

The display flights of Shelduck

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Display flights have been described for various species of Anatidae, but the flights of Shelduck *Tadorna tadorna* have not been noted. Aerial pairing displays are most frequent in May, with the greatest volume in the first half, although I have also seen them in other months, particularly February and March. As with dabbling ducks, displays centre on a single female and involve varying numbers of males; up to eight have been observed in North Kent, but larger numbers may occur. Flights usually originate when an unpaired female rises from a fresh water fleet or pool where she has been 'attended' by a number of unpaired males. She then leads the group in wide circles over the marsh in a flight which has two main phases. Initially the female often twists and turns violently, darting into a new direction or diving steeply. The males follow as closely as they can and try in turn to fly alongside her. For a short time one will achieve this position, but then she veers away and another male then attempts to 'close'. After this rapid fighting, or sometimes between periods of it, a slower and much more graceful display occurs. The group circle and swing leisurely using regular flapping flight interspersed with periods of gliding on characteristically set wings. The 'cranked' wings are held very much like those of gliding geese with the tips hanging vertically downwards and the primaries quivering slightly. As a party of gliding birds swing overhead a subdued running note 'arnk, arnk, arnk' can some-

times be heard from the female, accompanied by an infrequent chorus of soft clear whistles from the males. The vocalization is strongly reminiscent of aerial courtship flights in Wigeon.

Single, unpaired males often fly up to join in aerial displays whilst others sometimes 'drop out', planing back to the marsh in a leisurely way. Flights of up to six minutes duration have been recorded. All the females involved have been sub-adult: flights are characteristic of the non-breeding gatherings and are a major part of the pairing displays (see also Hori, *Ibis* 106: 333-360, 1964).

Pairing display flights have to be distinguished from sexual pursuits of mated females which also occur at this period. In the latter unmated males, predominantly sub-adults, attempt to break up established pair bonds; such attempts often attract further unmated males and violent aerial pursuits can result. However, these never contain the 'gliding phase' and vocalization described above, whilst the aggressive nature is quite distinct from the 'darting' phase of the display. Further, the mated male invariably defends the pair bond, clashing with other males in mid-air and driving them off. When a single male attempts to break into a pair bond the flight is strictly comparable with 'three-bird flights' of Mallard and Shoveler (Hori, *Wildfowl Trust 14th Ann. Rep.*: 124-132, 1963); the behaviour of the participants is very close to that of Shoveler.

Wildfowl and wildfowling in Bulgaria

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Summary

Bulgaria is not very important as a breeding place for wildfowl, because it is too far south, but large numbers stop there on passage in autumn and early spring and considerable numbers remain through the winter in milder years. The drainage of marshes has greatly reduced the habitat available and the construction of hydro-electric reservoirs has done little to offset the losses. The number of wildfowling in Bulgaria has risen from 36,000 in 1939-40 to 68,000 in 1945-46 and 100,000 in 1964. The kill has fallen from 128,000 ducks and 11,000 geese in 1939-40 to 126,000 ducks and 12,400 geese in 1945-46 and to only 25-30,000 ducks and 4-5,000 geese annually at the present time. In efforts to restore the position the shooting season has been shortened - it is now 1st September to 25th March - and a bag limit of ten ducks and three geese introduced. Further restrictions may be necessary, in conjunction with efforts in other countries. Shooting techniques are described. The keeping of Ruddy Shelduck in semi-domestication was formerly widespread, but the species has decreased greatly.

Only five species nest regularly in Bulgaria: the Greylag Goose, Mallard, Garganey, White-eye and Red-crested Pochard. The Greylag has decreased seriously and none of the others are increasing.