SUMMARIES OF RESEARCH PROJECTS CARRIED OUT IN 1963

A Comparative Study of Interspecies Communications

Margaret Altmann
University of Colorado
Project Number 124

This project initiated this summer is to continue through May 1966. The project, a comparative analysis of interspecies communications and social interactions in wild free-ranging ungulates, aims to extend and correlate our previous research. The group of hoofed mammals has been strangely neglected in respect to behavioral research although it provides a wide variety of social patterns and interaction systems. Subprimate behavior-theory and ecology can expect to be greatly strengthened by recognition of these patterns.

From the standpoint of comparative group dynamics in "non-restrained" animals this research forms a logical next step in our long-range investigation of group behavior in wild ungulates. The particular emphasis in the proposed research is centered on an analysis of the signals, vocalizations, gestures and postures and olfactory cues which transmit understanding, between different species within the ecological web.

An application of the findings will also have some bearing on the field of human, non-verbal communications, child development, and on the field of comparative animal behavior, and of environmental biology.

Based on the experiences of the initial and recent studies of behavior patterns in free-ranging wild ungulates, we feel certain that thorough observation and analysis of behavior in wild, free-moving animal groups is possible, although the difficulties and hardships involved are considerably greater than those in work with confined laboratory animals.

In the course of our previous ungulate investigations we have found that the free-living animals have a large number of gross and subtle postures, vocalizations, and gestures which serve in communications within and between species groups. Our recent observations in the field have strengthened our conviction that the significance of the subtle communications in their effect and in their limitations deserve further study and analysis by an experienced investigator.

The average human observer is oblivious to a majority of the communications thus exchanged within and between wild animal groups. In some cases special recording methods may have to be developed, as for example, in the European work by Zippelius-Bonn, on supersonic calls in small-rodent communications. This project deals with a survey of the communications proper and attempts to describe the effects and limitations of such communications among and within the ungulate groups.

There are five main types of signal methods in the wild ungulates:

1. By posture (example: caribou warning)
2. By gesture (example: moose-threat - ears folded back)
3. By sound (example: elk cow-calf calls)
4. By position effect (example: detour elk yearling as sign of submission)
5. By olfactory means.

The observations on all five categories of communications shall shed some light on the differences in "carrying power" of signals and in understanding between species within an ecological web.

The species of wild ungulates selected for our proposed research are the Wapiti elk (Cervus canadensis), the Wyoming moose (Alces alces) and the bison (Bison bison). The animals will be observed in normal undisturbed condition and also in periods of stress and social change. Stress situations are used by us as an experimental device to reveal group structure and behaviors not readily revealed under other conditions. As a by-product of this project we expect to secure some longitudinal case histories of typical and deviate wild ungulates under observation.

Extension of the field research into the fall months will provide a definite advantage over the limited usual summer research periods by permitting the observation of the most crucial period of interaction, the ungulate mating season.

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Some Aspects of Plant and Animal Distribution as Affected by Geologic Formations

Kenneth L. Diem and Garth S. Kennington
University of Wyoming
Project Number 112

Research conducted in the summer of 1963 was a continuation of a three year study initiated in 1961. The study areas have been described in the 1962 Biological Research Station report.

From the last of July until the end of August a total of 67 northern pocket gophers (Thomomys talpoides) were collected and frozen for analytical work. The flowers, leaves, stems and roots of Agoseris, Lupinus, Achillea, and Erigeron were collected and frozen for laboratory analysis. Five quarts of soil were collected on each area for soil analysis and plant growth experiments. Four rock samples were taken from each area to determine elemental composition of the parent rock strata. The comparative results of pocket gopher mound census for 1962-63 are given in the following table.