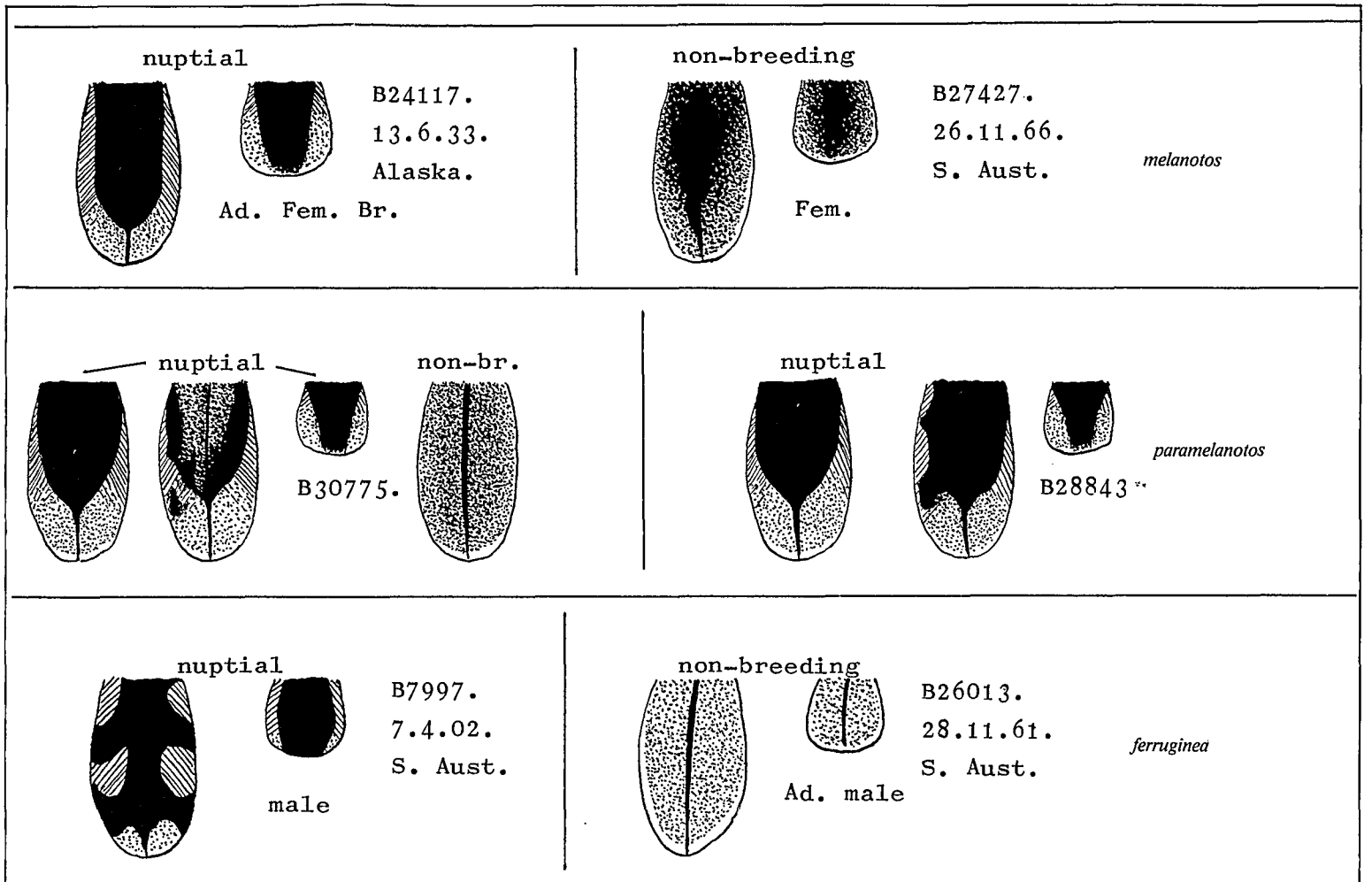

Figure 2. Mantle feathers (smaller) and scapulars of three calidrids. Diagonal shading indicates brighter rufous colouring and stippling is shades of grey or grey-brown. South Australian Museum Reg. No. of specimens and their localities are given. Dates are indicated thus: 13.6.33 for 13 June 1933.

Sight Records

Since the two *paramelanotos* specimens were collected, I had seen only one other example (at I.C.I. Saltfields, 23 km NNW of Adelaide, on 6 February 1979) until 1985 when a concentrated search for it commenced. This search consisted of 143 visits to the I.C.I. Saltfields between October 1985 and April 1987 and thus covered two summers when most migratory calidrids are present. Visits were made during all months but were less frequent in winter.

A.F. Lees and I saw a single *paramelanotos* on 7 December 1985, but then none was seen until 6 December 1986. From that date until 4 April 1987, I identified *paramelanotos* on 31 occasions. The exact number of individuals seen is not certain because all sightings were of single birds of similar appearance. Two birds were seen on five dates and I am certain that at least four individuals were present in the 1986-1987 season.

The following descriptions compiled from my field notes compare all birds I have seen from 1979 to 1987. To obviate the need to fully describe all six, Bird Three is used as a pattern because that individual allowed a more thorough study than the others.

BIRD ONE: Seen on 6 February 1979, it was similar to Bird Three in non-breeding plumage, but the bill appeared wholly black and the legs seemed darker because it was not seen so closely.

BIRD TWO: 7 December 1985. This bird was also in non-breeding plumage. It was not seen close enough to determine whether it had a yellowish base to the lower mandible of its otherwise black bill, and the leg colour, though darkish, was not clearly seen because the bird was wading deep in water amongst dead vegetation.

Description

As Bird Three, but pale eyebrow more noticeable behind eye. Crown heavily streaked but little trace of a split supercilium effect. Ear coverts darker. Breast more boldly streaked, with each striation standing out from a paler background, but streaking similarly abruptly demarcated from white lower breast.

BIRD THREE: This bird was present from 6 December 1986 to 4 April 1987 and was studied very closely by myself and numerous other observers. Many photographs were obtained (Fig. 3-7). It was in non-breeding plumage when first seen and had partially moulted into nuptial plumage when last seen.

Description of non-breeding plumage as on 6 December 1986.

Size and shape: Slightly smaller than *acuminata,* about the same size as *ferruginea* but longer-winged than either, with wings extending well beyond tail-tip. Stance more like *ferruginea* but body more bulky like *acuminata* and it seemed, by comparison, relatively smaller-headed.

Bill: Just longer than head length, slightly but noticeably evenly decurved; it seemed thicker than the bill of *ferruginea* with a more rounded rather than sharply pointed tip, although base was of similar shape. Black, except in very close views and in good light, when extreme base of lower mandible was seen to be yellowish.

Legs: Same length as *ferruginea,* but seemed thicker. Green-brown but at a distance looked darker.

Plumage: General colour pale grey-brown with white lower breast, belly and undertail. Head heavily streaked darker; dark crown stripe from bill to nape bordered by an obscure pale supercilium that was split by another horizontal dark line back from level with front of eye, giving the head a striped appearance. Split supercilium dull behind eye but showed as a noticeable white patch in front of eye. Ear coverts only slightly streaked but with orange wash when seen in good light. Small area of throat whitish. Neck heavily streaked dark grey-brown extending to upper breast and ending with a sharp division between it and the white lower breast; except for some greyish smudges on the sides of the lower breast near the carpal joint of wing, and a greyish line extending a short distance into the centre of the white lower breast. Rest of underparts white except for a few obscure greyish streaks on the lower flanks. Mantle feathers grey-brown with paler fringes. Scapulars, tertials and wing coverts grey-brown with blackish shaft lines and whitish fringes. Primaries in very worn condition, blackish-brown but with paler fringes appearing rusty in sunlight.

Flight pattern (features also seen whilst bird was preening): Upperwing pattern more like *acuminata* than *ferruginea,* with thin wing-bar formed by whitish tips to inner primary coverts and greater coverts. Central rump feathers blackish with narrow pale fringes and central uppertail coverts appeared dark with whitish fringes, giving a 'scaly' effect (see Fig. 7). Sides of rump and uppertail coverts white, the latter with dark marks near the shafts of some feathers. Tail feathers grey-brown and rounded except central two, which were darker, longer and pointed. In flight, bird had inconspicuous wing-bar and its rump and uppertail coverts appeared white but with a lighter central dark stripe than *acuminata.*

Description of bird moulting as on 22 March 1987.

Differed from above in having brighter chestnut, streaked crown, with supercilium more obscure except in front of eye. Ear coverts bright orange-chestnut. Sides of neck and breast tinged rufous, still heavily streaked, though not so sharply demarcated from white lower breast. Instead of the greyish smudges on sides of breast near carpal joint, there were only a few dark speckles. Underparts from lower breast to undertail remained white but with the few obscure streaks on the lower flanks gone. Many older mantle feathers and scapulars remained, but others had darker centres, so that the blackish shaft line could not be clearly seen, and were fringed bright rufous-chestnut. The tertials were blackish with bright rufous fringes.

BIRD FOUR: This bird frequented an area 4 km N of Bird Three and though observed very closely in good light, it seemed to differ only by having a

slightly longer bill, by lacking the pale greyish line extending slightly into the centre of the white lower breast from the sharply demarcated streaking of the upper breast, and by the grey-green leg colour. It was twice seen on the same day as Bird Three and journeys were made between each bird to establish that they were indeed different individuals. When first seen on 9 December 1986 it was in non-breeding plumage, but when last seen on 8 March 1987 it was moulting into nuptial plumage.

Description as on 8 March 1987.
Extreme base of lower mandible noted as pale; legs now noted as brownish-green. White supercilium confined to a patch in front of and slightly over eye. Ear coverts pale orange, streaked darker. Crown, neck and breast heavily streaked on a pale cinnamon background; but still sharply demarcated from white lower breast except at sides where there were some dark speckles. All white from lower breast to undertail coverts. Some scapulars with darker centres and bright rufous fringes. Primaries black and extending well beyond tail.

BIRD FIVE: This bird was first seen on 3 January 1987 by D.W. Eades, T. Reid and myself at Buckland Park Lake, which abuts the saltfields. It was then seen until 17 January. It differed from Birds Three and Four in having the pale supercilium more noticeable behind the eye, and having the streaking on the upper breast not so heavy although still sharply demarcated from the white lower breast.

BIRD SIX: Seen only on 23 January 1987, this bird was obviously different from the others present because it had a broken leg and very worn plumage. The mantle and wings appeared very dark but this was because the fringes of the feathers were heavily abraded. It otherwise only differed from Bird Three by having a slightly longer bill and slightly paler olive-grey legs.

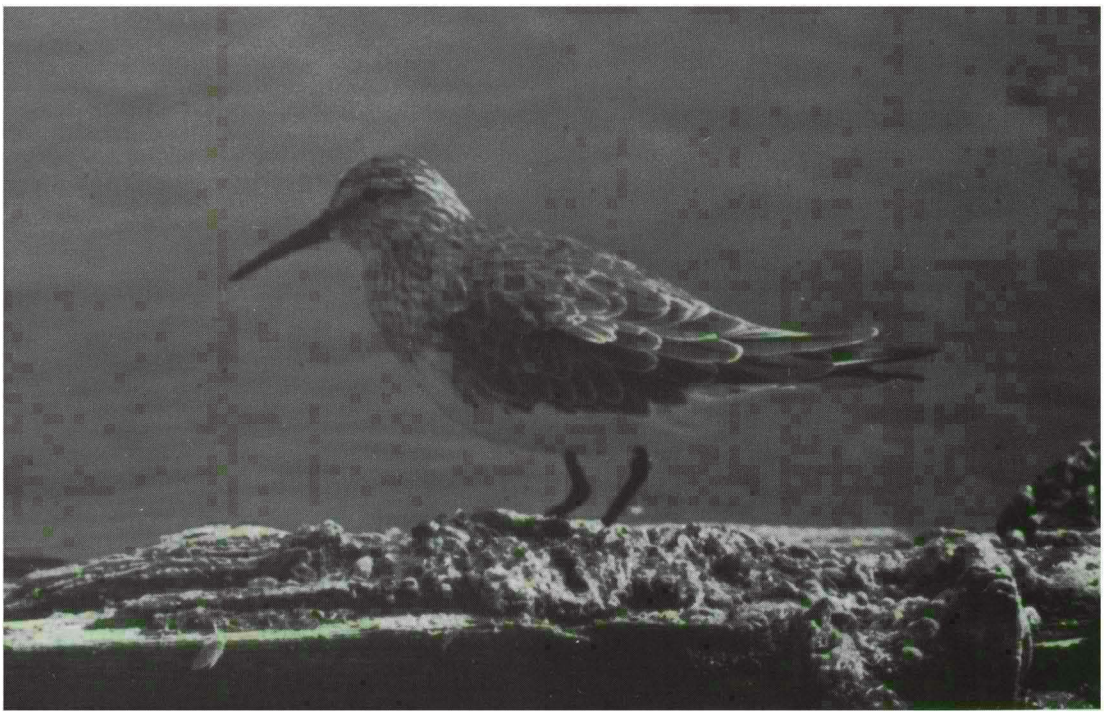

Figure 3. *Calidris paramelanotos*, I.C.I. Saltfields, South Australia, 3.1.87. This photograph and Figs. 4, 5, 6 and 7 are all of the same bird taken on the same date. Note the long wings extending beyond tail. *Photo: D.W. Eades.*

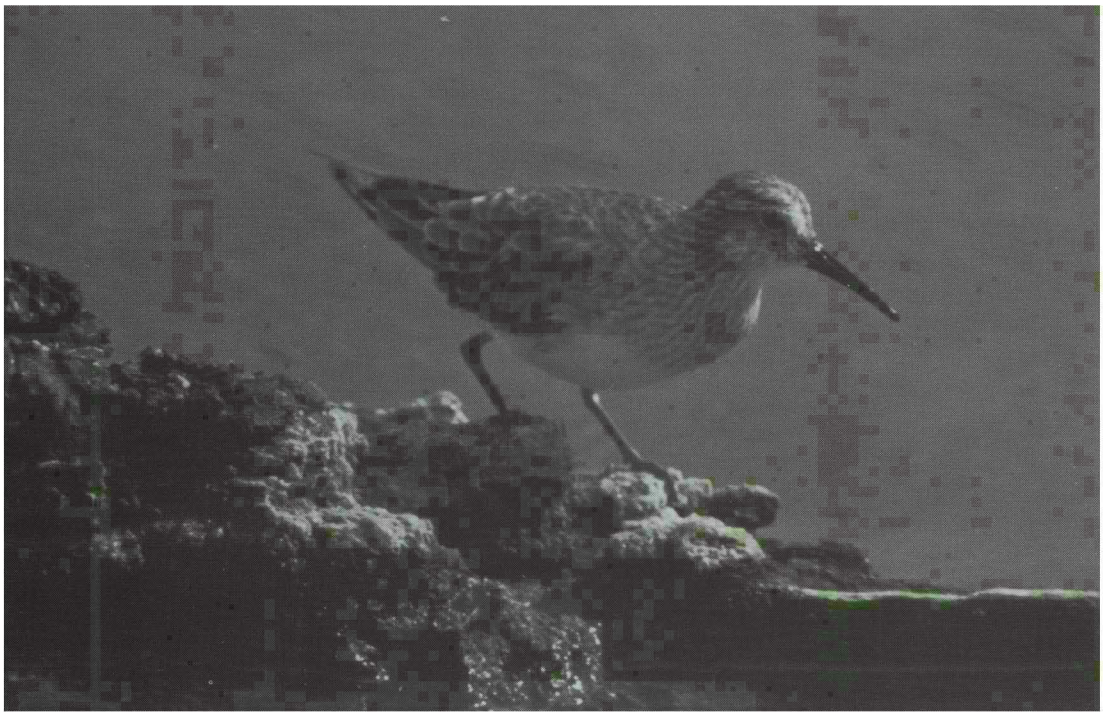

Figure 4. Note the heavily streaked upper breast, and its sharp demarcation from white lower breast and abdomen, and the split supercilium. *Photo: D.W. Eades.*

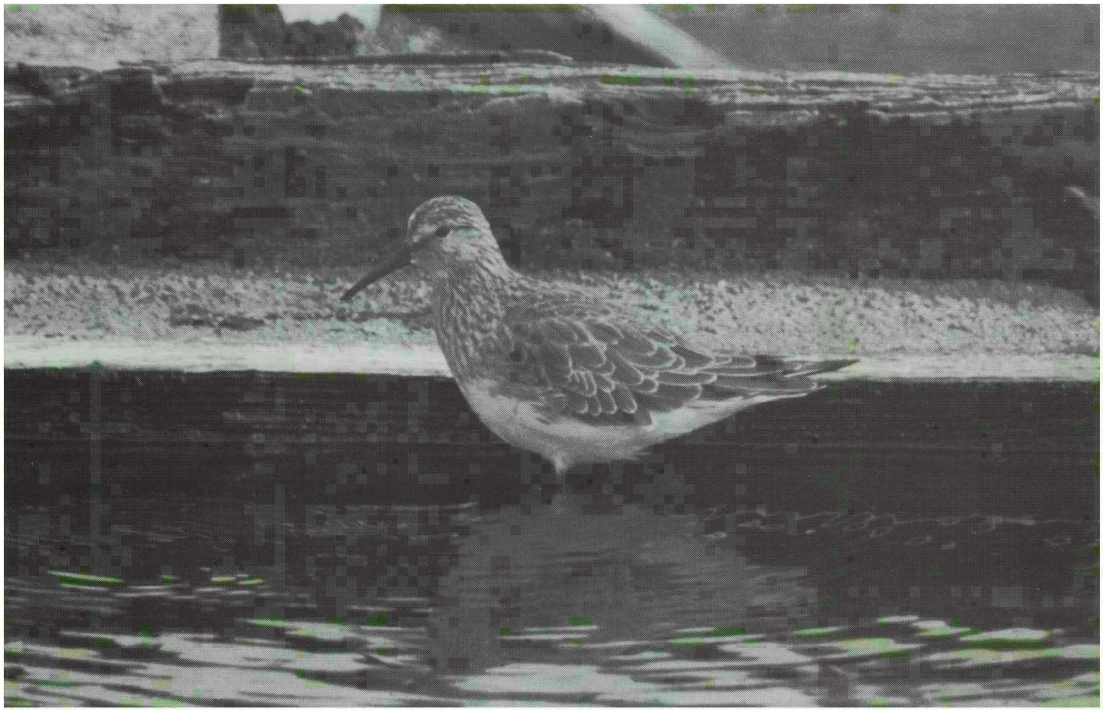

Figure 5. Note black shaft lines and pale fringes to scapulars and tertials and heavily streaked neck and breast. *Photo: D.W. Eades.*

Figure 6. Note new, growing primaries except nine and ten, which are very worn, and the white shaft of primary ten compared to darker shafts of others. Also thin wing-bar formed by white tips to greater coverts and inner primary coverts. *Photo: D.W. Eades.*

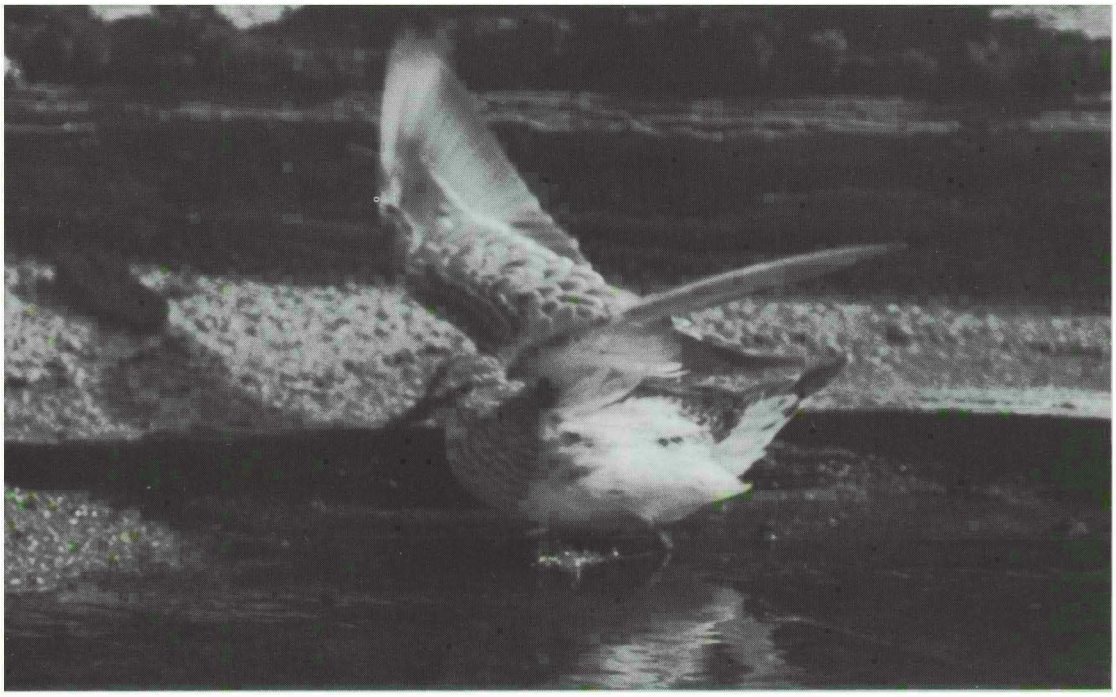

Figure 7. Note the 'scaly' pattern of rump feathers and central uppertail coverts, and the dark central marks of some lateral uppertail coverts. *Photo: D.W. Eades.*

Moult

Both collected specimens were in body moult to nuptial plumage and had new primaries. The bird of 16 February has more advanced nuptial plumage than the bird collected on 5 March.

Bird Three had very worn outer primaries (inner primaries not clearly seen) on 6 December and all but primaries nine and ten had been replaced by 3 January (see Fig. 6). It was first noticed to have commenced its body moult to nuptial plumage on 22 March. Bird Four had started body moult before it was last seen on 8 March, on which date it was noted to have new primaries.

It is evident from these observations that *paramelanotos* moults primary feathers during December-January and commences moult to nuptial plumage from early to late February.

Voice

The voices of Birds Three and Four were noted: Bird Three's call was written as *preep preep* not as harsh as *melanotos* but similar; bird four uttered a bubbly *creep.* In all there seemed little remarkable about their calls and to my ears they could be construed as intermediate in tone and quality between the calls of *ferruginea* and *melanotos.*

Behaviour

The first collected *paramelanotos* was solitary, the only other nearby wading birds being Red-capped Plovers *Charadrius ruficapillus.* The second specimen was first seen flying with some *ferruginea* but landed separately from them.

Bird One of the above list of sightings was seen within a loose group of *ferruginea* and *acuminata* feeding on mud at the edge of a salt lagoon.

Bird Two was first seen amongst dead vegetation in a lagoon containing two large roosting flocks of *ferruginea, acuminata* and Red-necked Stints *C. ruficollis;* but it was alone and about 20 metres from the nearest flock. When flushed it nevertheless flew with them.

At every high tide Bird Three occurred on the edge of a salt lagoon by a ruined wooden flume leading from a disused pumphouse. When the tide ebbed, the bird flew over the levee bank to a small seawater pool on the landward side of a fringing belt of Grey Mangrove *Avicennia marina* var. *resinifera.* It could reliably be seen at either location from 6 December to about 17 January, after which it could not be found at low tide but was seen fairly regularly at high tide one kilometre to the east on the edges of another lagoon. The bird was mostly solitary although when flushed it sometimes joined large groups of calidrids roosting on nearby mud spits. Although other waders were often coincidentally nearby, it mostly fed alone, either pecking from the surface of mud, deep-probing by pushing the greater part of its bill into the mud, or sometimes up to its belly in water and repeatedly dunking its bill below the surface with forward and downward head movements, seemingly identical to the method of *ferruginea* when feeding in similar circumstances.

Bird Four was also alone when first seen; feeding by pecking along the water's edge or probing into mud. It fed on a small mud spit, which it aggressively defended against the approach of one or two *acuminata.* On a later date it was seen feeding alone in the middle of a stream up to its belly in water, similar to the feeding habit of *ferruginea.*

Bird Five was with a large crowded group of *acuminata* and *ferruginea* feeding on a mud islet. It was later seen alone or sometimes with a few *ferruginea.*

Bird Six was with a large flock of roosting calidrids and flew with them when flushed to another site.

Most of the above sightings were of birds concentrated into smaller areas at high tide. Otherwise *paramelanotos* seems to be rather solitary in behaviour and it may associate only fortuitously with other calidrids.

Habitat

The first specimen of *paramelanotos* was collected by freshwater 35 km from the sea. The remaining records were all coastal. Two birds were seen in fresh or brackish water habitat and five were only observed in saltwater environments. Most birds were only seen at high tide when they frequented salt lagoons, a brackish stream or a shallow freshwater lake. At low tide they presumably fed on tidal mudflats on the seaward side of a belt of mangroves or, like Bird Three, in seawater pools within the mangroves or samphire.

IDENTIFICATION

When seen clearly *paramelanotos* is by no means the most difficult calidrid to identify, but it should be remembered that, as yet, the juvenile and full nuptial plumages have not been properly described. Some birds seen in partial nuptial plumage in South Australia could have been first year birds or females that may not have a nuptial plumage as brightly coloured as an adult male.

In non-breeding plumage *paramelanotos* can be mistaken for a heavily-marked *ferruginea;* but it has a slightly shorter decurved bill, legs olive green to green-brown rather than black, heavily streaked head and neck with the paler supercilium indistinct behind the eye, heavily streaked breast sharply demarcated from white lower breast and rest of underparts, darker centres to the back and wing feathers (beware juvenile *ferruginea*), dark stripe from rump to central uppertail coverts, and a thinner white wing-bar. Its legs usually seem to be of equal length to those of *ferruginea* but it appears to be a longer-winged and bigger-bodied bird.

When moulting to the more brightly coloured nuptial plumage *paramelanotos* is browner and most like *melanotos,* but differs in having a longer, more decurved, mainly black bill and longer, darker legs. The less obvious demarcation between the streaked upper breast and white lower breast may be due to incompletely grown feathers, with their paler tips obscuring the streaks that thus appear as speckles.

I have seen many thousands of *alpina* in Western Europe and although it seems to have been previously confused with *paramelanotos* most should be distinguishable by their smaller size, shorter wings and shorter legs; and all (including the larger Eastern Palaearctic and Nearctic races) by a more conspicuous white wing-bar, a black line from rump to tail-tip, black legs and a different call-note.

It should be noted that some descriptions and illustrations of *paramelanotos,* understandably, contain errors. Simpson & Day (1984) incorrectly stated that *paramelanotos* has "Breast *not* strongly demarcated" and that it has "Shorter legs" than *melanotos* when in fact the legs are longer (Fig. 1). Marchant *et al.* (1986) also inaccurately said *paramelanotos* has "shortish" legs. Of the illustrations those by Hayman (Marchant *et al.* 1986: pl. 82) are the most accurate; but Fig. 201b is wrongly captioned and is *melanotos* rather than *paramelanotos,* and Fig. 201d unaccountably shows *paramelanotos* with 14 rectrices instead of the 12 of all calidrids. (Some rectrices of the two specimens are missing but if all were present there would be 12). The illustrations by Davies (Lane 1987: pl. 13) correctly portray the scapular patterning of the alleged "adult breeding" (but if the bird was to carry those feathers in the exaggerated mode depicted, identification would be easy!); but the "adult non-breeding" is much too lightly streaked.

DISCUSSION

The unqualified remarks in Reader's Digest (1986) that *paramelanotos* may be "no more than a hybrid between Dunlin and Sharp-tailed Sandpiper" and, for example, other generalizations that it is *"Between Curlew Sandpiper and Sharp-tailed Sandpiper in general appearance"* (Lane 1987) are not supported by the available evidence which I have presented here that reasonably indicates a close relationship between *paramelanotos, melanotos* and *ferruginea.* The main question that must be resolved is whether the former is a hybrid of the other two or a distinct species.

Many of the characteristics of *paramelanotos* seem to be intermediate between those of *melanotos* and *ferruginea,* particularly the uppertail coverts, bill and legs. If a hybrid it is remarkable that all birds I have seen and collected are much alike and exhibit no more variation than is apparent in other *Calidris* species. Although if a fertile hybrid it would be very difficult to detect the progeny of a hybrid backcrossed with either species.

The closest relative of *melanotos* is generally thought to be *acuminata* (e.g. Marchant *et al.* 1986). In external appearance *ferruginea* is very different and if interbreeding with *melanotos* has occurred it must have been due to unusual circumstances, for example, individuals on the periphery of their breeding range being unable to find a mate of the same species. This hypothesis, while unproven, could be true because Holmes & Pitelka (1964) found a small population of *ferruginea* near Barrow, Alaska, 1440 km east of the easternmost breeding locality previously reported. The birds were first seen with a group of *melanotos* and later two *ferruginea* nests were found. Furthermore Holmes & Pitelka found that some vocalizations and aspects of the display behaviour of *ferruginea* were similar to *melanotos,* and when summarizing their study of these birds they said: "The Curlew Sandpiper exhibits a number of behavioural characters intermediate between *C. melanotos* and more typical members of *Calidris* such as *alpina* and [Baird's Sandpiper *C.*] *bairdii*."

With consideration of the external morphological characters and behaviour of *paramelanotos,* an alternative hypothesis would suggest that it is a relict species with phylogenetic links to *melanotos* and *ferruginea.*

Adult birds in *full* nuptial plumage need to be described to clarify some points, but the question of whether *paramelanotos* is a species or not is

unlikely to be answered until its natal home is discovered. However, if some of the many recent, but as yet undescribed, sightings from Victoria and New South Wales (such as the report by F.T.H. Smith of three together in New South Wales (Mitchell 1987b) can be verified, then the sheer number of records would suggest that it is a species.

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