

- HEILMANN, C. & MANNICHE, A. L. V., 1928-30: Danmarks Fugleliv. - Bd. III: 21.
- HOLSTEIN, V., 1927: Fiskehejren.
- JENSEN, F., 1959: Om kolonirugende Knopsvaner i Roskildefjorden 1958. - Dansk Ornith. Foren. Tidsskr. **53**: 42.
- KJÆRBØLLING, N., 1875: Skandinaviens Fugle ved J. COLLIN: 15, 135, 709.
- LYNEBORG JENSEN, L., 1954: Fiskehejren som ynglefugl i Danmark. - Dansk Ornith. Foren. Tidsskr. **48**: 202.
- NORUP, S., 1938: En Havørn og to Kongeørne ved Roskilde. - Dansk Ornith. Foren. Tidsskr. **32**: 50.
- SINDING, E. & WILLADSEN, S., 1940: Havørne (*Haliaëtus albicilla*), set i Danmark. - Dansk Ornith. Foren. Tidsskr. **34**: 200.
- WILHJELM, O., 1938: Vore ynglende Skalleslugerarter. - Dansk Ornith. Foren. Tidsskr. **32**: 111.

Manuskriptet modtaget 13. februar 1964.

Forfatterens adresse: Freddy Jensen, Fortvej 156, Rødovre, Vanløse.

Brief observations on a pair of Red-throated Divers (*Gavia stellata*) nesting in East Greenland

By

A. B. HALL and G. P. ARNOLD

(Oxford University Expedition to East Greenland, 1962.)

(Med et dansk resumé: Iagttagelser over et par Rødstrubede Lommer (*Gavia stellata*) på yngleplads i Østgrønland.)

INTRODUCTION

On 30th July, 1962, the nest of a Red-throated Diver (*Gavia stellata*) was found at the eastern end of the Holger Danskes Briller (71° 23' N, 24° 45' W), in Southern Scoresby Land.

OBSERVATION

During the first week of August, a hide was built using old foxtraps and sacking. The hide was moved progressively nearer to the nest until it was finally ready for use on the 4th August. It was occupied for seven hours on 5th August, and for five and a quarter hours on the 7th August. Ten days later it was occupied for a fur-

ther one and a quarter hours, but the birds did not return to the nest on this occasion. Unfortunately, further time could not be spared from the main biological work of the expedition, which was to study the behaviour of the freshwater crustacean *Lepidurus arcticus* (PALLAS).

DESCRIPTION

Hatching: When the nest was found, it contained two eggs, and these hatched between the 2nd and 5th August, at an interval of approximately 48 hours (Table 1).

Behaviour: Twelve hours' watching is insufficient for more than preliminary

Date	Eggs (<i>Æg</i>)	Chicks (<i>Unger</i>)
30 July	2	—
2 August	2 (1 chipping)	—
3 August	1	1 (remained on nest)
4 August	1 (chipping)	1 (swam off with adult)
5 August	Shells removed	2 (swam off with adult)

Table 1. Hatching Dates.

Tabel 1. *Klekningdata.*

observations and these are accordingly presented in graphical form only (Fig. 1). Since we were unable to distinguish the sexes infallibly, the adults are described as A and B (on 5th August), and C and D (on 7th August). From 11.51 hours on 5th August, when disturbed by the observer, the birds used a site some 2 m beyond the original nest.

The most interesting observation was the marked difference between the number of changes of the adults at the nest, and the number of fish brought on the two days. On 5th August, the adults changed four times during the observation period, but on 7th August not more than twice and perhaps only once. Similarly, nine fish were brought on the first day and only three on the second. These differences might well be explained by the much greater disturbances on the second day, when a great deal of time was spent chasing off intruding divers.

When the adults changed over at the nest, the bird landing from the water usually flicked moss over its back and often turned round a few times before settling down.

DISCUSSION

None of the sexual displays, e.g. the "Plesiosaur race" and "Snake ceremony" described by HUXLEY (1923) was seen, doubtless due to the lateness of our observations in the breeding season, and the waning of this behaviour with successful nesting.

RANKIN (1947) observed Red-throated Divers nesting in Shetland, and he noted that the bird on the nest always faced towards the loch, never inland. This we also observed in Greenland. Mosquitoes which flew near the sitting bird were deftly captured by a dart of the bill, and RANKIN reports that fly-catching was the principal occupation of adult birds on the nest.

Reaction to Disturbances :

- a. *Human*: The birds were very little disturbed by the construction of the hide, and the sitting bird would leave the nest only as the observers drew very close to the site. The departure was silent and unhurried. RANKIN noted a rapid departure followed immediately by a dive, whereas KEITH (1937) recorded a bird in Spitsbergen that allowed three observers to approach and touch it on the nest. Possibly these differences in recorded behaviour are due to different stages of incubation.
- b. *Overhead disturbance*: The crouched posture with the neck stretched out low, and the head slightly turned to look upwards, seems to be the normal reaction to potential aerial danger. We observed it when a Great Northern Diver (*Gavia immer*) passed overhead, and again when a Red-throated Diver did so. RANKIN records it on the appearance of a Raven (*Corvus corax*) in combat with two Arctic Skuas (*Stercorarius parasiticus*), and KEITH published a photograph of the posture (1937).

An alert posture with the neck vertical was noticed when Arctic Terns (*Sterna macrura*) flew over calling, and once when a flock of waders flew close past.

- c. *Avian intruders*: Another pair of Red-throated Divers which landed on the lake was rapidly chased away, one of the resident birds "running" over the water towards the intruders, and also

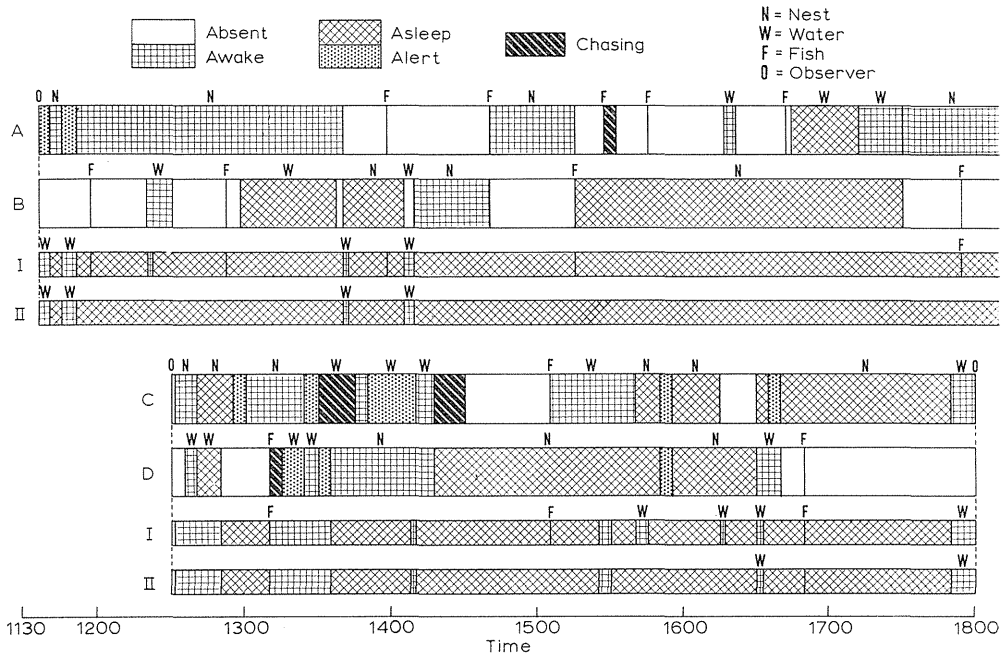


Fig. 1. Activity spectra of a pair of Red-throated Divers (*Gavia stellata*) and chicks at a nest in East Greenland in 1962. The activities of the adults (A and B) and the two chicks (I and II) for 5. 8. 62. are shown in the upper half of the diagram, and those for 7. 8. 62. in the lower half. The two adults are described as C and D on the second day, as it was not possible to distinguish the sexes infallibly.

Skemaet viser aktiviteten hos et par Rødstrubede Lommer og deres unger ved en rede i Østgrønland i 1962. Den øverste del af skemaet viser aktiviteten hos de voksne fugle (A og B) og de to unger (I og II) den 5. august. Den nederste del af skemaet viser aktiviteten den 7. august. Her kaldes de voksne fugle C og D, da det ikke var muligt at skelne kønnene sikkert.

diving after them and surfacing closer. A King Eider (*Somateria spectabilis*) and chicks were also chased away from the divers' nest. Although the Red-throats reacted to the presence of a pair of Great Northern Divers on the lake, they did not attempt to approach them. One bird swam to and fro some 20 m in front of the nest with lowered neck uttering half 'quack' – half 'croon' calls, while the second remained very still on the nest. KEITH, also, recorded demonstrations of anger against a single intruding Red-throat and Eiders.

Eggshell removal

On 5th August, adult A was seen to re-

move the shell of the second egg from the nest, and this must have occurred within twenty-four hours of hatching. The first eggshell must have also been removed with equal promptitude, since there was no trace of it on the 3rd August. In a review of eggshell removal in birds, C. & D. NETHERSOLE-THOMPSON (1942) refer to two records for the Red-throated Diver. That of KEITH (1937), describes the female removing the broken egg to the middle of the tarn where she and the male broke it into small pieces. However, G. ARTHUR (quoted by KEITH), recorded large fragments remaining in the nest.

TINBERGEN et al. (1962) have shown that for the Black-headed Gull (*Larus ridi-*

bundus) eggshell removal has considerable survival value as an anti-predator device. The presence of an eggshell near the nest endangers the brood, and this effect decreases with increasing distance. The eggs of the Red-throated Diver are a blotched olive-green colour which suggests that in this species also the clutch is protected by camouflage against predation. As the chicks too are inconspicuous and are present in the nest for several days after hatching, eggshell removal may well serve the same function as in the Black-headed Gull. Likely predators in Greenland are skuas, gulls and foxes.

The NETHERSOLE-THOMPSONS refer to individual variability in the occurrence of eggshell removal and this lends added interest to ARTHUR's observation. Possibly chicks of the Great Northern Diver are less subject to attack on the nest, for LACK and DUNLOP (cited by the NETHERSOLE-THOMPSONS) have recorded non-removal of the eggshell in this species.

Behaviour with chicks

Both adults brought fish to the nest in their bills, but always remained in the water swimming to and fro and "cooing" gently; the chicks left the nest and swam out to the parents to be fed. All the fish were sufficiently small in size to be taken whole by the chicks. This contrasts with RANKIN's observations in Shetland, where, on six separate occasions, fish which were brought to the nest were too large for the chicks and were eventually eaten by the captor. The method of enticing the young to food by swimming to and fro and calling softly appears to be the same in both cases.

Behaviour of chicks

The second egg hatched about forty-eight hours after the first, by which time the first chick would leave the nest and swim off with the adult, on our approach. The second chick, likewise, was able to swim within twenty-four hours of hatching. Although it seemed to be as active on the nest, this younger chick did not leave it so readily when fish were brought, and appeared to get less of them. The chicks were distinctly different in size during the first few days, but by the 26th August they were no longer distinguishable. RANKIN noted that the second chick in the nest he watched was, on hatching, "every bit as large and as active as the first". On 21st August an adult was seen to bring fish and feed one of the juveniles whilst it was swimming on the open water of the lake.

COMMENTS

It would be unwise to generalize from such scanty observations, but it is interesting to note:-

1. The marked difference in the numbers of fish brought to the nest on the two days.
2. That the adults never fed the chicks on the nest; instead the chicks left the nest and swam to the adult.
3. The fierce reaction toward the intruding pair of Red-throated Divers and the family party of Eiders, compared with the milder reaction to the presence of the much bigger Great Northern Divers.

ACKNOWLEDGEMENTS

We would like to thank Dr. G. C. PHILLIPS for his most helpful criticism of our original manuscript.

REFERENCES

- HUXLEY, J. S., 1923: Courtship activities in the Red-throated Diver. . . . J. Linnean Soc. Zoology. **XXXV**: 253.
- KEITH, D. B., 1937: The Red-throated Diver in North East Land. - British Birds. **31**: 64.
- NETHERSOLE-THOMPSON, C. and D., 1942: Egg-shell disposal by birds. - British Birds. **35**: 162-9, 190-200, 214-223, 241-250.
- RANKIN, N., 1947: Haunts of British Divers. - Collins, London.

TINBERGEN, N., BROEKHUYSEN, G. J., FEEKES, F.,
HOUGHTON, J. C. W., KRUK, H., and SZULE,
E., 1962: "Eggshell removal by the black-

headed gull (*Larus ridibundus* (L.)). A behaviour
component of camouflage" Behaviour. **XIX**:
74-117.

DANSK RESUMÉ

Iagttagelser over et par Rødstrubede Lommer (Gavia stellata) på yngleplads i Østgrønland.

I sommeren 1962 tilbragte deltagere i Oxford University Expedition to East Greenland 2 dage i et skjul, hvorfra man iagttog et par af Rødstrubet Lom (*Gavia stellata*) ved rede. Resultatet er afbildet skematisk i fig. 1. Forskellige iagttagne adfærdsformer, f. eks. reaktion ved forstyrrelse, fjernelse af ægskaller, forældrefuglens opførsel overfor ungerne, og ungernes adfærd, bliver beskrevet og diskuteret i relation til tidligere undersøgelser. Iagttagelserne er for sparsomme til at drage almene konklusioner, men særlig følgende interessante forhold iagttoges.

- 1) Der var stor forskel i antallet af fisk, som blev bragt til reden på de to dage.
- 2) De voksne fugle fodrede aldrig ungerne på reden; ungerne forlod reden og svømmede til forældrefuglen.
- 3) Reaktionen overfor et par fremmede Rødstrubede Lommer samt en familieflok af Kongeederfugle (*Somateria spectabilis*) var stærk, hvorimod fuglene kun reagerede svagt overfor tilstedeværelsen af den langt større Islom (*Gavia immer*).

Manuskriptet modtaget 6. august 1965.

Forfatterens adresse: G. P. Arnold, Fisheries laboratory, Lowestoft, Suffolk, UK.