THE

SALAMANDERS

OF

ULSTER COUNTY

BY

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SALAMANDERS
Moisture a Must

This little known group of animals can best be understood by realization of their great dependence on moisture. This goes back to the Devonian period when it is believed they were the first back-boned animals to come out on land. Yet, through some quirk in the slowly changing balance of evolutionary forces salamanders never graduated from their dependence on water, as did most of their relatives, such as the lizards.

Lizards and salamanders are often confused but they can be easily separated when it is remembered that lizards have scales over their skin while salamanders have only soft skin; lizards have claws on their toes, salamanders have not; and above all lizards are generally found in dry places and like warmth. This leads to an interesting point of semantics for "salamander" comes from a Greek word referring to "a mythical animal having the power to endure fire without harm". One explanation of this anomaly is that the name became attached to the specific group when one of our ancestors put a partly rotten log, which housed a salamander, on her cooking campfire and a salamander crawled out because it got too hot for him! It is not very good, but the best I have heard.

The dependence of this group of cold-blooded animals on moisture is quite logical when it is understood that the majority of them are lungless and depend on breathing through their skin for part of their oxygen supply. If they are exposed to air with low relative humidity for very long their skin dries and shrinks which closes off the pores through which their essential oxygen is coming. Death generally soon follows. Perhaps it is a reversion to the salamander stage in our phylogeny that makes humans sing in the bath.

The salamander's urgency for moisture explains several generalities of habit and habitat. During the part of their life when they are terrestrial they tend to be nocturnal and they are generally found in damp places such as under logs and stones or in moss. It is believed that in times of drought some species burrow deep in the earth and go into a state of estivation. Many kinds of salamanders hibernate in winter, while some of the aquatic ones remain active in springs and streams all through the cold weather. I have found Spotted Salamanders in March slowly crossing a snowbank on the way to a mating pool. It takes more than snow to cool their ardor.

Contrary to superstition, salamanders are not venomous and only the mud puppy in our area is large enough to inflict a painful bite. Their chief protection from enemies is their agility in swimming, running and leaping. They are slippery, as the novice collector soon finds out. Some species have tails which can voluntarily be broken off when danger catches up with them. These are regenerated. At least one of our local kinds, the Slimy, secretes a distasteful fluid from glands under its skin. Other kinds have been known to play possum. In spite of these defenses, salamanders are eaten by snakes, frogs, fish, mammals and even by other kinds of salamanders.

Salamanders are carnivorous taking only living animals, detected by sight. Their prey consists of insects, earthworms, crayfish and fresh water shrimp.

One oddity dating back to the fish stage of their ancestry is their lateral line organs consisting of sense cells in the skin which function in response to vibrations of low frequency in water. Although salamanders have no vocal chords they do make faint sounds consisting of clicking, squeaks and a sort of 'bleat' produced by air in the throat.

One of the most interesting aspects of the life history of salamanders is that of perpetuating the race, though in some species we know very little about it. To begin with the mating may occur at any time of year for the group as a whole and may occur in water or on land. Some, such as the Spotted and Jefferson's, assemble in ponds or streams shortly after the ice disappears and there after dark put on a "nuptial dance" that may start with nosing each other and end in a wild chase that makes the water boil. This 'Liebespiel' of these eight inch black and yellow beasts is a treasured yearly experience for those who know where and when to look for it. In due course the male deposits little sacks of spermatophores in gelatinous stalks on the bottom debris. Later the female picks these up to fertilize her eggs internally. Eggs vary greatly in number and may be deposited singly or in masses, some kinds in water, others carefully hidden on land. Some species guard their eggs till they are hatched, but beyond that point there seems to be no manifestation of mother love or parental responsibility. To the antianthropomorphic scientist the guarding of eggs is looked upon as only a wise provision of 'nature' for keeping the eggs damp!

All salamanders pass through a larval stage. In this they look like adults and have true teeth which distinguishes them from the tadpoles of frogs and toads. They also have external gills, which in the water inhabiting forms are large and bushy. Their time as larvae varies from a few days to months depending in part on the reliability of the water supply in which they hatched. Salamanders whose eggs are laid on land may pass the whole larval stage in the egg, again for considerations of moisture.

When larvae become adult their gills disappear and in a few of our species lungs develop. The lungless ones continue to secure some of their air through their skin as they did while larvae, and get the balance by a transfer of oxygen to the blood stream in the mouth and throat.

If a salamander survives the innumerable perils of early life and reaches adulthood he has a fair chance of living several years, perhaps as long as twenty. Even at this lowly stage of animal development there is an awareness of 'home' and the ability to return to the same shelter, presumably because there the moisture condition is suitable. It is believed that this homing from nightly foraging is partly muscle memory and partly sight. Their ability to return from the breeding area which may be several miles across country is less easily explained. For several years I have been trying to find out what makes so many of the Spotted Salamanders appear at their favorite pool the same night. Careful records of air, soil and water temperatures for several weeks before and after this migration have been inconclusive. Perhaps this 'scientific' investigation is only a justification for the main reason which is the pleasure of seeing them perform after they arrive!

To paraphrase a familiar quotation: "Tell me what the humidity is and I will tell you whether salamanders will be there."

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The salamanders which may be found in Ulster County are limited to fifteen possible species, of which we now have definite records of fourteen kinds. The local records have been gathered by Fred Hough and the writer during the last 25 years, with help during the last year from George Wilmott.* The help of these men in preparing this report is much appreciated.

We enlist your help in adding still further to our knowledge of our local amphibians. For the beginner probably the best reference pamphlet is "Reptiles and Amphibians of the Northeastern States", by Roger Conant, 1947, The Zoological Society of Philadelphia.

1. Mudpuppy - Necturus m. maculosus (Rafinesque)
   Length 10-15 inches, our largest and ugliest salamander. It is entirely aquatic and may be caught on a fishhook. Has been taken in the Hudson River at Kingston.

* For older records of occurrence in this area "The Salamanders of New York" by Sherman C. Bishop, New York State Museum Bulletin No. 324 has been most helpful.

2. Newt - Triturus v. viridescens (Rafinesque)
Length 3-4 inches. This is our commonest salamander and the best known one, both because it is often seen and because of its cross-word puzzle fame - the three letter word e-f-t. It is called an eft during the "teen-age" part of its life cycle, which it spends on land sometimes as much as two miles from breeding pools (this has been checked by marking them as they left the water). During this time they are bright orange, but are seldom seen except when moisture conditions are just right, usually after a rain. I have seen them as abundant as one per square yard along an old wood road.

After one to three years they return to the water where they were born, change to a dull bronze green with orange spots, develop sex organs and spend the next few years entirely in the water attending to the important business of perpetuating the species. They are more or less active all winter. In the spring the male's tail widens and his inner thighs become black and horny. The latter assists him in clasping the female.

The newt is one of our few lunged salamanders, so you often see them swim to the surface of the water to gulp a mouthful of air. Presumably in winter with lessened activity, they secure what air is needed through the skin. Cold water contains more oxygen than warm.

Newts are found throughout Ulster County.

3. Jefferson's Salamander - Ambystoma jeffersonianum (Green)
Length 5½-7 inches. A long slender animal, blue-black in color with flecks of silver along its side. It is seldom seen except in its breeding pools, where it gathers as soon as the ice is out which may be as early as late March. It is a spectacular sight to see up to fifty of these animals picked out by the beam of your flashlight in a pool with an area the size of an ordinary living room.

We have records of this species from Ashokan, Kripplebush and Mohonk.

4. Spotted Salamander - Ambystoma maculatum (Shaw)
Length 5½ to 8 inches. This is a shiny black salamander with irregular yellow spots. They are more chunky than the Jefferson's. They breed in

the same pools, but arrive a few days later. After egg laying is completed they gradually disappear from the pools apparently when the humidity conditions are right for cross-country travel - a warm rain is ideal. The eggs which occur in masses as large as a tennis ball are left to develop by themselves. By mid-summer the larvae are ready to transform and begin their dry land life. This genus has lungs.

Our records indicate that Spotted Salamanders are probably quite generally distributed through the wooded area of the county.

5. Marbled Salamander - Ambystoma opacum (Gravenhorst)
Length 3 to 4 3/4 inches. Color black with irregular blotches and bands of white or grayish. Its eggs are laid on land in the fall.

One record from near Rifton has been reported by George Wilmott. We are anxious to learn more about the distribution of this fellow.

6. Four-toed Salamander - Hemidactylium scutatum (Schlegel)

Length 2 to 2 3/4 inches. This is the midget of our local salamander clan. They come in assorted shades of tan and brown with small dark spots. There is a constriction at the base of the tail which is where the break comes when they voluntarily snap off their tail when in danger.

Our only record in the county is from the Pacama Vly, thanks to Fred Hough.

7. Red-backed Salamander - Plethodon c. cinereus (Green)
Length 2 to 3½ inches.
Their color is dark gray with a dull reddish streak down the back. There is a "Lead-backed" color phase of this species with a dark gray back. They are found in damp woods throughout Ulster County, even at the top of Slide Mountain.

8. Slimy Salamander - Plethodon glutinosus (Green)
Length 4¼ to 7¼ inches. Its color is shiny black with small flecks of silver gray on the back and sides. If you pick one up the identification becomes positive! Wherever his body touches your hand a spot of "glue" is left which sticks fast any dirt that gets on it and will not wash off. Time only wears it off. A number of records through the County have come to us.

9. Purple Salamander - Gyrinophilus p. porphyriticus (Green)

Length 5 to 7 3/4 inches. They are found in colors ranging from purple through orange to brown. Their habitat is usually springs and small streams. Our local records are from Mohonk, Montela and Panther Brook.

10. Red Salamander - Pseudotriton r. ruber (Latreille)

Length 2 3/4 to 6 inches. Its color pattern is distinctive and beautiful - brilliant red with scattered black spots over the back. They are locally common in cold springs and streams. I have found them in a spring which has a year round temperature of 47°. Our records include six localities in Ulster County.

11. Two-lined Salamander - Eurycea b. bislineata (Green)

Length 2 to 4 inches. Color orange yellow to straw with two dark lines down its back. It is usually found close to water, but apparently is not very common in our area.

12. Long-tailed Salamander - Eurycea l. longicauda (Green)

Length 3 to 6 inches, its tail being more than half of its total length. Its color is yellow with dark flecks scattered over the body. This salamander is a larger edition of the Two-lined in habits and habitat. It is quite rare in Ulster County, and we are anxious to secure additional records.

13. Dusky Salamander - Desmognathus f. fuscus (Rafinesque)

Length 2½ to 4½ inches. This is the next commonest animal after the newt, though being nocturnal it may not often be seen except when disturbed in its streamside home. It comes in a variety of colors, but one's usual impression is of a fast moving dark gray animal. They are found throughout Ulster County along woodland streams.

14. Allegheny Mountain Salamander - Desmognathus o. ochrophaeus (Cope)

Length 2 to 3 3/4 inches. To differentiate this animal from the Dusky is a job for the expert. We have several authentic records from our area.

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The fifteenth species which may be found in Ulster County is the Tiger Salamander. It is something like the Spotted,

but has duller colors and more irregular spots.

And so as spring air dampens, get out your boots and your flash light and join the uncrowded clan of night waders for whom moisture is a must in the enjoyment of the outdoors.

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