

SUMMARIES OF RESEARCH PROJECTS

A Comparative Study of Interspecies Communications
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The third season of research and naturalistic observations on interspecies communication was carried out according to plan in the Wyoming research area. The major part of the two and one half months season was devoted to supplementary testing, evaluation and scientific writing.

In last year's research report we had stated that communications concerning the security complex provided a good source of information. This was corroborated in more detail by this year's observations. The species specific patterns caused by graded intensities of warning and alarm messages under various environmental conditions, revealed the presence of both major categories of communication types: The iconic and the arbitrary type (P. Marler, 1961, in Journal Theor. Biol., 1: 295-317).

The iconic signal-type, which represents a direct physical relation to the information conveyed, comprised a large part of the security signals we observed in transmission across the species line. The arbitrary type of message in which the signal and the reaction to the signal are clearly different and separable behaviors is relatively rare. But in all three research periods we found in a number of cases reaction-chains transmitting the alert and alarm message across the species line three and four times. Each species did react in its own species pattern.

We found also that the high visual effectiveness of the herd-oriented elk featured far-reaching warning signals (gait changes), while the non herd-oriented moose, after reading a message, showed the warning in a closeup facial and posture expression. Most of the warning messages do not carry just a simple all or none character. They frequently provide also graded or scaled information about the intensity or gravity of the danger. Thus a slightly alarmed moose, for example, will show the "alert" posture and facial expression which will, in turn, cause a group of elk in the same area to freeze and scan the environment. This would be a light reaction. A seriously disturbed moose in high alarm will cause an elk group to execute their own full flight reaction involving the noisy, crashing breakaway characteristic of their species.

The transmission of messages containing negative character was observed to occur frequently within species groups as well as between different species. Thus we noticed that a predator (grizzly bear or a black bear) engaged in a non-hunting activity like foraging clover blossoms or berries, was not causing an alarm reaction in nearby grazing mule deer and elk. The non-aggressive mood of the bear is "read" by the other species in his environment. Such a signal of security had only temporary character and was terminated when the bear showed changes in intention by gesture and gait. Another type of negative message was conveying non-hostile intentions, when two animals meet at close quarters. This consisted in "looking past", not looking straight at the other animal and in a slight deflection of the direction of walking.

Distinct seasonal fluctuations in sensitivity to message-transmissal within and between species were observed. Such findings led at first to seemingly conflicting results, but showed later on as more observations were made, a clear picture. During the breeding season, for instance, a decrease in response to messages from other species is manifest. This is particularly noticeable in the male for the strong olfactory and vocal signals which take on a ritual character in that period (example: bugling and wallowing in elk), and provide specialized information for the species members. In some cases, however, we found that a message of seasonal connotations like the bugling in elk can take on a deterring character for another species and induce avoidance.

Among the topics which will need further research and interest is the study of negative signals and of communications leading to the formation of subgroups and special affiliations within herds. The establishment and dissolution of bond-behavior under various environmental and seasonal conditions will be a challenging task in the future.

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