

DWARF AND GIANT EGGS OF EIDERS *SOMATERIA MOLLISSIMA*

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Uit de nalatenschap van Kees Swennen — Na het overlijden van Kees Swennen in het voorjaar van 2020 (Spaans 2020¹) stonden de nabestaanden en vrienden voor de taak om de nalatenschap door te nemen. Hierin bevonden zich, naast zijn bibliotheek, veel aantekeningen en andere ‘overblijfselen’ van zijn veelomvattende wetenschappelijke werk. Tussen de stukken troffen wij twee vrijwel afgeronde manuscripten aan. De inhoud hiervan is voor lezers van *SULA* interessant: het gaat om een stuk over het voorkomen van dwerg- en reuzeneieren bij de eider en een stuk over leeftijdsbepaling van eiders in vrouwtjeskleed in het veld. Het eerste stuk, hieronder integraal afgedrukt, is niet alleen interessant vanwege het beschrijvende aspect (het voorkomen van afwijkende eieren), maar vooral vanwege de bijzondere link met een bepaald cohort, de eidervrouwtjes die in 1977 waren uitgebroed. Over de oorzaak wordt kort gespeculeerd en helaas krijgen we geen duidelijke informatie of die vogels jaar na jaar afwijkende eieren bleven produceren. Dat zou wel moeten, gezien de aanname dat deze vogels wegens een slechts start in 1977 ‘permanently sterile’ zouden zijn geworden. Ik heb het stuk in perspectief proberen te plaatsen door de resultaten te vergelijken met een later verschenen overzicht van het voorkomen van dwergeieren bij waterwild (Mallory *et al.* 2004), maar Swennens manuscript vormde tevens de inspiratie om te komen tot een eenvoudige analyse van eigen gegevens van een andere schelpdiereter, de zilvermeeuw, eveneens in *SULA*. Daarbij vergelijk ik het voorkomen van dwergeieren (werkelijke ‘reuzeneieren’ zijn nog niet gevonden) met het voorkomen daarvan bij de sympatrisch nestelende kleine mantelmeeuw over een periode van vijftien jaren (2006-2020). Achterliggende vragen zijn of er bepaalde individuen of jaarklassen aanwijsbaar die om welke reden dan ook meer dwergeieren hebben geproduceerd, en hoe beide soorten zich wat dit aspect betreft tot elkaar verhouden.

*When Kees Swennen passed away in the spring of 2020 (Spaans 2020¹), his family and friends were facing the task to go through his scientific legacy. Two nearly completed but hitherto unpublished manuscripts were found, addressing topics of interest to readers of SULA. Below is the first, reproduced as it was found, except for some minor editorial changes. It reports on the occurrence of dwarf and giant eggs in the Eider and it is interesting, not only because of the descriptive aspect, but because of the supposed link with a certain cohort: hatchlings of 1977. There is brief speculation about the cause and unfortunately we do not get information on whether the birds as adults continued to produce abnormal eggs year after year, which they should, given the assumption that these birds were ‘permanently sterile’ due to a bad start. I tried to put this in perspective by comparing the results with the publication of Mallory *et al.* (2004). Swennen’s manuscript was also the inspiration to arrive at a simple analysis of my own data from another shellfish eater, the Herring Gull, also published in SULA. I compare the occurrence of dwarf eggs (actual ‘giant’ eggs have not yet been found) with the the occurrence of this in the sympatrically nesting Lesser Black-backed Gull over a period of fifteen years (2006-2020). Underlying questions are whether there are certain individuals or year classes identifiable that for whatever reason have produced more dwarf eggs, and how do the two species relate to each other in this respect.*

Kees Camphuysen, Texel, september 2020

¹ Spaans A.L. 2020. Dr. C. Swennen (1929-2020) overleden. *Limosa* 93: 103-104.

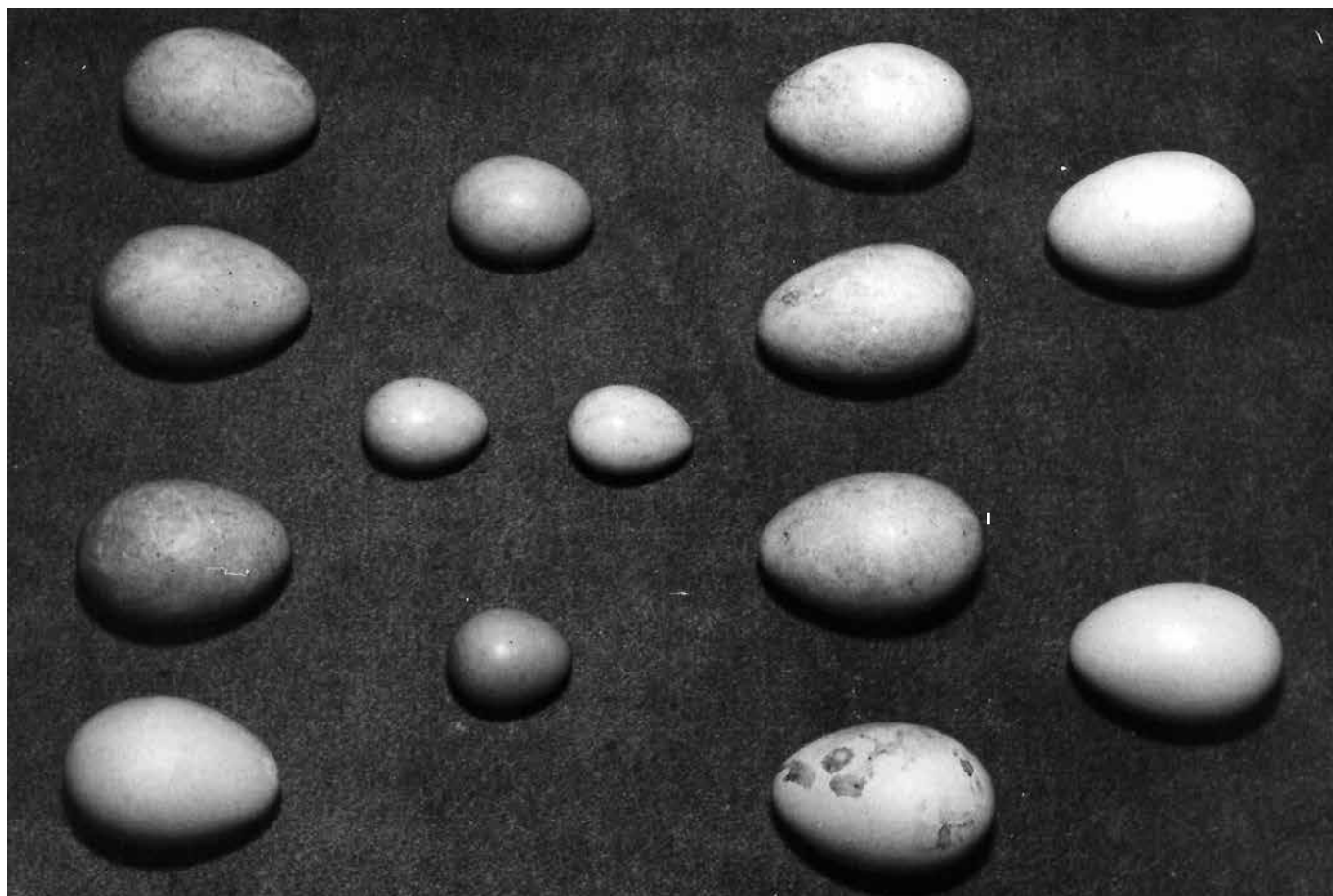


Figure 1. Normal and dwarf eggs of Eider collected on Vlieland, The Netherlands, 1963-1992. Left and right normal clutches (4 and 6 eggs respectively), centre (from top to bottom) one dwarf egg from a four-egg clutch, two dwarf eggs from a five-egg clutch, and the egg of a Pheasant *Phasianus colchicus* found in an Eider nest. Photo: Bert Aggenbach *Normale eieren en dwergeieren van eiders, verzameld tussen 1963-1992 op Vlieland. Links en rechts liggen normaal gevormde eieren (4 en 6), in het midden van boven naar beneden een dwergei uit een vierlegsel, twee dwergeieren uit een vijflegsel, en een fazantenei dat in een eidernest werd gevonden.*

I checked the nest contents of Common Eiders *Somateria mollissima* in the colony on Vlieland (about 53°N, 5°E) during the ringing of breeding females from 1963 to 1992 inclusive. During these thirty years, I noted two types of abnormal-sized eggs: giant eggs and dwarf eggs. One extremely large egg (95.0 x 59.1 mm, with a volume of 173.0 cm³) was found in May 1970. It contained two small embryos and yolks. The other four eggs in the nest had normal sizes. The length, breadth and volume of this giant egg were 22%, 15.3% and 66.3%, respectively, larger compared to an average egg (77.8 x 51.3 mm, 104 cm³; Swennen & van der Meer 1992).

Dwarf eggs were more common. Of the eggs observed during this study, 0.18% were dwarf eggs (number of nests checked (table 1) times mean clutch size (4.74; Swennen 1983)). Dwarf eggs occurred in three periods (table 1). In the first period 1963-1964, I saw five dwarf eggs in different nests: one among three normal eggs, twice one among four normal eggs and two among five normal eggs. Moreover, in 1963 and in

Table 1. Occurrence of dwarf eggs of Eiders in the Vlieland colony. *Dwergeieren in eidernesten op Vlieland.*

period	number of dwarf eggs (n)	nests checked (n)
1963-1964	5	746
1965-1981	0	2830
1982-1988	49	2213
1989-1992	1	584

1964 a dwarf egg was found by other observers (Spaans & Swennen 1965). The mean size of these dwarf eggs was $49.7 \pm 4.0 \times 36.4 \pm 3.0$ mm, with a mean volume of 33.9 ± 8.8 cm³. This volume is only 32.6% of that of normal eggs. In the third period, the clutches contained 1-3 dwarf eggs and no normal eggs. The dwarf eggs were even smaller than of the first series. One was remarkably narrow, measuring 57.38×30.43 mm. The shape of the others was normal to spherical. They had a length of 36.8 ± 4.6 mm (25.4 -43.8 mm), a breadth of 24.7 ± 1.9 mm (20.1 -29.9 mm) and a volume of 12.1 ± 3.5 cm³ (5.2 -15.1 mm³). This volume is only 11.6% of normal eggs. In the fourth period only one dwarf egg was found. Like in the first period, it was in a clutch of four normal eggs. The size of this dwarf egg was also within the range of the dwarf eggs from the first period. The female was unknown, but egg and situation were different from the second period.

The dwarf eggs were highly dissimilar in size. Most of them had some grains of chalk on the shell, especially on the end parts. All dwarf eggs contained only albumen and no yolk. Frequently, a small dark-coloured particle was found in the albumen of the dwarf eggs; a piece of yolk or an oocyte? Nothing is known about the females producing dwarf eggs in the first period. During the third period, eleven females were caught, some of them in more than one year. Without exception, they appeared to have been ringed as duckling on Vlieland in 1977. Of the ducklings ringed in that year, I found twelve birds breeding in later years. Only one of this cohort produced normal clutches, the eleven others laid only dwarf eggs. Each year, about ten to fifteen year classes of females were breeding according to the retraps of ringed ducklings. Only the females of the 1977 year class appeared to produce dwarf eggs. The year class 1977 had suffered high losses in the duckling phase due to diseases (Swennen *et al.* 1979). Therefore, it seems possible that a disease may have left most of the survivors permanently sterile. The hormonal state of the females producing dwarf eggs did not seem to be influenced, as they made a nest, shed their down in the nest, laid (sterile, abnormal-sized) eggs, which were incubated for several weeks. Dwarf and giant eggs are described of several species of birds, but for the Eider I found only records from Iceland (Gudmundsson 1932).

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SAMENVATTING – AFWIJKENDE EIDEREIEREN

Kees Swennen controleerde van 1963 tot en met 1992 de nestinhoud tijdens het ringen van eiders in de kolonie op Vlieland. Soms trof hij daarbij reuzeneieren of dwergeieren aan. Dwergeieren kwamen vaker voor (0,18% van de gecontroleerde eieren) dan reuzeneieren, maar alleen in de tijdvakken 1963-64 (5x), 1982-88 (49x) en 1989-92 (1x). In 1982-88 ving hij elf broedende vrouwtjes die dwergeieren hadden geproduceerd; zij waren zonder uitzondering in 1977 als kuiken op Vlieland geringd. Van dat cohort zijn twaalf vogels broedend teruggevonden en slechts een daarvan produceerde normale legfels, terwijl alle andere vrouwtjes alleen dwergeieren produceerden. Dat de jaarklasse 1977



bijzonder was, zou het gevolg kunnen zijn van de slechte start die overlevende kuikens in dat jaar hebben doorgemaakt (ziektes veroorzaakten een hoge sterfte onder de kuikens), als gevolg waarvan de meeste overlevende vogels misschien steriel geworden zijn.

C. Swennen, voorheen Texel

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Postscript — Dwarf eggs occur in clutches across a wide variety of bird species (Ingersoll 1910, Jacobs 1898, Mulvihill 1987). Mallory *et al.* (2004) surveyed the natural frequency of occurrence of dwarf eggs in wild nesting ducks, geese and swans. Of just over half a million eggs examined, 215 were dwarf eggs, yielding a frequency of 0.04%. They occurred at about four times this frequency (0.156% in 21,832 eggs) in a museum oological collection, demonstrating how biased museum collections can be. Dwarf eggs were not significantly more common within any taxonomic group among wild waterfowl, and their occurrence was not related to the mean clutch size of a species or to whether waterfowl exhibited regular conspecific nest parasitism. Cavity-nesting waterfowl had lower incidences of dwarf eggs than ground-nesting species. This study represents the largest recent examination of the occurrence of this anomaly in eggs of wild birds and is consistent with the hypothesis that dwarf eggs result from a temporary impairment of the reproductive tract. This may explain why dwarf eggs occur in all bird species studied.

For Common Eiders, Mallory *et al.* (2004) reported a dwarf egg frequency of 0.05% (12 in 22,391 eggs examined in the field over twenty years), and 0.19% (1 in 522 eggs examined) for all studied museum collections combined. This puts the frequency of Swennen (in fact 0.18% rather than his reported 0.2%, or 3.6x the frequency reported by Mallory *et al.* (2004) in an interesting perspective. Only in 1965-1981 not a single dwarf egg was reported from Vlieland, despite the check of 2830 nests (~13,414 eggs; table 1 in Swennen's paper), and the most recent period yielded a 'normal' frequency: 0.04% in 1989-92 (n=2768 eggs). In the other periods, however, the frequency was considerably higher than reported by Mallory *et al.* (2004): 0.14% in 1963-64 (n= 3536), 0.47% in 1982-88, n=10,490). The latter is even a 2.5x higher frequency than reported for museum collections. So, even without the 1977 cohort, an elevated frequency in dwarf egg occurrence was found in the early 1960s. It would be tempting to relate this result to the dramatic effects of chlorinated hydrocarbon insecticides on several waterbird species in the western Wadden Sea in early 1960s: incubating female Common Eiders were struggling even just for adult survival at the time (Koeman 1971, Koeman *et al.* 1968) and in 1964 and 1965, each year, around 30% of the total number of breeding females died (Koeman *et al.* 1972).

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