

number of unusual and puzzling plumages found among them”.

There is, presumably, little or no contact between the Golden Whistlers of Tasmania and those of the Australian mainland. We have, therefore, in Tasmania a small isolated population of *pectoralis*, a species that has developed unusual forms in other parts of the world. There is no, or totally insufficient, evidence at the moment that it will develop an unusual form here. Nevertheless, it is not beyond the bounds of possibility that we are watching the beginning will lead to hen-feathered male Golden Whistlers in Tasmania of a process that, somewhere down the line of evolution, mania.

#### SUMMARY

The Golden Whistler occurs throughout Tasmania wherever there is suitable bushland. In mountain gullies it tends to be replaced by the Olive Whistler. Golden Whistlers appear to be solitary in the autumn and early winter. In those seasons calls are infrequent and usually consist of the single note of the female. Breeding takes place chiefly in the early spring. Nests are usually about five to twelve feet above the ground in an upright fork. There is a certain amount of variation in the nesting material chosen. The bright male shares in the brooding. In one instance a male was recorded breeding in immature plumage. Golden Whistlers have rich, varied call notes. The characteristic call of the female is a single note. The remaining calls are probably, though not certainly, used only by the male.

Young Golden Whistlers have the plumage of the adult female. The males assume full adult plumage about the age of two years. The male in full plumage is not as common as might be expected. A brief survey showed that males in full plumage may be about 21 per centum of the Golden Whistler population in Tasmania.

Studies of small bird populations on islands indicate a potentiality for divergent evolution. Mayr extends the range of the Golden Whistler to various islands north of the Australian mainland. He gives instances of hen-feathered male Golden Whistlers among island populations. It is not impossible that Golden Whistlers in Tasmania are evolving towards hen-feathered males.

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**The Function of Panting in Birds.**—Under the title ‘Breathing of Birds in Hot Weather,’ E. F. Boehm, 1951, *The Emu*, 50, 210, has collected interesting references to the well-known panting phenomenon that occurs with birds in hot places. He suggests that it is possible that hot or sultry weather makes abnormal demands on their ‘oxygen economy’ with the result that their normal breathing becomes inadequate.

It would seem that panting or gasping in birds in hot conditions is a thermo-regulatory, rather than a respiratory, mechanism, and that it can be explained by the fact that although adult birds are homoiothermous (i.e. they have a temperature regulating mechanism to keep them constantly 'warm-blooded'), they do not possess sweat-glands and so cannot cool themselves in hot weather by one of the principal methods available to the Mammalia. The only integumentary glands possessed by birds (so far as is known) are the two uropygials located at the base of the tail (J. I. Kendall, *Microscopic Anatomy of Vertebrates*, London, 1947).

In normally hot temperatures within the habitat in which they have evolved, birds probably lose heat by radiation, convection and conduction, by removal via the faeces, and to some degree by evaporation, of moisture from the epithelial surfaces of the tongue and buccal cavity. If external temperatures rise very greatly a bird (particularly if it is generating much internal heat by activity) must call into play another mechanism if it is to avoid death by heat-stroke, i.e. the overheating of the central nervous system. Thus, it pants.

It will be recalled that Man and the horse sweat, whereas the dog and cat pant. The last-named both lack sweat-glands except in specialized regions such as the nose and sole of the foot.

The accompanying illustration shows a female *Pachycephala pectoralis* panting on her nest during a hot Sydney summer. Although the bird was motionless, thermo-regulation had become a problem because a colleague, who discovered the nest, had unfortunately stripped away a good deal of sheltering foliage in order to obtain an unimpeded view for photographic purposes.—A. J. MARSHALL, London, England, 27/3/51.

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**Gaping Bills in Hot Weather.**—I refer to Mr. E. F. Boehm's notes on 'Breathing of Birds in Hot Weather' and to his suggestions concerning the reason. Is not the explanation of birds holding their beaks open in hot weather on a level with dogs panting with the mouth open and tongue out? Unlike humans and horses, which derive a cooling effect from the evaporation of perspiration, dogs, having no sweat glands, have to depend on evaporation from the moist surface of the tongue and mouth, and I should think the gaping of the beak in birds has the same explanation.

I think that Mr. Boehm's suggestion of a shortage of oxygen can scarcely have anything to do with it, seeing that it is seen on exceptionally hot days (together with a tightening of the feathers against the body), in practically all birds, even while they are sitting quite still.—ERIC POCKLEY, Avalon Beach, N.S.W., 6/3/51.