

## THE DISPLAYS OF THE AMERICAN GREEN-WINGED TEAL

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THE displays of the European race of the Green-winged Teal (*Anas crecca crecca*) have been studied intensively (Lorenz, 1953, 1958; Lorenz and von de Wall, 1960; von de Wall, 1963) but no detailed description has been published for the North American race (*A. c. carolinensis*). Some displays of *carolinensis* have been described (e.g., Sutton, *in* Bent, 1923; Johnsgard, 1955), but in general it has been assumed that the behavior of the two races is identical (e.g., Phillips, 1923; Parkes, 1958). An inventory of *carolinensis* displays is presented here as a basis for intensive studies of pair-formation in this race now in progress. This account is based on observations of both wild and captive birds made at Delta, Manitoba between 1955 and 1963, and analysis of 800 feet of movie film.

The Green-winged Teal has a highly developed "social courtship" ("Gesellschaftsspiel," Heinroth, 1910) in which a number of males swim around a female giving display movements and whistling loudly. As Lorenz has described, many of the behavior patterns have homologues in the Mallard (*Anas platyrhynchos*) but all movements are faster. This paper deals primarily with the displays associated with social courtship and the process of pair-formation. In most cases I have used the names for displays coined by Lorenz.

### DISPLAYS OF THE MALE

*Burp*.—"Krick" Whistle, Lorenz, 1953; "Aufstossen" (Burping), von de Wall, 1963). The head is raised vertically as a loud, liquid *thu* call is uttered. The feathers of the crown are raised and the "mane" on the nape is conspicuous. As the call is given, the feathers of the back and wings are momentarily vibrated, giving the effect of a shuddering motion. Several Burps are often given in succession, the head being raised slightly each time.

In *crecca*, Lorenz (1953) noted that this call is given "in fear when a person is coming near their pen" and he believed that it "combines the functions of call-note and warning." It also occurs frequently as an introduction to social courtship (von de Wall, 1963). In *carolinensis*, the Burp occurs in the same situations. In captives, it became regular as a response to a mild disturbance in March. At times it is given by a paired male when his female is some distance away, and I have seen her apparently respond to the call by returning to him.

*Grunt-whistle*.—This display is performed when the male is broadside to the female, but not very close to her (usually 4 to 6 feet away). One or two rapid Head-shakes precede the display.

The Grunt-whistle consists of a brief rearing up on the water with the head

bent forward in an arc. At the peak of the movement the bill is very rapidly shaken in the water, causing a fine stream of water drops to be thrown up in the air on the side toward the female (Fig. 1). A single, loud, liquid *thiu* followed by a quiet grunting sound accompany the movement. Fast, quiet, cheeping noises, similar to those accompanying Bill-up (see below), have been heard during the preceding Head-shakes.

The Grunt-whistle is usually followed immediately by a Head-flick and a simultaneous Tail-wag, then Head-up-tail-up and Turn-toward-female may be performed. The latter two displays were recorded after forty-five of seventy-three Grunt-whistles.

*Head-up-tail-up* (HUTU) and *Turn-toward-female* (TTF).—These two displays are almost invariably linked together. In forty-eight sequences, TTF was omitted only once; in another instance, a male performed TTF without the preceding Grunt-whistle and HUTU.

The typical sequence occurs immediately after the Head-flick and Tail-wag which follow the Grunt-whistle. Twice I recorded two HUTU + TTF sequences separated only by Nod-swimming.

Like the Grunt-whistle, HUTU is performed with the long axis of the male's body lateral to the female. Suddenly the tail is cocked, the wing-tips rise about 45°, and the head is moved back and upward slightly, the bill resting on the chest. As the wings and tail are dropping back to a normal position the bird executes a rapid right-angle turn to face the female, the head remains in an erect and somewhat backward position and a single clear whistle is given (Fig. 2). This call is not so loud as that accompanying the Grunt-whistle.

*Bill-up*.—"Chin-lifting," Lorenz, 1953). The head is tucked deep "in the shoulders," the bill points up to a varying extent (at times perhaps as much as 45° from the horizontal), and chattering notes are given (Fig. 3). Very rapid lateral Head-shakes are often performed from the Bill-up posture.

The degree of up-tilting of the bill and the characteristics of the calls are variable. Bill-up is closely associated with overt hostility between males and the intensity of the display appears to be correlated with the proximity of the birds in question. The speed and pitch of the chattering increase until the quality of the noise changes to a series of very rapid whistles *pepepepepepe* . . . as the distance between the two birds decreases.

*Down-up*.—As von de Wall has noted in *crecca*, Down-up is preceded and followed by Bill-up, both displays occurring especially when hostile males approach one another closely. The tail and rear end of the body are suddenly raised high in the air and at once lowered again (Fig. 4). The movement is accompanied by a series of three rapid whistles.

*Nod-swimming*.—This is not highly ritualized as it is in the Mallard; the head is merely moved forward and back, with varying degrees of intensity, as



FIG. 2. Turn-toward-female. The tail and wings are being returned to their usual positions after the Head-up-tail-up.



FIG. 3. Bill-up by male on left and male in right foreground.



FIG. 4. Two males perform Down-up. The bird on the left is close to the peak position, the one on the right is past the peak.





FIG. 5. A male performs Turn-back-of-head as the female swims toward him.

FIG. 6. Bridling.

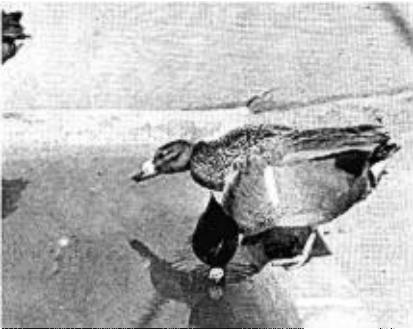
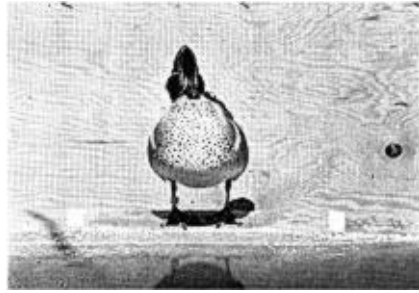


FIG. 7. Male gives Bill-dip while standing stiffly with his body in a deliberately lateral position to the female. The female is paired to this male as shown by the threatening component of Inciting which is being directed toward another nearby male.

FIG. 8. Male performs ritualized Preen-behind-wing.



the bird swims. Jerky swimming movements of this type are often performed as a male in a courting group maneuvers, avoiding other males and apparently trying to get into a favorable position to perform a display oriented at the female. The duration of a bout of Nod-swimming is variable and the activity appears to "punctuate" a period of social courtship, bridging many of the gaps between Shakes, Grunt-whistles, etc.

*Turn-back-of-head.*—The male swims in front of the female holding his head in such a position that the nape is directed at the female (Fig. 5). Often this display follows the Grunt-whistle + HUTU + TTF sequence but it can also occur independently.

*Bridling.*—This display is performed on land, although the female to which the male aligns himself laterally may be swimming nearby. First a Shake is given and, during the Tail-wag which regularly follows, the head is moved backward quite slowly, the chest protruding forward, and while in this posture a single whistle is given (Fig. 6). The long axis of the head is slightly off center, the head being moved to the side farthest from the female.

I can find no record of the postcopulatory display of *carolinensis* and I have not seen it. In *crecca*, the male gives a single Bridling movement (von de Wall, 1963; personal observation).

*Shake.*—Males perform body-shakes, both on land and while swimming, in a position lateral to the female. Some Shakes are isolated, but many immediately precede other displays, notably Drink, Bridling, and Belly-preen. These Shakes are similar to normal comfort movements, but sometimes they appear to be slightly exaggerated.

The term "Introductory Shaking" (Lorenz, 1953) is not entirely appropriate for this species. Shakes can occur at the beginning of a period of social courtship but they also occur at other times in the bout.

*Head-shake.*—Rapid lateral Head-shakes are given singly and they are also linked to certain other displays (see Grunt-whistle, Bill-up).

*Head-flick.*—This rapid head movement, involving a rotary component, occurs independently and also in association with the Grunt-whistle and Wing-flap.

*Bill-dip.*—The bill is briefly dipped in the water (Fig. 7). This movement does not appear to be rigidly linked with other displays, but several times it was noted in association with Preen displays.

*Drink.*—Drink is given as the male swims or stands at the edge of the water, his body being deliberately turned broadside to the female. The movement is similar to normal drinking but perhaps the up-tilting of the head is slightly exaggerated.

Sometimes Drink is immediately preceded or followed by another display. The following associations were noted (number of records in parentheses):

preceded by Down-up (1), Head-flick (1), Wing-flap + Head-flick (1), Belly-preen (2), Shake on land (4); followed by Preen-dorsally (3), Preen-behind-wing (1), Shake on land (1).

*Preening.*—Three preening movements appear to be ritualized: Preen-dorsally, Belly-preen, and Preen-behind-wing (Fig. 8). These are all performed as the male stands or swims with his body lateral to the female. Preen-dorsally is common in swimming birds but Belly-preen is given only on land. Belly-preen is usually preceded by a Shake; sometimes the preening movement is repeated rapidly a number of times, the bill touching the belly each time.

Nonritualized preening movements on other parts of the body may follow Preen displays and it is often difficult to distinguish between the two types.

*Wing-flap.*—This is also given with lateral orientation to the female but it does not differ strikingly in form from the normal comfort movement.

*Jump-flight.*—In social courtship groups, males perform short flights a few yards in length. Some are similar to the Jump-flights of the Mallard and Shoveler (*Anas clypeata*) but, as Lebreton (1958) noted in *crecca*, they are less obviously ritualized. Other flights seem to be merely avoidance responses resulting from a chase by another male.

*Multi-syllabled Whistles.*—These are heard constantly from males in social courtship groups. The calls associated with the Burp, Grunt-whistle, Head-up-tail-up, Down-up, and Bridling add to the chorus. A variety of calls (generally 3- or 4-syllabled, e.g., *te tiu te, te tiu tu tete*) are given without accompanying body movements and the bill is not opened conspicuously as it is during display movements (e.g., Fig. 2).

*Pre-copulatory Pumping.*—Pre-copulatory Pumping, involving vertical movements of the head, is similar to that of the Mallard and many other species of *Anas*. Many times I have seen these movements performed by both members of a pair but mounting has not followed.

#### DISPLAYS OF THE FEMALE

*Inciting.*—Inciting is similar to that of the Mallard, involving highly ritualized, sideways threatening movements (Fig. 7). After each pointing movement, as the head is moved back toward the body, a rapid, harsh, rattling call is given, higher-pitched than in the Mallard. As in other ducks, this display shows (to the observer and presumably to all males present) the female's attachment to one male and her rejection of another. Its performance is usually an indication that a pair-bond has been formed.

*Shake.*—Shakes are given by females during social courtship on the water and perhaps these should be regarded as displays.

*Nod-swimming* of the same type as that given by males occurs during social courtship.

*Preen-behind-wing*.—Once I noted a female giving a Decrescendo call, then she performed a Preen-behind-wing display and as her mate swam up she Incited beside him.

*Decrescendo*.—This call usually contains 4 to 7 distinct notes, the first being longer and higher-pitched than the others. It is usually distinguishable from the Decrescendo of the Blue-winged Teal (*Anas discors*) by its squeaky quality.

I have seen the male of a pair react to his mate's Decrescendo by swimming toward her. At other times, however, a female will give the call as her mate stands beside her. Captive Green-winged Teal females gave Decrescendos in May when this call is rarely heard from Blue-winged Teal.

*Loud, Repeated Quacks*.—On the wintering grounds in Louisiana in March, the female of a pair gave a series of evenly spaced, grating quacks in flight. In Manitoba, similar series of calls were heard from birds on the ground in late May and early June, the notes being very loud, harsh, and quite high-pitched. Similar calls were given also by a captive female when she was introduced into a pen containing a group of males in early May. This bird gave bursts of squeaky quacking for several hours, while intense social courtship ensued.

#### SOCIAL COURTSHIP

Captives held overwinter in the Hatchery Building at Delta engaged in social courtship from the first week in February until mid-June. I have also seen apparently fully developed social courtship in an outdoor pen on a mild day in early October. In *crecca*, Lebet (1961) records it as early as 10 August, but in Holland he did not see it regularly until November while von de Wall (in litt.) believes that social courtship begins in September and continues throughout the winter. In the wild, the activity probably continues throughout fall, winter, and spring in *carolinensis* also. Social courtship groups are commonly seen in Manitoba during the spring migration in April. Most of these parties contain less than ten males, but once I saw a group of twenty-five males around a single female. In mid-March, virtually all Green-winged Teal I observed at the Rockefeller Refuge in Louisiana were paired and presumably the groups seen in Manitoba form around females with weak pair-bonds. Although paired males will leave their mates to join a social courtship group, most members of these groups appear to be unpaired males.

A social courtship group can be detected very easily by the loud and often continuous whistling calls of the males, audible for at least a half-mile in calm weather. The activity of the group is incessant, the males circling around the female, performing displays, chasing, and avoiding each other in a bewilderingly complex pattern of interactions.

Most male displays are performed with obvious relationship to the position of the female. Shake, Wing-flap, Burp, Grunt-whistle, and Head-up-tail-up are given as the male is broadside to the female. Turn-toward-female involves a rapid 90° turn following Head-up-tail-up, while Turn-back-of-head is carried out as the male swims away from the female. When the group is close to shore, males will come out on land and give Shake, Bridling, and Belly-preen broadside to the female. Down-up can also be given as the male is orientated laterally to the female but this display seems to be influenced also by the position of other males; it is given especially when males are close together. Bill-up is closely associated with hostility between males and it occurs not only during social courtship but commonly during encounters in the absence of a female. Males frequently adopt the Bill-up posture when facing one another.

Overt hostility between males is not obvious during short periods of intense social courtship activity, when males are most intent on directing displays to the female. But these bouts are interspersed with periods when chasing and fighting between males become predominant activities. I believe that hostility is present throughout all social courtship. Even when the performance of displays is the main occupation of males, the constant changing of position (usually achieved by Nod-swimming) appears to be influenced by movements toward and away from other males as well as the ever-present attempt to orientate the body with respect to the female.

From time to time, social courtship groups take wing and fly around for a short time (30 seconds to 4 minutes recorded). Often the group alights in the same place or close by. These courting flights appear to be merely changes in location of a social courtship group; the males continue to call in flight, but I have seen no special aerial displays.

Drink and Preening displays are not characteristic of the social courtship situation. They are performed mainly by a single male as he stands at the edge of the water beside the female. These displays are associated especially with the period immediately after a new pair-bond has formed.

The precise functions of social courtship and of the individual displays cannot be evaluated at this stage. As Weidmann (1956) found in the Mallard, paired males will leave their mates to join a social courtship group around another female. Basically, however, social courtship involves unpaired males and, at least during the latter part of the pair-formation season, it appears to play an important role in the process of mate-selection.

#### THE DISPLAYS OF THE TWO RACES

The European and American forms of the Green-winged Teal are now generally considered to be geographical races of one species (Delacour, 1956; Scott, 1957; Parkes, 1958). While the female plumage patterns are almost



identical, there are a few notable differences in the males. Most important are the conspicuous white streak on the scapulars of *crecca* (absent in *carolinensis*) and the equally striking, broad, vertical band of white on each side of the breast in *carolinensis* (absent in *crecca*). In the Eurasian race, the male has a number of distinct white lines on the face but these are absent or poorly developed in the American race. Less conspicuous are the finer vermiculations of *carolinensis* and the presence of rusty tips on the secondary coverts of this race.

These male plumage differences are minor compared with those existing between the Mallard and Black Duck and, as Johnsgard (1960) has shown, the major displays of these two forms are virtually identical in form, although there are quantitative differences in the frequency of some displays. Minor plumage distinctions also exist between the European and Pacific Eiders (*Somateria mollissima mollissima* and *S. m. v. nigra*) but there are both qualitative and quantitative differences in the display repertoire of these two races (McKinney, 1961). In view of the wide distribution of many *Anas* displays (Lorenz, 1953; von de Wall, 1963) we would not expect to find striking differences in the displays of *crecca* and *carolinensis* and this is indeed the case. Although there remain a few gaps to be filled by further study, it appears that both races have the same display movements. Detailed analyses would be required to determine whether there are quantitative differences comparable to those existing between the Mallard and Black Duck. Such a comparison would be of interest in the geographically isolated Green-winged Teal races in view of recent discussions of the possible function of such differences as isolating mechanisms in currently sympatric forms (Johnsgard, 1960, 1964). Also it may be that some differences in display frequencies have evolved in association with male plumage characters, notably the conspicuous white scapular and flank marks.

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#### SUMMARY

The displays of the American Green-winged Teal are briefly described. Most of the displays are performed during social courtship but a few occur when the members of a recently formed pair are alone. Most male displays are given with the body broadside to the female, but one involves facing toward her, another entails facing away. Two displays

are associated with the hostility between males. Displays recorded for the European race occur also in the American race and no differences in behavior of the two forms have been detected.

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