Colour Reversion in Kingfishers' Eggs.

(Plate XI.)

By Robert Hall.

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Many species of birds lay coloured eggs in hidden places, so that light will not be even reflected upon them. The Chthonicola is one of them. Kingfishers' eggs are invariably white, upon our present knowledge, just as Pardalotes' are, both occurring under like circumstances. Yet each family, I find, is subject to reversion. Is one at liberty to use this term, considering the vast period of time since reptiles and primitive birds laid white eggs and then rust-coloured? The recent finding of rust-coloured eggs in three species of Australian Kingfishers and one of Pardalotus leads me to think that we are shown cases of reversion—a probable ancestral habit of secreting and depositing pigment. The primitive eggs, like those of their cousins, the reptiles, were probably white, as now, but not so highly glazed. The mediæval eggs were probably partly rust-coloured, as those of the present day Tuatara lizard of New Zealand, for example. The Kingfishers, having left the most probable exposed ground nests of the middle ages, with brown eggs, for protection, now lay white eggs, hidden in hollows. It has been thought that many birds, failing to produce brown eggs, after a long period of "typical whites," sought protection for their eggs in the hollows of trees. The finding of eggs of three species of Kingfishers leads me to go one step apart, and suggest that many birds, nesting in the open, with eggs protectively coloured, sought the hollows of trees for other reasons, and lost the mediæval brown, and, by reversion, got back to white. Natural selection, effecting a change in the habit of the birds nesting, did away with the necessity of protective colouration. Now we have Kingfishers' eggs reverting to the mediæval phase. This surely is a slow working, but most likely a universal one.

The Pardalote referred to laid a clutch of deep brown eggs in the hollow of a creek near Kyneton, Victoria. These were extracted with a long spoon by Mr. J. Rigby. A few days

later a second clutch was laid, of a fainter brown. These also were extracted. A third clutch was laid, with a much fainter layer of pigment upon them.

The Kingfishers referred to are *Dacelo gigas*, *Halcyon sanctus*, and *H. macleayi*. Of *D. gigas*, the eggs were placed in the open space of a spout, fully exposed to light. Two clutches, each three, were taken, and both showed brownish-grey markings upon them. Locality, Box Hill, Victoria. Of *H. sanctus*, five eggs formed the sitting, and they were placed in the darkness of a tree hollow. Locality, Clayton, Victoria. (Collected per Mr. F. W. Munt.) Of *H. macleayi*, three constituted the sitting. All were spotted upon the sides rather than upon the ends. Locality, Richmond River District, New South Wales.

In *D. gigas* and *H. macleayi* the tendency of a portion of the colour is to appear as if beneath the surface, but there needs to be a further layer or superficial series of blotches to show a contrast in layering. In *H. sanctus* the pigment is all superficial.

The colouration of birds' eggs abounds with theory, and, rather than add to it, I simply add a new fact or two.