

Plumage Changes of the Black-fronted Plover

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Having kept the Black-fronted Plover (*Zonifer tricolor*) in captivity from a few days' old chicks until the adult stage, and carefully studied, and kept records of the plumage changes following on each moult, and compared notes with birds secured under wild conditions, I record the changes that took place as follows:—Chick (nestling), October, 1921: Covered with down of a light sooty black colour, tipped, or flecked light brown, giving a mottled appearance; iris, greenish yellow; tarsus and toes, pale steel blue; nails, black; mandible, steel blue.

Immature plumage before the first moult takes place—July, 1922; forehead and crown, dark brown, laced golden brown; lores, ear coverts, dark brown, mottled golden brown; a white line between the ear coverts and crown, extending from the back of the eye to the nape; hinder crown, dark brown, laced golden brown; cheeks, dark brown, each feather edged and tipped golden brown; genys, chin, throat, lower throat, white; foreneck, white; chest and upper breast, dark brown, each feather laced a golden brown; lower breast, abdomen, vent, flanks, under tail coverts, white; tail white, each feather having a black band one inch wide, tips white, the two central feathers tipped golden brown, the outer feathers with less black, quills white; upper tail coverts, white, lightly tipped black; rump, dark brown, laced golden brown; upper back, back, lower back, dark brown; hind neck, brown edged golden brown; nape, light brown; thighs, white; mantle, dark brown, edged golden brown; median wing coverts, dark brown; lesser wing coverts, dark brown; greater wing coverts, white with a black blotch upon outer edge of feathers, tips white, making a white bar across the wings, a few feathers edged a dark brown, tipped a golden brown; primaries, black with base of feathers whitish; quills black, base of quills white; humeral feathers, dark brown, edged golden brown; spurious wing, black, quills black; secondaries, a few feathers brown, tipped a golden brown, one feather pure white with a faint black blotch upon the outer webbing, some black splashed white on the inner webbing, others white deeply tipped with black, quills in some feathers black with white base, others white with tips black; under wing coverts, white; iris, pale steel blue, blotched greenish yellow; margin round eye, steel blue; wattle (the fleshy excrescences at base of upper mandible), steel blue, gradually turning to a flesh pink as it develops; tarsus and toes, bluish grey; nails, black; mandible, grey, tipped steel blue.

Plumage change after the first moult which was general on the whole body—beginning November, 1922:—Forehead, crown, hinder crown, ear coverts, cheeks, black; a white line between the ear coverts and crown extends from the back of the eye to the nape. Hind neck, nape, lores, light brown; genys, chin, throat, lower throat, fore-neck, white; chest, upper breast, black; lower breast, abdomen, vent, under tail coverts, flanks, upper tail coverts, thighs white; upper back, back, lower back, dark brown; rump, blackish, few feathers tipped white; mantle, dark brown, glossed bronze; median wing coverts, dark brown, glossed bronze, tips black edged with white, base of feathers grey; lesser wing coverts, dark brown, glossed bronze, base of feathers grey; greater wing coverts, blackish, tipped white; primaries, black, grey at base, quills black, white at base; humeral feathers, brown, laced golden brown; spurious wing, black, quills black; secondaries, three feathers brownish black, two-thirds of the inner webbing from the base white, quills black, white at base, the rest of the feathers white, tipped brownish black, quills white, black near tips; under wing coverts white; tail, the basal half of the feathers and quills white, terminal half, black, tipped white, also quills; iris, pale steel blue, margin round eye, greenish yellow; fleshy excrescences at base of upper mandible, salmon pink; mandible grey, tipped steel blue; tarsus and toes steel blue, nails black.

Plumage change after the second moult—beginning August, 1923:—Forehead, crown, hinder crown, lores, ear coverts, black; a white line behind the eye; cheeks, genys, chin, throat, lower throat, fore-neck white; chest, upper breast, black; lower breast, abdomen, vent, under tail coverts, flanks, upper tail coverts, thighs, white; upper back, back, lower back, dark brown; hind neck, nape, light brown; mantle, dark brown, glossed bronze; rump, brown, a few feathers flecked white at tips; tail, white, each feather banded black, tipped white, except the two central feathers, which are black, flecked with white, quills at base white; median wing coverts, dark brown, glossed bronze, a few at the tips flecked white; under wing coverts, white, a few flecked light brown; lesser wing coverts, dark brown, glossed bronze; greater wing coverts, black, the outer webbing of each feather at the tips greyish white, except the inner webbing and tips of the two central feathers which are white; primaries, black, grey at base, quills white at base, secondaries, the three outer feathers black, white at base, quills black, white at base, two long inner feathers brown, flecked greyish white at tips and edge of outer webbing. The five central feathers have the lower half white, all secondary feathers white at base, also quills; humeral feathers, dark brown, glossed bronze; spurious wing, black; iris, pale steel blue, margin round eye greenish-yellow; the

excrescences at base of upper mandible, salmon pink; tarsus and toes, steel blue, developing a brownish tint; nails, black; mandible, bluish grey, tipped bluish black.

Plumage change after the third moult—beginning August, 1924. Full adult:—Forehead, crown, hinder crown, lores, ear coverts, nape glossy black, with a broad white line behind the eye; cheeks, genys, chin, throat, lower throat, fore-neck, white; chest, upper breast, glossy black; lower breast, abdomen, vent, under tail coverts, flanks, upper tail coverts, thighs, white; upper back, back, lower back, rich brown, glossed purplish bronze; hind neck, light brown, glossed purplish bronze; mantle, brown, glossed purplish bronze; rump, brown; tail, the two central feathers, black; others white, barred black, white tipped; the lesser wing coverts, humeral feathers, rich brown glossed purplish bronze; greater wing coverts, under wing coverts, white; secondaries, the three outer feathers white with a black spot middle of outer web, the two long inner feathers brown, the rest of the feathers white with a black mark on outer web, brown mark on inner web, lightly glossed bronze; primaries, spurious wing, black; median wing coverts, submarginally barred with black and tipped white; iris, yellow, margin round eye rich yellow; mandible, yellow, tipped brownish black; excrescences at base of upper mandible, red; tarsus and toes, reddish brown; nails, black.

The adult plumage of the female is similar to that of the male, but not so bright in colour markings. The fleshy excrescences at the base of the upper mandible are not so bright in colour; there is a variation of colour in the tarsus and toes of adult birds, from brown to a dull red, which probably age or seasonable condition causes.

Specimens were secured and kept in captivity at Wangaratta, north-eastern Victoria.

Eggs of Plumed Frogmouth.—I enter below a few particulars about *Podargus plumerifus*, the Plumed Frogmouth. In my opinion this bird is very rare. I have noticed it only once or twice and took particular notice of it on those occasions. After mating, the birds choose a nesting site, generally a box tree, and the nest, which is placed about 20 feet from the ground, is a flat platform of sticks broken off the boughs which overhang the nesting site. The eggs, two or three, are glossy white and rather rounded. The bird itself is more pugnacious than other Frogmouths, and when an intruder approaches, it does not seek shelter but sits upright on an open limb of a tree.—C. W. WELSH, Warwick, Queensland. Communicated by NEVILLE W. CAYLEY, R.A.O.U., Rose Bay, N.S.W.