

The Stomach Contents of Young Mutton-birds

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The impression might be gained from reading Mr. F. Lewis's article on the feeding habits of the Short-tailed Shearwater (*The Emu*, vol. 45, pt. 3, January, 1946, pp. 225-8) that scarcely any investigations have been carried out on the feeding habits and stomach contents of petrels. Students of this interesting group will recall the writings of such workers as W. A. Forbes (1), R. A. Falla (2), R. M. Lockley (3), R. C. Murphy (4), and D. L. Serventy (5), in which substances such as cuttle-fish (cephalopod) beaks, gravel, pumice, cinders, feathers, and vegetable matter have been recorded from the stomachs of these birds. Mr. Lewis's investigations, rather than indicating "... some remarkable feeding habits of this species (*Puffinus tenuirostris*) differing very much from generally-accepted ideas on the subject," to a large extent duplicate information already available in literature.

The presence of macerated vegetable matter in the stomachs of young birds, a fact which puzzled Mr. Lewis, has been noted and discussed by Lockley (*loc.cit.* pp.40-41), in his detailed study of the Manx Shearwater (*Puffinus puffinus*). Lockley remarks—

His parents still occasionally brought in some green leaves of sheep's sorrel from the turf outside. I would like to be able to believe that they did it to amuse Hoofti; but in fact Adam and Ada were fond of toying with this plant, even before Hoofti was born, and I know that they ate it regularly—they sometimes threw it up from their gullets when I hand-fed them. They now plucked other dwarf plants, components of the rabbit grazed turf on the knoll: scorpion-grass, sea stork's-bill, pearlwort, tormentil, rock-spurrey, milkwort, eyebright, and chickweed; and carried them in to Hoofti.

Some years ago my friend, Captain J. D. McComish, interested himself in the subject and endeavoured to ascertain the purpose of seeds (also pumice-stone and charcoal) found in the stomachs* of young.

* The term stomach is here used in a general sense because no evidence is available as to whether the substances mentioned (seeds, pumice-stone, and charcoal) were found in the proventriculus or in the gizzard of the young Flesh-footed Shearwaters. A bird's stomach (apart from the crop, which may be absent in some species, but well developed in such birds as pigeons) consists of two distinct parts, which, taken together, correspond with the single human stomach. The upper part is called the proventriculus; the lower part, the gizzard, a very powerful muscular organ, which, by active contractions, grinds undigested food that passes down to it from the proventriculus. The gizzard often contains hard substances that help to make the grinding mechanism efficient. Thus in birds there is a 'fore-stomach' (proventriculus), and a 'stomach proper' (gizzard). Mr. Lewis in his notes states—"In some cases the young birds had apparently been fed too much clinker, as pieces had passed out from

Fleshy-footed Shearwaters (*Puffinus carneipes*) breeding on Lord Howe Island. Roy Bell, now residing on Norfolk Island, who collected birds on Lord Howe Island during 1913-1915, said he thought the adult birds picked up the seeds floating on the water and gave them to the young birds in the burrows with their usual food, and that the seeds were ultimately ejected by the nestlings. Bell had heard Lord Howe Islanders refer to these seeds as 'Mutton-birds' ballast.' Mrs. Whiting, of the island, told Captain McComish that, as a girl, she always called the seeds 'Mutton-birds' loading stones' in the belief that they had something to do with the balancing of the birds when in flight. Such explanations rightly belong to the realms of folk-lore.

The seeds are those of a leguminous plant, *Caesalpinia Bonducella*, locally known as the 'wait-a-bit' or 'policeman.' Both names refer to the difficulty of releasing one's clothing from the curved thorns of the plant.

During the past few years correspondence on the subject has passed between Max Nicholls, a resident of Lord Howe Island, and Captain McComish; this is given below, together with comments added by Captain McComish.

Nicholls to McComish, 9/12/40. "Re 'wait-a-bit' seeds in young mutton-birds. All I have seen were taken from the young birds just when they were ready to leave the burrow, or a little before that time. . . . Many of the young birds didn't have seeds, but bits of round pumice-stone, which is too light to be considered as ballast. I have never noticed any great number of seeds close to the water's edge; most of them seem to come out of the sand above high-water mark. The last heavy rain washed out hundreds. They would last for years in the ground as they are so hard. The buffalo grass has killed most of the plants; they were very numerous I am told." [Note by McComish—"I had told Nicholls that I was of the opinion that most of the seeds float to Lord Howe Island from islands to the northwards, and that I did not think that the few plants growing at Ned's Beach, but nowhere else on the island, could produce the large number of seeds that are found there."]

Nicholls to McComish, 24/5/42. "Mrs. Hines gave me some lumps of charcoal she had just got out of young mutton-birds. I haven't seen any seeds in them this year."

Nicholls to McComish, 3/8/42. "Re charcoal in mutton-birds. There is a lot lying about the properties of Togo Payten and Herbert Wilson, where they have been burning logs. The birds could easily get it near their burrows."

Nicholls to McComish, 1/8/43. All the islanders say 'wait-a-bit' seeds, pumice-stone, and charcoal are got out of the mutton-birds."

An early reference to seeds in Mutton-birds on Lord Howe Island is that by J. M. Maiden (6), who remarks, about the plant *Caesalpinia Bonducella* that "The

the gizzard into the stomach." From the context of these remarks and from information supplied in a recent letter (29/3/46) most of the hard substances mentioned by Mr. Lewis were found in the proventriculus ('gizzard' of Lewis), and in some instances in the gizzard ('stomach' of Lewis).

Islanders say they find one of these seeds, and no other, in each Mutton-bird (*Puffinus*).” The seeds of *C. Bonducella* are large, grey, smooth and more or less oval in shape, and measure approximately $\frac{3}{4}$ inch x $\frac{5}{8}$ inch x $\frac{1}{2}$ inch.

No evidence is available as to how the young Mutton-birds on Lord Howe Island obtain the foreign matter. All three substances mentioned—seeds, pumice-stone, and charcoal—could be collected by the adult birds from the surface of the sea and fed to the nestlings. It seems unlikely that almost fully-developed birds would leave their burrows at night and collect pumice-stone from the shore. Indeed, the nature of the nesting areas on the island, except at Ned’s Beach, would make this a difficult venture for the birds. Charcoal, from burnt timber, is present within some of the nesting areas. The few ‘wait-a-bit’ plants now growing on the island are restricted to a small area at Ned’s Beach. It seems probable, therefore, that the adult birds collect the seeds of this plant at sea from the numbers washed out of the sand by high tides, or from among those borne by the sea towards the island from places lying to the northwards.

My sincere thanks are accorded to Captain J. D. McComish for making available much of the data and the correspondence, relating to Lord Howe Island, used in these notes.

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Stray Feathers

Swifts and the Weather.—In the pages of *The Emu* in the past there are some references to the appearance of Spine-tailed Swifts (*Hirundapus caudacutus*) during, or prior to, unsettled weather, notably a series of records by A. E. Bridgewater in volume 34, page 99.

My experience with the species in this district has been far different. The appearance of Swifts here has invariably been the prelude to drought conditions, and the larger the flock and the greater the height, the longer the following dry spell. They were numerous in 1928, which was exceptionally dry, but were not in evidence during the good