The Time Sequence of Events in Multiple Nest Building by Blackbird (*Turdus merula* L.).

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(Med et dansk résumé: Begivenhedsforløbet ved serieredebygning hos Solsort (*Turdus merula* L.)).

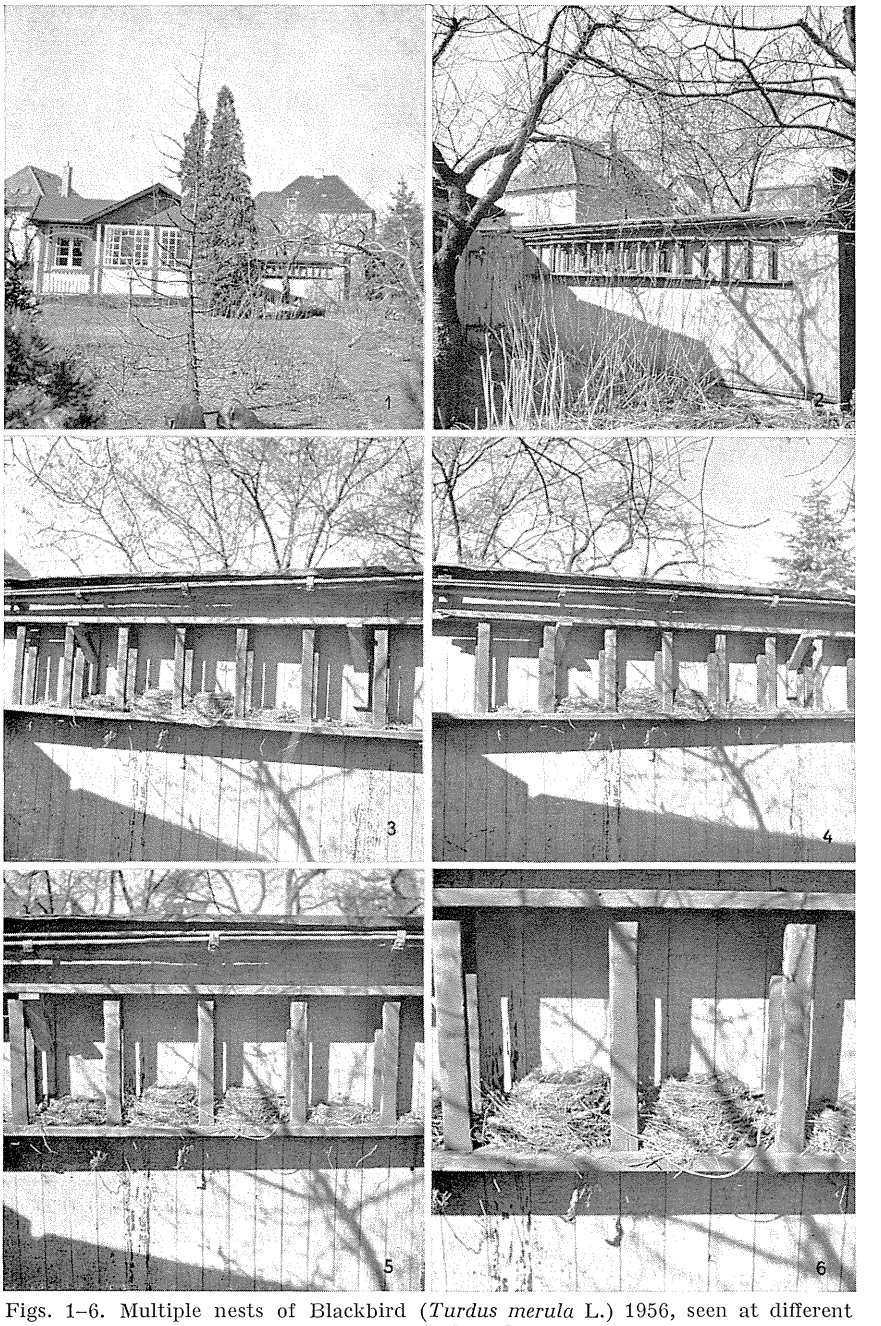
(Plate (*tavle*) I).

In a survey of multiple nest building of various birds one of us (Hemmingsen, 1956) stressed the desirability of closer, continuous observations to decide whether such nests are built successively or simultaneously. The other one of us, A. F. B., then made such closer observations of a multiple nest building by Blackbird which had been repeated in successive years in his garden, and which was mentioned and pictured in the survey mentioned. On account of other pressing work A. F. B. had to leave the matter at that, and A. M. H. then undertook the treatment of the data with the results here presented.

On 28. March 1956 in the same ladders as in the previous years eight almost equal beginnings of nestbuilding were observed with only a few pieces of straw in each (cf. figs. 1–6; where, however, nothing is seen in the eighth nest (fig. 2), as counted from the left, because the few pieces of straw were taken later by the wind). The next day the nests were larger in the middle of the series. On 30. March and the following days closer, continuous observations were made of the nest building process.

As a sample we reproduce the observations of the female bird during one half hour on 30. March 1956. The nests are numbered from the left (South) to the right (North).

What might be called dry straw was brought to the nest at every landing. By the term "prodded" is meant the peculiar stabbing and shuffling movements by means of which the bird pokes about to arrange and rearrange the nest material. These movements were seen at most visits, even in nests 1 and 7, but were absent at some few visits. They might last from a



Figs. 1–6. Multiple nests of Blackbird (*Turdus merula* L.) 1956, seen at different distances and angles.
(*Seriereder bygget af Solsort* (Turdus merula *L.*) *1956, set i forskellig afstand og under forskellige vinkler*).

Observations (*Iagttagelser*) 30. March 1956.

9^{20}	came from the			ground, *jorden,*	landed in		5, *landede i*	5, prodded *pirkede*)
9^{24}	–	–	–	East (*Øst*)	–	–	3,	–
9^{25}	–	–	–	–	–	–	4,	–
$9^{25'30''}$	–	–	–	North (*Nord*)	–	–	6,	placed material, went to 5, prodded (*anbragte materiale, gik til 5, pirkede*)
9^{26}	–	–	–	–	landed in		3,	prodded
9^{28}	–	–	–	South (*Syd*)	–	–	7,	–
9^{29}	–	–	–	North (*Nord*)	–	–	3,	–
$9^{30'30''}$	–	–	–	–	–	–	4,	–
9^{36}	–	–	–	South (*Syd*)	–	–	5,	–
9^{39}	–	–	–	North (*Nord*)	–	–	3,	–
9^{43}	–	–	–	South (*Syd*)	–	–	5,	did not prod (*pirkede ikke*)
9^{44}	–	–	–	East (*Øst*)	–	–	3,	– – –
9^{45}	–	–	–	North (*Nord*)	–	–	4,	prodded
9^{50}	–	–	–	South (*Syd*)	–	–	1,	but went to 2 with material, then prodded in 3 (*men gik til 2 med materiale, pirkede derefter i 3*)

few seconds up to 3 minutes (31. March and 2. April). It will be seen from the above sample of observations that apparently the nests were visited at random. A closer analysis of the distribution of visits over the nests is given in table 1.

It will be seen from table 1 that the number of landings are grouped about the middle nests as if the bird had tried to hit the middle of a target, the number of visits falling off gradually with increasing distance from the middle of the target. Actually, the grouping is as would be expected from the law of errors, considering each nest a class in the frequency distribution of landings.

It might be suspected that there was an association between the direction from which the bird came and the position of the nest where it landed. Table 2 suggests for the landings in which the directions were noted that when the bird came perpendicularly to the ladder from the East, that is so that the ladder would be clearly visible in its entire length, the

Table 1.

Frequency distribution of landings over nests.
(Landingshyppighed ved de forskellige reder).

Nest number from left (South) to right (North). *(Redenummer fra venstre (Syd) til højre (Nord).* / Period of observation. *(Iagttagelsesperiode).*	0	1	2	3	4	5	6	7	8
	Number of landings (*Antal landinger*)								
30. March. 8^{12}–10^{21}. Intervals ..... mostly (*oftest*) $^1/_2$–2 (max. 10) min.	1	3	10	20	23	10	7	2	2
about 16^{00}	0	0	0	0	1	1	1	0	0
31. March. 10^{15}–11^{17}. Intervals ..... $^1/_2$–12 min.	0	0	3	4	2	3	0	0	0
13^{45}–13^{55}	0	0	0	0	0	0	0	0	0
1. April. 11^{40}–11^{44}. Intervals ..... 1–3 min.	0	1	0	1	0	1	0	0	0
11^{47}–12^{05}	0	0	0	0	0	0	0	0	0
2. April. 10^{15}–11^{03}. Intervals ..... 1–8 min.	0	0	3	1	6	1	1	0	0
3. April. 10^{30}–10^{45}	0	0	0	0	0	0	0	0	0
	1	4	16	26	32	16	9	2	2

Table 2.

Association between direction of landing and nest of landing.
(Sammenhæng mellem landingsretning og redenummer).

Nest number from left (South) to right (North). *(Redenummer fra venstre (Syd) til højre (Nord).* / Direction from. *(Retning fra).*	0	1	2	3	4	5	6	7	8
	Number of landings (*Antal landinger*)								
North (*Nord*)		1		7[1]	7	3	3		1
East (*Øst*)			5	9	14	3	1		
South (*Syd*)	1	2	6	4	4	4	2	1	
West[2] (*Vest*)			1			1		1	1
Ground (*Jorden*)		1	1	2	1	1			

[1] At two of those the bird came actually from the West to the North end of the wall and from there went to nest 3.

[2] Over the wall.

middle nest (4) was preferred, and landings in extreme nests were rare or absent. The flights from the West and from the ground were few and taken together show a greater scatter. On the average the visits from the North fell more to the North than those from the South. The small number of observations and the skew distributions of the number of landings from most of the directions make a statistical test appear unwarranted.

The cases in which the bird went to a neigbouring nest immediately after landing are tabularized in table 3.

It will be seen from table 3 that when the bird went to a neighbouring nest immediately after landing this was generally a continuation of the direction from which it came. As it generally landed on that side of the middle from which it came this was equivalent to a movement toward the middle nests. But in the one case in which it landed so far to the opposite side that a continuation would have meant going

TABLE 3.

Cases in which the bird went to a neighbouring nest immediately after landing. m = material brought; p = prodding.
(Tilfælde, hvor fuglen gik til en naborede lige efter landingen. m = materiale bragt; p = pirkende redebygningsbevægelser med næbbet).

Landed in nest no. (*Landede i rede no.*)	Went to nest no. (*Gik til rede no.*)	And then to nest no. (*Og derefter til rede no.*)	Direction from. (*Retning fra*)	Continuation of direction. (*Fortsættelse af retningen*)	Towards middle. (*Mod midten*)
1	2 (-p)		North (*Nord*)	—	+
4 (-p)	3 (p)		–	+	?
4 (m)	3 (p)	2 (p)	–	+	—
6 (m)	5 (p)		–	+	+
6	5 (m, p)		–	+	+
6	5		–	+	+
8	7 (m)	6 (-p)	–	+	+
6 (m)	5 (p)		East (*Øst*)		+
0	1 (p)		South (*Syd*)	+	+
1	2 (m)	3 (p)	–	+	+
7	6 (m)		West (*Vest*)		+
8	7[1]	6 (m)	–		+
5	4		?		+
6	5 (p)		?		+
6	5		?		+

[1] Attempted to go to 7, but went to 6.
(*Forsøgte at gå til 7, men gik til 6*).

outside the nest area it did not continue but moved toward the middle. Only in one case (a landing in 4) the urge to continue the direction overrode the centripedal urge, so that it moved to neighbouring nests (3 and 2) in the direction away from the middle.

It will be seen also that material was brought, and proddings made, either at the landing or in the neighbouring nest or in both, and that the bird might even continue to the next following nest where material might be laid and proddings made.

The 31. March. Moist leaves and earth were seen to be carried to some nests, and earth was found in 2, 3 and 4; dry leaves, in 5. No. 3 and 4 were equal in size; next in size came 2 and 5; and then 1 and 6; whereas 7 and 8 had hardly increased since 30. March.

The 3. April. All nests had received dry new material on top of the earth lining, especially 3 and 4 (it had been raining at intervals).

The 4. and 5. April. 10^{15}. Dry material in all nests. No. 3 appeared finished. Loose leaves in no. 4. Pair seen in garden (male had been seen and heard singing throughout the period of daily studies).

The 6.–19. April. Female brooding in 4 with some interruptions. 7. April. 2 eggs seen in 4; 8. April. 3 eggs; 9. April. 4 eggs. 11. April bird seen leaving 4, for the garden. On returning flew to 3, looked into the empty nest, yet began brooding in it (3) for at least 2 minutes.

The 22. April. Two young in no. 4. But 4. May one of them, and 6. May the other one jumped from the nest, and were found dead.

Weighings three years later of nests 2–7 (1 and 8 had been taken by the wind) gave the following results in g in order of the nest numbers: 335, 471, 388, 150, 28, 16. In accordance with the impression conveyed by the figures nest 3 weighs much more than nest 4, although it was nest 4 that had been used (and also visited most frequently during nest building, at least during the periods of observation). The nest weights include the earth contained at the bottoms of nests 2, 3, 4 and 5. In nest 5 there was but little earth. In nests 7 and 8 there was none.

Discussion.

The observations under consideration prove for the nests in question and strongly suggest, that as far as symmetrically arranged multiple nests in general are concerned, the individual nests are not built successively; but several are under construction at the same time. But the observations do not definitely prove that asymmetrically arranged or irregularly situated multiple nests may not be built successively; as has in fact been suggested or asserted (BRUNFELDT and TELLING, 1956, on asymmetrical arrangements in Blackbird; OWEN, 1911 and 1914, on irregularly situated multiple nests in Robin; cf. the quotations by HEMMINGSEN, 1956). The present data arouse suspicion, however, that even such nests may have been under construction at the same time. And tables 2 and 3 suggest that asymmetry may arise if landings from directions perpendicular to the series of nest possibilities are difficult or impossible and access less easy or excluded from one end of the series of nests.

The arrangement of the nests in the same ladders was more asymmetrical in 1955 (HEMMINGSEN, 1956, fig. 1) than in 1956 (figs. 2–5 of the present paper). In 1955 there was actually no possibility of having more than two nests falling off in size to the left of the largest one, because only the inner ladder reached beyond those two nests, the breadth of two ladders being required for a nest site. Also to the right of the largest nest in the extreme assymmetrical arrangement in fig. 2 published by BRUNFELDT and TELLING (1956, fig. 2) there is seen to be for the same reason no possibility of nest sites. The absence of sufficient nest space in the compartments on one side of the largest nests seems thus also to favour the development of an asymmetrical arrangement.

For comparison with a number of earlier reports of multiple nests in this and other bird species we refer to HEMMINGSEN (1956).

DANSK RESUMÉ.

Begivenhedsforløbet ved serieredebygning hos Solsort (*Turdus merula* L.)

I en tidligere oversigt over serieredebygning hos forskellige fugle (HEMMINGSEN, 1956) fremhævedes ønskeligheden af kontinuerlige iagt-

tagelser for at få afgjort, om sådanne reder bygges samtidigt eller successivt. Den ene af forfatterne (A. F. B.) har foretaget sådanne iagttagelser og den anden (A. M. H.) har bearbejdet dem. Et uddrag af iagttagelserne (side 49) viser, at hunsolsorten besøgte sine redeanlæg i en stiges fag (fig. 1–6) tilsyneladende tilfældigt. En nærmere analyse af landingshyppigheden ved de forskellige reder (tabel 1) viser, at den er størst ved de midterste og faldende til begge sider herfor, og at grupperingen følger fejlloven (normal hyppighedsfordeling).

Tabel 2 viser, at når fuglen kom flyvende vinkelret på stigen, så at denne kunne ses tydeligt i hele sin længde, blev midterreden foretrukket. Kom den fra en af stigens ender, var landingen gennemsnitlig nærmere ved denne ende end ved den anden. Besøgene fra jorden eller den modsatte side af stigens ophængning var få og spredte. Tabel 3 viser, at når fuglen begav sig til en naborede lige efter landingen, var det sædvanligvis i fortsættelse af den retning, hvorfra den kom. Og da den sædvanligvis landede på den side af midten, som den kom fra, vil det sige, at den søgte til den nærmest mod midten liggende naborede. Men i et tilfælde, hvor den landede på den modsatte side af den, den kom fra, så at en fortsættelse ville føre den bort fra midten, gik den til naboreden nærmest midten. Kun i eet tilfælde fortsatte den efter at være landet i midterreden til de to næste reder i samme retning, den var kommet, altså bort fra midten. Der blev anbragt redemateriale og pirket i reden enten ved landingen eller i naboreder eller i begge eller endog i en tredie naborede. Jordudforing fandtes i de midterste reder. I den næststørste af de midterste reder lagdes 4 æg og udrugedes 2 unger (der omkom), idet fuglen dog også blev set ruge mindst 2 minutter i den tomme, største rede.

Successiv serieredebygning med asymmetrisk eller uregelmæssig fordeling af rederne med hensyn til størrelse er angivet af henholdsvis Brunfeldt og Telling (1956) og Owen (1911 og 1918). Men nærværende materiales tabel 2 og 3 tyder på, at i hvert fald assymmetrisk redefordeling kan opstå, hvis landingen vinkelret på rederækken er vanskelig eller umulig og adgangen vanskeligere eller udelukket fra den ene ende af rækken. Og en betragtning af stigeanordningen i figurerne hos Brunfeldt og Telling (1956) og Hemmingsen (1956) tyder på, at en asymmetrisk fordeling også kan begunstiges af mangel på redeplads i de »narrende« stigefag på den ene side af de største reder.

References.

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Brunfeldt, K. and Telling, K., 1956: Ejendommeligt redebygningsfænomen hos Solsort (*Turdus merula* L.). (Peculiar phenomenon of nest building in Blackbird). – Dansk Ornith. Foren. Tidsskr. **50**, p. 177–178.

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MINDRE MEDDELELSER

Rød Glente (*Milvus m. milvus* (L.)) som overvintrende i Danmark.

Den 22. december 1958 iagttog jeg en Rød Glente (*Milvus milvus*) ved Farstrup, Nordvest-Fyn. I ca. 15 min. havde jeg fuglen under observation. Under fourageringen foretrak den lavtliggende engarealer samt græs- og brakmarker, og undgik øjensynligt de pløjede marker. Den slog ikke ned, mens jeg iagttog den. Fuglen lod sig flere gange let iagttage i en afstand af ca. 50 m. En gang kredsede den rundt, i knap 1 min., 20–30 m over hovedet på mig, hvorved jeg havde rig lejlighed til at konstatere dens typiske artskendetegn. Da jeg desværre ikke var i besiddelse af kikkert, kunne det ikke med sikkerhed afgøres, om det drejede sig om et ungt eller gammelt individ.

Ca. 7. januar 1959 iagttog en erfaren jæger, hr. AXEL DYBMOSE, en Rød Glente ved Rue Mose (Kulemose) 3,5 km SØ for Farstrup. Det har sandsynligvis været den samme fugl, jeg så den 22. december. I samme tidsrum har enkelte andre af egnens beboere ment at have set Glenten.

Rød Glente er såvel her i landet som det øvrige Skandinavien en trækfugl, der om efteråret som regel ikke ses efter primo oktober. Den overvintrer i Middelhavslandene. Såvidt jeg har erfaret, er denne forekomst det første tilfælde af overvintrende Glente i Danmark. I vor ornithologiske hovedlitteratur er der således ikke nævnt noget om vinteriagttagelser. Fra 1938 foreligger der dog en meget sen forekomst af Sort Glente (*Milvus m. migrans* (L.)), idet skovrider, dr. phil. V. HOLSTEIN så en trække mod syd over Jægerpris den 29. november. (D.O.F.T., **47**, 1953, p. 203).

Det er i øvrigt meget interessant, at der også fra Sverige foreligger en iagttagelse fra vinteren 1958–59. Fil. lic. G. OTTERLIND meddeler mig således (*in litt.*), at hr. ROLF HANSSON så et eks. af Rød Glente nær Harlösa i Skåne den 14. januar 1959. Og »Vår Fågelvärld«s redaktør tilføjer: »Det är det enda fynd, jag kan erinra mig från vintertid. Av *M. migrans* känner jag ej något vinterfynd.«

Fra Norge meddeler museumsdirektør, cand. real. H. HOLGERSEN mig venligst følgende (*in litt.*): »Den sorte glente er aldri påvist i Norge, og den røde er meget sjælden. Den har ruget, men er i dette århundre bare iakttatt noen ganske få ganger: Mandal 2. august 1906, Ytre Rendalen 2. august 1926, Sola (Jæren) 9. august 1957, og så det eneste