

Friar-Birds, both large and small. Amongst other trees planted in the streets are many Queensland silky oaks (*Grevillea robusta*). Just now they are in full bloom, and a blaze of golden glory, with scores of honeycups, and the Honey-eaters are here in hundreds. The Green-backed Oriole's sweet note and mimicry is heard on all sides; but the Friar-Bird is predominant, and is worth coming some distance to hear. After the early morning meal they devote their whole energies to vigorous song and noisy chatter in all languages. An election conference is quite a mild proceeding to the racket amongst the Leatherheads.

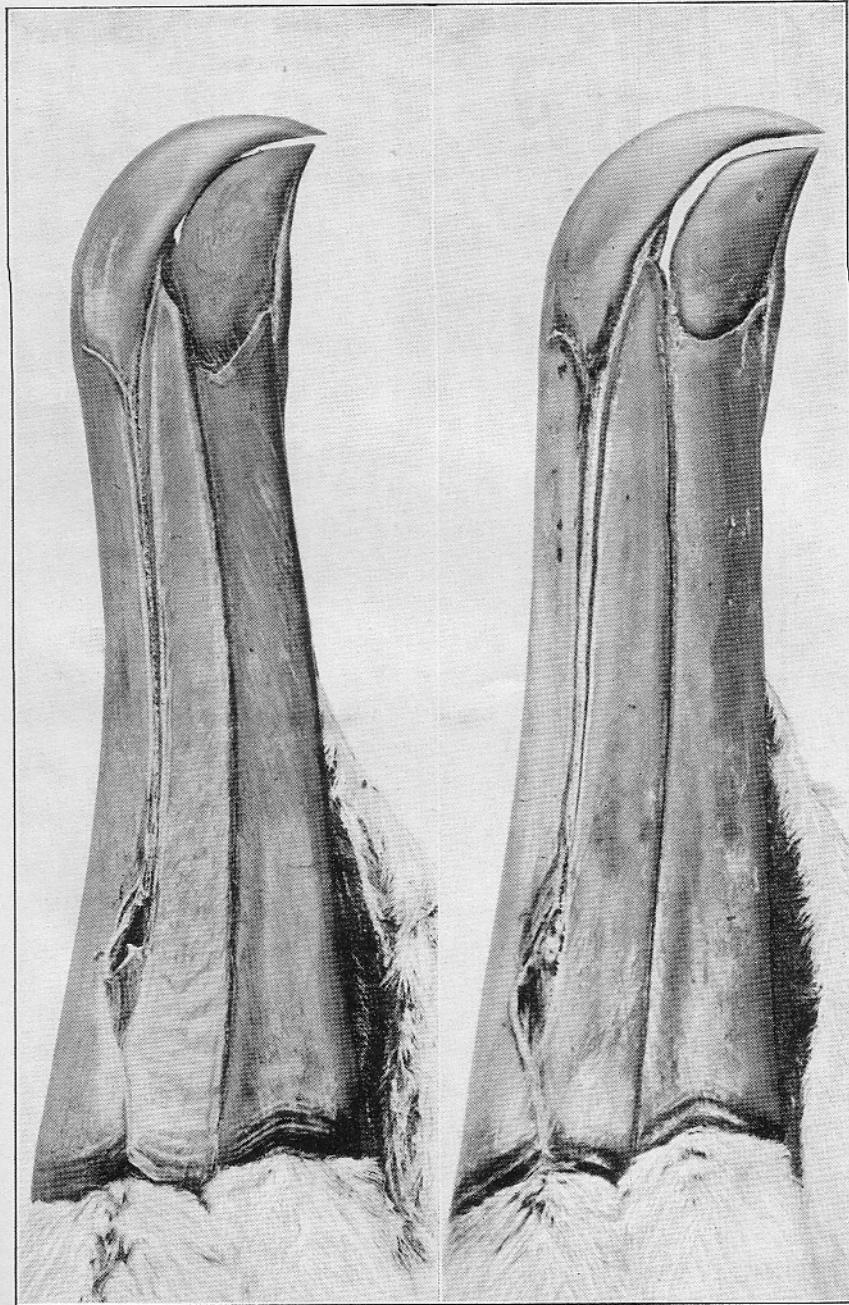
This year, for the first time we know of, the Blue Martins or Wood-Swallows (*Artamus*) are drinking at the nectar cups in the silky oaks. They rise in a cloud from the trees, uttering their single note and sweet call, and, after circling a while, settle again. In previous years these birds frequented the open country, nesting on myall stumps, fence-posts, and any convenient spot at a little height from the ground, but we have not seen a nest this year; probably the drought has interfered with their regular habits.

Your reprint, in the October number of *The Emu*, page 151, of Mr. Taverner's views and the *Canadian Fisherman* on the balance of nature is very interesting, and we should be pleased to read other contributions on the same subject. At present it looks as though judicious thinning of Cormorants as well as foxes is advisable in this country, for it is quite indisputable that both Cormorants and Pelicans are making serious inroads on the nation's fresh-water fish supply.

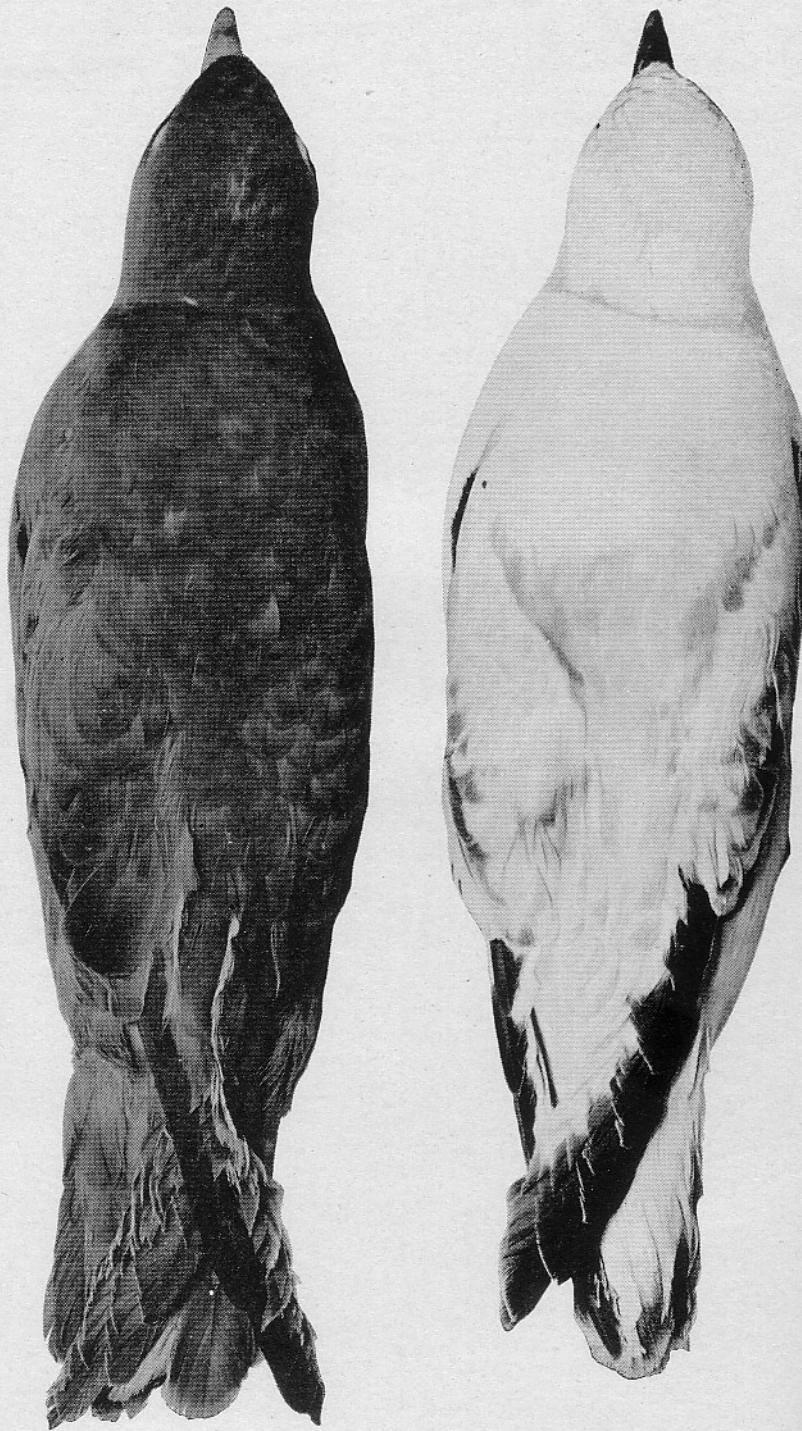
Variation in the Albatrosses and Petrels.

By LEVERETT MILLS LOOMIS, F.A.O.U., SAN FRANCISCO.

It is part of the work of the systematist to determine the range and character of the variations occurring within the limits of species. That large series are required in these determinations is well illustrated in the Galapagos Albatross (*Diomedea irrorata*). The bill variations of sexually mature individuals of this species are especially notable. Independent of sex, thirty-three breeding birds, taken at the same rookery during the same season, display marked differences in the basal width of the bill and the concavity of the culmen (see Plate LVIII.) The nasal tubes also vary in shape. Even in the same individual the shape of the tubes may be dissimilar. A like discrepancy in the form of the nasal tubes is found among eighty-one specimens of the Black-footed Albatross (*Diomedea nigripes*) obtained on the high sea. So far as ascertained, the bill variations of the Galapagos Albatross, described above, are individual variations, the examples in which they occur being sexually mature. Obviously, it is idle to assume



Variation in the Bill of the Galapagos Albatross (*Diomedea irrorata*).



Dark and Light Phases of the Fulmar (*Fulmarus glacialis*).

from meagre series that similar variations in any Albatross are constant characters.

Dichromatism is a prominent variation among the Petrels, and the basis of a number of apocryphal species in this group; "*Fulmarus rodgersi*," an extreme light phase of the Fulmar (*Fulmarus glacialis*), being an example* (see Plate LIX.) In the Fulmar and in some other Petrels a difference exists in the geographic range of the phases, but the distribution does not correlate with environmental conditions after the manner of geographic variation, strongly suggesting that dichromatism originated in saltations (mutations). The phases of the Giant Fulmar (*Macronectes giganteus*), of the Neglected Petrel (*Pterodroma neglecta*), and of the Wedge-tailed Shearwater (*Puffinus chlororhynchus*)† are additional instances of dichromatism in the Petrels. It is particularly significant that a light and a dark phase occur in the downy young of the Galapagos Albatross.‡ To what extent dichromatism prevails among the Albatrosses and Petrels can be determined only by an exhaustive study of large series from numerous breeding stations. It is highly probable that the so-called intergrading species, like *Puffinus assimilis*, will prove to be dichromatic variations.

Geographic or environmental variation has long been a stumbling-block in the way of systematists. In America, during the last century, many conspicuous variations were mistaken for constant characters and described as species. Later, when larger series were available for study, these alleged species were discovered to be unstable and were demoted to the rank of varieties. Subsequently the term variety was supplanted by the term sub-species, it being taken for granted that geographic variations are incipient species. Such is the genesis of the sub-species in America. Individual, dichromatic, and geographic variations all have evolutionary possibilities, but we do not know the remote future of any of these variations, nor the manner in which existing bird-species were evolved. It follows, therefore, that we merely trade on our ignorance when we affirm that geographic variations are the beginnings of future species. Often has it been asserted in their defence that sub-species are aids in the determination of migration routes. Words alter no facts. It is the fact of geographic variation, and not the trinomial, that aids in the determination of migration routes. The White-faced Petrel (*Pelagodroma marina*) and Kuhl's Shearwater (*Puffinus kuhli*) are examples of Petrels exhibiting geographic variations.

The term species, from the standpoint of birds, has been used frequently in the foregoing paragraphs. Two meanings are involved in the definition of this term. One pertains to nature, the other to classification. In nature, a bird species is a fund-

* Cf. Proc. Calif. Acad. Sci., 4th series, vol. ii., part 2, 1918, p. 88.

† Cf. *Auk*, vol. xxxvi., 1919, pp. 487-489, plate xix.

‡ Cf. Proc. Calif. Acad. Sci., 4th series, vol. ii., part 2, 1918, pp. 78, 79, plates ix.-xi.

amental group of bird individuals, absolutely separated by a peculiar assemblage of characters from all other bird individuals. In a classification based on constant characters, the species is the unit of a system. Within the species occur the individual, dichromatic, and geographic variations.

It devolves upon the systematist to determine the species and the range and character of their variations. But it does not devolve upon the systematist to reduce classification to a state of chaos by attempting to make definite indefinite variations.

Camera Craft Notes.

White-fronted Chats.—There is no series of pictures which has cost us more time and trouble than that of the White-fronted Chat (*Ephthianura albifrons*). This fact may surprise observers who know how common the bird is around Melbourne. It nests quite freely in the suburbs, and our photographic experience of it has been limited practically to Preston, very little beyond the outer fringe of the suburban habitation. From the days of eleven years ago, when we operated with a ten-shilling camera, we have disturbed scores of Chat families with our attentions, and the total result, so far as adult birds are concerned, is the two pictures reproduced. That of the male was obtained after a three-hours' wait in the branches of a wattle tree near the nest. The picture of the female, taken during a subsequent season, cost us no less trouble. In each case one exposure only was made. We often wonder whether the experience of other photographers agrees with ours as regards birds which build in populated parts. They all appear to possess a deep-seated objection to a very close acquaintanceship with man. Birds of the secluded parts, on the other hand, treat camera and operator with an indifference born of ignorance.—R. T. LITTLEJOHNS, R.A.O.U., and S. A. LAWRENCE, R.A.O.U. Melbourne, 27/2/1920.

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WHILE waiting to photograph a White-shafted Fantail at the nest shown in the illustration, the behaviour of the two old birds was of peculiar interest. The female bird fed the young brood fearlessly, but the male bird would not come to the nest, although he hovered near with food. After a time this seemed to exasperate the mother Fantail, and she chased her mate through the scrub with angry chatter, and finally took the food from him and fed the young ones. This happened several times, until at last the male mustered up sufficient courage to feed the chicks himself. The photograph of the young Penguins was taken at Phillip Island, and shows the birds in an interesting stage of moulting.—L. G. CHANDLER.