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## The Nesting of the Banded Stilt

(*Cladorhynchus leucocephalus*).

By J. Neil McGilp and A. M. Morgan, M.B., B.S.

Eggs supposed to be the progeny of this species were described by E. P. Ramsay in the "Proceedings of the Linnæan Society of New South Wales," Vol. VII, page 57, 1882. A. J. North, in "Nests and Eggs of Birds Found Breeding in Australia and Tasmania," Vol. IV, page 293, 1913, showed that these were the eggs of the White-headed Stilt (*Himantopus leucocephalus*). Campbell likewise described eggs in the "Southern Science Record," page 234, which were also White-headed Stilts', because his collector had also forwarded an egg to the Australian Museum, Sydney, which he afterwards acknowledged to be that of the White-headed Stilt, he having made a mistake in identification. Campbell later described the nest and eggs of the same bird in his "Nests and Eggs of Australian Birds," published in 1900, attributing them to the Banded Stilt. Mathews, in "The Birds of Australia," Vol. III, page 154, 1913-14, copied Ramsay's description, and added a short description of the nest differing from Ramsay's, which was apparently taken from some notes of S. A. White which referred to the White-headed Stilt, and had been transposed in error to the Banded Stilt. We understand that there is a clutch of eggs in the H. L. White Collection in the National Museum, Melbourne, which is labelled as belonging to this species, but are said to resemble the eggs of the White-headed Stilt, which they probably are. They are certainly not the eggs of the Banded Stilt.

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The first discovery of authentic eggs of the Banded Stilt was made by Mrs. B. E. Cannon, of Kukerin, Western Australia, some time about the end of July, 1930; the exact date has not been published. The colony was breeding on a sandspit running into Lake Grace. An egg and photographs of the birds were sent to Mr. L. Glauert, of the Western Australian Museum; Mr. Glauert recognized the species from the photographs and a description accompanying them, and, following a request for more material, received 23 unblown eggs. Messrs. L. Glauert and C. F. H. Jenkins published in the "Journal of the Royal Society of Western Australia," Vol. XVII, 15th January, 1931, a description of the eggs and two chicks. In the same paper they report on three other supposed nesting-places in Western Australia, one at Kurrawang, between Kalgoorlie and Coolgardie, on the authority of a description of an immature bird received from Mr. F. A. Schoch, head master of the local school; the second from the Menzies District, 80 miles north of Kalgoorlie, on the authority of a letter received in March, 1930, from Mr. T. Smith, of Kalgoorlie, who wrote, *inter alia*:—"Almost as soon as they were hatched they started to walk to the coast. I doubt if any reached there. I would be quite safe in saying they must have died by the hundred thousand, for a strip of country about 30 miles wide was literally white with the dead birds; they were all in good condition, and there was water in the lake they came from"; the third, on the authority of a letter from Mr. H. S. Day, who, in company with Mr. E. Corboy, M.L.A., saw the birds nesting at Lake King, 90 miles east of Kukerin. He wrote:—"These Snipe have been plentiful here at Lake King and district this winter. On Lake King, which is 22 miles long and has up to two feet of water in the winter-time, the birds have been in tens of thousands, and have reared countless chickens. The Snipe were not here last winter, which was a dry one, whilst this one has been very wet. Might an old bushman suggest to you that the 'Snipe' yearly select the wettest portions of the W.A. lake country for their migrations."

As regards the Kurrawang occurrence, the presence of immature birds cannot be taken as evidence of local nesting. In the huge flocks of these birds seen on the Coorong every summer there is always a considerable proportion of immature birds, and they certainly do not nest there. It is probable that the birds do not assume adult plumage until they are at least a

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year old. The second instance appears to be quite definite, but we suspect a misprint, not hundreds of thousands but hundreds of millions of chicks would be needed to make a strip of country 30 miles wide, however short, "literally white." Mr. H. S. Day's explanation that the irregular appearance of these birds in a certain locality depends upon the rainfall is probably the correct one.

We are publishing this account of the second discovery to confirm Mrs. Cannon's observations and to add some others which she has not recorded. It seems somewhat extraordinary that the second discovery should have so soon followed the first, after the nesting of these birds remaining a mystery for so many years. Our colony was discovered by Mr. R. McKay, manager of Moolawatana Station, on 29th December, 1930. In the course of his wading about in Lake Callabonna in search of Swans' eggs, with culinary intent, he visited an island, about three-quarters of a mile from the shore, which had never, so far as we know, been landed upon while the Lake contained water until Mr. L. McGilp visited it on 19th December, 1930. On that date there were neither birds nor eggs there. Mr. McKay recognized the birds, and at once telegraphed the news to Adelaide. As one of us had just arranged to visit the district on business, the other took advantage of the opportunity to accompany him. Lake Callabonna is situated about 350 miles in a direct line north by east of Adelaide and directly north of Lake Frome, into which it overflows on the rare occasions on which it contains sufficient water to do so. The nesting island is in the southern portion of the Lake, known locally as Lake Mulligan, but not separately named on the map. The upper portion is joined to it by a channel about 400 yards wide, and is famous for its deposits of the bones of the *Diprotodon* and other extinct vertebrates. Lake Callabonna contained a considerable quantity of water last February (1930), but was not searched on that occasion. Previous to that it had been dry since early in 1918, when many water birds nested there. Possibly the present bird was amongst them, but as it was not visited by any ornithologist the point must remain unsettled. It is said that on that occasion the local blacks camped at the Lake side, and lived on what they called "Gulls' eggs," which were quite likely the eggs of the Banded Stilt, as the blacks are apt to call any water-bird which is not a Swan or a Duck, a Gull. They may have been Gull-billed Terns, which were

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nesting there at the time of our visit, but not in sufficient numbers to provide food for more than a day or so.

We arrived at Moolawatana on the evening of 10th January, 1931, and immediately inspected some eggs which Mr. McKay had collected for us on 4th January, 1931. Our first impression was one of disappointment—"Those couldn't be Banded Stilts' eggs; they must be some kind of Terns'"—but on further consideration we realized that no Terns which could possibly breed in that locality laid eggs in the least resembling those we were looking at. On inquiry we found that Mr. McKay had brought home a dead bird for our inspection, which proved to be undoubtedly a Banded Stilt. We sat up till midnight blowing eggs and discussing the chances for the morrow. We reached the shore of the Lake at noon next day, and it was not many minutes before we were in the water, making for the island on the rim of which we could see, with the field-glasses, a large flock of white birds, too far off, of course, to identify the species, but we felt sure they were the birds we were searching for. There were about two feet of water and six inches of mud, which made the wading rather heavy work; there was a firm bottom under the mud and no deep holes, but the mud was mixed with coarse sand which got into our boots and made walking uncomfortable. The island is about 250 yards long and 15 to 20 feet high in the middle, and shears off to a mud spit at each end. There are a few samphire-bushes growing upon it, but no other vegetation. It is composed of dry mud mixed with coarse sand like the mud of the Lake. The surface is caked fairly hard, but when broken through reveals a powdery subsoil. As we neared the island, about a dozen White-headed Stilts and Avocets flew away, while one Avocet remained on the bank with feebly flapping wings and quivering legs, looking as though posing for a picture of hopeless despair. A densely-packed mass of Banded Stilts was standing in the shallow water fringing one end of the island; those furthest out, where the water was deeper, were swimming. They took very little notice of us. On reaching the top of the island a vast flock of the same birds rose with a whirr of wings, raising quite a dust as they did so, and revealing thousands of eggs on the bare ground. They flew out a few yards to their mates in the water, and settled among them. We sat down about 30 yards from the rookery, and in two or three minutes they returned to their eggs in a body as they had left them, settling at the far end of the

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colony and walking leisurely towards us in a straight line like a regiment of soldiers advancing on a wide front. As they came towards us they examined the nests on either side of them until they considered they had found their own. Each bird then stood some little distance from the nest, bent the neck forward, momentarily touched the edge of the nest furthest from it, we thought to measure the correct distance, and then gently lowered itself upon the eggs, shuffled a little to get comfortable, sometimes attempting to arrange the eggs with the bill, and then sitting contentedly, all facing the wind, which was from the south at the time of our visit. Apparently they did not always find the right nest, for on several occasions we saw a bird angrily turn another off a nest and take its place. Several fights were going on between the sitting birds. Each, with the feathers of the head, neck, and back ruffed, attempted to peck the other, fencing with their long thin bills as though they were foils. When returning to their nests, and while sitting, the birds keep up a soft musical chattering, but there was no "barking" overhead or wounded-bird trick, as is the case with the White-headed Stilt; in fact, the birds seemed not in the least excited. They took no notice of us talking as long as we sat still, but once, when a samphire-stick was accidentally broken, the whole flock rose. On the other hand, wishing to take a photograph of the birds rising, one of us was to shout out when the camera was focused, which was done as arranged. A few birds near us showed some uneasiness, but not one rose. We then moved up to within 13 yards of the colony, the whole flock rising as we stood up, and sat for an hour watching the behaviour of the birds. Every now and then a bird would get up and either run or fly to the water, dip its breast and neck two or three times, and return to its eggs, no doubt to keep the eggs moist, for the day was hot, the temperature under the veranda at the station being 104°. and there was a dry wind blowing. Also every now and then a bird would run up from the water and feed its sitting mate, sometimes also taking its place, so that there was a constant procession of birds running to and from the nests and the water. There was abundance of food, for the water was swarming with small crustaceans of the genus *Apus*, and the birds did not have to leave the vicinity of the island to gather enough for themselves and their mates. What the crustaceans live on is a mystery to us, as the mud is bare, without vegetation as far as could be seen. A few birds, perhaps a hundred, were feeding in the shallow water in other parts of the Lake, probably non-

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breeders, as during the time we were there no bird either came to or left the vicinity of the island. Occasionally one of the birds on the water "barked." The call is like that of the White-headed Stilt, but is of softer pitch and not so harsh. The space occupied by the main colony was about three chains square, nearly rectangular, and considerably longer than broad; the egg cavity was six inches in diameter at the top and shaped like an inverted cone. Each nest was almost exactly a foot from the next. The nests were arranged in rows in the long axis of the colony, slightly sinuous, but it would have been quite easy to walk from one end of the colony to the other between two rows of nests; they were not so regularly arranged in the short axis, and there did not seem to be room for another nest. Clutches varied from one to five, the great majority being three. There were only about 35 clutches of five seen, fours were numerous, twos less so, and ones uncommon. The clutches of two were not incomplete, for one of them collected was too heavily incubated to be blown. No single eggs were taken. The eggs were not arranged with their points inwards, as with Avocets and Plovers, but were placed haphazard. When we saw the eggs Mr. McKay had collected for us we thought he had mixed up his clutches, so irregular were they in their markings, but he assured us that he had marked each clutch as he gathered them, and that we would see for ourselves that he was right when we saw the nests, and we found that this was so. Clutches of two and three were fairly uniform; four clutches almost invariably had at least one egg of another type in them, and five clutches sometimes had three types. We concluded that the birds did not always lay in their own nests, and that two or three was the normal clutch; the average number in each nest would be about three. Taking the area of the main colony as three chains square, and allowing 18 inches square to each nest, there were 26,136 nests and 78,408 eggs in it. Besides the main colony there was another, much smaller, at one end of the island, and a number of little ones grouped about isolated samphire-bushes; these would bring the number of nests up to about 27,000, and the eggs to 81,000. The eggs we took were heavily incubated, so much so that two clutches were unblowable, and the others only through very large holes.

Mr. R. McKay, under date of 25th January, 1931, describing a visit to the island on 21st January, 1931, writes:—"Instead of the half-acre of eggs I had become accustomed to seeing, I

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beheld instead a half-acre of fluffy white chicks. Probably ninety per cent. of the eggs were hatched out, and the chicks were rapidly picking their way out of the remaining few eggs. When I drew near to the island I first saw three old birds leading perhaps 60 young ones into the water. They appeared to be having some difficulty in enticing the little ones to enter the water, as they kept scampering back towards the nests. However, before I reached the island the old birds got them afloat, and once in the water the little ones showed no hesitation. On my reaching the island the birds left the nests as before, but only went to the water's edge. As I approached the nests the young birds rushed about from one nest to another to such an extent as to make some very mixed families. They did not run all together, but one would suddenly spring from the nest and dash across to another nest and snuggle in, and this went on continually all the time I was on the island, with the result that at times there were as many as 15 or 20 chicks in some nests and one or none in others. When the young one leaves the shell it is covered with pure white down, the only black about it being the beak, eyes, and legs. They must have hatched out pretty well at the same time, as, with exception of a small percentage just out of, or partly out of, the shell, they are exactly the same size. They are totally different from the Red-necked Avocet, which, as I noticed there, are marked when hatched. As I stood among the nests the young ones, like green lambs, ran up to me and clustered around my feet, and it was only with extreme caution that I could move. Once when I was in one position for a long while waiting to get a certain snap I must have had 200 of them nestled against me. Mortality seems to be high among the clutches, there being several hundred dead ones throughout the colony; I should think they smother, huddling together in such heaps. With regard to the birds touching the ground or eggs before settling on the nest, I watched them closely for some time, and it appeared to me that sometimes the beak touched the ground and at others just went close to it, but at all times the beak was well in front of the nest an inch or two. I would not like to say whether the birds are particular as to which nest they take. I have seen birds settle apparently contented on a nest, only to leave it a few minutes later for another. One thing is always sure, and that is that there are no vacant nests after the birds settle. As to the bird ruffling its feathers when settling on the nest, I could see no instance of this. The bird just lifts the wings a little and appears to draw

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the clutch into position as she closes them. If, as often happens, there are two many young ones in the nest for her to cover, she flicks the surplus out with her beak and they promptly scuttle for another nest. The little things have no balance at all, and cannot run more than two or three feet without toppling over on their heads. On this visit to the island there were no signs of the smaller colonies at either end of the island; nothing but the main colony in the centre of the island. It is possible that, when hatched, they attached themselves to the main colony for security, or it may be that they were hatched earlier and were the ones I saw in the water."

A long series of eggs was taken for the South Australian Museum, as the eggs varied enormously, no two clutches being quite alike. They varied in size, in colouring, in marking, in shape, and in the colour of the lining, which was sometimes green like the eggs of some Hawks and sometimes creamy white. A few of the eggs had a greenish tinge in the shell, but this disappeared soon after blowing.

A general description covering every type of egg cannot be given, as there are so many, none of which has the least resemblance to the eggs of the White-headed Stilt or Red-necked Avocet, the birds' nearest relatives in Australia. Nor do they resemble the eggs of any other bird of their order (*Charadriiformes*), except that some types are somewhat like those of Oyster-catchers. Amongst the eggs of Australian birds with which we are familiar those of the Crested Tern are most like them. We do not know of the eggs of any bird which vary so much; for, although those of the Guillemot and Little Auk present a more violent contrast in colour, they are fairly uniform in shape and size. Amongst Australian birds it is again the eggs of the Crested Tern which come nearest to them in variety of colour. In describing the eggs we are taking each character separately.

Texture of Shell.—Chalky, finely granular, and without lustre. This character is uniform.

Ground Colour.—Varies from deep fawn through all shades to pure white, the latter colour perhaps predominating.

Colour of Markings.—This is fairly uniform, the most frequent being ink black and occasionally very deep brown. The edges of the large black blotches are often brown. All the eggs have more or less submerged markings of grey or faint

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purple. Colour can be easily removed from the large black blotches by rubbing with a wet handkerchief. A fair proportion of the eggs look quite white at first glance, but a careful search usually reveals a few dark markings, sometimes submerged. However, Mr. McKay showed us one egg which was pure white.

Shape of Markings.—The commonest shape is scriggly lines twisting and turning in every direction, sometimes disposed more closely at the larger end of the egg, forming a ring, and sometimes spread all over it. Most figures and letters of the alphabet can be made out if enough eggs be searched. The next most common shape is deep-black rounded or irregular blotches, like the former, sometimes scattered all over the egg and sometimes forming an irregular zone at the larger end. In another less common type the whole egg is dotted fairly uniformly with small black spots. In this last type the ground colour is always white. We noticed that the eggs with the deepest fawn ground colour were more apt to be marked with blotches than lines, but this is by no means invariable.

Shape of Eggs.—This varies from blunt ovals, about the shape of an average Fowl's egg, to long or short sharply pointed ovals; the long pointed eggs are about the shape of 'Red-necked Avocets'.

Measurements.—The average measurements of 50 eggs are 5.53 x 3.96 cm. The long diameter varies from 5.8 to 4.9 cm., and the short diameter from 4.8 to 3.6 cm.

When Mr. McKay visited the island on 29th December some of the nests already contained five eggs. As there were no eggs there on 19th December, laying probably began not later than 24th December. On 21st January many recently hatched clutches were seen, and also many eggs from which the chicks were just emerging. The incubation period is therefore about 28 days.

The Banded Stilt is the only member of the *Charadriiformes* which ever normally lays a white egg or has a white chick. Even the Sheathbills (*Chionis* and *Chionarchus*), although themselves white in adult life, are said to have slaty-grey chicks, but without pattern. We do not know of any other case either amongst the *Charadriiformes* or their near relatives, the *Lariiformes*, with the above exception, in which the chick is uniformly coloured. It seems to us that the Banded Stilt has for so many generations nested upon islands either inaccessible

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or difficult of access that protective colouring of the eggs and chick has become superfluous. Certainly, in the colony we saw, the eggs were very conspicuous, and Mr. McKay's photograph shows that the chicks are equally so. Messrs. Glauert and Jenkins describe the down of the chick taken from the egg as whitish with a black base. Mrs. Cannon's description of the down as "white like eider down" is somewhat confusing. It may mean that the chick is the colour of eider down, or she may share the common impression that eider down is white. Unfortunately, we have not seen a chick; none was hatched out at the time of our visit. Mr. McKay describes the chick as pure white, and in his photographs they appear white against the background of the earth, which is grey. In a photograph at close quarters, too much out of focus to be reproduced, the chick appears quite white. The quiet and confiding habits of the birds at their nesting-place is further evidence that they are island-nesters, which usually seem to consider themselves in perfect safety on their isolated islands; as, indeed, they were until man took a hand in disturbing them. Many such birds, the Banded Stilt amongst them, are by no means so tame in the non-breeding season. However, they do not invariably nest on islands, as Mrs. Cannon's discovery shows, but this can scarcely have been a normal site, as Lake Grace is in a settled district, and had the birds habitually nested there their eggs would have been discovered long ago. It seems probable that they have been forced there by lack of facilities in the interior. We think the explanation of why the eggs of the species have remained so long undiscovered is that they are accustomed, as we found, to nest on islands of large lakes of the interior, which are filled at irregular and infrequent intervals. The country in which these lakes occur is either sparsely populated or totally unpopulated. Even in the sparsely-populated areas there are few bushmen with curiosity enough to undertake a wade of a mile and a half or so to visit an island on the chance that they may find something of interest. Our island was too far off to see any birds at all with the naked eye, and with the field-glasses all that could be seen was a white patch of birds at the water's edge. It was by the merest chance that Mr. McKay visited the place, and, for all anyone knows to the contrary, the birds may have nested there every time the Lake was full.

Besides the Banded Stilts a small colony of Silver Gulls was constructing nests in the samphire-bushes, one of which

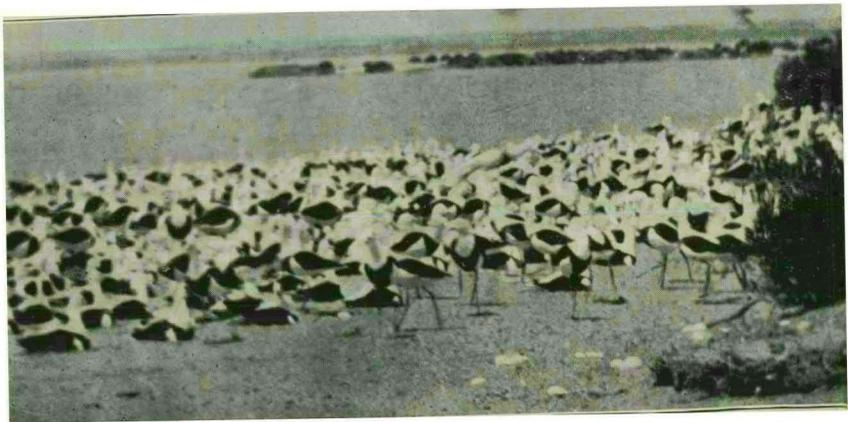


1.—Types of eggs.

B. Cotton.



J. Neil McGillp. 2.—Portion of nesting site, with birds sitting.



J. Neil McGillp.

3.—An enlargement of part of 2.



J. Neil McGillp.

4.—*Birds' rising from the nests.*



J. Neil McGillp.

5.—*Portion of colony, showing eggs.*



R. McKay.

*6.—Old birds and chicks.*

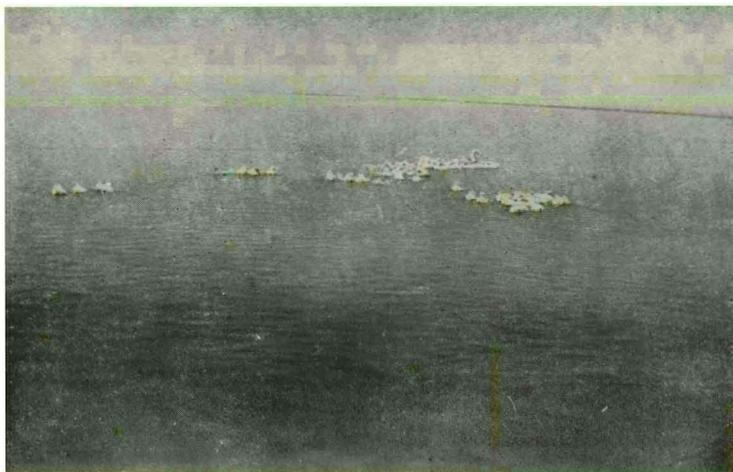
R. McKay.

*7.—Old birds and chicks.*



R. McKay.

8.—*Newly-hatched chicks.*



R. McKay.

9.—*Chicks swimming.*



R. McKay.

10.—*An enlargement of part of 6.*

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contained two eggs; the others were not yet laid in. On one of the mud spits a small colony of Red-necked Avocets had scraped out nesting cavities, but, although they appeared to have been freshly excavated, one only contained eggs, four in number, of the usual type.

Dr. Ian MacGillivray visited the island on 16th February with the hope of obtaining photographs of the young, but with the exception of about half a dozen adult birds they had all left the island, and perhaps the Lake, but as the latter is about 35 miles long they may have been upon some other parts of it.

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