

## On some Pellets or Casts of a Screech Owl (*Tyto alba delicatula*, Gould).

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In a pine tree at the Reebbeds, near Adelaide, a screech owl has been in the habit of resting during the daytime, from the last week in December, 1914, or possibly the first week in January, of the present year.

In June, a number of pellets were noticed under the tree, and some of these were exhibited at a meeting of the Royal Society of South Australia. Later more pellets were gathered, and it was thought that a paper dealing with these would be of interest.

The screech owl (*Tyto alba* or *Flammea flammea*, "B.O.U. List, 1915") is widely distributed, being found in all the continents, and is known under many names, such as "Masked," "Delicate," "Barn," "White," and "Screech" Owl," and in New South Wales sometimes as the "Night-hawk." In England it is commonly known as the "Barn Owl" (*Strix flammea*, but now as *Flammea flammea*). Many varieties or sub-species have been named; our common sub-species as *Strix delicatula*, Gould; but Mathews now refers to it as *Tyto alba delicatula*, and it will be known in the near future as *Flammea f. delicatula*.

In common with other owls this species lives largely on mice, rats, young rabbits, small birds, and night-flying insects; bats and frogs are also eaten. The food is not passed through the intestines as with most other birds, but after the nourishment has been extracted from it, the waste parts are ejected from the mouth as pellets, and from these the nature of the food of the bird may be easily found out.

The screech owl lives a solitary life, except during the nesting season. On mating a suitable hollow is found, and in this the young are reared; these not coming into the open until

they are practically able to take care of themselves; but on the ground beneath the nesting hollow the pellets are always numerous, although it is probable that these are from the old birds only.

It is seldom to be seen away from watercourses, or at least from permanent waterholes. Sudden cold seems to be very injurious to it, as after every cold snap a few dead birds may be picked up.

Whilst rabbit shooting by moonlight this owl has often been observed flying low down over rabbit warrens, and to suddenly clutch at some object with its claws: from examination of the pellets this object must often have been a young rabbit; matured rabbits do not appear to be attacked. It has also been observed alighting to capture crickets and other insects.

It was once very common at the Reedbeds, but, like other native birds, of late years has become scarce. A few are, however, still to be heard at night, or occasionally may be seen perched in some thickly foliated tree during the daytime. Its worst enemy is undoubtedly man, who, blaming it for killing chickens, pigeons, and young game birds (usually due to the rat) shoots it remorselessly.

Its hideous call, resembling the shriek of a child in agony, and suddenly breaking the stillness of the night, also prejudices people against it. But the pellets from this single bird are sufficient to prove that the species is one of the most useful, if not actually the most useful one, that we have in Australia. The Laughing Jackass (*Dacelo gigas*) has been seen on several occasions to kill, or seriously injure, individuals, and, in common with other owls, it is frequently mobbed by small birds. Hawks have been known to attack it.

There can be no doubt as to the approximate date when the particular owl, whose pellets are now under consideration, began to frequent the pine tree, as the ground beneath this had been raked over just before Christmas, and no pellets were seen. It is also certain that no other owl used the tree during the past year, so that the whole of these pellets are from one bird. But the same bird used other trees, and has now disappeared. It is reasonable, therefore, to estimate that the total number of pellets ejected for the six months is at least double that found under the tree, or for a whole year four times that number. Of the pellets the actual number obtained were:—

Complete or almost so—172.

Partly broken up, or loose skulls—109.

These were presented to the Museum, and as it was considered desirable for Museum purposes that they should be exhibited in mass, but seven complete ones were disintegrated for examination. From these and from examination of pellets generally, and from the loose bones, the following particulars were prepared by the Entomologist, Mr. Arthur M. Lea, who also received much assistance as regards the identification of bone contents from the Ornithologist, Mr. F. R. Zietz, the Director, Mr. Edgar R. Waite, who also identified some of the bones, and Dr. A. M. Morgan identified some sterna and skulls of a few doubtful specimens. The pellets were estimated to contain bones of vertebrates as follows:—

Sparrows . . . . .	160
Starlings . . . . .	16
Musk Lorikeets . . . . .	10
*Other small birds . . . . .	5
Young Rabbits . . . . .	15
Bat . . . . .	1
Frogs . . . . .	48

Allowing, as previously surmised, that the bird ejected as many elsewhere for the six months, a fair estimate for a year's destruction of various pests would be:—

Sparrows . . . . .	640
Starlings . . . . .	64
Mice . . . . .	1600
Young Rabbits . . . . .	60

In addition numerous rats and thousands of destructive insects would be eaten. The bone contents of the seven disintegrated pellets represented:—

1. Four mice.
2. Two mice, four frogs, and a jew lizard (*Amphibolurus barbatus*).
3. Two mice and seven frogs.
4. One mouse and one young rabbit.
5. One mouse and two sparrows.
6. Three mice and one sparrow.
7. Three mice, one young rabbit, and one frog.

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\* Mostly Honey-eaters.

The fact that a jew lizard was eaten is of interest as indicating that possibly small snakes are also eaten, although no bones of such were noticed in the pellets. No fragments of egg shells were seen, and this is also of interest, as these are so hard and indigestible that, had the owl habitually fed on birds' eggs, some fragments of these must have formed part of the pellets. Very few birds' claws were seen; and practically no flight or tail feathers.

The following insects, or parts of the same, were identified as occurring in the pellets:—

Soldier ant (*Myrmecia pyriformis*).

Green-headed ant (*Ectatomma metallicum*).

Sugar ant (*Camponotus* sp.).

Mole cricket (*Gryllotalpa coarctata*).

Ground cricket (*Gryllus servillei*).

Large carnivorous cricket (*Gryllacris* sp.).

Introduced earwig (*Labidura truncata*).

Fragments of several kinds of cockroaches (*Blattidae*).

Numerous night beetles (*Antitrogus burmeisteri*).

Numerous dung beetles (*Onthophagus pentacanthus*).

Numerous large cockchafers (*Anoplognathus odewahni*).

Some pellets were made up almost wholly of remains of these beetles, and, owing to their loose construction, probably others were broken up, and so not examined.

Thousands of fragments of small cockchafers of the genus *Heteromya*, probably of several species of these common night-flying beetles.

Small stag beetle (*Figulus lilliputanus*).

Stag beetle (*Lamprima varians*).

Weevil (*Desiantha maculata*).

Weevil (*Rhinaria tibialis*).

Wire-worm beetle (*Lacon caliginosus*).

Night beetle (*Pterohelaeus*, 2 species).

Night beetle (*Helaeus haagi*).

Beech beetle (*Caedimorpha heteromera*).

This and the preceding species were probably taken during a visit to the adjacent beach.

Longicorn beetle (*Phoracantha recurva*).

The pellets vary from the size of a small walnut to that of a hen's egg. When first ejected they are covered with a slimy

crust, but through which many bones project, the most common of these being heads, breast and leg bones of sparrows (*Passer domesticus*), and lower jaws and leg bones of mice. On exposure to weather the pellets partially break up, and the bones become more noticeable; still later the pellets fall to pieces, but loose skulls, jaws, and other bones, are to be seen in large numbers under the trees the owls frequent. The pellets are also sometimes pecked to pieces by birds, in particular by family groups of the "Happy Family" or "Twelve Apostles" (*Morganornis superciliosus*). The softer parts are often eaten by larvae of clothes moths, by Museum beetles (*Anthrenus* and *Dermestes*), *Psocus*, etc. Small spiders and ground mites are also to be seen in large numbers in them. On many pellets sparrow skulls form the most conspicuous feature, but on closer examination numerous lower jaws of mice become visible. On some of the larger pellets rabbit bones and jaws may be easily made out. Only one jaw of a bat was noticed, but doubtless had all the pellets been disintegrated others would have been seen. Many pellets contained remains of both sparrows and mice; some, remains of rabbits and mice; others, at least two kinds of birds; and scattered generally through them were the harder parts of insects. Occasionally two sparrow skulls were distinctly visible in one pellet, and rarely three. In one three mouse skulls were distinct. Very many of the sparrow and starling (*Sturnis vulgaris*) skulls were smashed in at the base, this evidently having been done before the birds were eaten.

The outer crust is frequently largely composed of the fur of mice and rats, and the whisker hairs of rats and rabbits are always visible on the pellets containing bones of same. On many pellets curious leathery objects were visible, and one pellet was broken up to examine one of these closely, when it was found to be portion of the stomach wall of a sparrow. Pellets composed largely of the remains of mice break up less readily than others, whilst those largely composed of remains of frogs and insects break up very easily. No doubt with mice and birds the fur or feathers act as a kind of cement to bind the whole.

Mr. J. W. Mellor recently presented to the Museum many pellets of the same species of owl. These were found under a pine tree at Lockleys, near Adelaide. The trunk of the tree is only about six yards from the back door of a newly-built house, and the owl did not appear to be disturbed by the build-

ing operations. The pellets were certainly not older than a year, and were remarkable for the large numbers of larvae of clothes moths working in them. They were also being eaten by numbers of a small introduced beetle (*Ptinus fur*). They were estimated to contain bones of vertebrates as follows:—

Sparrows (introduced) ..	465
Starlings (introduced) ..	10
Musk Lorikeets . . . . .	2
Other small birds . . . . .	5
Mice . . . . .	80
Rats . . . . .	5
Frogs . . . . .	5

There was a striking difference between these and the first lot examined, sparrow skulls being far more numerous, and jaw bones of mice much scarcer; no bones of rabbits were seen in them. Three pellets were disintegrated for examination, and their bone contents were as follows:—

1. Four mice and one sparrow.
2. Three mice and one sparrow.
3. Three sparrows.

A pellet found elsewhere contained bones of two mice and a rat.

An owl found dead in July was handed to the Museum, and Mr. Zietz found in its stomach remains of one mouse only.

In conclusion a paragraph may be quoted from Waterton, dealing with this species of owl in England:—

“When it has young it will bring a mouse to the nest every twelve to fifteen minutes. But in order to have a proper idea of the enormous quantity of mice which this bird destroys we must examine the pellets which it ejects from its stomach. Every pellet contains from four to seven skeletons of mice. In sixteen months from the time that the apartment of the owl on the old gateway was cleaned out there has been a deposit of above a bushel of pellets.”

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