

REMARKS ON THE TAXONOMY OF THE GENUS *CALAMANTHUS* (FIELDWRENS)

SHANE A. PARKER AND H. JOHN ECKERT

INTRODUCTION

The RAOU Checklist (1926) listed four species of fieldwrens: Striated *Calamanthus fuliginosus*, Rock C. *montanellus*, Rufous C. *campestris* and Rusty C. *isabellinus*.¹ An anomaly of this arrangement, pointed out by Serventy (1937), is that the grey-backed form *dorrie* Mathews, 1912 was listed under C. *isabellinus* instead of C. *montanellus*. A second error is that *ethelae* Mathews, 1912 of southern Eyre Peninsula appeared under C. *campestris* whereas it too is a member of the *montanellus*-group. Beyond these minor adjustments, a fuller taxonomic reappraisal is long overdue; below are offered some considerations for a revision of this interesting genus.

THE NUMBER OF SPECIES IN *CALAMANTHUS*

The first step in the present taxonomic reappraisal is the combining of *campestris* and *isabellinus*; for, in South Australia these two forms, or rather their extreme expressions, are connected by a long and gradual cline from south to north. This action leaves us with three groups (see map, Fig. 2):

- (a) The *campestris*-group, consisting of a single rufescent-grey-backed form exhibiting marked but gradual geographical variation from birds with moderate dorsal streaking (e.g. in southern South Australia) to birds with little or no dorsal streaking (the *isabellinus* type of the interior).
- (b) the *montanellus*-group, consisting of the grey-backed form *dorrie* of Dorre and Dirk Hartog islands, and the olive-grey-backed forms *montanellus* (southern Western Australia), *ethelae* (southern Eyre Peninsula, southern Yorke Peninsula) and *winiam* (syn. *parsonsi*; Ninety-Mile Plain of South Australia and the adjoining Big and Little Deserts of Victoria). The form *montanellus* differs from the other two olive-grey-backed forms in being yellowish, not whitish, beneath; *winiam* differs from *ethelae* chiefly in having a longer, relatively finer bill (length of culmen from skull in adults: *ethelae* 7♂♂ 13.2-16.0 mm, 3♀♀ 15.0-15.8; *winiam* 5♂♂ 16.3-18.1, 4♀♀ 15.9-16.8; see also Fig. 1 and Pl. 3). All have moderate dorsal streaking.
- (c) The *fuliginosus*-group, consisting of yellowish-green-backed populations with heavy dorsal streaking, in south-eastern South Australia, southern Victoria, south-eastern New South Wales, and Tasmania.²

The question is, as it has always been, how many species are to be recognized in this assemblage?

Among the most recent commentators, Condon (1951), Schodde (1975) and Keast (1978) recognized only one, whereas Keast (1961) and McGill (1970) recognized two, treating *fuliginosus* and *montanellus* as conspecific and *campestris* as a separate species. Certainly *montanellus* resembles *fuliginosus* in its olive and yellow rather than rufous tones. But we suspect that this resemblance stems from an ecotypic factor, namely the generally higher rainfall within the ranges of *montanellus* and *fuliginosus*³, and that for the following reasons *montanellus* may be phylogenetically closer to *campestris*:

- (a) *Shape of bill.* The bills of the *campestris*- and *montanellus*-groups are similar in profile, being rather slender with a curved culmen. That of *fuliginosus*, on the other hand, has a deeper base and a lesser curvature of the culmen and is generally wedge-shaped in profile (Plates 1, 2)⁴. Bill-depths (taken at hind-edge of nostril, adults only): *campestris*-group 24♂♂ 3.1-3.7 mm, 20♀♀ 3.1-3.6; *montanellus*-group 28♂♂ 3.2-3.9, 16♀♀ 3.0-3.9; *fuliginosus*-group 20♂♂ 3.8-4.9, 13♀♀ 3.8-4.9.
- (b) *Sexual dimorphism.* In all forms of *Calamanthus*, males tend to be more heavily streaked below than females. In the depth of colour of the throat, lores and eyebrows, however, there is some variation. In *fuliginosus*, sexual dimorphism is pronounced in this respect, the throat (save for the ventral streaking), lores and eyebrows being pure white in the adult male and buff in the adult female. In the *campestris*- and *montanellus*-groups the difference is slight and sometimes barely discernible, these regions being white in the male and usually off-white in the female.
- (c) *Upper tail-coverts.* In the *campestris*- and *montanellus*-groups the upper tail-coverts are tinged with rufous and have few or no streaks. In *fuliginosus*, these feathers are strongly streaked, like those of the back, and either are of the same ground colour as those of the back or exhibit an extremely faint rusty wash. In other words, the upper tail-coverts are in *fuliginosus* more or less concolorous with the rest of the dorsum, whereas in the *campestris*- and *montanellus*-groups they present a contrasting dull-rufous patch. (N.B. In study skins at least, the upper tail-coverts of *Calamanthus* may be hidden by the long silky feathers of the rump or absent through loss during preparation).

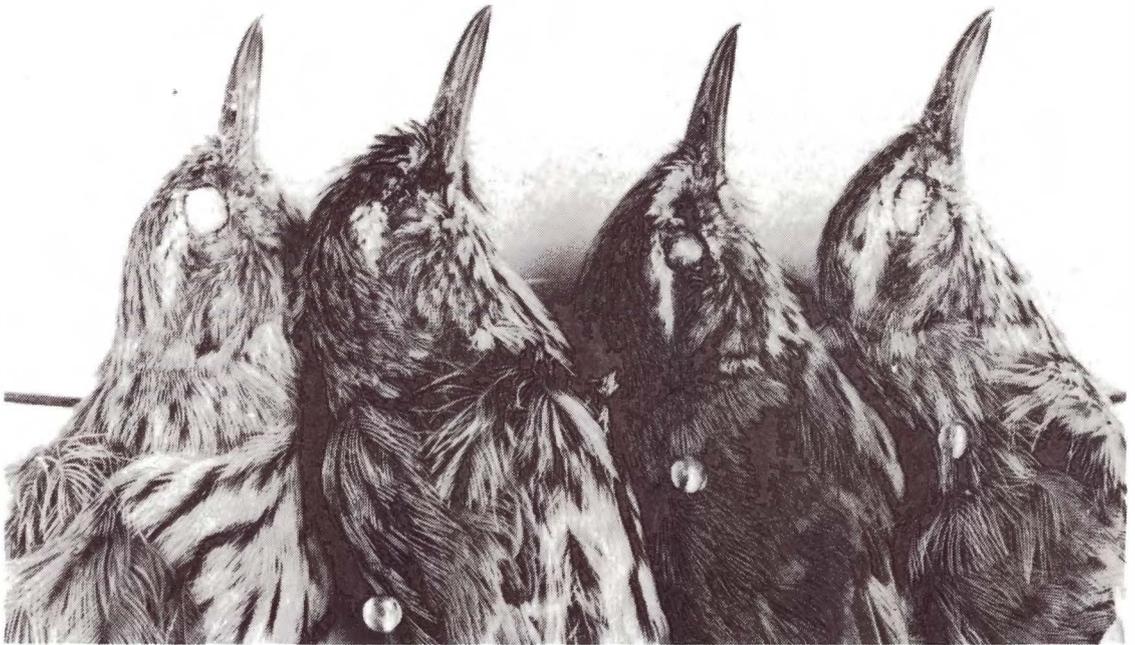


Plate 1. Showing similarity of bills of *C. campestris montanellus* and *C. c. ethelae* to that of *C. c. campestris*. Left to right: *montanellus* ♀, WAM A2428, Woolundra, WA, ♂, WAM 6897, Mount Barren district, WA; *campestris* ♂, SAM B23090, Port Augusta, SA; *ethelae* ♀, Eckert Coll., Cape Spencer, Yorke Peninsula, S. A.



Plate 2. Showing dissimilarity between bills of *C. campestris montanellus* and *C. fuliginosus*. Left to right: *montanellus* as in Plate 1; *fuliginosus* ♂, SAM B4593, Launceston, Tasmania. ♂, SAM B19203, Bool Lagoon, SA.



Plate 3. Showing difference between bills of *C. campestris ethelae* and *C. c. winiam*, the latter's being longer and relatively finer. Left to right: *ethelae* ♂, Cape Spencer, Yorke Pen., S.A., ♀, Wanna, Eyre Pen., S.A.; *winiam* ♀, 10 miles south-east of Meningie, S.A., ♂, 12 miles south-east of Meningie (all Eckert Coll.).



Plate 4. Bills of *C. campestris winiam* and *C. fuliginosus*, showing putative character displacement in former (see text). Left to right: *winiam* as in Plate 3; *fuliginosus* ♂, SAM B19203, Bool Lagoon, S.A., ♂, SAM B30972, Piccaninnie Ponds, S.A.

(d) *Pattern of tail.* In the *campestris*- and *montanellus*-groups the outer rectrices have conspicuous white areas at their tips and a broad black subterminal bar. In *fuliginosus* the white tipping is more or less wholly subdued by a grey wash, and the subterminal bar is narrow.

In addition, some distinction can be drawn between the main habitats of the two groups. Populations of the *campestris*- and *montanellus*-groups frequent mainly saltbush, bluebush, samphire and desert heath in the arid zone, and heath and mallee-heath communities in wetter districts. The form *fuliginosus*, on the other hand, chiefly affects rank herbage such as cutting-grass swamps and wet tussock grassland, though also occurs occasionally in heath.

This, however, still leaves the question of how many species ought to be recognized. Among the reasons that led Schodde (1975) to accept no more than one species was the apparent phenotypic intermediacy of *winiam* between the *fuliginosus*- and *montanellus*-groups. However, the bill of *winiam* is of the slender curved *campestris*-type, not the more wedge-shaped *fuliginosus*-type. Furthermore, in its habitat, rufous upper tail-coverts,

pattern of tail and (*pace* Schodde) degree of sexual dimorphism in colour of throat, lores and eyebrows, *winiam* shows affinities with the *campestris*- and *montanellus*-groups.⁵ Rather than being a link to connect these last two groups with *fuliginosus*, *winiam* can in fact be used to argue for the recognition of *fuliginosus* as a separate species; for, the bill of *winiam* appears to exemplify *character displacement*. The theory of character displacement (Mayr 1963: 82-85) states that where two similar forms meet, interaction between them may lead to a reinforcement of those morphological differences which would potentially allow the two forms to co-exist without competition. The bill of *winiam* appears to be a good example of this: not only is it of the *campestris*-type but it is an exaggeration of it, being longer and relatively more slender than the bills of other forms in the *campestris*-*montanellus* assemblage (Fig. 1, Plates 3, 4). By the theory of character displacement, this suggests that *winiam* and *fuliginosus* are, or were formerly, in contact and that competition accentuated the differences in the shape of the bill — unilaterally, on the side of *winiam*. So, how closely are the ranges of *winiam* and *fuliginosus* known to approach each other?

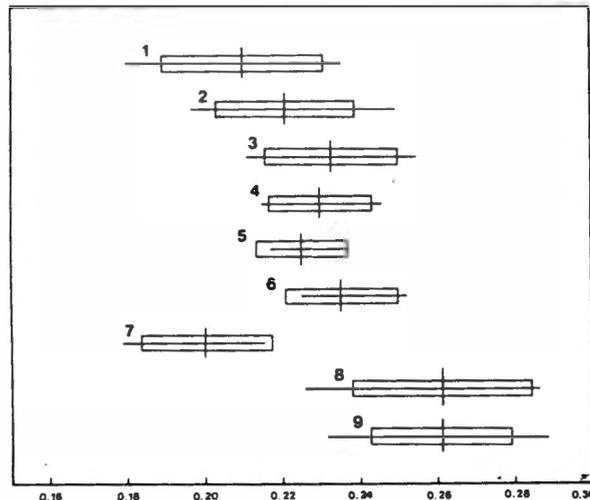


Figure 1. Bill depth: length ratio in forms of *Calamanthus* (depth at hind-edge of nostril, length from tip to base of skull). The vertical line represents the mean, the horizontal line the range, and the rectangle the standard deviation $\times 1.3$ on either side of the mean, within which 90% of the population may be expected to occur (see Rowley 1970: 36). Forms are grouped in approximate geographic sequence, which in particular highlights the distance in this character between *C. c. winiam* and *C. fuliginosus* (see text for discussion). Samples are of adults of both sexes combined; sample sizes are given in brackets: 1, *C. campestris campestris, isabellinus*-type (15); 2, *C. c. campestris, campestris*-type (25); 3, *C. c. dorrie* (11); 4, *C. c. montanellus* (15); 5, *C. c. ethelae*, Eyre Pen. (4); 6, *C. c. ethelae*, Yorke Pen. (4); 7, *C. c. winiam* (8); 8, *C. fuliginosus*, mainland (20); 9, *C. fuliginosus*, Tasmania (19).

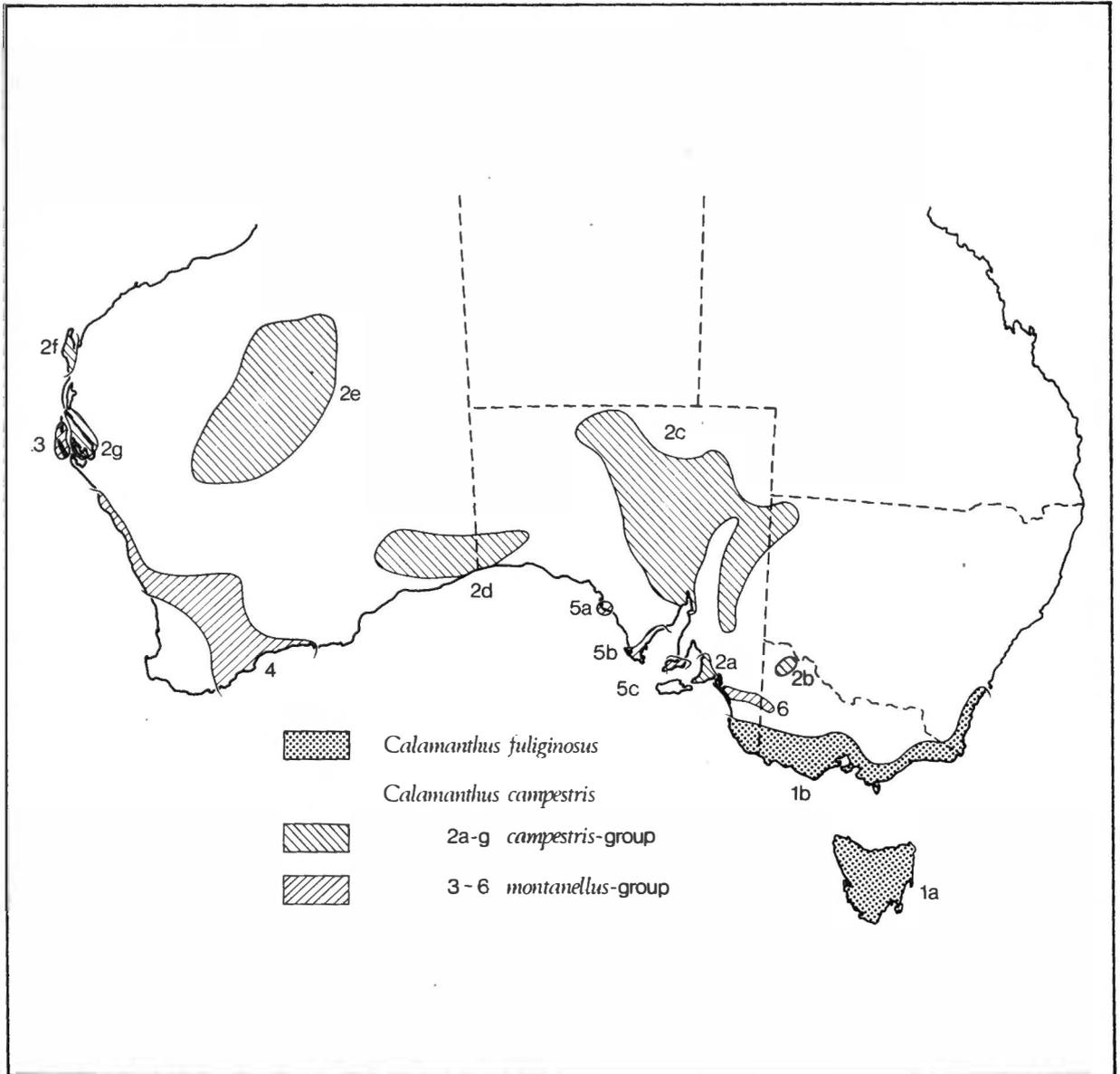


Figure 2. Approximate known distributions of forms of *Calamanthus* (based on specimens only). 1a, b, *C. fuliginosus*; 2a-g, *C. campestris campestris*; 3, *C. c. dorrie*; 4, *C. c. montanellus*; 5a-c, *C. c. ethelae*; 6, *C. c. winiam*.

In view of apparent character displacement in *C. c. winiam* (6), that population may actually be or have been in contact with population 1b of *C. fuliginosus* (see text). In *C. campestris*, 2e and the northern members of 2c were formerly regarded as a separate species, *C. isabellinus* (Rusty Fieldwren); 2a of the southern Mount Lofty Ranges and adjacent districts has not been reported since the late 1930s. The single record of a *Calamanthus* from Kangaroo I. ('Cariche Station', 20 Dec. 1973, *S. Aust. Orn.* 27: 109) was actually from Carrie Station, southern Yorke Peninsula (*vide* K. Thiele, pers. comm.).

The form *winiam* inhabits the heath and mallee-heath associations of the Ninety-Mile Plain in the Upper South-East of South Australia and the adjacent Big and Little Deserts of Western Victoria. By specimens, it is known in South Australia south to Bunn's Bore and 16 km north-east of Keith. The form *fuliginosus* occurs mainly in wet rank herbage, and in South Australia is known, by specimens, north to Robe and the Big Heath and Bool Lagoon districts. Within this gap of some 120 km, there have been recent sightings of fieldwrens in heath from 1) halfway between Taratap and Avon Downs, 2) 4 km west of Kalandra and 3) between Amherst and Narabyn, and in cutting-grass *Gahnia* from 4) near Wirrildee and 5) The Granites ca 17 km north of Kingston (J. Reid pers. comm.). If these are tendentially referred by habitat to *winiam* and *fuliginosus* respectively, then the distance between the known ranges of these forms is diminished from 120 km to the 9-10 km between localities 1) and 4).

Further study, including collecting, is necessary to determine whether *winiam* and *fuliginosus* meet, and if so how. In the meantime, with reference to the theory of character displacement, we regard them, and therefore the *campestris*-*montanellus*-group and the *fuliginosus*-group, as not conspecific. The arrangement stemming from this argument is (see map, Fig 2):

- (1) *Calamanthus campestris*: two subspecies-groups, the *campestris*-group (*C. c. campestris* only) and the *montanellus*-group (*C. c. dorrie*, *C. c. montanellus*, *C. c. ethelae*, *C. c. winiam*).
- (2) *Calamanthus fuliginosus*: no subspecies.²

No English names so far proposed being apt for this arrangement, we suggest Western Fieldwren for *C. campestris* and Eastern Fieldwren for *C. fuliginosus*.

VARIATION IN SOME WESTERN AUSTRALIAN POPULATIONS OF *C. CAMPESTRIS*

Opinions regarding the identity and relationships of the populations of *Calamanthus* inhabiting the Shark Bay district have differed (e.g. Carter & Mathews 1917; Serventy 1937; Mees 1962). We have examined the following material: Dorre I. 12, Dirk Hartog I. 6, Peron Peninsula 4, opposite mainland (mouth of Wooramel River, Bush Bay, Carnarvon district, Boolathanna) 18, and the Point Cloates — North-West Cape district 9⁶. The mainland populations we refer to *C. c. campestris* (syn. *rubiginosus* A. J. Campbell, 1899, Point Cloates); they resemble however not the *isabellinus* populations in the desert to their east, but the more heavily-streaked *campestris* populations further east (see Fig. 2), though differing from the latter in being generally slightly greyer on the dorsum. The examples from Dorre I. and Dirk Hartog I. differ from the

mainland birds in having the dorsum markedly greyer, the rufescent tones more or less absent from the back and much reduced on the crown, and the light edges to the primaries and secondaries a clearer, less rufous-tinged white, imparting in some instances a frosted aspect to the folded wing. The grey backs and greatly reduced rufescence of the island populations place them, in our opinion, beyond the limits of *C. c. campestris*, and with Serventy (1937) we recognize them as constituting a separate subspecies *C. c. dorrie* Mathews, 1912 (syn. *hartogi* Carter, 1916). Serventy (*op. cit.*) has argued that *dorrie* should be associated not with the *campestris*-group but with the *montanellus*-group, and that the present distribution of these forms is best explained by the hypothesis that increasing aridity in recent times has displaced the *montanellus*-group southwards, leaving *dorrie* stranded on Dorre and Dirk Hartog, while favouring the coastward expansion of *C. c. campestris*. The present distribution of the emu-wrens *Stipiturus malachurus* and *S. ruficeps* in the same region (Keast 1957) may be adduced as a parallel. In the case of *Calamanthus* there is a gap in the known distribution, *montanellus* being recorded no closer to *dorrie* than Kalbarri, some 140 km south of the Shark Bay district. It would be of interest to know which form of *C. campestris* occurs on the Edel Land Peninsula (between Kalbarri and Dirk Hartog I.), whence Carter & Mathews (1917) reported a specimen (not traced) allegedly intermediate between *dorrie* and nominate *campestris*. The specimen from Kalbarri (WAM A10535), incidentally, is markedly paler above than other specimens of *montanellus*, though still retaining the greenish dorsal cast of that subspecies.

Hall (in Hall 1974: 195) regarded a specimen collected sixty miles (96 km) east of Southern Cross, WA (BMNH 1964.17.349) as intermediate between *montanellus* and *rubiginosus* (i.e. nominate *campestris*). We have examined this together with a second specimen taken at the same time and place (NMV B8697), and conclude that they are not intermediates but individuals of *montanellus* slightly paler than usual, possibly a consequence of the more arid environment in this locality (both collected on 1 Dec. 1962, *vide* McEvey & Middleton 1968: 189, McEvey *in litt.* 17 Feb. 1981; date incorrectly given as 2 Dec. 1962 in Hall 1974).

NOTES

¹ This article forms part of the groundwork for a forthcoming checklist, wherein, following CSIRO (1969) and Serventy *et al.* (1982) and *contra* Schodde (1975) and Schodde *et al.* (1978), *Hylacola*, *Calamanthus*, *Pyrholaemus* and *Chthonicola* are maintained as separate genera rather than included in *Sericornis*, and the English names of heathwren and fieldwren are used for *Hylacola* and *Calamanthus* respectively. The revised classification of *Calamanthus* presented in this article has already been adopted, with our consent, by NPIAW (1982).

- 2 The most recent reviewer of the *fuliginosus*-group, Condon (1951), recognized three subspecies: *albiloris* of south-eastern South Australia and Victoria west of Melbourne, *fuliginosus* of Victoria east of Melbourne, south-eastern New South Wales and north-eastern Tasmania, and *anthoides* (*syn. diemenensis*) of northern, north-western and western Tasmania. We have examined thirty specimens from Tasmania (including the six syntypes of *diemenensis*), and twenty-three from the mainland part of the range, and conclude that no subspecies are recognizable within the *fuliginosus*-group.
- A comment on the type-locality of *C. fuliginosus* (Vigors & Horsfield, 1827) is pertinent here. This name was based on a specimen collected in 'Van Diemen's Land' by Robert Brown. Mathews (1922: 286) ascertained from Brown's manuscript that the specimen was obtained in April 1804; he then, without giving reasons, restricted the type-locality first to 'South' Tasmania, then implicitly to 'Northern Tasmania (Eastern districts)' (Mathews 1922: 277, 287). In fact, in April 1804 Brown was in the Derwent River district of mid-eastern Tasmania (Whittell 1954: 56-57), which may be taken as the type-locality.
- 3 Anomalous in this respect is the population of *C. c. campestris* inhabiting the relatively wet South Mount Lofty Ranges and adjacent districts (Fig. 2). Significantly, perhaps, there have been no published reports of this isolated population since the 1930's.
- 4 In an argument for regarding *montanellus* and *fuliginosus* as separate species (Anon. 1924), the shape of the head was adduced as one of the distinguishing characters, though the shape of the bill itself was not specifically mentioned. A comparative study of the cranial anatomy of the forms involved is warranted.
- 5 Schodde (1975) also suggested that *fuliginosus* and the *campestris-montanellus*-group differed from each other in the colour of the iris, and that evidence from this character indicated gene-flow between *winiam* and *fuliginosus*. Our conclusion, based on the descriptions of the iris-colour of one hundred and twenty-three specimens representing all forms of *Calamanthus*, is that the variation in this character requires further study before its value to taxonomy can be ascertained.
- 6 Carter (in Carter & Mathews 1917: 588) asserted that, locally, no fieldwrens occurred south of Maud's Landing. The next locality south from which fieldwrens have been recorded is Point Quobba, forming an apparent gap of 150 km (G. F. Mees *in litt.*).

ACKNOWLEDGEMENTS

For the loan of study skins in their care we are indebted to Mrs M. K. LeCroy, American Museum of Natural History, Mr W. E. Boles, Australian Museum, Mr I. C. J. Galbraith, British Museum (Natural History) (BMNH), Mr R. H. Green, Queen Victoria Museum Launceston, Mr A. R. McEvey, National Museum of Victoria (NMV), Dr R. Schodde, CSIRO Division of Wildlife Research, and Dr G. M. Storr, Western Australian Museum (WAM). For other assistance, including helpful discussions and information, we are most grateful to Mrs LeCroy,

Mr McEvey and Dr Storr, and also Dr G. F. Mees and Messrs P. Aerfeldt, J. M. Bourne, J. R. Ford, L. Joseph, L. P. Pedler and J. Reid.

We extend our thanks also to Miss J. Thurmer for executing the figures and Mr R. Ruehle for taking the photographs.

REFERENCES

- Anon. 1924. The *Calamanthi*, or Field Wrens. S. Aust. Orn. 7: 206-208.
- Carter, T. & G. M. Mathews. 1917. The birds of Dirk Hartog Islands and Peron Peninsula, Shark Bay, Western Australia, 1916-1917. Ibis (10) 5: 564-611.
- Condon, H. T. 1951. Notes on the birds of South Australia. S. Aust. Orn. 20: 26-68.
- CSIRO. 1969. An Index of Australian Bird Names. Techn. Pap. Div. Wildl. Res. CSIRO Aust. 20: 1-93.
- Hall, B. P. (ed.) 1974. Birds of the Harold Hall Australian Expeditions 1962-70. London: Brit. Mus. (Nat. Hist.).
- Keast, J. A. 1957. Variation in the Australian Emu-wrens (*Stipiturus*). Proc. Roy. Soc. N.S.W. 1955-56: 47-53.
- . 1961. Bird speciation on the Australian continent. Bull. Mus. comp. Zool., Harv. 123 (8): 305-495.
- . 1978. The relationships of the Fieldwren *Calamanthus fuliginosus* (Acanthizinae). Emu 78: 20-24.
- McEvey, A. R. & W. G. Middleton. 1968. Birds and vegetation between Perth and Adelaide. Emu 68: 161-212.
- McGill, A. R. 1970. Australian Warblers. Melbourne: Bird Observers' Club.
- Mathews, G. M. 1922. The Birds of Australia, 9. London: Witherby.
- Mayr, E. 1963. Animal Species and Evolution. Cambridge, Mass.: Belknap Press, Harvard.
- Mees, G. F. 1962. Birds, in: The results of an expedition to Bernier and Dorre Islands, Shark Bay, Western Australia in July 1959. Fauna Bull. 2: 98-112.
- NPIAW 1982: The National Photographic Index of Australian Wildlife, 1982. The Wrens and Warblers of Australia (eds V. N. Serventy, A. R. McGill, J. D. Pringle & T. R. Lindsey). London, Sydney, Melbourne: Angus & Robertson.
- RAOU. 1926. The Official Checklist of the Birds of Australia, 2nd ed. (rev.) Melbourne: Govt Printer.
- Rowley, I. The genus *Corvus* (Aves: Corvidae) in Australia. CSIRO Wildl. Res. 15: 27-71.
- Schodde, R. 1975. Interim List of Australian Songbirds. Passerines. Melbourne: RAOU.
- , B. Glover, F. C. Kinsky, S. Marchant, A. R. McGill, S. A. Parker. 1978. Recommended English names for Australian Birds. Emu 77: 245-310.
- Serventy, D. L. 1937. *Calamanthus* forms in the Shark's Bay district, Western Australia. Emu 37: 103-105.
- Whittell, H. M. 1954. The Literature of Australian Birds: a History and a Bibliography of Australian Ornithology. Perth: Paterson Brokensha.

*S. A. Parker, South Australian Museum,
Adelaide, South Australia, 5000.*

H. J. Eckert, Langhorne Creek, South Australia, 5255

Accepted 25 May 1983