

THE HABITS AND LARVAL STATE OF *PLETHODON CINEREUS ERYTHRONOTUS*.

BY W. H. PIERSOL, B.A., M.B.

ALTHOUGH *Plethodon cinereus* is considered by Cope ('89) "the most abundant salamander in the northern and central United States" its habits and development have received but little attention. Cope ('89) gives a brief outline and Wilder ('94) a scant mention, Montgomery ('01) adds a few points and describes the larvæ of one bunch of eggs. Reed ('08) discusses the coloration of adults. Kingsbury ('95) touches on the questions of the transference of sperm and the season of egg-laying but without coming to any definite conclusions. Sherwood ('95) gives a date on which eggs were found. As regards *Plethodon oregonensis* the behavior in captivity of a female found with her eggs is described by Van Denbrugh ('98), and Hubbard ('03) deals with some protective devices. There are several other papers in which *Plethodon* is mentioned but without reference to habits or development. The observations recorded below have been made partly in the field, partly in the laboratory, and on specimens from several localities, all however within a radius of fifteen miles from Toronto. Unless recorded as single occurrences, all observations have been verified in at least one subsequent season. Cope ('89) divides *P. cinereus* into three sub-species of which *P. cin. cinereus* and *P. cin. erythronotus* only are common. For the sake of ensuring uniformity the latter variety alone forms the subject of this paper. Many larvæ of *P. cin. cin.* have also been found and comparisons made with similar stages of *P. cin. eryth.* show that in the larva as in the adult the sole distinction between the two varieties is the coloration. The difference in geographical distribution which Cope mentions is not invariable, one bit of woodland may yield the two varieties in about equal numbers, another quite similar but a few miles away may contain *P. cin. eryth.* in abundance and but few *P. cin. cin.* No locality yielding either variety alone, or a majority of *P. cin. cin.* has been met with.

The typical coloration of the two sub-species is closely adhered to, the intermediates noted by Reed ('08) are very rare and even then approach closely the types; and only one specimen with much more than the normal amount of red was found. About 250 adults have been under examination, a number not so great as that used by Reed but sufficient to show that in