

eighteenth, probably since the earthquake, and there are literary records of two or three others in the last century. The records include the first New Zealand record of the Black-fronted Dotterel, the second of the Least Sandpiper, and what is presumably the fourth of the Japanese Snipe. It is to be hoped that projected developments on the lagoon do not result in such changes that this interesting and attractive group of birds will cease visiting Napier. I would like to express appreciation of Mr C. G. Crawford, who has accompanied me on many occasions, besides supplying me with notes of his own visits; also to Mrs R. Sorrel and Miss C. Saxby, both of whom have always been ready to provide motor transport, and whose interest and enthusiasm have been a valuable stimulus.

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A BREEDING RECORD OF THE KIWI IN NORTH AUCKLAND

By E. G. TURBOTT, *Auckland Museum*, & G. C. WIGHTMAN, *Okaihau*

The following notes by G.C.W. describe a nest of the North Island kiwi (*Apteryx australis mantelli*) found on 16 January 1955 in the Okaihau district, North Auckland. A dog had unfortunately killed a female kiwi (sent to the Auckland Museum) near the nest, and the same dog about a week later led to the discovery of the nest and sitting male kiwi.

The nest was on a farm which had recently been taken over by G. C. and T. Wightman. It was situated in a patch of bush, surrounded by rough farmland which includes much bracken fern and tea-tree scrub. Evidently fires on the adjacent land have fairly recently come within a short distance of the bush remnant itself. In the neighbouring area there are wide tracts of bracken and scrub. There is still a good deal of heavy bush in the district, the nearest being the Puketiki State Forest, which is some six miles away.

The nest contained two eggs, although this was not known until hatching had taken place, as every precaution was being observed to avoid disturbing the incubating bird. Visits to the nest were made at about weekly intervals, from 16 January until 11 February. One chick was seen in the nest on the 11th with the adult, the egg having hatched between this date and the preceding visit on the 6th. The second egg hatched between the 20th and 21st, this chick being found dead in the nest.

As F. D. Robson, in *Kiwis in Captivity* (Bulletin of the Hawke's Bay Art Gallery and Museum, Napier: 1947; third ed. 1950), has recorded so many details of the kiwi's breeding habits, we have attempted to make a fairly detailed comparison with his observations in the following notes. Robson's observations were made on captive kiwis at the Greenmeadows Game Farm, Hawke's Bay.

The nest found at Okaihau was in a tunnel, about 2 feet 6 inches long, beneath a solid mass of debris including part of the old base of a tree-fern, which appeared to be completely weatherproof. The sitting bird always faced in the same direction, i.e. to the north, and sat across the entrance. In his observations over a number of seasons Robson found that the male always sat in the nesting box facing south, and the eggs, when there were

two or three, were arranged 'in a row, one in front of the other' under the bird. By this means, the male is able to incubate up to three of the disproportionately large eggs. It seems likely that, once two or three eggs have been placed in line, the sitting bird would tend to keep them in the same position. However, it appears from Robson's supplementary observations (third ed., 1950) that in the 1948 season the male* incubated a single egg facing in this same direction. Robson states that, in the 1949 season, the male mostly sat facing south, but the position was sometimes changed during the season; in this season two eggs were laid, but from Robson's account it appears that the male changed position at intervals and not when the second egg was laid.

The kiwi sat at the entrance and left the back of the tunnel unoccupied. One egg could generally be seen projecting behind the bird. As mentioned above, the presence of the second egg was uncertain during the incubation period.

On 11 February, the entrance was found to be partly covered with twigs and dead leaves, mainly of rewarewa and tree-fern, and it was on this visit that the bill of the recently hatched chick was seen behind the sitting bird. The adult was raised slightly with a stick to make sure that it was sitting on a second egg, and the entrance covered again.

As heavy rain fell on the 11th, it was supposed that the covering was placed over the entrance for shelter. (There was no rain from 16 January to 11 February, which was during a period of drought.) However, Robson's observations have shown that 'when the chick hatches, the male blocks up the opening of the box, and keeps it blocked up until the sixth day'. On 13 February the entrance was completely covered with the same material, and it was still covered, although the amount of material varied, on the 15th, 17th, 19th and 20th. On all these visits the kiwi was seen on the nest, enough of the covering being removed from the entrance for observation, and the material carefully replaced. The chick was seen with a torch at the back of the tunnel on the 19th, a small opening being made at the end of the tunnel for observation.

The arrangement of the twigs and leaves used to cover the entrance gave the impression that at least some of the material had been built up from the outside. There is no mention of this in Robson's account. The material used was like that included in the surrounding debris, so that it could have been obtained from within the tunnel.

When the nest was visited at 8.30 p.m. on the 21st after heavy rain the male and the chick had left, and the entrance was completely covered. A dead chick was found in the nest, the second egg having hatched since the visit on the previous day. It was noted that a small piece of the end of the shell, a little over an inch in diameter, was attached to the feathers.

It might be added that the female of this pair was almost certainly the one accidentally killed about a month earlier shortly before the nest was found; and this was confirmed by the absence of any indication of the female's presence, especially during the final stages of incubation. According to Robson, the female shows interest in the nest by frequently tapping the outside, and the covering over the entrance, at this stage, and is answered by the male tapping from the inside.

The first chick, which was hatched between 6 and 11 February, appeared to have stayed in the nest for some ten days, as the entrance remained at least partly covered, but could possibly have left the nest to feed before the hatching of the second egg. Robson found that the chick did not go out of the nest for food until the sixth day after hatching, when the male cleared the entrance to enable it to come out.

The eggs were apparently laid within 12 - 16 days, as shown by the interval between the times of hatching. Approximately the same period is recorded by Robson between the first and second eggs of the 1943 season. However,

*The same male is referred to throughout Robson's observations.

his records show that the eggs up to the second or third of a 'clutch' were mostly laid at intervals of 25-32 days. The incubation period is 75 days, as recorded by Robson, but may vary in exceptional cases up to 80 days; the first egg generally takes 77 days. Robson found that the chick began feeding as soon as it left the nest, and returned to the nest while the remaining eggs were being incubated.

In addition to the nest described above, G.C.W. has a record of another kiwi's nest which was found on the adjacent farm in January-February 1952. This nest, unfortunately destroyed by fire, also contained two eggs; one was infertile and the other contained a well-grown chick.

On 21 January 1955 the Auckland Museum received another record from Mr P. A. Laurent, of the neighbouring town of Kaeo. Mr Laurent wrote that a kiwi's nest had been destroyed by a bulldozer engaged in the construction of a new road cutting, at Tauranga Bay, about a mile south of the Whangaroa Harbour entrance, in the same district. The sitting bird was found dead under a fall of earth, and was sent to the Museum by Mr Laurent. There were two eggs in the nest, one of which had been broken, and the other (weight 14 oz, containing a well-developed chick) was also sent to the Museum. The locality is in open country with bracken fern, and some scrub and bush. Mr Laurent also mentioned that a live kiwi was found in January 1954 in this area: it was in a hollow log which had been moved when constructing a road through scrub.

NOTES ON THE HEN AND CHICKENS ISLANDS

By B. S. CHAMBERS, S. CHAMBERS, and R. B. SIBSON

Through the courtesy of the Commissioner of Crown Lands, Auckland, members of the King's College Bird Club spent a week, 15-22 December, on Big Chicken Island in 1953, and six days, 15-21 December, on Hen Island in 1954. On both trips the skilled seamanship of Mr Norman Warren (skipper of the *Gunner*) saw us safely to and from these islands. One of the advantages of sailing from Leigh is that one is soon in waters which are the feeding ground of countless petrels and shearwaters, of which no less than twelve species breed on the outer islands of the Hauraki Gulf. Within the triangle formed by Leigh, Little Barrier and Hen Island, one should see on any day in the summer at least six species, and with luck as many as ten of the local breeding species may be logged. The two defaulters are the far-ranging Black and Grey-faced Petrels, whose oceanic beat is away to the north and east. To the watcher of birds there is something particularly satisfying in the flight of petrels at sea. He cannot have too much practice at identifying even the commoner species under the varying conditions of calm and storm, and at studying the characteristics of shape, flight and plumage pattern.

There are in the Chickens group five islands of some size, strung out in a line which runs roughly east and west. The Big Chicken, or Western Chicken as it is sometimes mistakenly called, is in the middle. To the west are the two smallest islands, on which we had no opportunity to land. To the east, separated by a narrow channel, is the Middle Chicken. It rises a little higher than the Big Chicken; and from what was seen on one brief visit, its sturdy unspoilt forest would be a suitable home for Saddlebacks, if further experiments at distributing this rare and beautiful bird are contemplated. The line of islands ends with the Eastern Chicken, on the outermost tip of which a light has been placed. This has necessitated the cutting of some bush, but for the most part the island is untouched by man. During a brief reconnaissance thirteen species of land birds were seen.

The Big Chicken, with an area of some 340 acres, rises steeply on all sides except part of the west, where a pleasant sandy beach is backed by a gently rising valley, deep in flax and rather surprisingly sporting an alien