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# Ontogenesis of Secretion in the Skin of the Tiger Salamander

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One hundred ten larvae of Amblystoma tigrinum melanosticum were used to determine the approximate stage at which time the skin glands of the tiger salamander start secreting. It was determined that the serous glands (poison-venom) do not secrete upon stimulation either naturally or artificially until the animals are in the very last stages of metamorphosis. Shortly after metamorphosis there is a profuse secretion of the poison glands as well as some increase of mucous secretion upon stimulation. The poison glands are chiefly located in the dorsal two thirds of the body skin whereas the mucous glands are on the ventral one third. The chief stimulus was an electrical shock of three volts, with a frequency pulse of twenty per second, a duration of ten milliseconds. Poison glands are more effective on the predator in those animals that are non-aquatic. This is nature's way of protecting the metamorphosed tiger salamander. The poison glands are three times the size of a mucous gland; each possesses a blood capillary ring (net).

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## SEMINARS

Seminars were held each Thursday evening at 7:30 P.M. in the home of the Director. They were well attended by Research Station personnel, Student Conservation Program students, and other biologists who happened to be in the area at the time. The number of biologists attending varied from 40 to 50. This was more than the facilities would accommodate except by some standing or sitting on the floor. The space problem for seminars is a critical one. I sincerely trust we will be able to provide new accommodations before we have to restrict attendance. Each seminar was followed by an informal period of discussion and refreshments.

The following is a list of the seminars presented.

Kenneth B. Armitage and Brad House - Research in the Antarctic.  
Robert W. Lichtwardt - Evolution of Fungi.  
Elliott A. Maynard - Evolution of Insects.  
Glenn A. Noble - Stress as a Factor in Parasitism.  
Norman C. Negus - Population Dynamics of Rodents.  
J. Gordon Edwards - Ecology of High Altitude Insects.  
Howard E. Evans - Comparative Ethology of Digger Wasps.  
Margaret Altmann - Social Roles in Animal Groups.  
Kenneth L. Diem - Plant and Animal Distribution as Affected by Geological Formations.