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Comparison of Montane Ant Communities  
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Chico State College  
Project Number 80

The summer's work was concerned with three problems; sagebrush ant populations, a census of mound building ants on Moose Island, and the ecological life cycle of Formica opaciventris.

Study of the sagebrush ant population was concluded with a re-examination of 20 quadrats established and examined in 1957.

On Moose Island, the population of mound-building ants was recensused, and the diameter of each mound recorded, so that there is a record of the change in distribution, abundance and growth for three successive years.

In the Formica opaciventris studies, some of the factors affecting thatching behavior were examined. Relationships between adjacent mounds were observed, and the reproductive pattern was studied, for individual nests, and for the entire population of mounds.

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Regeneration in Amphibia  
Charles S. Thornton  
Kenyon College  
Project Number 68

The following projects were investigated:

1. Skin Transplantation. It is known that head or body skin of salamanders will, when grafted to the limb, inhibit regeneration of the limb on subsequent amputation. The mechanism of inhibition is unknown. Using the very favorable Amblystoma tigrinum melano-stictum of Jackson Hole, I have uncovered evidence that head skin will inhibit, or fail to inhibit, limb regeneration depending on whether an epidermal apical forms or not. When the head skin graft forms an apical cap, regeneration occurs; regeneration failure, in limbs with head skin grafts, is correlated with failure of an apical cap to form.

2. Deafferentation of Limbs. The influence of motor nerves on limb regeneration was investigated by means of removing the sensory complement of the left fore limbs of A. tigrinum larvae. This was accomplished by means of a dorsal incision which bared the dorsal spinal ganglia II through VI. These were removed along with the

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dorsal root. This operation proved sufficient to prevent sensory nerve regeneration as later sensory tests of the deafferent limb indicated. Sections of these limbs are in process of being impregnated with silver for detailed histological study. Deafferented limbs regenerated with only a very slight delay over normal controls.

3. Asymmetrical Regeneration. There is at present insufficient evidence to choose between two theories of the action of the apical cap. According to the present writer (Thornton, '54-'58) the apical cap serves to bring about the aggregation of mesenchyme cells to form the regeneration blastema. Singer ('59, Growth Symposium) believes that the apical cap starts tissue dedifferentiation which thus provides the cells for the blastema. During the summer I produced asymmetrical regenerates by causing the apical cap to form asymmetrally on the limb tip. This can be done by removing a strip of skin adjacent to the apical cap, but on one side of the limb tip only. When this operation is performed the apical cap, for unknown reasons, forms at the side of the limb tip near the new wound. Three series of experiments were undertaken: a) removal of a skin patch beginning at two days after amputation; b) removal of a skin patch beginning at seven days after amputation; c) removal of a skin patch beginning at 11 days after amputation. In all cases the regenerate projected at a sharp angle from the side of the limb tip. The asymmetry produced is attributed to the activities of the apical cap in attracting blastemal cells, because in the 7-day series, most of the tissue dedifferentiation had occurred, while in the series in which skin removal began on the 11th day all tissue dedifferentiation had already taken place and blastema cell aggregation was the only possibility left for this stage of regeneration. These particular experiments are to be extended to include other experimental approaches to this problem.

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Shrub Distribution in Jackson Hole  
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Project Number 99

During the 1959 summer field season in the Jackson Hole area, a new project was started. This project, which is supported by the U.S. Forest Service, covers a study of the reproductive capacity and seedling establishment of native and introduced species of browse plants. Especial attention has been given to Rosa, Amelanchier and Prunus. Teton County is particularly rich in shrub species, and most of these have very definite distribution patterns. Reasons for restriction of habitat have been sought as preliminary to studies of seed germination. All of these shrubs are important browse for big game animals.