Tiedonantoja • Brief reports

Nesting of Temminck's Stints *Calidris temminckii* during an arctic snowstorm

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During a 5 weeks' stay (15 June to 19 July) in Finnmark, the northernmost part of Norway, in summer 1977, I made almost daily observations on Temminck's Stints breeding abundantly in the river delta of Sandfjord (70°30'N, 30°40'E). In total, 23 nests and 3 broods from unknown nests were found. The behaviour of the birds and the fate of the nests during a blizzard in late June were so interesting that the sequence of events may be worth reporting separately.

Fairly good weather prevailed in Finnmark during the first half of June, and consequently the breeding of the birds began normally. But on 20 June the weather changed abruptly: early in the morning wet snow began to fall and a strong NW wind arose. On 21 June the wind increased to storm force, and the continuous snowfall turned the whole landscape white. On 22 June the blizzard continued, though somewhat weakened; in the afternoon the snow cover had partly melted on the coast, forming huge ponds, but extensive areas were still covered with a layer of snow up to 10 cm deep. On 23 June the wind had declined to 5—6 Beaufort, but rain and some wet snow fell throughout the day; most of the snow cover had melted. On 24 to 26 June the temperature was still close to zero and it rained frequently; not until 27 June did the weather improve. The snowstorm was the worst occurring in this season in Finnmark for 25 years and caused great material damage; in the fjelds the snow cover measured half a metre in places and all the roads were closed.

Between 15 and 19 June I had found 18 nests of Temminck's Stint, two of which were destroyed before the blizzard. Except for one, in which the first egg was laid on 18 June, all the clutches were complete when found. According to later observations, incubation had commenced at most one week before the snowstorm. On 20 June I remained indoors, and during the worst blizzard, on 21 June, I visited only one nest, located by the roadside; on this nest the bird was sitting amidst the snow. On 22 June I checked 11 nests; five of these were being incubated, but in the remaining six the eggs were wet and cold, in one case buried in the snow. On 23 June I checked 12 nests; only one was still being incubated, all the others seemed deserted. On 24 June the incubating birds had returned to 9 of the 12 nests checked. Between 25 and 28 June, incubation recommenced in all the nests, but was very irregular to begin with; at times the eggs were cold for hours.

In two nests, the interruption in incubation lasted exceptionally long. Nest no. 12 seemed deserted on each of the daily checks from 22 to 25 June, but on 27 and 28 June the bird was observed incubating; on 29 June the eggs were cold again on two visits but on 30 June the bird had returned to the nest. On nest no. 14, the bird was still incubating on 23 June, when all the other nests were abandoned, but from 24 to 28 June the eggs were cold on each visit; on 30 June, however, the bird was flushed from the nest again. In this connection it should be mentioned that the feeding intervals of an incubating Temminck's Stint normally last 5 to 10 minutes, during which time the eggs do not cool down much; thus, ice cold eggs had clearly not been incubated for a long time.

To summarize, many Temminck's Stints were still incubating during the worst blizzard on 21—22 June, but they subsequently deserted their nests for 1—2 or, in extreme cases, for 4—5 days. After their return they at first incubated irregularly, with long interruptions. Interestingly, the temporary desertion of the nests caused a revival of territorial behaviour: before the snowstorm trilling was heard only rarely, but on 22—23 June the birds were displaying and chasing each other

eagerly, in spite of the miserable weather! The reaction was the same as in the case of nest failure; then too the male, freed from incubation, starts trilling again.

The long interruption in incubation, during which the eggs were exposed to temperatures close to zero and at times buried in snow, might have been expected to kill the embryos. However, the losses remained relatively small. In total, the 12 nests that survived until the date of hatching produced 35 young, while 11 eggs (24 %) in four nests failed to hatch. In two clutches (nos. 6 and 12) all four eggs were spoiled; both were incubated for more than a month, i.e. far beyond the normal incubation period of about 21 days. In all the successful nests, too, the incubation was prolonged due to the interruption; in five nests where the clutches were completed before the blizzard, 23 to 26 days elapsed from the day when the nest was found to the hatching of young. As incubation had probably proceeded for some days before the nests were found, the actual incubation period was still longer.

Earlier, the influence of heavy snowfall upon the nesting of waders has been described by Bengtson (1963), Spjøtvoll (1972), Pulliainen (1978) and Ojanen (1979), among others. The reaction of the incubating bird seems to depend on four major factors:

(1) The stage of nesting. Newly completed clutches are more likely to be deserted, either temporarily or for good, than those already incubated for some time, because fresh eggs are more resistant to chilling than incubated ones.

(2) The thickness and duration of the snow cover. All waders at first attempt to continue incubating in snow. For instance, Lapwings *Vanellus vanellus* have been seen sitting on the nest in a 10 cm deep snow cover (Casén 1960), a Dotterel *Eudromias morinellus* was photographed incubating in snow with only its head and the forepart of the back visible (Spjøtvoll 1972), and both Whimbrels *Numenius phaeopus* (Pulliainen 1978) and Curlews *N. arquata* (Ojanen 1979) have been observed on the nest in a totally wintery landscape, with only their long beaks projecting from the snow! If the snow layer grows thick or covers the ground for several days in succession, the birds find it more and more difficult to persist in incubating: they leave their nests for increasing periods and may finally abandon them. Lapwings, which coped successfully with a shorter blizzard at Kokkola in May 1958 (Casén 1960), suffered heavy losses at Oulu in May 1968, when the snow cover reached about 30 cm and stayed for 4 days (Ojanen 1979).

(3) The size of the bird. Large-sized species have slower energy expenditure and better cold-hardiness than small-sized ones and can tolerate longer periods of fasting; consequently, they are better adapted to endure spells of adverse weather during the breeding season without leaving their nests. The Curlew and Whimbrel, for instance, can manage to incubate in snow for several days (Bengtson 1963, Pulliainen 1978, Ojanen 1979).

(4) The incubation strategy of the species. Single-sex incubating species experience greater difficulties during adverse weather than species in which both mates share the parental duties. Norton (1972) has shown that a species of the former category spends less time on the nest on colder days because of the increased energy costs of incubation and greater difficulty in securing enough food, whereas in two-sex incubating species nest attendance increases at low temperatures. The effect of incubation strategy on nesting success was demonstrated clearly by Spjøtvoll (1972) during a prolonged snowstorm in Norway. The single-sex incubating species *(Eudromias morinellus, Calidris temminckii* and *Phalaropus lobatus)* suffered severe losses, whereas the two-sex incubating species *(Pluvialis apricaria, Charadrius hiaticula* and *Capella gallinago)* succeeded well in their nesting.

According to the above reasoning, Temminck's Stint should be particularly vulnerable to weather disturbances during breeding: it is our smallest wader and each nest is attended by a single bird (Hildén 1975). In fact, Temminck's Stints in Finnmark in 1977 interrupted their incubation within a couple of days from the beginning of snowfall; this probably resulted from the birds' inability to secure insect prey during incubation intervals in the cold, snowy weather. Similarly, Bengtson (1963) observed in Iceland in May 1961 that waders commonly left their nests during a long spell of heavy snow, either for some hours every now and then or continuously for some days, but returned to incubate when the snow had melted. Contrary to my observations on Temminck's Stints, this interruption damaged many eggs; besides the total loss of several clutches, no less than 27—45 % of the eggs failed to hatch in successful nests of *Pluvialis apricaria, Capella gallinago, Tringa totanus, Calidris alpina* and *Phalaropus lobatus.*

Selostus: **Lapinsirrin pesinnästä arktisessa lumimyrskyssä**

Kesällä 1977 koetteli ankara lumimyrsky Ruijaa 20—23.6.: maa peittyi rannikoillakin yh-

tenäiseen lumivaippaan, ja rajumyrsky riehui pahimmillaan 12 boforin voimalla. Vielä 24—26.6. lämpötila pysytteli nollan vaiheilla ja sateli yhtenään.

Kahtena ensimmäisenä takatalvipäivänä lapinsirrit vielä yrittivät hautoa, mutta hylkäsivät sitten pesänsä 1—2, eräät jopa 4—5 päiväksi; sen jälkeen haudonta alkoi uudestaan, mutta oli aluksi hyvin epäsäännöllistä. Haudonnan keskeytyminen vaikeissa sääoloissa ei kuitenkaan ollut kohtalokasta: 12 säilyneestä pesästä kuoriutui 35 poikasta ja vain 11 munaa (24 %) jäi kuoriutumatta. Kahta pesyettä, joissa kaikki munat olivat pilaantuneet, emo hautoi pitkälti toista kuukautta.

Näiden ja aikaisempien vastaavien havaintojen perusteella hautovien kahlaajien reaktio takatalven sattuessa riippuu neljästä päätekijästä: (1) pesintävaiheesta (hautomattomat pesyeet hylätään herkemmin kuin haudotut), (2) lumipeitteen vahvuudesta ja kestosta (jonkin aikaa kahlaajat voivat hautoa jopa lähes kokonaan lumeen hautautuneina), (3) linnun koosta (isot selviävät paremmin kuin pienet) ja (4) lajin hautomisstrategiasta (yksinhautojat ovat huonommassa asemassa kuin sellaiset lajit, joilla molemmat sukupuolet vuorottelevat haudonnassa).

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Notes on nests, eggs and nestlings of the Siberian Tit *Parus cinctus*

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In the north the Siberian Tit often starts breeding before ornithologists make their systematic spring checks of nest-boxes. Some broods may even have left the boxes before the first check. In these cases the Siberian Tit's nest can be identified only by thoroughly analysing the nest material. The problem is how to distinguish the nest of the Siberian Tit from those of the Willow and Great Tit, two species that also breed regularly within the same area in northern Finland. The aim of this note is to make the task easier. The information given is partly derived from my own studies of 22 Siberian Tit nests at Kilpisjärvi, Finnish Lapland, partly from the literature.

There are interspecific differences in the nest material used. In a Great Tit nest, there is plenty of moss and the nest cup is lined with wool and hairs. According to the literature, the Willow Tit — very rarely breeding in boxes — only occassionally uses moss; the nest cup is a mixture of bark, wool and hairs. In the nest-boxes at Kilpisjärvi Biological Station, the Siberian Tit built a cup lined with a thick layer of rodent hair. However, the best diagnostic feature is perhaps a layer of decayed wood gathered under the nest. Sometimes there is also moss and grass between these two elements.

Eggs or dead young left in the nest may be further aids to identification. Titmouse