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## A Comparative Study of Negative Messages in Big Game Herds

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## SUMMARIES OF RESEARCH PROJECTS

A Comparative Study of Negative Messages in Big Game Herds  
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Project Number 124

The summer season 1966 of research and naturalistic observations of the signal system, in particular of negative messages, in big game herds and individuals, was carried out according to plan. The research area was in the Teton National Forest and in Grand Teton National Park. The game species selected were the Wyoming moose (Alces alces), the mule deer (Odocoileus hemionus), the Wapiti elk (Cervus canadensis) and the American bison (Bison bison) as in our previous long-range research.

A negative message can be defined as a communication which is not transmitted or induced by a sudden signal or cue, but does arise gradually and creates a mood or atmosphere in a group or herd of animals. For example, a herd of elk will spread out in a meadow to graze only if no contraindicating danger signals or clues are transmitted. Once the "atmosphere" for grazing is ready, the number and intensity of safety checks goes down. However, a species-specific scanning or filtering of scents and of images in motion and of noises above the general background noise (wind, leaves, rain) remains in active operation. Thus a change in the situation noticed by one herd member will quickly be transmitted by alert signals (head raising, freezing, warning gait, and posture) to the other herd members and frequently also to other species in the same area. The gradients of warning-intensity are clearly expressed by the sender and apparently well distinguished by the receiving individuals as indicated by the response. A gradient was found to exist from a light alert (head up) to a breakaway flight (irregular jumps and trampling) in elk herds. A check on occurring mistakes in responses to these positive signals revealed almost no errors in mature animals, few errors in calves and yearlings.

In the negative message system we found so far not a single error or misreading. All age and sex groups were in full response to the message conveyed. There was, however, the obvious finding that young calves and fawns after integration into the herd (older than three weeks) participated in these responses by way of their dams, as coupled units. The calf will look and listen to its dam, not to the animal which gave the message and thus there will be a slight lag in reaction time in the reading of the message. The yearlings showed the most variability in reaction time and extent. Sex differences were not traced, so far at least, but they may exist.

Evaluation and interpretation of observed material is under way and will continue for the next year. Simultaneously carried out observations on short and long term affiliation of non-related animals were continued and yielded information on herd structure and group changes.

In 1966 the patterns of elk, moose and mule deer movements were found to be further affected by the extent and acuity of the pine-bark beetle spray program. This change in patterns of movement extended far beyond the sprayed and treated forests into part of the Teton Wilderness Area and into other non-sprayed areas of the Grand Teton National Park, since the assembly and access routes for the influx of big game in early summer were disturbed and cut off. Barriers and interruptions of olfactory trails and scent-messages greatly affected all big game groups and will account for an unwanted damaging effect on the game distribution.