

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.

'After the autumn equinox birds migrate from Pontus (i.e. the Black Sea provinces) and from the colder countries, wishing to escape the approach of winter. Some of them wander into neighbouring countries, but others make for more distant lands. After the spring equinox the birds return, on account of their fear of the heat. The cranes, for example, fly from the plains of Scythia (i.e. from the direction of the Dobrudja) to the marshes of upper Egypt and from there towards the sources of the Nile. The Pelicans also change their abode. They come from Strimon (Struma) to the Danube, where they rear their young. . . .'

Thus Aristotle, more than twenty-two centuries ago, sketched in broad outline the picture of the migration of birds through Bulgaria. Because of its southerly situation (the northernmost point is on latitude $44^{\circ}12'30''$ and the southernmost on latitude $41^{\circ}14'$) and its position near the warm Mediterranean shores, Bulgaria is a land preferred for migration by many species nesting in the North. On account of its close proximity to the shores of the Aegean Sea, the presence of the 'backbone' of the Balkan Peninsula, the Stara Planina massif, which keeps it sheltered from the cold north winds, and of its immediate contiguity with the Black Sea, which also has a moderating effect on the winter, Bulgaria is not very cold, in spite of the fact that, to a considerable extent, the Rodope Mountains stop the warm south winds. Almost the whole of northern Bulgaria and the greater part of the mountainous areas have a mean January temperature below 0°C . The 0°C isotherm embraces eastern Bulgaria, but the larger areas of southern and central Bulgaria and also the Black Sea coast have a mean January temperature above 0°C . The valley of the Struma and the Pirin district have a mean January temperature above 2°C and the southern part of the Black Sea coast, the part beyond the Strandja Mountains, has a mean January temperature above 3°C . Only on the peak of Mussalla in the Rila Mountains is the mean January temperature as low as -11°C . If we compare these data with the biological requirements for the wintering of waterfowl, it can be seen that Bulgaria presents itself as a suitable annual wintering place, particularly upper Thrace, sheltered as it is from the winds, and also the regions by the Black Sea. As is well known, in Eastern Europe the -6°C January isotherm forms the eastern limit for occasional wintering of some ducks, but for the majority of species the -2°C January isotherm serves as the effective boundary of their winter range.

This boundary is determined mainly by the availability of unfrozen water where the birds can find food, and partly also by whether there are places for roosting (Bobrinski 1951). On the assumption that, on the way to their winter quarters, birds need places that are ecologically favourable to them, then even up to the present day Bulgaria really answers to their biological requirements.

In the Sofia district the appearance of wild ducks and geese depends on the climatic changes. A cool and rainy spring usually holds back the migrants. In the event of a deterioration in the weather, particularly if it turns cold in early spring, the birds that are on their way north turn back. Few large flocks winter for long by the Danube. They prefer the lakes of the Black Sea coast and the water meadows by the rivers in south Bulgaria, particularly in Thrace. Among the Sofia shooters there is a belief that when the 'Serbino' (as they call the west and south-west winds) blows, it blows the birds away to the east and then the migrants hardly ever land. On the other hand, when the 'Rumunetso' or 'Krivetso' (i.e. 'oblique wind', because it comes from the north-east, from the direction of Rumania) blows, it pushes the migrating flocks into the Sofia district and then good shooting is expected. But if the 'Moryak' (the 'seaman') or 'damp wind' blows from the south or south-west and brings the warmth of the Mediterranean Sea and thaws the ice, the migrants are expected to pass quickly through from south to north almost without stopping, since the weather is improving and it is warm.

Conservation problems

In the past Bulgaria was even more favourable for migration. The flooded areas formed by the overflowing of the rivers in their lower reaches (particularly the tributaries of the Danube and of the Maritsa and the rivers flowing into the Black Sea) and the many lakes and marshes formed a diverse and variegated landscape, which understandably lured the migrants into calling here twice a year. And since most of these expanses of water were well overgrown with hygrophytic vegetation, which provided the birds with cover in the breeding season, a variety of waterfowl nested in this country, in numbers undoubtedly greater than today. These lakes and marshes mainly originated in the Quaternary age, when subsidences of the earth took place, giving rise to depressions of various sizes. At the beginning of this century the map of Bulgaria still showed 29 large Danubian marshes, 18 large lakes and

marshes situated along the Black Sea coast and 11 in the interior of the country. Most of them have been drained through the necessity to reclaim new agricultural land and in the battle against malaria. Some of them were very large, like the Straldja Marsh in the eastern part of the plain of Sliven. This marsh, on which pelicans, swans, etc. nested, had an area of about 35 sq. km. and was over four metres in depth. Others were situated on mountain plateaux, like the Dragoman Marsh, where many wild ducks nested. Some of the marshes, such as the Batak Marsh in the Rodope Mountains, on which cranes used to nest, still exist, but not in their original state. The Mandra Marsh has been altered and the White Pelicans, which up to thirty years ago nested there, have been banished. Now they visit it only sporadically in large wandering flocks. The draining of some of the lakes in the eastern part of the country is envisaged in connection with the increased construction of holiday resorts. This could deprive us of the last suitable places of refuge where some interesting species of wild ducks and geese still nest. These are also essential resting places for waterfowl, following the line of the Black Sea migration route.

Three of the breeding places of marsh and water birds still existing in the last ten years, the Pomorie Marsh, the Mandra Marsh near Burgas and the inner part of Lake Varna (the part not made salty by the channel to the Black Sea) are not nature reserves. Only the Sreburna reserve, in the Silistra district near the Danube, is protected by statute on account of the Dalmatian Pelicans and other marsh birds nesting there. However, it has been cut off from the Danube by the draining of the connecting channel and this prevents the water from being renewed and so hastens its choking up and eventual doom. We hope that, thanks to the co-operation of the International Council for Bird Preservation, we will be able to join in the M.A.R. scheme to make possible the provision for the future of more suitable places for the nesting and resting of waterfowl.

At the present time a great hydroelectric construction programme is being carried out. Over 23 large reservoirs with areas of over 1,000 decares (250 acres) have been built. For example, the Isker Reservoir near Sofia alone has an area of about 30,000 decares (nearly 12 sq. miles) and the water held back forms a huge lake fifteen kilometres long. A few hundred small reservoirs and fish ponds have also been built. Unfortunately, for waterfowl these enticing expanses of water constitute almost aquatic deserts. The inconstancy of the water level,

which varies very much, produces a changing shore line unsuitable for the dense growth of water-loving vegetation in which the birds could hide and nest. Also the food supply in these reservoirs is too poor for them to attract ducks except as roosting places. Nevertheless the presence of these reservoirs, particularly in western Bulgaria, continues to support the migration route which passes through the western part of the country.

The improvement and enrichment of the lakes with plants that are preferred by wildfowl during the moult (e.g. with *Vallisneria* sp., Water Chesnut *Trapa natans*, Duckweed *Lemna lemna*, Wild Rice *Zizania aquatica*, etc.) has not yet been attempted in Bulgaria, nor have biotechnical measures for assisting nesting, such as the preparation of artificial nesting boxes, either floating or standing on piles, and the creation of other suitable nesting places for ducks, been applied. There are, however, limitations on the gathering of reeds, the stalks and leaves of which are used to produce various woven articles and rough matting. Where this gathering is necessary, periods in the autumn and winter are set aside for it, so that it does not hinder the settling of the birds in the spring. The former savage burning of the dry reeds in early spring is now strictly forbidden, but the clearing from the banks of the lakes of the salt-loving and sand-loving vegetation with a view to improving the numerous holiday resorts, as well as the already increased visits of holiday-makers to the Black Sea coast, have an unfavourable influence on some species, particularly the Shelduck *Tadorna tadorna*. The cutting down of the old hollow trees which contained suitable nesting holes and in general the reduction of the old self-sown forests by the shore restricts both *Tadorna tadorna* and the Ruddy Shelduck *Tadorna ferruginea* in their choice of habitation.

Among the unfavourable factors might also be mentioned the turning of herds of pigs on to the marshes to feed, which undoubtedly has a bad effect on the broods of water birds and waders nesting on the ground. In most of the lakes by the Danube and the Black Sea, fishing is carried out on a large scale and this also disturbs the birds which inhabit those lakes. In spite of the purification plants envisaged for the newly constructed oil refinery near Burgas there is a danger of the oiling of birds by floating waste, particularly on Lake Vaya and Osmanli Bay. Last year we observed the first such fouled birds – a Black-headed Gull *Larus ridibundus*, a wagtail *Motacilla alba*, and wild ducks – and probably their number

will grow. The chemical waste from some factories discharged into the marshes and rivers also has an unfavourable influence on the lower animal life in the water. This necessitates the preservation of other clean coastal marshes, rich in food and protective vegetation, where birds can breed or rest during migration undisturbed.

Unfortunately Bulgaria lies below the southern limit of the breeding ranges of most species of waterfowl. It is definitely included in the breeding ranges of only *Anser anser*, *Anas platyrhynchos*, *Anas querquedula*, *Aythya nyroca* and *Netta rufina*. All the other species may have nested in slightly larger numbers in the past than they do today, but nevertheless it was an uncommon occurrence, and today the nesting of such birds in this country is quite sporadic.

The comparative warmth of recent years is probably a reason for the northward movement of the southern limit of the breeding range of some species and it may be connected with the decrease in numbers of breeding pairs in the southern regions. However the appearance of new more southerly types (particularly Central Asiatic and Mediterranean or birds known to be characteristic of lakes in the Steppes) has not been noticed. For example, the occurrence of the Marbled Teal *Anas angustirostris* has not been established, nor has the nesting of the White-headed Duck *Oxyura leucocephala*, and the numbers of Gadwall have not increased. As for the expansion of the range of the southerly species *Netta rufina*, it began about twenty years ago and there is absolutely no great increase in its frequency in this country nor is it a markedly predominant species. The disappearance of the last scattered and isolated nesting sites of the Greylag Goose *Anser anser* and of *Tadorna ferruginea* probably indicates the unhappy prospect that in the near future these birds will not be in the list of species nesting in this country.

Wildfowling

As in all the countries situated in southern Europe, the Bulgarian shooters are mainly 'consumers' of wildfowl that consists not of local but of migrating birds which are 'despatched' to this country annually from the northern lands - its 'producers'. The number of Bulgarian wildfowlers has almost doubled in comparison with pre-war years, but according to statistical data the number of ducks killed has fallen about five times and of geese two to three times. In 1939-40 there were 36,000 shooters and 128,000 wild ducks and 11,000 wild geese were shot: in 1944-45, with 55,000

shooters, 159,000 ducks and 11,300 geese were shot: and in 1945-46, with 68,000 shooters the figures were 126,000 and 12,400 respectively. At the present time the number of shooters is about 100,000 but only about 25-30,000 wild duck and 4-5,000 wild geese are shot annually. The reason for this decrease lies in the reduction in the number of suitable nesting sites, due to the draining of expanses of water in the lands situated to the north of this country where the birds mostly breed, e.g. the Ukraine, and also in the comparatively long shooting seasons and the lack of limitations on the amount of game taken in many of the southern countries. Unfortunately, in the Middle and Near East the uncontrolled and unlimited shooting of waterfowl continues and hence they become in shorter and shorter supply and the 'duck crisis' worsens. For this reason a severe shortening of the shooting season and the laying down of limits on the size of bags of game taken has recently been necessitated in this country. To each wildfowler a limit of three wild geese and ten wild ducks is allowed. In the 'Scheme of regulations and seasons for hunting in the U.S.S.R.' (1964), which has been issued for discussion, even lower limits have been proposed, which makes the future prospects of waterfowl more optimistic. It is proposed to allow, in one day's shooting, not more than five waders and snipe and only five wildfowl (ducks and geese) in the European part of the U.S.S.R., and up to ten small feathered game and eight waterfowl in the Asiatic part and in the northern regions. The acceptance of these limits would be acclaimed by all countries. In Bulgaria, while the shooting of indigenous game is allowed only two days a week and is not allowed except by groups of at least three people, migratory game (including waterfowl) can be shot on any day of the week and by individuals shooting alone.

Formerly the shooting seasons were very long - from 1st or 15th July (later, from 1st August) to 1st or 15th April. A few years ago new shooting seasons were established in this country - the shooting of wild geese begins on 1st September and finishes on 25th March. We reckon that this season is still too long and that in no case should the shooting season for waterfowl continue after 1st March, in conformity with the recommendations of the I.C.B.P. This proposal is designed to prevent the killing of birds that are preparing to breed, many of them having paired by the middle of March and some having already begun to nest, e.g. Mallard, Ferruginous Duck, and especially the Greylag Goose. This is the way in which

most harm is done to the few remaining birds still nesting in this country. We believe that, when the shooting season for wildfowl has been shortened in Rumania too, it will be even more possible to guarantee an untroubled migration for the birds returning to the North, since this measure has already been taken in the European republics of the U.S.S.R. and in almost all European countries.

The use of waterfowl is mainly for sport. Collecting their eggs is forbidden. The use of their skins is now unknown and even in the past there was only very limited and local use of skins, mainly of grebes *Podiceps cristatus*, etc., for the lining of clothes. The collecting of down from the nests of *Tadorna tadorna* is also unknown now, but for that reason no efforts at all are made to prepare artificial holes in the ground in which it can nest.

It is absolutely forbidden by law to shoot five species: *Tadorna tadorna*, *Tadorna ferruginea*, *Oxyura leucocephala*, *Cygnus cygnus* and *Cygnus olor*.

In Bulgaria wildfowling is only a sport and has no commercial aim. It is forbidden to sell or trade with the birds killed. Only organised shooters have the right to shoot. Even during the Turkish oppression, in a copy preserved in the Rila Monastery of a 'firman' (decree) issued in the town of Edirne (Adrianople) from Sultan Bayazid Hassan II to the Grand Vizier Kara Mustapha Pasha, giving him control of the lands in the Plovdiv province, we read that among the taxes from which he was exempted, besides 'resuli badihava' i.e. the right to breathe air, there was also 'resuli timar' i.e. the right to hunt birds. But with the passing of the first game law of 1880, all game, resident and migratory, were counted as state property and only a recognised hunter had the right to hunt it on payment of a tax. Hunting with special nets called 'purliga', which was carried out here and there, mainly along the Black Sea coast, principally for Quail but also for other migrants too, was limited to two months (from 15th August to 15th October) and a large tax of three gold levs was imposed. Quite soon afterwards this rapacious and commercialised form of hunting was forbidden and forgotten. Among those methods of hunting that are no longer used there are also: hunting with a circular fishing net called a 'serkme' with weights round the edge for Coot *Fulica atra* and Ferruginous Duck *Aythya nyroca*; with a net called a 'vinter' stretched on a hoop and put in the water with a live duck tied up inside it as a decoy; with snares stretched in small channels cleared among the marsh plants where the ducks swim;

and with a bait of worms and a fishing line attached to a stake buried in the ground by the shore. Today these unethical poaching methods are no longer used.

At the beginning of this century the Greylag Goose was so abundant as a nesting bird that the fishermen from Tataritsa in the Silistra district, Dobrudja, killed 40-50 Greylag Geese with sticks during the moulting period and caught about 100 young birds for food. Such devastating raids on the geese continued up to just before the last war. Thus, for example, on 15th July, 1940, when the young geese had already grown almost as large as the parents and the adult birds were moulting, a gang of 70 people caught about 150 Greylag Geese, unable to fly, in the Koykusha Marsh between the villages of Belene and Oresh, again by the Danube. In 1942, young geese with clipped wings were kept in many gardens in the village of Sreburna. These birds had been caught on the neighbouring marsh, which is now a reserve for pelicans and other birds. Now that abundance of geese no longer exists and is already just a quickly fading memory. The Greylag Goose is declining as a nesting bird in this country. Hunting it by the destructive method described above is now strictly prohibited.

Shooting from a 'gyume' is a characteristic method. This is an oriental method of hunting, which formerly was used in Bulgaria only in the region of Thrace, but has now spread to the Sofia district and other places. The 'gyume' is a hut sunk into the earth by the marsh and covered with turf. Since it is almost below the surface of the earth, it looks from above something like an army bunker, merging with the background of the marsh landscape. Inside it is covered with sheet iron so as to be dry and it has a place for a small stove. There is room for two to five people. There are also portable hides, usually with walls of rushes or sticks. These cannot be heated. There are small openings like loopholes directed towards the marsh, or sometimes to all sides, so that one can shoot in various directions. This type of shooting is usually accompanied by the use of 'decoys', hybrids between domestic ducks and Mallard *Anas platyrhynchos*, which have good vocal capabilities and can quack. Rubber or wooden models of wild ducks and the use of silhouettes or whistles are unknown. The decoys are usually arranged in two diagonal lines. If they quack superfluously and without reason, they may be arranged in pairs, so that each male is with a female, when they keep quiet. If they do not quack to lure the wild ducks, some are hidden in the 'gyume' and

then the others begin to call to them. The same result can be achieved if they are arranged in two separate lines, the males in one and the females in the other. The wild ducks *Anas platyrhynchos*, *Anas acuta*, *Aythya nyroca* and, less commonly, *Anas penelope*, *Anas querquedula* and *Anas crecca* respond to the quacking of the decoys. Actually, these latter species land in front of the 'gyume' as much as the former ones, but they stay on one side, are very wary and usually soon fly away. The decoys each have on their legs a ring which is free to turn and to which is connected a cord about a metre long. This cord is tied to a ring fixed to a small stake driven into the ground. In front of each decoy is a pile of earth so that the bird can get out of the water and rest on the little hillock, or else under water there is a stake hammered into the ground and on to it is nailed a board like a little table, on which the bird may rest. The decoys are not fed much so that they are lighter and smaller in size than domestic ducks. They are most often kept with clipped wings, since sometimes when they fly away they do not return.

Shooting with decoys from a 'gyume' is a very deadly method. In the migrating season there are cases of over one hundred birds being killed in one night. For this reason the number of such erections on the marshes is limited. In the Sofia district it is no longer permitted to build new ones, but the existing ones have been left to be used as long as possible.

Having in mind the unsportsmanlike mass-productive nature of shooting wild ducks and geese from a 'gyume', which is contradictory to the ethics of the sport, we reckon every limitation on this oriental method of shooting to be a means of saving a multitude of wildfowl on their return to their homeland.

In antiquity the Ruddy Shelduck *Tadorna ferruginea* was kept in gardens as a favourite decorative bird and as a substitute for a watch-dog, since it gave the alarm on the approach of a stranger. Among discovered fragments of old Bulgarian drawings of various birds, there are some of ducks and some showing stylised forms of geese, which resemble this species. The domestication of the Ruddy Shelduck is a very interesting problem. It was still found here and there in this country until quite recently. In the village of Rousocastro in the Burgas district (1952), shelduck reared together with domestic ducks did not try to escape even though their wings were not clipped. In 1950 in the village of Tyulenovo in the Dobrudja I saw a domesticated shelduck of this kind, which honked on the approach of a stranger like a 'live alarm'.

At the end of the last century a few authors (Reiser, Christovich, Lorentz *et al.*) reported the same phenomenon in the villages along the Danube, in the town of Svishtov and other places. This custom may be due to the spread of Roman influence and may have been preserved through the ages since the Roman era, particularly along the Danube in Rumania and Bulgaria. Some historians suppose that these were the sacred geese kept on the Capitol hill, the cackling of which woke the Romans and saved the old town on the approach of unfriendly forces to attack it.

The Ruddy Shelduck is a much-loved bird in the folklore of the southern Slavs. In Serbian songs it is extolled as the golden-winged 'utva' and in Bulgarian songs as the golden-winged 'shatka'. In one of the Bulgarian folk songs they sing about the hunting of Krali Marco, a feudal lord in western Bulgaria and Macedonia who became a vassal of the Turks after fighting against them. Here is an interesting extract from it:

Krali Marco said to the king,
'Gather your forces and feed your falcons.

Let us go to hunt game.

Let us hunt that wild game,

That wild game, the golden-winged duck'.

For this hunt they are said to have gathered 3,000 soldiers, each with a falcon trained for hunting, and Krali Marco himself had a trained Imperial Eagle *Aquila heliaca*.

They went to hunt game

And passed through a broad plain.

And they reached a great lake.

They saw the golden-winged 'shatkas'.

All the ducks fell to the bottom,

They fell to the bottom of the lake.

They could not find a single one.

A novel from the Bulgarian renaissance at the end of the last century by Tsani Ginchev mentions hunting with falcons for Ruddy Shelduck, Wood Pigeons *Columba palumbus* and Bustard *Otis tarda* in the meadows and flooded places overgrown with willows by the River Yantra. At that time, during the Turkish oppression, only important Turkish administrators and military leaders (pashas, viziers, beys, etc.) went hunting like that with trained falcons. Today that kind of hunting is forgotten, and perhaps soon the Ruddy Shelduck too will be forgotten as a Bulgarian bird. In those days it really did occur there by the Yantra, where Reiser saw it at the end of the last century.

[Editorial note: a second part of this paper, discussing the status of all species of wildfowl known to have occurred in Bulgaria, has had to be held over.]