

# Birds That Bury Their Eggs

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It is sufficiently astonishing that some birds should have developed the habit of foisting their eggs upon other birds. It is no less astonishing that another group of birds should have developed the device of making natural incubators for their eggs, and so allowing their babes to be born beneath earth and debris.

We need not concern ourselves with wondering whether these mound-builders have discarded the habit of brooding or simply have failed to acquire it. At any rate, they have not spared themselves labour by adopting this curious procedure, for a great deal of work is entailed in the building of the nests, and constant attention, of a highly-skilled nature, is necessary. Some nest-mounds may be as much as fifteen feet high and from fifty to sixty feet in circumference. In such cases the babe may be born fully six feet below the surface, and yet it kicks its way upward, pauses a brief while on the summit, and then strolls off blithely to make its way in this brave new world.

Marvelling at these things, we should feel a touch of sympathy with the people who, more than three hundred years ago, declined resolutely to believe the tales of travellers regarding such birds as these. Nevertheless, it is odd that the existence of mound-builders - which were first reported from the Philippine Islands in 1521 - was doubted so long, for it was not until the early part of the nineteenth century that the habits of the birds were authenticated.

Australia is distinguished in possessing three kinds of mound-builders. The Jungle-Fowl or Megapode, a crested brown-and-grey bird about the size of a large domestic fowl, extends from the far north of Australia to coastal central Queensland. The Scrub-Turkey, a brownish-black and brownish-grey bird with pink-red skin about the neck, and in size approximating a domestic turkey, occurs in coastal jungles from North Queensland to New South Wales, and throughout certain inland scrubs. The handsome Mallee-Fowl, which suggests in shape and size a greyish-mottled domestic turkey, has no fancy for coastal jungles; it frequents dry mallee and kindred scrubby areas of the interior, extending through portions of New South Wales, Victoria, South Australia and Western Australia.

There is only one kind of Mallee-Fowl, but various species of Jungle-Fowls and Scrub-Turkeys are scattered throughout islands to the north of Australia.

When John Gould, the "father" of Australian bird-study, came upon the Scrub-Turkey (then called the Wattled Talegallus) in the year 1839, he declared himself to be amazed by its "curious and extraordinary habits." He discovered that for several weeks prior to the period of laying the birds scrape together large heaps of decaying vegetable matter, and, at the proper time, convert it into a pyramidal mound. This work being completed, and time allowed for sufficient heat to be engendered, the eggs are deposited in a circle, at a distance of nine or twelve inches from each other, and buried more than an arm's depth, with the large end upward. They are covered as they are laid, and are allowed to remain in the mound until hatched.

Another point which Gould ascertained was that the young, from the hour they are hatched, are clothed with feathers and have their wings developed sufficiently to enable them to fly on to the branches of trees. They are equally nimble on their feet.

"In fact," he said, "as a moth emerges from a chrysalis, dries its wings, and flies away, so the youthful Talegallus, when it leaves the egg, is sufficiently perfect to be able to act independently and procure its own food."

Gould made those statements about the young birds from observations in a zoological garden, for even at that early period several Scrub-Turkeys had been taken to Regent's Park, London, where they made nesting mounds from which the young duly emerged.

Equally "novel and extraordinary," in the English bird-man's view, were the discoveries made about the same time in regard to the Jungle-Fowl. One of his assistants, John Gilbert, when exploring in the Northern Territory, came upon several curious mounds, which white people of the district declared to be aborigines' burial-places, but which the natives themselves said were houses or nests of *Oooregoorga*, the Megapode. The question was settled when Gilbert saw eggs taken from a large mound, at a depth of six feet. Subsequently, he himself attacked a mound fifteen feet high and sixty feet in circumference, and, after an hour's hard work in the heat, with the aid of an aborigine, he uncovered eggs at a depth of five feet. Each of the eggs had been placed in a perpendicular position. Each averaged three and a quarter inches by two inches, and each was brownish covered with a kind of epidermis, which easily chipped off, exposing a pure white surface beneath.

Another mound, composed of earth, stones, and decaying vegetable matter, was eight feet high and seventy-seven feet in circumference. Yet another of these remarkable pyramids, discovered by John Macgillivray, of H.M.S. *Bramble*, on an island, was no less than a hundred and fifty feet in circumference; it comprised an immense amount of material which probably had been used for several years.

"Remarkable!" cried the pioneering birdman, again, when he learned of the ways of Australia's third mound-builder, the Mallee-Fowl. John Gilbert, writing from the Wongan Hills, Western Australia, in September of 1842, related to Gould that he was taken by an aborigine to see a "Ngou-oo's" nesting-mound, at sight of which he became so excited that he immediately began scraping off the upper part. He desisted when rebuked by the blackfellow, who then scraped the earth off very carefully from the centre, throwing it over the side, so that the mound soon presented the appearance of a huge basin. At a depth of two feet the eggs were exposed; they were resting on their smaller apex, and the earth around them had to be removed most carefully to avoid breaking the fragile shell. The interior of the mound was composed of fine particles of gravel mixed with vegetable matter, and its temperature was estimated at about 89°.

Of the other mounds which Gilbert saw in that wild, lonely area, the largest was forty-five feet in circumference and nearly five feet in height. He was much struck by the large size of the eggs and by the fact that unlike those of the Jungle-Fowl, they were placed directly in the centre of the mound, all at the same depth, separated only by about three inches of earth, and so placed as to form a circle. The eggs varied in colour from a very light brown to a light salmon.

While John Gilbert was making those observations in Western Australia, kindred observations of equal interest were being made in the adjoining colony. At that period South Australia was experiencing considerable financial and political stress; nevertheless its Governor, Sir George Grey, contrived to throw off the cares of office and go to the scrubs of the Murray River to study, as he said: "the habits and manners" of the Mallee-Fowl. In December of 1842 Sir George Grey reported having discovered that when an egg was laid it was completely enveloped in soft sand, and had from three to six inches of sand between its lower end and the layer of dead leaves at the base of the mound. The sand was then thrown in again, and the mound left in its original form. In this manner the bird proceeded from day to day, until there was a circle of perhaps eight eggs all standing upright in the sand, with several inches of sand between each.

"Two great peculiarities about these eggs," Sir George Grey said, "were, firstly, that both ends were of nearly the same size, so that they balanced well in a perpendicular position, and, secondly, that the shell was extremely thin, as a result of which every one placed under a domestic fowl was broken."

It will be observed that those men of old - Gould, Gilbert, and Grey - between them gathered a considerable amount of knowledge of the ways of the strange mound-builders. Indeed, they left relatively little to be revealed by later observers. All three suspected that the chicks of each species were able to emerge from the mound unaided, and this has since been established. All three suspected, too, that it was necessary for the parent birds to regulate the temperature of the mounds, and this also has proved to be a fact.

It was not definitely known, in those early days, whether more than one pair of birds ever shared a single mound, but it has since appeared that this is sometimes the case. Several Scrub-Turkeys' mounds have been found to contain from twenty to thirty-five eggs each, obviously the product of two or three birds. Mallee-Fowls' mounds, too, have occasionally been found to contain double or treble clutches of eggs - as many as twenty. On the other hand, there is a record of a curiously small mound of a Mallee-Fowl; only eighteen inches in diameter and containing only one egg, it was believed to be the product of a modest young female.

Another point upon which the early investigators were not clear, in regard to the Mallee-Fowl, was whether the heat of the sun or the warmth promoted by decaying vegetation was chiefly responsible for maintaining the temperature of the mounds. There is a difference of opinion on this point today. Personally, I am inclined to think that in the case of the Mallee-Fowl, which breeds in dry places, the "direct" heat of the sun is the chief factor, whereas in respect of the Jungle-Fowl and Scrub-Turkey, which breed in sunless jungles, it is probable that the necessary warmth is caused mainly by mouldering vegetation.

Moisture is essential in every mound. Indeed, bushmen who work in coastal jungles are prone to regard Scrub-Turkeys as rain-prophets, since the birds begin to scratch mounds together on the approach of wet weather in springtime. Again, observers of Mallee-Fowls have stated that if rains fall in autumn the birds will begin nesting operations, and will continue to attend the mounds during practically the whole of the year.

Doubtless the damp material introduced into the chambers is chiefly for the purpose of altering, the condition of the shell - to convert the calcium carbonate in the fresh shell to calcium bicarbonate in the incubating shell, and thus allow the release of the chicks. Early experimentors with incubators learned, by hard experience, the necessity of having moisture with carbon dioxide to cause an egg-shell to become, very gradually, sufficiently friable to break. The mound-building birds discovered this fact ages before the first artificial incubator was invented.

How essential it is, too, that these "Thermometer-Birds" shall rake over the mounds from time to time has been established by experiment. In three cases in which Mallee-Fowls' mounds were denied this attention, owing to their being surrounded with wire-netting for the purpose of capturing the young, every one of the eggs failed to hatch. It became obvious, from these experiences, that the mounds must be aerated and the temperatures must be regulated.

Profiting by the lessons thus learned, Mr Bruce Leake, of Kellerberrin, Western Australia, constructed a "nest-mound" near his home, placed a layer of dampened leaves in the hollow, and, having enclosed a clutch of eggs taken from a genuine mound, opened the structure each day, and, by pouring in hot sand, kept the interior at an average temperature of about 95°. As a result he secured, in about nine weeks' time, six healthy chicks.

Mr Leake has sent me the following summarized account of this enterprise:

In 1926, and again in 1931, I transferred eggs from nests found in the Bush to an artificial nesting-mound which I made in my orchard, constructed on lines similar to the original nests. Incubation takes nine weeks, and it is necessary to have wet leaves, etc., in the bottom of the nest; these heat and help to incubate the eggs, and also create moisture in

the mound. Otherwise, the eggs become too brittle and break easily. During both years I was successful in hatching out young ones. These are fully feathered when they emerge from the nest and can fly three or four yards at once.

At present (1934) I have some Mallee-Fowls, which I hatched out two years old in my orchard. The female birds have an unusually wild nature, more so than I have noted in any other bird.

Mr Leake adds that in each case the chick was very damp on emerging from the egg, being covered with a slimy substance which doubtless would protect the feathers as it fought its way up through the sand. Marks in the mound showed that the course taken by the emerging chicks was almost perpendicular.

Wildly independent little creatures, they kicked and gurgled protestingly if held. Moreover, when a chick a few hours old was placed with one that emerged five days earlier, the older bird refused to have anything to do with his "brother" - he ruffled his feathers, spread his wings, and would not go near the new arrival for two days. This, Mr Leake suggests, appears to indicate that the young birds lead an independent existence, and do not even know their parents. Other observers have stated, however, that the old birds sometimes, gather the young ones when they emerge.

What extraordinary creatures these mound-builders are! It is fitting that the Mallee-Fowl has been commemorated in place-names in various parts, such as Lowan in Victoria and Gnowangerup in Western Australia. "Low-an-ee" and "Louan" were aboriginal names for the bird in northern Victoria, and "Gnow," or "Ngow" or "Ngowoo" were used by natives of the West, these names, it appears, being based on the bird's curious notes. Aborigines of northern New South Wales knew the Scrub-Turkey as "Wee-lah" and to this day certain natives of northern Queensland call the Jungle-Fowl "Cha-rook-ka."

I like that name, "Cha-rook-ka." It takes me back to the rich jungles of northern Queensland - to the times when I heard a strange, clattering bird-voice breaking the calm of the tropic nights with its assured cry:

"Cha wong! Cha-wha! Cha-cha-cha! Cha-rook-ka!"

Alas, all three of these wonderful birds have fallen away in recent years. The Jungle-Fowl is still holding its own in the wilder portions of tropical jungles, but the Scrub-Turkey has been driven from many parts of its range, and in some areas the Lowan has been exterminated through the clearing of the country for wheat-growing. A serious handicap to all three birds is that they are "good eating." When it is remembered that foxes and feral cats assist in the slaughter of Mallee-Fowls, and that the bird's eggs (each of which weighs about three times as much as an average domestic fowl's egg) are freely taken by settlers, the wonder is that the species has survived as well as it has. Clearly, however, if the Lowan is to be saved for posterity it will be through the medium of National Parks.