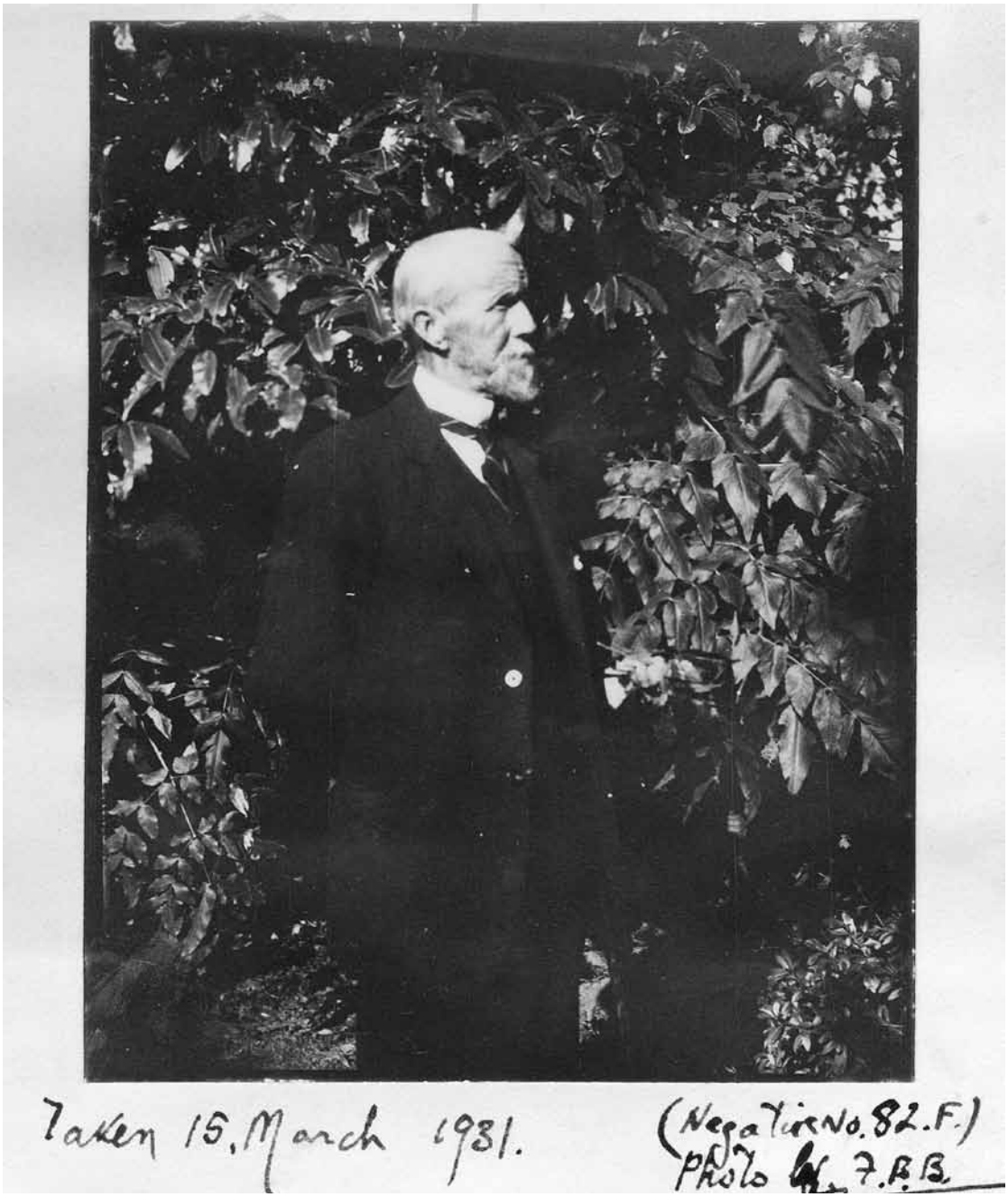
W. W. Smith and the first breeding of Kiwis in captivity **David Medway**

W.W.Smith (1852-1942), who was Curator of Pukekura Park from 1908-1920, was also a leading naturalist of his time. The Christchurch naturalist, James Drummond, described Smith as "perhaps the most reliable observer in New Zealand" (*Taranaki Herald* 28/4/1928, p.12). The Dunedin naturalist, G. M. Thomson, writing in 1922 in his *Naturalisation of animals & plants in New Zealand*, said that Smith was "one of the most careful and observant naturalists in New Zealand" whose "experience as a field naturalist is second to none in the Dominion". Smith's abilities as a naturalist are also referred to in a feature article about him in the *Taranaki Herald* (Christmas Supplement 17/12/1932), and in an Obituary in that newspaper (*Taranaki Herald* 3/3/1942, p.2).

Smith commenced duty as Curator of Pukekura Park on 23 March 1908 (*Taranaki Herald* 4/7/1908, p.2). He recorded much later, in 1923, that "Thirty years ago, when residing at Ashburton, I began some experiments with a pair of living kiwis received from the Nelson district. Owing to my leaving the district later, for two years, my experiments were abandoned, and the birds were sent to the Christchurch Gardens. On coming to reside in New Plymouth, fifteen years ago, I resumed and conducted a series of experiments with kiwis in captivity, extending over eleven years" (*The Young Citizen*).

W. W. Smith taken on 15/3/1931 (Fred B. Butler, Puke Ariki PHO2012-0002).



In June 1923, Smith was invited by the Young Citizens League of Auckland to contribute articles about birds to *The Young Citizen* being their monthly journal devoted to the interests of young people (Smith Archives, Puke Ariki). The first article Smith contributed to that journal was a long and very detailed account of his experiments with the Kiwis he had kept in captivity in Pukekura Park. It appeared in *The Young Citizen* in three instalments - Volume 3(5)(31/7/1923), p.4, Volume 3(6)(31/8/1923), p.4, and Volume 3(8)(31/10/1923), p.5. Extracts from it appeared in the *Taranaki Herald* of 28/10/1933, p.4, 27/1/1934, p.3, and 22/6/1937, p.6. Unfortunately, none of the diaries that Smith might have kept for the years he experimented with Kiwis in Pukekura Park, other than that for 1908, are known to exist.

On 30 June 1908 Smith wrote about Kiwis to Newton King of neighbouring Brooklands, and on 6 July 1908 he received a reply offering them (Smith Archives, Puke Ariki). Smith later recorded that in July 1908 Newton King gave him a large female Kiwi which had been captured the previous week. Smith prepared a "spacious and dark house with soil floor, and a large wired-in grass yard" in which to keep his Kiwis. Roomy boxes were sunk in the ten-foot square soil floor as sleeping and nesting compartments. A food box and drinking trough, which was filled daily with clean water, were placed on each side of a ten-inch square door giving access from the house to the yard (*The Young Citizen*). Somehow the myth developed and has persisted that Smith kept his Kiwis on the small island in Fountain Lake which was removed in 1954 during construction of the fountain. The house and yard to which Smith referred is undoubtedly the structure at the northern end of what is now Hatchery Lawn which is depicted in the accompanying photograph by A. W. Reid of Stratford. This photograph is not dated, but internal evidence indicates it was taken in the 1910s at the time Smith was undertaking his Kiwi experiments. A regular visitor to Smith's nearby cottage recalled that there might even be time for a visit to the large pen where his Kiwis lived (*Taranaki Herald* 7/3/1942, p.4). Smith's experiments must have been known to many locals during the eleven years he carried them out in a prominent structure in a well-frequented part of the Park.

Smith procured three more Kiwis, two males and a female, shortly after he received the first Kiwi from Newton King. It was considered that the Kiwis added to the attractiveness of the grounds (*Taranaki Herald* 19/2/1909, p.2). It appears that Smith experimented with a total of fifteen birds of different ages and from different parts of Taranaki during the eleven years he kept Kiwis in captivity in the Park (*The Young Citizen*; *Taranaki Herald* 30/8/1932, p.4). It is apparent that Smith did not retain all the Kiwis he examined during this period. In letters of 12 and 17 November 1911, he informed James Drummond that all twenty Kiwis of both sexes, from districts remote from each other in Taranaki, that had passed through his hands during the last three years belonged to *Apteryx mantelli*, the North Island Brown Kiwi. Smith told Drummond that he had obtained "extremely interesting results with these grotesque birds in captivity". He was expecting more Kiwis the following week which he would examine carefully (Drummond papers, Canterbury Museum). The Kiwis examined by Smith over the years came from a variety of sources. For example, in February 1909 a half-grown Kiwi brought in by a resident of Urenui was placed "for the present" with the Kiwis that Smith had under observation, and in May 1909 a "most magnificent" specimen captured by a hunter at Puniwhakau was presented to the Pukekura Park Board (*Taranaki Herald* 19/2/1909, p.2; 21/5/1909, p.3). It appears that wild Kiwis were at least occasionally present in Pukekura Park in the years Smith was conducting his experiments. He mentioned that one or other of his captive birds would call and "on hearing a responsive hail from other kiwis in the bush in Pukekura Park would listen attentively until the response ceased" (*The Young Citizen*).

In 1933, Smith wrote that after many years experience with Kiwis in captivity, and "inducing them to nest and rear their young successfully, I am thus impressed that the kiwi can be saved from extinction" (*Taranaki Herald* 28/10/1933, p.4). He considered that "When kept in roomy and comfortable quarters and well fed the older birds pair and lay eggs and hatch them". Five large robust females laid seven eggs during the years he kept Kiwis in the Park (*Taranaki Herald* 30/8/1932, p.4). Smith retained "each pair of birds about two years, and again liberated them, with their young, in their original bush home, whence they came, and where their natural food is plentiful" (*The Young Citizen*). Taken together, these statements suggest that more than one pair of Smith's captive birds produced young, but he has left a detailed record of only the first successful breeding.

Smith recorded that the food of his captive Kiwis was "varied much" during the years of his experiments. They were "voracious feeders, and consume much solid food nightly when supplied to them. The females being larger and stronger than the males require more food. Owing to the difficulty in obtaining a sufficient quantity of their natural food, including earthworms, huhu and other large beetle grubs, slugs and larvae of the several large and splendid root-feeding species of Porina moths, I continued to feed them on beef, mutton and the flesh of healthy rats when my dog caught them. They partook freely of liver, and the cleaned and washed intestines of cattle and sheep. All these foods had to be cut in small pieces swallowable by the kiwis, otherwise they could not have eaten them ….. They prefer earthworms and huhu grubs to any other natural food. A healthy female would consume a pint of huhu every night if procurable. They relished half-boiled rice and, when placed in a shallow dish of water, they would pick out every seed. They liked hard-boiled eggs and cheese, but would not eat bread, porridge or potatoes". Smith supplied them with "coarse grit, lime, pounded oyster-shell, and egg-forming food to force or induce them to nest and lay eggs" (*The Young Citizen*).

In December 1909, one of the original Kiwi pairs nested and the female laid two eggs on the soil floor in their dark recess. The first egg was laid on the 10th, the second on the 18th. North Island Brown Kiwis normally lay the eggs of two-egg clutches at intervals of about three-four weeks, but a bird in captivity near Napier in 1943 laid two eggs of the same weight only eleven days apart. The second egg laid by Smith's bird was slightly smaller than the first. Smith recorded that the two eggs measured, respectively, 5.35 and 5.28 inches in length, with a breadth of 3.33 and 3.27 inches. They weighed 15¼ and 13¾ ounces. With averages of 135mm in length by 84mm in width and 411 grams in weight these eggs are about the normal dimensions and weight of those of North Island Brown Kiwi. The male took possession of the nest and began incubating the eggs the day after the second egg was laid. Smith observed that only the male incubated them, and that the time it left the eggs each evening to feed, drink, wash, and ramble about the grass yard was very irregular. The heat generated by the bird when on the eggs made the soil in which they were embedded very dry. To obviate this, Smith sprinkled lukewarm water around the eggs to produce a more moist bed to aid in their incubation. Smith waited until the sitting bird went into the yard in the evening when he shut it out until he had examined the eggs. He found that on placing the bulb and part of the mercurial tube of a good thermometer perpendicularly on the side of both eggs, it recorded, on most nights, from 103 degrees (39.44°C) to 105 degrees (40.55°C). The heat of the soil for six inches around the eggs generally ranged from 82 degrees (27.77°C) to 85 degrees (29.44°C). Smith considered that "The high temperature is favourable to the bird leaving the nest for several hours each evening without chilling the eggs" (*The Young Citizen*).

The first egg hatched on the night of the 42nd day of incubation, and the second egg hatched some time during the night of the 43rd day. He was "somewhat impressed that these eggs were incubated and hatched under exceptionally warm conditions, which may have developed them one or more days sooner than if hatched naturally in the cool forest" (*The Young Citizen*). In fact, these incubation periods are considerably shorter than the normal incubation period of about 70-90 days for North Island Brown Kiwi. Nevertheless, Smith considered that both chicks appeared to be normally developed. They were "early astir in the evening in quest of food, and they occasionally visited the food-box on very dull and wet days. They were exceedingly active, and soon learned the locality of the shallow box, and to extract the earthworms and grubs from the soil placed therein. In a fortnight they were able to eat fresh mince-meat and fish, and continued to thrive perfectly". Smith did not see them drinking during the first month (*The Young Citizen*). Smith recorded that "The newly hatched chick is pure white, and the delicate bill is light pink, changing to reddish brown in a month. In two months the plumage is pale brown, intermixed with whitish markings. At four months the general plumage assumes a darker brown, with the shafts of the feathers of a lighter tint. At six months it is a uniform brown, with a blackish shade, but not so dark as the mature plumage of adults". Smith considered that "the snow-white kiwi chicks of the first month are exquisitely beautiful objects", and that a Kiwi chick for weeks after hatching was "the most exquisitely beautiful form of young bird-life conceivable in its white silky plumage and bright pink beak and legs" (*The Young Citizen*; *Taranaki Herald* 30/8/1932, p.4).

The pure-white plumage of these newly-hatched chicks, and its subsequent darkening, is a matter of considerable scientific interest because the chicks of the North Island Brown Kiwi normally have dark-brown plumage when they are born. In 1912, Smith thought that the difficulty he had experienced in making his captive Kiwis lay and hatch their eggs was probably due in some measure to certain foods which they obtain in their wild state

being lacking in foods supplied to them in confinement (*Taranaki Herald* 5/7/1912, p.4). Perhaps some mineral deficiency in the diet that Smith's adult Kiwis subsisted on at the time caused a similar deficiency in their eggs which prevented the production of melanin by the developing chicks or prevented the deposition of melanin into their growing feathers. Apparently Kiwis moult throughout the year and their feathers are constantly being renewed. Frequent moulting, coupled with some unknown chemical change that enabled the production of melanin by the chicks or enabled the deposition of a gradually increasing amount of melanin into their feathers, might explain the progressive darkening of their plumage over the months following their birth. It is not known what effect, if any, the abnormally short incubation period of these chicks may have had on the colouration of their plumage. In 2011, two much-publicised white chicks were hatched from eggs produced by a pair of North Island Brown Kiwis living in the wild at Pukaha Mount Bruce National Wildlife Centre near Masterton. They are thought to be the first white Kiwis hatched in captivity, but those produced by W. W. Smith's birds beat them by 101 years !!

The author of the feature article about W. W. Smith that appeared in the *Taranaki Herald* (Christmas Supplement 17/12/1932) considered that Smith had achieved the feat of raising the first Kiwis in captivity. It is generally believed that the credit for this belongs to F. D. Robson, Curator of the game farm of the Hawkes Bay Acclimatisation Society near Napier where in 1945 a pair of captive North Island Brown Kiwis produced two chicks. It is a pity that Smith did not publish an account of his unique experiments in a scientific journal so that they became widely-known in the scientific community. Nevertheless, his article in *The Young Citizen* which described them was known to, and his achievements were recognized by, at least one eminent scientist. Dr (later Sir) Robert Falla, then Director of the Canterbury Museum, on learning of the Napier event pointed out that years earlier "Mr W. W. Smith of New Plymouth had some kiwis which mated and raised chicks, and he published a very full and detailed account of their family life" (*Taranaki Herald* 17/10/1946, p.3).

View of Fountain Lake in the 1910s (A. W. Reid, Puke Ariki PHO2012-0001).

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