

## V. SUMMARY

1. The spatial and temporal distributions of Plethodon c. cinereus have been compared with those of Eurycea b. bislineata by means of field captures.
2. The vertical distribution of Plethodon within the soil has been studied as a means of interpreting the field captures which were made on the surface.
3. Three approaches were used in this study, and they involved the use of: (1) a mark and release method in a field plot for a comparative study of the surface captures of Plethodon and Eurycea under natural conditions, (2) underground cages, in which the vertical distribution of Plethodon could be measured under partially natural conditions, and (3) mazes, in which the vertical distribution of Plethodon could be measured under controlled simulated soil conditions.
4. Plethodon and Eurycea were found to differ in (1) seasonal distribution, (2) spatial distribution, and (3) temperature range.
5. Both Plethodon and Eurycea showed restricted home ranges.
6. Plethodon are distributed within the soil, at least to

a depth of 12 in. if they are given the opportunity to utilize underground passageways.

7. The Plethodon found on the surface were but a small part of the population under plot, cage, and maze conditions.

8. The occurrence of individuals on the surfaces depended upon environmental conditions.

9. The vertical distributions in the underground field cages were affected by water table level, surface cover, and by low temperature.

10. Within the experimental mazes, vertical distributions were affected by moisture and temperature gradients; preference was shown for cool, wet substrates. If part of the temperature gradients exceeded 18°C, the salamander distribution was skewed toward the cooler temperature; the hotter the temperatures, the more sharply the distribution was skewed.

11. While salamanders appeared on the surface only when it was dark, the vertical distribution within the soil was only very slightly affected by light and dark cycles both in the cages and mazes. Nor were the number of captures under superficial shelter objects significantly higher at night than during the day in the field plot, as might be expected of a nocturnal animal.

12. Hibernation survival depends upon the severity of the

winter, 50% of the caged Plethodon survived during the winter of 1957 while none survived the winter of 1958.

13. Experimentally-placed shelter objects, pine boards, rocks, and tar paper had approximately twice the efficiency of naturally-occurring logs and rocks in yielding salamander captures.