

**Biting in the Triumph Display of the Canada Goose.**—The Triumph ceremony is a characteristic behavior pattern in the social life of all species of true geese. It is exclusively performed between birds which know each other and often occurs as a “greeting ceremony” when partners meet after a time of separation. It is also frequently observed during the period of territorial fighting in spring, both before and after attacks on other geese.

The first part of the ceremony, rolling (Fischer, Z. Tierpsychol. 22:247–304, 1965), is characterized by a loud “honking” vocalization in the Canada Goose (*Branta canadensis*). The neck is extended forward at an angle of about 45° to the ground and is waved up and down. The second part, cackling, is accompanied by a “snoring” sound. The head and neck are protruded almost horizontally to the ground. In this position the male may perform a thrust with his head, often terminated with a bite, toward the female who then immediately withdraws her head from the cackling posture and turns it to the side, or she may turn her head away from the male without first withdrawing the neck.

During the course of a study of the sequential patterning and the interactions between male and female in the ceremony I made some observations which may give a clue on the factors underlying the performance of the bite from the male.

Eight pairs of Canada geese were studied during the springs of 1973 and 1974 and about 300 hours of observation were recorded. More detailed descriptions of the ceremony and related behavior in the Canada Goose are given by Collias and Jahn (Auk 76:478–509, 1959), Raveling (Behaviour 37:291–319, 1970) and Radesäter (Ornis Scand. 5:87–101, 1974).

In Table 1 the number of male cacklings with a bite and the number of male cacklings without a bite are compared with respect to the orientation of the female to the male. Significantly more bites were delivered when the birds were meeting frontally than when they adopted more laterally oriented positions ( $\chi^2 = 10.05$ ,  $df = 3$ ,  $p < 0.05$ ). A result similar to this was also obtained in an analysis of ceremonies eliciting fighting in juvenile geese (Radesäter, Behaviour 50:1–15, 1974).

The Triumph Display is regularly elicited when strange geese are coming too close to the pair in the territory. However, male biting in the ceremony seemed to be more likely in some situations than in others, obviously depending on the relative rank of the intruder pair. This difference was not due to any difference in the orientation between the partners during ceremonies elicited by intruders of higher or lower rank respectively.

If the intruder pair was superior in rank to the pair under observation, the male

TABLE I  
NUMBER OF MALE CACKLINGS WITH A BITE COMPARED WITH THE NUMBER OF MALE CACKLINGS WITHOUT A BITE IN TRIUMPH CEREMONIES WITH DIFFERENT ANGLES BETWEEN MALE AND FEMALE

	Angle			
	0–45°	45°–90°	90°–135°	135°–180°
Cacklings with bite	6	9	21	17
Cacklings without bite	50	30	40	38

was less likely to attack but his cacklings more frequently involved a bite (15 with a bite, 15 without) than was the case if the intruder birds were subordinate to him (2 with a bite, 17 without). This difference also holds true statistically ( $\chi^2 = 6.35$ ,  $df = 1$ ,  $p < 0.01$ ). The male was also more likely to attack a subordinate pair (14 attacks out of 19 intrusions by subordinate pairs, 12 attacks out of 30 intrusions by superior pairs,  $\chi^2 = 4.03$ ,  $df = 1$ ,  $p < 0.05$ ).

The occurrence of male nape biting or nibbling during the Triumph Display was first mentioned by Klopman (Mag. Ducks and Geese 12:6-9, 1961) who made the suggestion that sexual tendencies, revealed by its close resemblance to the bite performed by the male during copulation, might contribute to its occurrence. In a study of the associations between the Triumph ceremony and other behavior patterns, however, I could find no evidence that sexual tendencies were involved in the ceremony (Radesäter, *Ornis Scand.* 5:87-101, 1974). This study instead indicates that the Triumph ceremony is more closely related to agonistic behavior than to other behavior patterns. Ontogenetic data also suggest that aggressive tendencies underlie biting. In small goslings frontal meeting during cackling frequently turns into biting and fighting among the siblings. During these periods a marked rank order develops which is then regularly demonstrated in each cackling by the subordinate individual's facing away from the dominant bird (Radesäter, *Behaviour* 50:1-15, 1974).

In adult birds the biting seems to be correlated both with the releasing situation and with the season. Biting is much more frequently observed during the territorial period than during other seasons. Male biting is correlated with the rank of the intruder bird. In the case when the intruder birds are of superior rank the evoked aggression of the male is possibly inhibited from an "outlet" (as is demonstrated by the low number of actual attacks) but in this situation he is more apt to deliver a bite toward his own female. In this situation male biting fulfills the criteria of a "redirected activity" and indeed indicates that aggressive tendencies may effect its occurrence.

Although observational data are still fragmentary and more convincing results not yet available, one may speculate that one function of the Triumph Display in the Canada Goose is to allow the expression of activated aggressive tendencies in a peaceful way when such tendencies are inhibited from a natural outlet. It does not seem improbable that a ritualized male bite and a female appeasing signal might serve this function. It would also be possible that aggressive tendencies activated by the mere presence of the female in the territory might be canceled in this way in situations where it is prevented from an outlet, e.g. by an attack toward other geese.

The cackling of the Canada Goose thus can be said to involve a demonstration of rank between the partners. The performance of such dominance—subordinance rituals in meeting situations is also known for other species (Nelson, XVth Proc. Int. Ornithol. Congr. 1970:371-388) and it has been suggested that they may function to suppress aggression and thus allow a friendly meeting between presumptively hostile partners.

The influence of aggressive tendencies on the male bite and female facing away indicated that these factors might have influenced the development of the Triumph ceremony in geese.

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