from sharp spines. Another good point regarding them is that they love to capture the succulent but non-sporting lamprey, that enemy to some of our best fishes, especially the fresh-water varieties, such as the Murray "cod" and blackfish. The lamprey is an eel-like fish which is provided with a suctorial mouth devoid of teeth, with which it is able to attach itself to a fish, and by rotating its harsh tongue it makes a hole in the skin of a fish, through which it sucks out its life's-blood. Lampreys are more plentiful than is generally supposed, and are called eels by persons unacquainted with their structure. It is not an uncommon error for such persons to make when they announce that they had captured eels in the River Murray, in which stream none, up to the present, have been found to exist. The great fighting capacity of a trout constitutes the chief pleasure to fly-fishermen, and if these fish lost this characteristic trout-fishing would lose most of its charms, and would be but a mediocre sport. If the weaklings of the trout were allowed to propagate their species these fish would become decadent, and would eventually evolve into sluggish and slow-moving creatures if their natural enemies, which eliminate the least fit to live, were destroyed. It is simply the application of the well-known law of disuse inheritance causing deterioration and atrophy in the structure. This is instanced in the flightless, inactive birds of New Zealand, which for centuries past, on account of having no ground enemies to cause them to fly up off the ground out of danger, have gradually lost the power of flight, and have become decadent, and are thus consequently disappearing, never to return. In our wisdom, therefore, let us prevent, as far as we can, the decadence of our fishes, allowing nature to use its aids to this desirable end, and by so doing the now despised and outcast Cormorants will be relegated to their proper sphere of usefulness.

Observations on the Finch as Foster-Parent to the Cuckoo.

BY C. F. COLE, MELBOURNE.

AT a recent meeting of the Bird Observers' Club one of the members mentioned that he had on several occasions last season found young Cuckoos dead in the nests of the Red-browed Finch (*Ægintha temporalis*), and wished to know if any other member could throw any light upon the subject, and whether it were possible that the Finches, upon finding they had brought forth strange progeny, had poisoned them by giving them some special food.* This theory carries no weight

* T. H. Tregallas, *Emu*, vol. vii., p. 187.

whatever with me, because, as far as my observations go, the Finch cannot act as foster-parent to the Cuckoo. Either the Finches deserted their nests, or the young Cuckoos died of starvation, partly brought about by opposite methods of feeding and food. The Finches being granivorous in their habits, the food which they collect for their young is taken either into the throat or crop, and after being softened, most probably by the salivary glands of the crop, is ejected back into their bills and then into the mouth of their young. On examining this food I find it to be very similar to fine boiled oatmeal, and consisting chiefly of grass and other small seeds that have been shelled, the bill of the Finch being adapted for this purpose. It is a recognized fact amongst naturalists that the first food the Finch family feed their young upon is insects. This may be so, but I have proved beyond doubt that insect life is not essential to the rearing of young Finches, having seen Spotted-sided (*Stagonopleura guttata*), the European Goldfinch, and others reared in captivity upon nothing but plain canary seed. Upon examining young Finches in their early stage I have always found their crops to contain this assimilated food. Amongst native Finches my observations are based chiefly upon the Red-browed and Spotted-sided, whose nests were to be found in scores in the citrus trees growing in an orchard in the Ovens Valley (Victoria), and with the acclimatized European Goldfinch at Upper Hawthorn, Melbourne. Having upon several occasions found the egg of the Pallid Cuckoo (*Cuculus pallidus*) deposited in that of the Goldfinch, I never had the opportunity of proving my theory, on account of the Goldfinch always deserting her nest upon finding the strange egg placed therein, until last November twelvemonths, when I found a Finch's nest situated low down in a pear-tree in the orchard, and containing three Finch's eggs and a Pallid Cuckoo's. On examining them I came to the conclusion that they would soon be hatched. This surmise proved to be correct. On the fourth day from finding the nest, at noon, all four young birds had hatched. I knew that the Cuckoo would eventually get rid of his nest-companions, either by ejecting them—the commoner method in vogue amongst these strange birds—or else by trampling them to death. This trampling to death business, as far as my observations go, is that the Cuckoo finds it easier work to get rid of the stronger than the weaker nestlings, my reasons being these :—Young birds in the nest always strive for the top position, which naturally falls to the stronger. With the young Cuckoos it is the reverse ; they work to get beneath, and as a rule there is no trouble, the other young birds readily making way, thus playing into the hands of their murderous nest-mate, who, getting them into the hollow between its shoulders, easily casts them out to destruction. I have on rare occasions found the Cuckoo to quickly sit upon

and by its greater strength smother and crush the life out of weak or sickly nestlings. One can easily prove how readily the young birds in a nest make way by simply placing the finger in the nest and gently working it downwards beneath them, this action at once causing them to make for the uppermost position. The second day from hatching the Cuckoo had got rid of its three nest-companions; their carcasses I found upon the ground being devoured by scores of small ants. The Cuckoo up till this stage looked both well and strong, but, knowing that warmth was more essential than food up to this period, it was hard to say if the Cuckoo had received any food or not, because the food of insectivorous birds passes into the stomach, and maceration takes place in the œsophagus or gullet before entering the stomach. In granivorous birds the maceration takes place in the crop or dilated gullet above the breast-bone, and then passes into the gizzard, dissection being the only way to prove if the Cuckoo had received any food or not. Knowing that young insectivorous birds require to be fed more often than those of granivorous ones, I wondered if the Finches would exert themselves more on account of the voracious appetite of their foster-chick, which could easily consume more than the three young Finches put together. It was now purely a matter of time, so, visiting the nest occasionally, I found at the end of the third day that the inmate looked "seedy," and upon looking into the nest on the morning of the fourth day I found it dead. Upon dissecting this young Cuckoo I found the organs in a wasted condition and the body devoid of any fatty substance, proving beyond doubt that death was due to starvation. The stomach had very little food in it, this being similar to that described in the beginning of this paper, but not enough to sustain life in so voracious a bird as the Cuckoo, and, besides, not being the class of food necessary to rear a Cuckoo. In concluding, I can only say that it was with delight that I heard Mr. Tregallas state that he had found the dead bodies of young Cuckoos in the nests of the Red-browed Finch, and I await with eagerness the time when some other observer will bring forth a note proving or disproving the ability of the Finch family to act as foster-parents successfully.

CARD.—Mr. George R. Marriner, F.R.M.S., wishes to inform his correspondents that he has resigned the position of Assistant in Biology at Canterbury College, Christchurch, in order to take up the Curatorship of the Public Museum, Wanganui, New Zealand, and will be pleased in future to receive and exchange pamphlets on Natural History at his new address.

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