

the main ridge, its call pealed from all parts of the canopy below, and birds were encountered wherever one went. Mostly in parties of two or three, they were spending much time busily examining the trees or vigorously tearing off pohutukawa bark in search of insect life. One bird was seen to feed another repeatedly, once with a large larva, while a third bird took no part in these proceedings.

INTRODUCED BIRDS

Blackbird, Thrush, Hedge Sparrow were noted, mainly on the Manuka-Kanuka slope north of the lighthouse. All were recorded on the south side and Blackbird on the north. Hedge Sparrows were heard in full song.

DOES THE LITTLE TERN (*Sterna albifrons*) REACH NEW ZEALAND?

By H. R. McKENZIE and R. B. SIBSON

Although we have been visiting the west coast of the Firth of Thames almost monthly since the winter of 1941, it was not till January 1949 that any small terns comparable in size with the Fairy Tern (*S. nereis*) or the Little Tern (*S. albifrons*) were seen. The Fairy Tern is known to be one of the rarest breeding birds in New Zealand, maintaining a precarious hold on one stretch of coast in Northland where the population may not exceed six pairs. Since the Fairy Tern does not breed in the Firth of Thames, it was at first assumed that the small terns which appeared there from time to time were wandering non-breeding birds of this species. When they were distantly seen, the colour of the bill could not be distinguished; when they were seen closely and the bill was seen to be dark and the crown white or mottled, they were thought to be immature Fairy Terns. However, as the number of recorded occurrences increased and we had several opportunities of examining these small terns on the ground at ranges of 20 to 30 yards, we began to find reasons for doubting whether these birds were indeed Fairy Terns. At the time of writing we have not yet been able to identify *Sterna nereis* positively by an all-yellow bill in the Firth of Thames. On the other hand we have on at least four occasions examined in the field small terns apparently in the full adult breeding dress of *S. albifrons*.

These small terns resort to the south-western corner of the Firth of Thames where there are wide mud flats and they can fish in the shallow water along the tideline, especially at the mouths of muddy creeks and rivers, Pukorokoro, Kairito, Waitakaruru and Piako. We have not seen them north of the Miranda beaches and their favourite haunt seems to be near the mouth of the Waitakaruru, which owing to its inaccessibility has not been visited by us nearly as frequently as the rest of the Miranda coast. When big tides force the waders, for the most part Godwits, Knots and Wrybills, to leave Waitakaruru for the Kairito shellbank, at the northern end of what is known to local bird-watchers as 'Wrybill Reach', or the Miranda Lagoon, these small terns habitually go with them, so that their visits to these two well-watched localities as a general rule coincide only with the highest tides.

Since 1949 small terns have been studied with interest in the Firth of Thames by many observers—Mr and Mrs Prickett, Miss N. Macdonald, Miss L. M. Burnside, Miss A. J. Goodwin, Miss M. Sansom, Rev. R. J. Fenton, Rev. W. M. Garner, M. J. S. Black, O. Cheesman, J. C. Davenport, A. G. Gorbey, B. D. Heather, F. Murray, W. W. Renouf, E. G. Turbott, D. A. Urquhart, B. D. Bell and D. H. Brathwaite.

LIST OF REPORTED OCCURRENCES

Date	Number	Place	Observer(s)
31/1/49	2	Piako rivermouth	H.R.McK.
2/12/51	2	Kairito Creek	E.G.T., J.C.D.
15/12/51	1	Waitakaruru	D.A.U.
19/1/52	1	Waitakaruru	H.R.McK., O.C., R.J.F.
22/2/53	3	Pukorokoro Ck.	N.M., R.B.S.

19/3/53	4	Miranda lagoon	H.R.McK.
18/4/53	4	Waitakaruru	H.R.McK., J.C.D., A.J.G.
31/5/53	3	Miranda coast	H.R.McK., W.W.R., L.M.B.
24/11/53	3	Miranda lagoon	R.B.S.
13/12/53	2	Waitakaruru	census
14/11/54	1	Miranda	H.R.McK. et al.
15/1/55	3	Miranda	H.R.McK. et al.
27/2/55	2(?)	Miranda - Waitakaruru	H.R.McK. et al.
26/6/55	1	Waitakaruru	J.C.D. et al.
4/12/55	5	Waitakaruru	J.C.D.
27/12/55	6	Kairito Ck.	N.M., R.B.S.
2/1/56	13	Miranda lagoon	R.B.S., J.C.D., J.P.
3/1/56	11	Miranda lagoon	H.R.McK., L.M.B.
15/1/56	7	Kairito Ck.	R.B.S., D.A.U.
19/2/56	1	Kairito Ck.	R.B.S.
27/2/56	5	Miranda	H.R.McK., M.J.S.B.
21/4/56	11	Kairito Ck.	R.B.S., D. Mills
13/6/56	3	Miranda lagoon	H.R.McK., W.M.G.
17/6/56	1	Kairito Ck.	R.B.S.
25/11/56	7	Waitakaruru	R.B.S.
30/11/56	4	Kairito Ck.	R.B.S. et al.
17/2/57	9	Miranda lagoon	R.B.S., H.R.McK. et al.
/4/57	10	Kairito Ck.	R.B.S., B.D.H. et al.
9/6/57	1	Kairito Ck.	B.D.B., D.H.B.
6/7/57	1	Miranda coast	N.M.

The grouping of these occurrences seems to show that these small terns arrive in the Firth of Thames in November and leave five to seven months later, though one was still present in early July 1957.

DESCRIPTION AND FIELD CHARACTERS

Plumage

The most obvious field character of these terns is their smallness. On 15/1/56 R.B.S. and D.A.U. eventually located seven squatting among Wrybills (*Anarhynchus frontalis*) where at first only three had been visible; and in the air, with their narrow wings and small bodies, they can quickly fade from sight. The tails of those seen between November and February are so short that the name of 'Stump-tailed tern' would not be inappropriate. There is some lengthening of the outer tail feathers in April. In flight they give the impression of being darker on the fore-edge of the wing and in the leading primaries than *S. nereis* when seen on their breeding grounds in Northland. This point of difference is emphatically confirmed by N.M. and A.G.G., who have given much time to the study of Fairy Terns between Pakiri and Ruakaka. All of these terns that have been closely examined between November and January have had dark bills and feet, white foreheads and mottled crowns with more black towards the nape. However between February and June some acquire a plumage which is indistinguishable from that of an adult Little Tern (*S. albigrons*).

On 22/2/53 N.M. and R.B.S. were able to examine three closely as they rested on the mud of Pukorokoro Ck. All three were showing some yellow in the legs; two still had dark bills and smoky 'shoulder' tabs; the third was showing some yellow at the base of the beak. At the time they were assumed to be two immature Fairy Terns and an adult going into winter plumage. However a month later at the same place H.R.McK. found one of four small terns in the full plumage and colouring of an adult *albigrons*, so far as could be ascertained by sight in the field. Notes were taken down while the bird was studied at fifty yards with the aid of a 30x telescope. 'Main part of bill yellow, though a little more orange than the full yellow of Fairy Tern; dark tip to bill, sharply defined at junction with orange-yellow (later found to agree with illustration in *Handbook of British Birds*, Vol. 5, p. 42, and also agreeing as to depth of dark tip); white on forehead less than half-way up to top of crown from bill; dark on "shoulder" and primaries much less than on the others; dark strip or band from under eye to bill; legs reddish- or brownish-yellow, not the full yellow of Fairy Tern'.

In the 1955-1956 season the number of these small terns in the Firth of Thames surpassed all previous records; but it was not till 21/4/56 that a bird in plumage similar to that described by H.R.McK. three years before was

seen. Accompanied by David Mills, son of a Sussex ornithologist, R.B.S. met with eleven small terns at Wrybill Reach. Most that could be examined still had dusky bills, but one which rested conveniently close had a yellow bill with a black tip; and the black on the head passed under the eye right forward to the upper mandible, there being no white gap as in *S. nereis*, as is made clear in photographs by G. A. Buddle, G. J. Moon, Miss N. Macdonald and Mr and Mrs Prickett.

Subsequently further strong evidence in favour of *S. albigrons* was obtained on 13/6/56 at Miranda lagoon by H.R.McK. accompanied by W. M. Garner and L. P. Sladdin. Three birds, studied closely and at leisure, had yellow bills, shaded dark along the lower part, with definite black tip; black low on front of head; dark 'shoulder' patch and primaries; black band forward from eye to bill, feet tan yellow. These birds were not quite as fully into breeding plumage as the one of 19/3/53. One, the smallest, was less advanced, the bill being a little yellow and the black not so far down the forehead. It could well be a link between those in immature or winter dress and those in or near breeding dress.

We have considered the question whether birds which looked like adult *albigrons* with black-tipped bills might not be *nereis* before the change into adult plumage with wholly yellow bill had been completed. There are three strong points against this: (a) the black tip ended sharply without any blurring, (b) the black of the cap came too far forward and made the white of the forehead narrower than it is in *nereis*, (c) the black stripe along the lores reached forward to the bill.

On 25/11/56 R.B.S. had excellent views in clear sunshine of seven small dark-billed terns at the mouth of the Waitakaruru river. They settled on the mud and had to keep moving as the creeping tide pushed them. Three looked like first-year birds with brownish mottling on the wing. The others could have been adults with the black on the head much diminished, or sub-adults, i.e. second-year birds, but in at least one a streak of black ran forward to the bill. The near-black in the primaries was very noticeable. It is difficult to conceive that at this season *S. nereis* could have looked like these birds.

Seasonal occurrences compared with Fairy Tern

The Fairy Tern has for several years been noted to arrive on the North Auckland coast in September, being then in full breeding dress, and to leave by early February, still in full colour. This contrasts strongly with the occurrence of the Little Tern, which is in eclipse plumage almost the whole of the time the Fairy Tern is present in breeding plumage. Frequent patrolling of the northern beaches in winter has not revealed Fairy Tern until 13/7/57, when Mr and Mrs Prickett found and closely studied two at Te Arai with fully yellow bills and feet. This may possibly mean that they, or some of them, do not change colour at all, but it is probable that they lose colour between February and July, just when the Little Tern changes into colour. Immature birds would be likely to confuse the issue.

Voice

A sharp 'kweek' or a rasping 'zweek' is evidently a note of anger or alarm. It was made by each of seven birds as they rose from among Wrybills. Sometimes it is often repeated. H.R.McK. has heard an urgent 'peep, peep, peep' as they hover. They also have a lively pleasant chattering, 'chi-chi chi-chi'.

Behaviour

In the Firth of Thames these small terns are most commonly seen in company with waders. They often fly with and settle among the great flocks of Bar-tailed Godwits and Knots which frequent the Firth from October to April. On 2/1/56 when thirteen small terns were counted, it was not easy to be sure of the exact numbers because while some rested in full view on the edge of the waders, others were out of sight in the middle of them. After January when the Wrybills return, the small terns show a marked preference for resting among them at the full tides. They feed generally along the tidelines, especially near the mouths of creeks. They have a habit of hovering at a height of only three or four feet over the long-legged waders as they stand in

the shallow water, and they may actually dive among the waders to catch their prey.

On 17/2/57 a very high tide of 11ft 8ins was predicted for 9.30 a.m. Accordingly, in expectation that such a brimming tide would cause a great concentration of shore-birds at Miranda, we reached the lagoon about 8 a.m., to find it already crowded with thousands of waders – eventually fourteen species were identified, nine Arctic and five New Zealand breeders – with more continually streaming in from the direction of Piako and Waitakaruru. Mr and Mrs Prickett and B. D. Heather now joined us. Four small terns were quickly spotted as they flew over the resting waders; but although they settled for short periods among Wrybills on the edge of the main pack of Godwits and Knots, they were rather restless and left in a southerly direction. The tide meanwhile was still rising and a few waders were still arriving. We had not waited for long when nine small terns flew in from the direction in which the four had disappeared. For some time they seemed reluctant to settle, but after prospecting some way inland up Pukorokoro Creek, flying rather high, they returned to the northern end of the lagoon where the smaller waders had gathered. Here they settled in the edge of the shallow water among Wrybills, Banded Dotterels and Curlew Sandpipers. As they rested and preened we had ample time to watch them in a good light. One bird was particularly interesting because it appeared to be in the almost complete breeding dress of *S. albifrons*. Its yellow bill had a dark tip and there was only the faintest trace of white between the bill and the black stripe on the lores. In another bird the bill was dark brown with the yellow faintly showing through towards the base; but the loreal stripe already virtually reached the bill. The other seven were obviously in less advanced plumage. They had dark bills and it was easy to see white on the lores between the bill and the forward end of the black ocular stripe.

Another was seen closely on 9/6/57 by B.D.B. and D.H.B. at Kairito Creek. It had a fully yellow bill with the definite black tip, black forward on to forehead almost complete, and the black stripe tapering forward almost to bill.

The latest winter record for these birds was of one seen on the Firth of Thames coast by N.M. on 6/7/57 at 'White Bridge', a little north of Miranda. It had the appearance and flight of the birds already described as being in winter or immature plumage. It was certainly not *Sterna nereis* and was most likely a young Little Tern which was not going to breed in the current season.

These terns often give the impression of being in pairs. On 2/1/56 couples would break away from the resting flock for a few minutes' fishing which was not easy in the teeth of the strong easterly wind. On 21/4/56, when eleven were counted near Kairito Creek, nine were flying overhead at one time and the noise was strongly reminiscent of a colony of *albifrons* in England. Pairs often flew together and after spiralling, the pairs would dive at great speed, the one bird on the tail of the other, calling excitedly. These must have been pair-formation or courtship flights. At a very different season, on 30/11/56, on the same muddy stretch of coast, four small terns split into two couples and became quite agitated overhead, though they could not have had any territorial attachment. The 'zweek' note was used again and again. They also made an excited chittering, very different from the clamour of the White-fronted Terns, which had a breeding colony 200 yards away.

DISCUSSION

We believe that the small terns which we have described are visitors from the northern hemisphere and that they belong to the eastern race (*sinensis*) of the Little Tern, which according to Mayr ranges from the coast of Asia to the New Guinea region and rarely to the Bismarck Archipelago. During the southern summer they are in immature dress or the eclipse plumage of adults; but the assumption of breeding dress between February and June and the decline in their numbers point to a breeding season north of the equator. The dark-billed ones that have been seen in May and June would be non-breeding yearlings, or second year birds; for there are good reasons for believing that

many terns do not breed till their third or fourth year. If these small terns have reached New Zealand from eastern Asia, it is not surprising that many of them should be immature; for it is characteristic of the young of many migratory birds to wander further than the adults and the normal wintering range. Nor is it inconceivable that Asiatic Little Terns should reach New Zealand. The European Little Tern is a vagrant to the coast of South Africa; and a remarkable instance of wandering by the Little Tern has just been published (*The Ring*, p. 144), viz. one ringed as a nestling on 20/3/49 in Java, Indonesia, was recovered on 4/12/52 in Gold Coast, West Africa.

Sterna albigrons is a species with many races, of which those breeding in cooler climates are migratory, while those which breed in or near the tropics are more or less sedentary. It is the common small tern of eastern and northern Australia from which two races *placens* and *tormenti* have been described by Mathews. Little seems to be known about their behaviour; and their validity as subspecies is in question; for they are not mentioned by Alexander, who gives only the subspecific name *sinensis* for Australian Little Terns. *Sterna nereis* is the common small tern of southern and western Australia, and a race has been described from New Caledonia under the name *exsul*. Little has been reported of it. In a key to the South-west Pacific Terns Mayr does not separate immature *albigrons* from immature *nereis*.

If the small terns which have been recorded in the Firth of Thames with increasing frequency are indeed *nereis*, some interesting questions arise. Where do they come from? Where are they being bred? Is there some unknown breeding ground in New Zealand, where *S. nereis* is much more successful than on the east coast of Northland? Miss Macdonald and others who have been studying the few known pairs, report that owing to sandstorms and predators, human and otherwise, very few young have reached the flying stage in recent years, certainly not enough to form a flock of thirteen, or even seven.

The stretch of the Firth of Thames which these small terns favour is very different from the typical habitat of *nereis* in the north, where the few breeding pairs are distributed along a clean, sandy coast, backed by extensive dunes through which at intervals shallow, clear rivers flow into the sea. In the Firth of Thames soft alluvial mud and mangroves are characteristic of the creeks and the outgoing tide exposes a vast acreage of flats. If the terns which we have described are immature Fairy Terns, it is a discovery of some significance, that what by New Zealand standards is a flock of them should resort in their second and probably in their third years to a habitat so very different from their typical breeding place; and it forms an interesting addition to our knowledge of the life history of the Fairy Tern. However, we find it difficult to reconcile our observations of their plumage, moults and behaviour with what is known of the Fairy Tern; and we believe that they are Little Terns of Asiatic, or less likely, of Australian origin.

Outside the Firth of Thames small terns which could not be positively identified as *S. nereis*, and, if the Little Tern is reaching New Zealand, may have been *S. albigrons*, are occasionally reported: e.g., one, dark-billed, at Te Ngaio, Kaipara, seen on 6/1/49 by D. A. Urquhart, B. D. Heather and R.B.S.; one at Puketutu, Manukau, flying with Godwits, seen on 1/3/54 by R.B.S.; one over Maungawhio mudflat at the base of the Mahia Peninsula seen on 19/11/55 by G. E. Sopp and H.R.McK.; one at Harania Creek, Manukau, flying with Knots, seen on 13/3/57 by R.B.S.

THE NESTING OF THE HARRIER

By M. F. SOPER, *Queenstown*

Owing to their extreme timidity at the nest and the readiness with which they will desert if disturbed, continuous observations on any one pair of nesting harriers are not so easily obtained as with most New Zealand birds. The following generalisations are taken from the notes of 15 nests observed for varying periods of time during the course of attempts to establish a photo-