and food caches, a list of plant species was compiled that are used extensively as food. Two burrow systems were excavated for purposes of determining their extent and nature. A number of specimens were live-trapped, and certain aspects of behavior were observed in captivity, such as swimming, diving, defensive positions, and vocalization, etc.

More than 80 specimens were obtained for examination in the laboratory. A more complete and detailed report will be submitted upon completion of the laboratory work.

Information still desirable:

1. Data on home range and territorialism.
2. Additional reproductive data.
3. Data on growth rates.
4. Further analysis of habitat and competition with related species.

(Grant from New York Zoological Society.)

Intestinal Protozoa in Jackson Hole Mammals

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Project Number 86

GENERAL PROCEDURE:

1. Demonstrate presence of and identity of protozoa.
2. Determine if these organisms are parasitic, commensal or coprozoic.
3. Examine soil for cysts or motile protozoa which might become coprozoic.
4. Cultivate protozoa in the laboratory.
5. Make permanent stained slides.

METHODS:

1. Fecal samples from the following animals were examined for protozoa by the direct smear method: elk, bison, moose, bear, coyote, marmot, horse, cattle, sheep.
2. Thirteen soil samples were taken from various areas frequented by the host animals.
3. Fecal samples and soil samples were moistened and placed in tight-fitting plastic containers and stored in a refrigerator which was maintained at approximately 4° C.
4. Representative samples were also kept in similar containers at room temperature.

5. Fecal samples were boiled for 20 minutes and, after cooling, were mixed with fresh untreated soil samples to increase the organic content of the latter.
6. Cultures were made using a proteose-peptone fluid medium and a peptone-yeast extract agar slant. These cultures were kept at room temperature and at 4° C.
7. All samples were checked daily for the first two weeks and about every other day thereafter. Permanent slides were made whenever new organisms appeared.

RESULTS: In most samples continued refrigeration resulted in an increase in numbers and variety of protozoa. There was thus established a COLD CULTURE which demonstrated the presence of soil protozoa in the animal intestine. Some of the flagellates were motile in fresh droppings and in cold culture. Motile amoebae did not appear until after several days of refrigeration. Following is a summary of the hosts and the protozoa found in their feces after refrigeration: Elk - Amoebae, Copromonas, Monas, Cercomonas, soil ciliates. Bison - Amoebae, Copromonas, Monas, Cercomonas, soil ciliates. Moose - Amoebae, soil ciliates. Bear - Coccidia, small flagellates. Coyote - small flagellates. Marmot - Coccidia. Horse - Amoebae, Copromonas, Monas, Cercomonas, soil ciliates. Cattle - Amoebae, Copromonas, Cercomonas. Sheep - Amoebae, Copromonas, Cercomonas, Monas, soil ciliates.

The amoebae probably belonged to the Genus Valkampfia. After several days to several weeks of cold culture there appeared in the fecal samples of elk, bison, horse and sheep a large (50 to 70 microns) binucleate amoeba whose taxonomic position has yet to be determined.

SIGNIFICANCE: A completed study of these protozoa would throw light on the following problems:

1. Morphology and identity of coprozoic forms, which has received little attention.
2. Identity of truly parasitic forms, which have been confused with coprozoic species.
3. Adaptation of protozoa to soil and fecal environments and to warm and cold temperature.
4. Host-parasite relationships.
5. Transfer of parasitic fauna from one host to another.
6. Parasitic zoonoses.

REQUIRED FURTHER WORK:

1. Thorough study of fresh material to identify true parasites.
2. Extensive examinations of soils for free-living species.
3. Special study of moose, bear, antelope and deer.
4. Culture experiments with soil and fecal samples using many types of culture media.
5. Continued microtechnique using phase microscopy and special staining processes such as the Feulgen method for

demonstrating nucleic acids.

6. Experiments to determine viability of cysts under varying periods of desiccation and other environmental conditions.
7. Determination of possible pathogenicity of these protozoa to elk and other hosts.

(Grant from National Science Foundation.)

Altitudinal Distribution of Ant Communities

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Project Number 80

Objectives - During this second season the goal of the project has remained the analysis of ant faunal characteristics and relationships within distinct communities, and the comparison of these parameters of the ant fauna in biotic communities at increasing altitudes. We expect that this study will lead to an increased understanding of biotic communities in general, and the highly important ant fauna within them, in particular, and to a better understanding of the changes in biotic communities that occur with increasing altitude.

Procedure - Operationally the project has been divided into three phases:
Phase 1: collection of ants in distinct plant communities at increasing altitudes together with observations on their nesting site, associations with other ants, relation to other animals and effect on the vegetation.
Phase 2: a statistical description of the ant fauna of 5 selected communities, Big Sagebrush, 6500 ft., Lodgepole Pine, 6500 ft., Big Sagebrush 8500 ft., Spruce-Fir, 8500 ft. and Alpine Tundra, 10,500 ft. In this phase the composition, relative density, nesting sites and spatial distribution of the ants on a single selected stand are determined by quadrat sampling.
Phase 3: analytical investigation of community dynamics within the ant fauna obtaining a quantitative measure of diurnal periodicity of foraging activity, vertical stratification, food preferences, territoriality and home range of the dominant species.

Results - In addition to the communities at which we have collected during 1955 we have collected the ant fauna of the following communities:

1. Grass meadow, 6500-7000 ft.
2. Grass-sedge meadow, 6500-7000 ft.
3. Grass-sedge-willow flat, 6500-7000 ft.
4. Gravelly streamsides, 6500-7000 ft.
5. Grass-sedge meadow, 8500-9000 ft.

Collecting was made at several stations in each type of community. Ants have been preserved in alcohol for determination.