this species is intensely interesting with regard to its migratory distribution. It seems to take the same course as the Leaden Flycatcher as far as Ourimbah, then follows the hills to the west to where they gradually merge into the Blue Mountains. The Leaden Flycatcher, however, continues along the coast as well as along the eastern slopes of the Mountains." This is not strictly the case as there does appear to be a certain amount of coast-wise travelling with the Satin species. Mr. Hindwood has kindly let me have a summary of his own and other observations on this species in the Sydney district from which it is evident that during October and November (mainly November, the dates being 7, 8, 12 (twice), 15 and 17) and during late February and March, individuals obviously in transit may occur in the Sydney area. The suburbs in which the observations were made were Wahroonga, Roseville, Willoughby, Middle Harbour and now Cronulla.

Monarcha melanopsis—Black-faced Flycatcher. Mr. Tubb found a specimen on February 6, 1942.

The species is a transit migrant locally (*cf.* A. R. McGill, *The Emu*, vol. XLIII, 1943, p. 143).

Lalage tricolor—White-winged Triller. One male bird was recovered on October 7, 1942—the same day on which the Budgerygah was found. There had been southerly weather and on October 5 a severe local hailstorm. A transit migrant.

Sturnus vulgaris—Starling. One bird was found on October 30, 1942. The weather had been quiet and calm during the week.

The Black-cheeked Falcon

By NORMAN CHAFFER, Roseville, Sydney, N.S.W.

Throughout the spring and summer, the Black-cheeked Falcon is sparsely distributed through the district surrounding Sydney, but in the autumn and winter its numbers appear to be augmented. Certainly it is seen far more frequently during the two latter seasons, although that may be due, to some extent, to its closer approach to the city at those times.

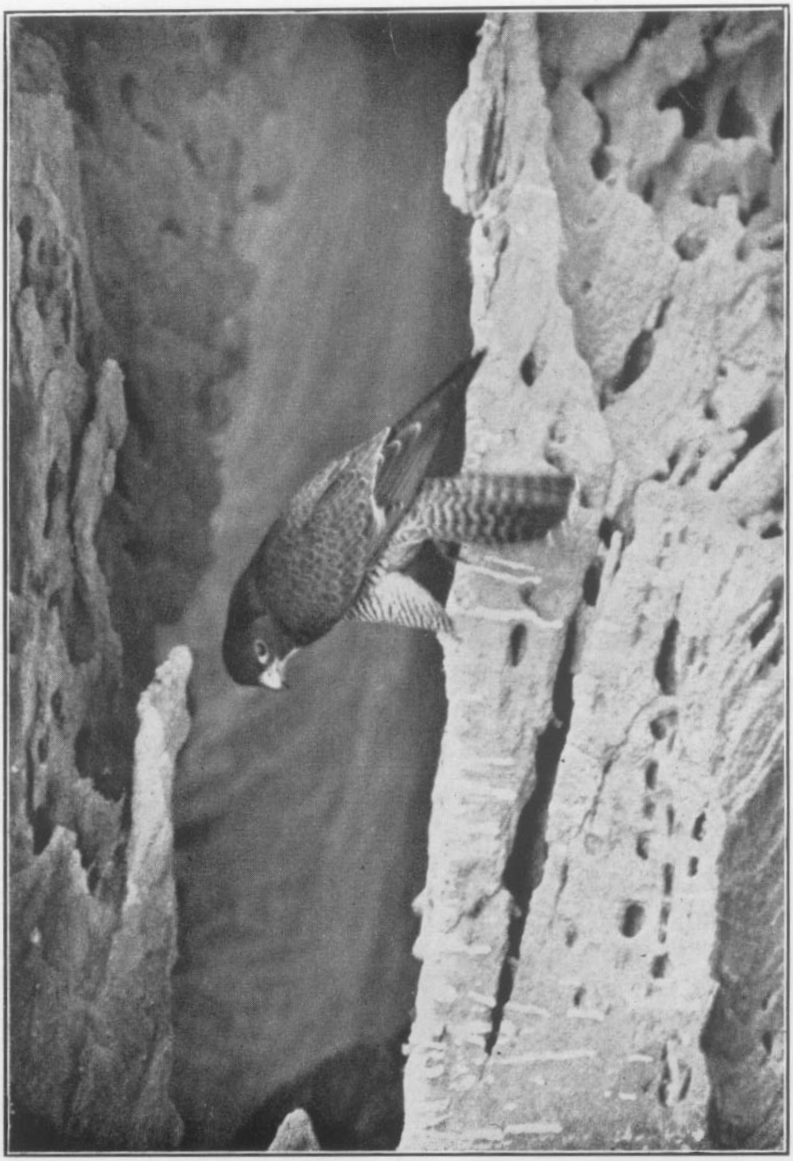
It is a memorable sight to watch birds of prey harrying the Starlings, when those birds have gathered into their huge autumn flocks. While usually the attacks on the Starlings are carried out at such an altitude as to make identification uncertain, the aggressor is, I believe, mostly the Falcon. The Starlings, massing close together, mount high in the air, ascending in great circles, the whole company turning in perfect unison. Fast as the Starling flies, the Falcon can easily outstrip it. Rising above the flock, it turns and dives at the massed birds at a tremendous speed.

A sudden ripple passes through the flock, which momentarily divides, but quickly unites again when the Falcon passes through. One would imagine that the hunter could scarcely miss its prey in such a densely-packed mass of birds. However, I have watched it dive to the attack, time and time again, without effect. The flocking of the Starlings would appear to afford them a great measure of protection, the numbers probably confusing the Falcon during the attack. The Falcon is far more successful against single birds, these, if away from cover, having small chance of eluding the relentless and speedy hunter. The introduced Indian dove and the domestic pigeon are a favourite food and frequent victims of the Falcon.

At Cowan Creek, an arm of Broken Bay, a pair of Falcons has been in residence for many years, probably nesting in the rugged sandstone cliffs of the steep hillsides. From some vantage point they wait for the passage of a bird on the journey of a half mile or so across the water. When the prey is well out from cover, the Falcon launches his attack, diving like an arrow at his victim. One such attack, witnessed by my brother, was made on a Noisy Friar-bird, and both birds struck the water in a confused heap. They were not far from land, and each scrambled ashore, and sat dejectedly on rocks not many yards apart. A Sea-Eagle nests in this territory, and is often attacked by the Falcon. This may be merely a form of sport for the Falcon, for I have never seen it strike the Eagle. The latter expresses its resentment in loud cackling calls, and endeavours to close with its tormentor. As the Falcon dives to the attack, the Eagle suddenly tips upside down, and grabs upwards with its powerful claws. By the time the grab is completed the Falcon is usually a score or more yards past the Eagle, and probably again rising for a further attack.

The site chosen for nesting is usually the crevice in some inaccessible cliff. A nest in a fairly accessible position was shown to me in the New South Wales National Park. It was in the crevice of a low cliff, some 30 feet from ground level, and contained two well-grown young. The birds had been nesting in the area for some years, and, although their eggs had been taken on more than one occasion, they returned each year to the same nesting spot. Beneath the nest were found a dozen rings from the legs of domestic pigeons. Feathers of other birds were also noted, including those of the Crimson Rosella, and many wings of cicadas, and wing-cases of beetles.

Although the nesting crevice was in heavy shadow, owing to its southern aspect, and a considerable overhang of the cliff above it, I decided to attempt a photograph of the birds. November 14 was selected for the attempt, and a reflex camera equipped with a 12-inch lens was used. This



Black-cheeked Falcon at nesting site.

Photo. by Norman Chaffer.

camera was lashed in the top branches of an *Angophora*, about 25 feet from the nest, and a thread run out to a cave, near the foot of the tree. During these proceedings the Falcon repeatedly swept past protesting loudly. It came quite close, but did not actually attack me. I settled myself as comfortably as possible in the cave prepared for a long wait. Occasionally the Falcon put in an appearance, but did not approach the nest. Some five or six hours passed by, and I had almost abandoned hope of securing a photograph, when, at 4 p.m. the Falcon suddenly arrived at the nesting ledge, with a bird in its claws, and the accompanying picture was taken.

An Attempted Simplification of the Mathematical Method of Subspecific Differentiation and Identification

By R. S. MILLER, B.C.E., Melbourne, Vic.

In ornithological literature recently there has appeared a mathematical approach to the question of differentiation of species and subspecies. Whilst, in my opinion, this approach is the only satisfactory one, I am afraid that it clashes with the principles of the standard rules for nomenclature; that, however, is not the point I wish to raise here.

As it is likely that most readers of *The Emu* are slightly lost in the assured manner of expression in which several recent contributors have approached the subject, I thought it might help towards a more general appreciation of such contributions if I attempted in simple form to express the fundamentals of the method. This contribution is therefore tendered for the benefit of readers not versed in such method. As this is a bird journal I will confine my statements to birds and consider the species recently written of by Fleming and Serventy in *The Emu* for October, 1943, viz. *Puffinus assimilis*.

When examining 25 individuals of this species from Western Australia it was found that the length of the culmen varied from 21·9 mm. to 25·5 mm., the mean or average length being 23·68 mm. It is to be understood that I have not available the exact data from which these writers worked and from here on my statements are to be taken as typical of their method and not matters of fact to be used by workers dealing with this bird.

Let us arrange the birds together in groups according to the length of culmen. In order to do so we must select limits to the groups, since there appears to be continuous variation in size between the minimum and the maximum. A convenient grouping is obtained with the figures given