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Blood Studies on *Amblystoma tigrinum melanosticum*
Paul G. Roofe
University of Kansas
Project Number 92

Blood Flow through the Salamander Brain

One thousand five hundred feet of 16 mm. film were used to measure the rate of flow of blood through the olfactory lobe of the brain of *Amblystoma*. This was done through the compound microscope. Both normal and experimental approaches were carried out. Such drugs as histamine, epinephrine, norepinephrine etc., were used in the experiment. The study demands the measuring of the movement of red blood cells as seen in projections from one frame to another frame.

High Altitude Studies

Both adult and larvae *Amblystoma* were subjected to a decompression chamber. A simulated altitude of 15,000 feet was maintained for varying periods. Red and white blood cells were counted, as well as hematocrit and hemoglobin determinations were made along with differentials. There is no appreciable difference between the normals and the "high altitude" animals, either as larvae or adults.

Splenectomized Animals--Adults

When the spleens of adult animals were removed and allowed to remain for ten days, they showed a considerable drop in all blood elements. This was quite dramatic. However, in the large larvae there seems to be a compensating mechanism whereby the liver takes over immediately and there is practically no drop in any of the blood elements.

Secretory Activity of the Autonomic Nervous System

In my efforts to experimentally control the flow of blood through the brain, I stumbled onto a very unexpected phenomenon. On stimulation of the skin with a current frequency of 20 cycles per second, each shock, 10 milliseconds and a voltage of one volt, a profuse, viscous bitter and smelly secretion occurred in the head and tail regions indicating that the cranio-sacral division of the autonomic system is well developed but a very weak and ineffective thoracico-lumbar section exists. This was only a beginning of a very fundamental problem especially if we follow this up with its natural response to hazardous experience.

Re-checking the Normal Blood Constituents

The various blood constituents were determined for the animals from Pacific Creek, Gros Ventre, and Colter Bay areas and were found to differ considerably. Those from the Colter Bay area were higher in hemoglobin, hematocrit, red blood cells, and white blood cells.

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