

sparingly on the beach in summer. Specimens were shot as late as 27th May, 1898. 22nd October was the earliest noted date of arrival. There appeared to be two varieites—one of large, solitary birds, and a second of smaller birds that went in flocks (probably *L. limosa*).

(132.) *HECTERACTITIS BREVIPES* (Grey-rumped Sandpiper).—Fairly numerous on the coast in summer from November to May, sometimes seen in considerable flocks, as eight were once secured at one discharge of the gun. One specimen was shot 6th June, 1899, out of a small flock feeding in mangroves.

(133.) *TRINGOIDES HYPOLEUCUS* (Common Sandpiper).—Only one specimen was seen, and shot, on beach, 30th October, 1901.

(134.) *GLOTTIS GLOTTOIDES* (Greenshank).—A scarce bird. One specimen was shot at the Yardie Creek, 24th January, 1898, and odd birds seen in mangroves near North-West Cape. They are very shy and difficult to approach.

(135.) *CALIDRIS ARENARIA* (Sanderling).—A quite common bird on the beach, where they may be seen almost any time of the year, feeding generally with Turn-stones and Little Stints. I have seen and shot many specimens in June and July, so it is evident they do not all leave to breed. Probably immature birds often remain.

(136.) *LIMONITES RUFICOLLIS* (Little Stint).—A very common beach bird, and may be seen any month of the year, but most numerous in the summer.

(137.) *HETEROPYGIA ACUMINATA* (Sharp-tailed Stint).—Mostly seen in mangroves about the North-West Cape in the summer months, but a few birds were seen at the flooded salt-marsh south of Point Cloates in June, 1900.

## Observations on the Western *Gymnorhinæ*.

(With Plate.)

BY ALEX. WM. MILLIGAN

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THERE are two questions affecting our Magpies which I should like to ask and shall endeavour to answer. The first is, "Why are the bills of the Western species longer and more narrow than those of the Eastern ones?" The second is, "Why should there be (as there undoubtedly is) an absence of 'hilarity of song' as compared with their Eastern congeners?" The first question I will endeavour to answer by advancing two theories, namely—(a) the depth of food supplies, and (b) attrition. In support of the first theory let me say that the heat of the Western Australian summer season, and the length, in point of time, of it, are notorious, as also are the open sandy nature, generally, of the soil and the almost entire absence of tracts or swards of indigenous grasses. By reason of the heat beating upon the open soil for a continuous and lengthened period, and without the natural protection of the latter by such swards, grubs, worms, and the lower forms of life, upon which the birds principally subsist, naturally seek lower levels in the soil. To follow these forms, the birds would of

necessity be compelled to probe deeply, perhaps to the full extent of their bills, or nearly so, in quest of their daily food ; and these very acts, oft repeated, as they must be, would tend to and would in course of time develop the bill both in length and girth. As a counteraction, however, to the girth development, the same repetition of the same acts would, by the fact of the bill meeting with harder substances than itself (that is to say, the vitreous sand granules), cause the bill to become attenuated by trituration. In Eastern Australia the soils of the agricultural districts, wherein the birds are principally found, are moister and more cohesive, and are better protected from a milder sun by a natural clothing of grass, the surface roots of which, more important still, form the natural home of the lower forms of life before referred to. As a consequence the natural food supplies of the birds are nearer, if not actually in, the surface soil, and a shorter bill serves the purpose of obtaining them. And if the bills of the Eastern forms be closely examined it will be readily seen that the depth to which they are probed in quest of food is the beginning of the distinct arch of the culmen. Again, the contact of the bill with the moister and less granulous soil does not cause friction in the same degree and consequently a corresponding reduction in girth. Collaterally, and perhaps in combination with the above theory, I might have advanced even with greater force the well laid and accepted principle of natural selection. Repeating what has been said in reference to the daily quest of food by the Western birds, there would, I think, accepting that principle, be a tendency to an increased length of bill. Birds with bills of short or of medium length would on the average be placed at a considerable disadvantage in search of their daily food, while birds with bills of a more appropriate length would correspondingly be placed at an advantage, and so tend to survive and to leave progeny inheriting the same characteristic. Such "survival of the fittest" (that is, of birds whose bills are longer) would go on until the length of bill best adapted to the conditions of their existence was attained.

My answer to the second question is that the absence of "hilarity of song" is due solely to the peculiarity of climatic conditions. The sudden and spontaneous outburst of song is invariably simultaneous with the termination of a period of privation or enforced rest. In the latter respect birds in a natural state undoubtedly sing more hilariously in the early morning, after a period of darkness and rest. In countries where the winters are rigorous, and particularly where the surface of the earth and the vegetation are covered with snow for a comparatively lengthened period, birds of purely local habits or enjoying only a restricted range suffer privations. Consequently, what is more natural to them than, on the relaxation or removal of those severe conditions, that they should give full vent to their only mode of expression, namely, that of song? It is a fact that many birds, such as the *Limicolæ*, evade the rigours of winter of Northern Europe and Asia by

seeking the warmer and more congenial shores of Australia; and it is singular, indeed, that not one of these birds possesses any claim to song. In Western Australia there is not, strictly speaking, any winter season. Snow, even in the highest mountain peaks of the extreme south, is a rarity. The seasons are only two—the hot and the rainy. The latter is never what might be called really cold, except, perhaps, on the occurrence of an occasional blow from the Antarctic. Immediately after the first rains at the back end of the hot season numerous flowers and shrubs at once come into bloom, and they are followed by a succession of others during the rainy season. There is not, in fact, any stagnation of vegetable growth in any month of the year. Even many of the birds nest and bring up their young in the early part of the rainy season. With climatic conditions such as these, what is there to prompt spontaneity of song to any degree. Certainly bird-song is heard in greater volume in the months corresponding to the springtime of South-Eastern Australia, but that fact is principally due to migrants who have arrived from the northern parts of the State to breed, and who aid to swell materially the volume by their love-song.

A parallel is afforded in the vegetable life of the State. Our indigenous trees are not deciduous, and even deciduous trees introduced from colder climates evince a disposition to maintain the old leaves until the reappearance of the new. The budding into leaf and the blossoming of trees and the outburst of the song of birds are simultaneous in cold climates.

The foregoing remarks are not intended to imply that the Western Australian birds are songless. On the contrary, they do possess song in a marked degree, but that is not conspicuous at one particular time more than another, for the reasons stated. For instance, the species under notice carols in the same manner as the Eastern birds, but not so markedly or spontaneously at certain periods. This partially suppressed characteristic is not alone peculiar to the species mentioned, but it is observable in many others, notably the Magpie-Lark (*Grallina picata*) and the Dusky Miner (*Manorhina obscura*).

[The plate (No. X.) of *Gymnorhina dorsalis*, male, female, and immature female, should have appeared in connection with Mr. Milligan's paper in the previous part, page 99, but was unavoidably held over.—EDS.]

## Some Rectifications in Tasmanian Ornis.

BY (COLONEL) W. V. LEGGE, F.Z.S., &c.

ACANTHIZA EWINGI (Gould).

IN my address at the annual Congress I recently had occasion to allude to the fact that Ewing's Tree-Tit still stood as a valid Tasmanian species, although it had been omitted from the list of the genus in the B.M. Catalogue. It was pointed out that