

THE JUMPING ABILITY OF PLETHODON AND ITS POSSIBLE BEARING UPON THE ORIGIN OF SALTATION IN THE ANCESTORS OF THE ANURA.

On the evening of August 18, 1917, at Snowville, N. H., I picked up a gray-backed *Plethodon cinereus* 71 mm. in total length. It was caught crossing a sandy road just before dusk. While I held it on one open hand, it surprised me by *jumping* to the sleeve of my other arm. I experimented further by holding my open right hand at varying distances from the salamander on the left hand. In its efforts to escape, the creature always scurried straight ahead, in the direction in which it had been pointed, and when it reached the edge of my palm, it leaped across the open space to the other hand, repeatedly clearing a distance of fully twice its length. In this manner I kept it jumping rapidly for perhaps two dozen times before it became sufficiently fatigued to quiet down.

The fact that this salamander is a leaper may possibly be known, but I had never before observed it. I had always considered the terrestrial urodeles as exclusively creeping animals, probably because I had hitherto found them chiefly in the daytime, during their inactive hours. This *Plethodon* was just starting out on its nocturnal wanderings, and was no doubt at its liveliest. I now understand how members of the species cross deep ruts in roads, and how they surmount such obstacles as logs and fallen boughs in the boggy woods that they inhabit. The discovery also throws light on the way that they capture Bibionid flies, winged ants, Collembola, and other active insects, remains of which I have found in the stomachs of *Plethodon cinereus*, taken under dead logs in the early morning. I had often wondered how a sluggish salamander—a lowly creature which I had supposed to move like a stranded mud-puppy—could feed upon flying or jumping insects.

I now infer that it lies in wait and leaps at its prey like a cat at a sparrow.

When I look at the diminutive legs of this salamander—legs hardly thicker than a pin, and devoid of modernized, condylarthrous joints—I marvel that they should be able to propel the squat, snaky body for a distance of twice its length through the air. It seems mechanically incredible, even though the saltatory impulse doubtless comes^s more from the myocommata rather than from the minute muscles of the limbs.

With all of this in mind, why could not some of the temnospondylous Stegocephalians, such as the Permian *Cacops*, or *Dissorophus*, or the African Triassic *Brachyops*, have begun the jumping habit? And may not the ancestors of the frogs and toads have been excellent leapers even before they lost their loose-hung bodies and permanent tails? None of them, surely, had less of a “jumping build” than *Plethodon*. Furthermore, if the direct, as well as the collateral ancestors of the Anura were large creatures, it is easy to believe that decrease in size and weight would be a necessary concomitant to improved saltatory power during the tailed epoch. *Plethodon* approximates a crocodilian in build; if it were as large and heavy it probably could not jump.

All known Anura, even as far back as the Jurassic, are extremely modernized, and are separated by a wide evolutionary gap from the Palaeozoic amphibians. My intention is merely to suggest that such a form as *Cacops* may well have been a leaper; and to draw an analogy between the modern urodeles, in which the saltatory habit is doubtless an incipient land-living development, and the primitive temnospondyls, which, as recently suggested,¹ may possibly be the forbears of the leaping frogs and toads.

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¹ Gregory, W. K., *The American Naturalist*, Vol. 51, 1917, p. 317.



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