ART. II.—*Notes on the Plumage Changes of Petroeca phoenicea (Gould); Pachycephala gutturalis (Latham); and Microeca fascinans (Latham).*

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The following notes, made upon three species of our most common insectivorous birds, bear reference especially to the males, because of their development from birds, which, in the early stages, present so marked an opposition in plumage to the adult. Having taken a sample of each of three characteristic genera of our birds and traced their development in plumage, I believe the observations will apply to the many species of the first two treated and a few of the third. While Petroeca exhibits a plain plumage in the early stage and a brilliant one in the later, and Microeca an ornamental plumage in the early stage, with an unassuming one in the later, it is to be noticed that Pachycephala has a striking, though uniform, plumage in the first place, a brilliant one in the last stage, and a quiet grey one in the intermediate stage. In Petroeca and Microeca, the marked changes are performed, roughly speaking, in two acts, while in Pachycephala its varying changes have three distinct and opposed plumages, as regards the colour—the males alone are referred to.

## Petroeca phoenicea, Gould.

Until certain of the following specimens were collected by the author, there were two points of interest about which much private discussion occurred:—the first, a local matter, namely where the species goes to in the summer, and the second, whether the male effects seasonal changes in its plumage, and if so, how? By collecting male specimens in the Plenty Ranges on the 27th of January last, and observing others while on an excursion with the Field Naturalists' Club of Victoria, I conclude

without hesitation that it is not a general act for the birds to go further south than this colony to summer, although a few may do so. In addition, from data supplied to me of birds being found in the coastal lines of Mornington in December, and from a nest being found by myself near Box Hill late in the Spring, I am of Mr. Gould's opinion that the species merely becomes secluded during the spring and summer and reventures into the close environment of towns with the income of the autumn.

As to the question of change in plumage, Stage H clearly shows a moult and that the shedding of red feathers is simultaneous with the supplying of new and stronger "reds." As to when the red is first obtained I find in certain cases it appears in the nestling, while in others it may not appear for nearly twelve months, when it bursts out in new feathers as a clear light red.[1] In the following year's moult a strong red is obtained. There is also a red that make its appearance on the chest in the young that seems to me to be light scarlet. There is nothing to indicate that this red does not belong to the nestling, and although it looks as if age had intensified it, there is no evidence in support of it by the other specimens. It is in my opinion a bird highly developed at the first. The "red" when once obtained keeps the bird a "red one" always, and it becomes a flame-breasted bird about the third year. As in the case of Malurus cyaneus, Ellis, the month will vary with the date of brood and the season.

I believe no description of a fully adult male has yet been rendered, for I see no account particularly of the flush of dull red above the forehead, which, in Phase G, is very distinct.

I have handled sixteen male birds that have the appearance of maturity. Of these, nine are uniform grey, agreeing with the description of the adult by Messrs. Gould and Sharpe. Five have so faint a wash of dull red above their foreheads, that it has either been previously overlooked or not taken into account because of its subdued nature; two are distinctly washed with dull red across the fore part of the crown. With this latter crown-colour there is an exceedingly intense red upon most of

[1] Dr. Sharpe (Brit. Mus. Catal. Birds, vol. iv., 1879) remarks: "The young male is similar to old female but with orange instead of vermilion breast."

the under surface. Corresponding with the three phrases of the crown are three phases in the red of the under surface—light, medium and strong.

An examination of the following phases has shown me, first, that the white frontal mark may appear in the brown plumage phase or not until the bright red and deep black feathers of a late stage have come; the latter being the exception or in the minority of cases; second, that the orange red of the throat, chest and breast in the majority of cases does not appear until some twelve months have elapsed, but that the nestling or young may have (*a*) stray orange-red feathers on the breast, (*b*) a uniform very pale-red breast, (*c*) a uniform brown breast, which is the general case; in the third place, the black quills and distinct white markings to them, appear as the bird is undergoing its second moult. The throat does not become uniform red till the second moult is effected. The scarlet red of the adult does not appear within at least two years, and the flame-red, three.

Although I have had no opportunity to examine a phase actually from the nest, many of its feathers, if not all, are seen in Phase B, which is, in my opinion, practically a nestling with a longer wing and tail. It is still an open question, and I have thought it better to leave a doubtful gap rather than wait, possibly years, to find and record it under these remarks Phase B is recently out of the nest and retains the back feathers of the nestling, judged by analogy. At the same time it shows its first plumage to have pale orange-red feathers on the chest, which is not so in four of the five stages of Phase C, and but feebly in the fourth stage of Phase C. In addition there is a small white frontal mark that is not in the far advanced Phase E (which is brown), though represented in certain stages of Phase C. The five stages of Phase C are birds in brown plumage and except in one case, $C_4$, where there are particles of very faint red about the breast, there is no red. The strong white of the forehead clearly shown in $C_5$, is scarcely visible in $C_1$, while in the intermediate stages it varies. The distinct white wing bar of the adult is represented in $C_1$ by a bar of buff, which varies gradually between $C_1$ and $C_5$, in the latter being a fairly clear white, but not the strong white of the mature bird. The under tail coverts of $C_1$ are not so white as in $C_5$. Phase D shows two of its stages to

have a conspicuous chest patch of red, with frontal patch and abdominal area white, while a third has only a flush of red, and that upon its throat, with frontal mark brown and white. Although two stages of Phase D may be no older than any stage in Phase C, and both having the same time removal from Phase B, I place them under different heads because of the red in D that is not in C. The third case just referred to is placed with D on account of the orange-red throat and brown chest. Phase E is a most interesting one. A week earlier in its career it would have been placed with C, but being now in a state of metamorphosis, conspicuous with contrast of feathers, it stands apart from all others. The breast, back and wings show most of their plumage to be of the early stage, but bright red is appearing through the breast feathers, and jet black quills are maturing in the wings, while the tail has dropped its brown quills before the "blacks" are ready to serve their purpose. The examples of Phase F show the first clear light red of most of the under surface after the moult of "brown," one a deeper red than the other. Phase G is the stage figured by John Gould,[1] and generally looked upon as the adult. It is described as such by Dr. Sharpe.[2] Phase H is the fully matured bird. Its red is intense, and but for the developed forehead it would lead one to believe it to be a case of erythrism. Phase J appears to be the same age as H. Its value lies in the moult being clearly shown, and the process of replenishing both quill and contour feathers.

*Phase B.*

Young ♂, sk., 19-11-97. Heytesbury, Victoria. (Per Mr. George Graham).

It has recently left the nest and has its wings and breast colours more intensified than in the stages slightly older. The whole of the upper brown surface shows the streaked feather so characteristic of the nestling, the whole length of the rachis of each feather being whitened; frontal mark, white; wings, deep brown with a tawny band across each, and tawny edgings to secondaries and coverts; tail, deep brown, except outer

1 Birds of Australia, vol. iii., pl. 6.

2 Brit. Mus. Cat. Birds, vol. iv

rectrix, which is whitish with a brown edge along most of the inner web, and a brown patch towards the extremity of the outer one; throat, chest, lower breast, and lower abdomen, greyish-brown; upper breast, pale orange-red; under wing coverts, pale salmon-grey; bill, deep brown; legs, brownish-black. Length of wing, 2·8 inches; tail, 2·25 inches.

There is a possibility that an error has been made in the identification of this specimen, as both *P. phoenicea* and *P. leggii* breed in the same district. It is not consistent with the numerous other skins of young handled by me, and in all probability it should not show any red. That phase C shows a single red feather is more likely to be abnormal than normal. For this reason it will be better to consider this phase of *P. phoenicea* has not red upon the under surface.

*Phase C.*

Stage $C_1$. Young ♂, sk., 10-1-97. Myrniong, Victoria.

Although older than B it shows no pale orange-red breast. This is the nearest stage to B, because in it there remain the characteristic shaft-marking of the dorsal contour feathers and buff, oblique markings of the wings; coverts greatly tipped with rufous brown; outer tail quills, though mostly white, show brown markings at the bases; upper surface brown, small frontal mark light brown, tending to cream, all but outer tail feathers deep brown; under surface light brown, tending to white, and whiter than in any other stage; the abdomen almost white; beneath breast plumage lie concealed three solitary faint red feathers which are not of very recent development; under wing coverts ruddy brown; bill and legs deep brownish-black. Length of wing, 2·85 inches; tail, 2·4 inches.

Stage $C_2$. Young ♂, sk., Oct. 1899. Essendon, Victoria.

Upper surface brown; forehead like back; under surface lighter brown, except on abdomen, which is creamy white; under tail coverts cream white, and whiter than in $C_1$; oblique bands across wings whiter than in $C_1$; outer tail quills whiter than in $C_1$; bill and feet blackish; length of wing, 2·85 ins.; tail, 2·2ins.

Stage $C_3$. Young ♂, sk., 1-6-97. Box Hill, Victoria.

Similar to $C_2$, except the frontal mark, which is more distinct from the forehead; primaries lighter brown than in 1 and 2.

Stage $C_4$. Young ♂, sk., Victoria.

The head being rich brown makes it differ from the other stages. Upper surface brown; small frontal mark brown, with a faint inclination to white in it; whole under surface inclined to rich brown, and in parts of the throat, chest and breast to light reddish-brown; one centre quill of the tail shows white at tip, not previously noted. In other respects it agrees with the other stages of this phase. Length of wing, 3 ins.; tail, 2·4 ins.

Stage $C_5$. Young ♂, sk., 10-7-97. Essendon, Victoria.

Frontal mark white and of adult's superficial area; rest of forehead and crown greyish-brown; edge of penultimate inner secondary white and prominent. These three regions are distinctly in advance of the earlier stages. Under surface much lighter than in any other stage of this phase, the throat tending to greyish white, with much of the latter on the lower breast and abdomen; under tail coverts and outer tail feathers whiter than in the foregoing stages; dorsal surface brown; remaining regions as in $C_4$. Length of wing, 3·05 inches; tail, 2·4 inches.

*Phase D.*

Stage $D_1$. Young ♂, sk, 31-3-97. Heytesbury, Victoria. (Per Mr. Geo. Graham).

Upper surface uniform brown, the upper tail coverts being deeper brown and agreeing with the centre tail feathers; frontal mark brown, intermixed with brownish-white; throat faint red; chest and sides of upper breast brown; centre of breast, abdomen and under tail coverts creamy white, certain of the coverts streaked brown about the mid-rib; flanks brownish; wings deep brown, the coverts and secondaries edged with light brown; band upon wing white, roughly edged with fulvous; bill and legs deep brownish-black. Length of wing, 3·05 ins.; tail, 2·35ins.

Stage $D_2$. Young ♂, sk., 12-4-98. Essendon, Victoria.

Upper surface light brown; central tail feathers brown, very small spot of brown on outer web of outer feather; penultimate tail feathers brown, with an oblique portion of it dull white; frontal mark small and white; wing brown, cream band across it and secondaries edged with cream; coverts greyish-brown; chin greyish-white; throat brown, with a cream coloured band across

lower part; chest light scarlet; breast and abdomen white; flanks brownish; under tail covers deep cream; bill and legs black. Length of wing, 2·7 inches; tail, 2·15 inches.

Stage $D_3$. Young ♂, sk., 12-10-99. Victoria.

This skin is practically the same as $D_2$, the conspicuous patch of the same hue of red across the chest occupying less of the chest and more of the breast than in $D_2$. Length of wing, 2·75 inches; tail, 2·15 inches.

*Phase E.*

Imm. ♂, sk., 27-1-00. Plenty Ranges, Victoria.

This specimen shows abundant evidence of a thorough ejectment of one quarter of its brown plumage. That it is a young bird, and is assuming the strongly contrasted "blacks and reds" of the adult is quite evident. Before collecting, I observed it to fly some thirty yards over the bracken just as a Sericornis, or Malurus would do. The process of moult was taxing its grace in flight. The portion of the old plumage remaining is the brown of the breast, back, and half of the wing quills. The reds are coming and many have appeared in a blotchy manner upon its breast. The old tail quills have all been displaced by new, soft and short ones, the laterals being white-edged; forehead brown, not yet moulted; lores black; 1, 2, 3 and 4 primaries are old and grey; 5 is a new black quill two-thirds correct length; 6, 7, 8 and 9 quills are new and black, spotted with white as in adult; 10 is new and black and half grown; the remaining quills are old and grey, new innermost secondaries black; wing coverts are new in addition to old, while others are maturing; upper tail coverts are new and old, intergrowing; under wing coverts "bursting;" under tail coverts principally new; head feathers are partly new blacks, but mostly old greys; legs feebly feathered, mostly new. The "reds" of the lower portions of the chin and throat are in their sheaves, though visible owing to the partial fall of the old feathers; under surface brownish-grey, feathers old; bill and legs black. Length of wing, 2·9 inches; tail, 1·35 inches.

*Phase F.*

Stage $F_1$. Imm. ♂, sk, April, 1897. Heytesbury, Victoria. (Per Mr. Geo. Graham).

Without a standard for comparison or a knowledge as to what range the under and upper surfaces have in their colouration one would believe this to be a fully developed bird. Place it against a fully adult skin and you will find the red of the under surface lacks density, the grey of the upper is not so leaden, and the forehead is uniform with the grey crown. The frontal mark is white; lores dark slate; chin grey; abdomen and under tail coverts white; central tail feathers slate-brown, lateral mostly white, penultimate tipped white; wings brownish black, secondaries and coverts edged white; inner primaries tipped white; the white patches on quills clear white; under wing coverts smoky white, and whiter towards tips; base of lower mandible light brown, other portions of bill deep brown; legs leaden-black. Length of wing, 3·15 inches; tail, 2·45 inches.

Stage $F_2$. Imm. ♂, sk., 30-8-97. Essendon, Victoria.

It is very much the same as $F_1$. There is a flush of dull red, scarcely perceptible above the frontal mark, that indicates the approach to maturity.

*Phase G.*

Imm. ♂, sk., 10-7-97. Maribyrnong, Victoria.

A description is not necessary for this phase, as it has been described as the adult.[1] By the above I do not wish to convey the meaning that Dr. Sharpe has described an immature bird for an adult, but, rather, that an immature adult has been described when a stage distinctly more developed would have been described had the skin been available or a previous description known to be on record.

*Phase H.*

Ad. ♂, sk., 1898. Victoria.

When this skin is placed parallel with fifteen others together, a glance at each of the crowns will show this to be coloured dull red, while all the others are greyish; a careful look will show some of them to have a faint flush of dull red upon their crowns. Still keeping them in a row, the ventral red of this specimen shows distinct from all others in its intensity.

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[1] Brit. Mus. Cat. Birds, vol. iv., 1879.

The frontal mask is silky white; across base of forehead a narrow black line; flush of dull red above frontal mark and on to crown, which is dull slaty-grey, like the rest of the dorsal region; lores slaty-black, sides of face and ear coverts grey; tail slaty-black, except outer quills, which are mostly white, an oblique brown mark being upon inner web and a second brown mark towards tip of outer web; penultimate quills partly white; chin and sides of throat slaty-black; throat, chest and breast rich scarlet; lower part of abdomen and under tail coverts white; flanks slate-grey, with white tips to feathers; primaries black at base, sooty-brown at distal half, a band of white across the inner series near base; secondaries brownish-black, external webs edged white; inner primaries and secondaries tipped white; lesser wing coverts blackish-grey, other coverts white, or black tipped white; under wing coverts and axillaries brownish-grey, with whitish tips; thighs brownish-grey; irides, bill, legs and feet, black. Total length 5·1 inches; culmen, 0·45 inches; wing, 3·05 inches; tail, 2·4 inches; tarsus, 0·8 inches.

*Phase J.*

Adult ♂, sk., 27-1-00. Plenty Ranges, Victoria.

The value of this skin is shown in the method of its change in the colour of its plumage, while strong "reds and blacks" have appeared and are still appearing, the old weak reds and wing quills have not all yet been pushed away. It is exhibiting a thorough renewal of the complete plumage. On the breast are some very bright new "reds," judged to be new by the quill barrels and faded old reds. The primaries are very unequal. Counting inwards, the fifth is just leaving its sheath, and the sixth averages half-an-inch shorter than those adjacent. The tail quills are considerably off their normal length in the centre, and much shorter laterally; the white of the external quills being clear white, as in full age; under tail coverts pure white and new; thighs newly feathered, though not yet concluded. The head has new dull red feathers in addition to new "greys," and the back has new as well as old "greys;" bill and feet black. In other respects it appears to agree with the last phase.

## Pachycephala gutturalis, Latham.

A glance at the specimens exhibited in support of this species shows three distinct colour phases; the young being uniform rusty-brown, the intermediate stage varying grey and brown, the adult phase jonquil-yellow, black and white. Six phases clearly show the development towards a seventh or mature stage. A, B, C, E and F demonstrate steps in the growth of the male, while D shows a stage of the female immediately after C, when the male "yellows" fail to appear, and the stage progresses no further. In outward material this is where the female is first and always recognised. It is at this stage that the last of the rusty brown feathers of early age drop out and, if a female, they are simply replaced by "greys," but if a male, a few "yellows" appear. This is where the index of sex is first shown externally, though feebly.

While both sexes are in the nest, they are rufous. Upon leaving the nest, a few light brown feathers mix, and these remain for some time. In early spring of the following year the rusty coloured secondaries are all that remain of the brown phase. Following this stage, if the bird is to prove itself a male, a slight indication of "yellow" will appear somewhere in the regions of yellow. Being now spring, the bird, in my opinion, will, in rare cases, breed in this far from nuptial plumage, but, as a rule, it will hold over this part of its career until the following season. As in many other Australian birds, I take phase $E_1$ to be a precocious male breeding, but not in breeding plumage, showing only the faintest external indication of its sex, but strongly developed internal organs. This bird was perched close to a nest of eggs, and was delivering a pleasant strain, much as an adult would do. Phase F is the connecting link of the adult and junior stages. A few black feathers of the head and pectoral collar are first to appear, while one or two "yellows" below the breast help to indicate the sex. There is yet no indication below the plumage of the mass of yellows. Probably they will come with the throat "whites," of which there is no sign just now. Being August 25, I am strongly disposed to believe no development into full livery will come into effect until early next spring. The state of plumage of this specimen is specially interesting.

Phase G is the bird known as the adult male. In addition to this last place, Dr. Gadow[1] describes a young male differing in a few minor points only from one of the phases here noticed.

*Phase A.*

Nestling ♂, sk., 7-11-96. Heytesbury, Victoria. (Per Mr. George Graham.)

Rufous strongly predominates throughout the plumage, being most marked upon the throat and chest; wings brownish, edges pale, the secondaries and their coverts bearing a rufous flush; shoulders dusky white; bill brown; feet yellowish brown. Length of wing, 2 inches; tail, 0·25 inches; culmen 0·25 inches.

*Phase B.*

Young ♂, sk., 12-1-97. Myrniong, Victoria. (Per Mr. T. A. Brittlebank).

Whole of plumage rufous except tail, primaries and portions of secondaries, which are greyish-brown; edges of primaries light; rufous of abdomen much lighter than on other portions; humeral coverts whitish; bill and legs light brown. Length of wing, 3·5 inches; tail, 2·35 inches; culmen, 0·42 inches.

*Phase C.*

Young ♂, sk., 17-12-96. Caldermeade, Victoria.

Under surface brownish-cream, with rusty brown feathers irregularly distributed on each side of the throat, the left side of the chest, the centre of the breast, and feebly upon the abdomen; under tail coverts washed with light brown; wing primaries light brown; secondaries and coverts richly marked with rusty brown; forehead grey; crown and ear coverts light rusty brown; remainder of upper surface greyish-brown, with individual pale rufous feathers intermixed; upper tail coverts faint rufous; tail greyish-brown; under wing coverts and axillaries whitish; bill deep brown at distal end, light brown proximal end; legs slaty-black. Length of wing, 3·7 inches; tail, 3·25 inches.

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1 Brit. Mus. Catal. Birds, vol. viii., 1883.

*Phase D.*

Young ♀, sk., 28-8-96. Box Hill, Victoria.

Upper surface brownish-grey (adult grey next moult); a touch of deep brown on the upper tail coverts; primaries light slate, light edgings; secondaries rufous, except centres of innermost, the edges of the outermost being slate-brown and only edged with rufous; under surface as in adult, with a flush of light brown added, to slightly obscure a tendency to white on the throat and to darken the breast; under tail coverts white, the shaft of each feather brown; bill deep brown, lighter at base of mandible; feet slate. Length of wing, 3·7 inches; tail, 3·1 inches.

*Phase E.*

Stage $E_1$. Young ♂, sk., 19-9-96. Box Hill, Victoria.

Head and neck, dark grey; back, dark grey washed with pale olive, slightly more pronounced on the upper tail coverts; tail uniform (greyish), a slight flush of olive on the middle quill; primaries slaty-black, light grey edgings, secondaries edged with olive-green; coverts olive-grey; under wing coverts, whitish; lores grey, like head; throat whitish; chest and breast grey, tinged with indistinct yellow; abdomen and under tail coverts whitish, flushed with tawny yellow; bill and feet black. Length of wing, 3·85 inches; tail, 3·1 inches.

Stage $E_2$. Young ♂, sk., 10-1-97. Myrniong, Victoria.

Secondary coverts bright yellow; throat approaches nearer white than $E_1$. Beyond these regions much as in $E_1$.

Stage F. Imm. ♂, sk., 25-8-96. Heytesbury, Victoria (per Mr. Geo. Graham).

Upper surface greyish, the back and upper tail coverts washed with olive; forehead slightly intermixed with black feathers (new); wings blackish slate coloured edgings; certain of the secondaries edged with pale olive-grey; tail grey, one or two of the quills slightly darker at the distal end; throat greyish-white; brownish-grey crescent, narrow on the chest and broad on the sides, above which in the middle of the chest is appearing a blackish pectoral band; breast and abdomen fawn-white, deeper on the flanks; a few small patches of yellow appear on breast, abdomen and sides of chest; under wing coverts white; under

tail coverts white; bill black; legs deep brown. Length of wing, 3·9 inches; tail, 2.9 inches.

*Phases G and H.*

Adults, ♂ and ♀, are described in the British Museum Catalogue of Birds, vol. VIII., 1883, by Dr. Hans Gadow.

## Microeca fascinans, Latham.

This species shows at least five phases in the development of its plumage, two of which are strongly contrasted immediately before and after the first moult. The nestling A, very different from the parents, bears a small distinguishing tail, in this respect resembling the adult. Specimen B, a few weeks out of the nest, presents much the same appearance as the nestling, days before it leaves the nest. The first moult does away with the whole mottled plumage, excepting the winglets, and the dress becomes dull and uniform. It still remains darker than in the following phases. C is an immature bird, yet, though younger than D, it presents higher developed tail quills and winglets, by carrying more white upon them. As a set-off against this prematurity are the brown base to forehead, and brownish edges to wing quills, which, along with other parts, indicate a younger stage than D. The specimens D and E are what appear to be matured birds. While D is greyer than C, E is greyer than D; the deep brown of A giving way regularly through all the stages to a brownish-grey in E. Specimen E has its centre tail quills tipped with white, being the most highly developed stage of all.

*Phase A.*

Nestling, sk., 2-11-94. Box Hill, Victoria.

The whole plumage, except wings, abdomen and under tail coverts, is mottled, owing to the exposed end of each feather having a white cuneate mark upon a deep brown feather. The white predominates upon the neck, and the dark brown upon the head. The breast presents a blotchy appearance, because of faintness of white marks. Wings brown; primaries tipped with a brownish-white; secondaries edged with a pale tawny; coverts bearing the wedge-shaped marks of the back; under wing and tail coverts chalky white; a small amount of lustre on the

white of the abdomen; lateral tail quills white, each feebly marked on the tips with brown; centre quills brown; bill and legs brown; nails brown. Length of wing, 1·8 inches; tail, 0·95 inches; tarsus, 0·57 inches; culmen, 0·23 inches.

*Phase B.*

Young ♂, sk., 1-1-97. Box Hill, Victoria.

General appearance of plumage very much as in A. The first indication of a moult of the original feathers shows on the back where a patch of uniform dark brown feathers has appeared with others following. In a few days, I take it, the moult of the contour quills will be general. Tail: outer quill white, except at tip which is faintly spotted with brown; penultimate quill white, with the inner web of the proximal half obliquely marked with brown; the third quill similar to the second, but with more and deeper brown in about the same position; centre quills dark brown; bill blackish-brown; legs brown; nails black. Length of wing, 3·3 inches; tail, 2·45 inches; tarsus, 0·6 inches; culmen, 0·3 inches.

*Phase C.*

Imm. ♂, sk., 26-8-93. Box Hill, Victoria.

It presents quite a different appearance from the spotted example B. The tails remain nearly alike. Upper surface and forehead, brown; sides of breast, greyish-brown, other portions of under surface white, tinged with light brown in parts, and delicately washed with it in other portions; primaries narrowly tipped, and secondaries edged, with pale brown; under wing coverts whiter than in B; outer two rectrices white, third deep brown on basal two thirds of inner web, fourth bears a large white mark on terminal part of inner web; middle quills, deep brown; bill, upper mandible black, lower brown; legs, blackish-brown. Length of wing, 3·4 inches; tail, 2·45 inches; culmen, 0·35 inches; tarsus, 0·7 inches.

*Phase D.*

Adult ♂, sk., 17-7-96. Box Hill, Victoria.

The whole upper surface is lighter brown than in C, and the ventral brownish-white of C is here represented with a clear

white; narrow base of forehead white; primaries narrowly tipped and secondaries mostly edged with white; the four outer tail quills much as in C, except that there is more brown on the basal half of the inner web of the second, and much more on the third. This appears as if the colour gradation of the tail is no safe index to the age of the bird. Certainly the tail appears not to be so far advanced towards maturity as in C, also the wing speculum is brown, while that of C is white, showing more maturity. Evidently the parts of a bird's plumage do not develop uniformly to indicate the age of the bird. Other parts of the plumage are more advanced than in C. The sexes are said to present no difference when adult. Bill and legs black. Length of wing, 3·5 inches; tail, 2·55 inches.

*Phase E.*

Adult ♂, sk., 10-4-97. Heytesbury, Victoria. (Per Mr. Geo. Graham).

Similar to D, the whole upper surface having more grey upon it. All the white edges of the wings are much deeper and clearer, including the wing speculae. The tail has more white upon the lateral quills, and the centre ones are tipped with white. Under mandible and feet are blacker than in D. Length of wing, 3·5 inches; tail 2·55 inches.