

ened him sufficiently to have made other attitude and action impossible. C. S. LUDLOW

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THE SONG OF FOWLER'S TOAD (*BUFO FOWLERI* PUTNAM)

IN SCIENCE for September 29, Mr. H. A. Allard states that for some years he has heard at Clarendon, Va., two types of toad cries. One was uttered early in the spring, "a steady, trilling monotone," lasting "from 10 to 20 seconds," and "resembling the song of *Bufo americanus* as it is heard in New England." The other was that of Fowler's toad, "the unmistakable, weird, wailing scream which advertises its presence throughout its range." He further states that on May 2, 1916, he caught toads uttering the former note, and found them to be *Bufo fowleri*. He presented them to the National Museum, where they are under accession number 59692.

Now I have collected for some years in the region in question, as my home is in Alexandria, and I have found both *B. fowleri* and *B. americanus* fairly common, although *fowleri* seems the more abundant. I have studied the breeding habits of these toads at Haverford, Pa., where both occur very commonly and are quite distinct.

Americanus is one of the first Anura to appear in the spring; *fowleri* one of the last. Transformed *americanus* are sometimes met with before *fowleri* begins to sing. The note of *fowleri* there is always the short snoring scream. The note of *americanus* is always much longer, although its trill and its softness are somewhat dependent on whether the toad is on land or in the water. I have collected *fowleri* in numbers at Brevard, N. C., at an altitude of 2,200 feet. The note there was the same which I have heard at Alexandria and at Haverford.

Finally, during the first part of September, I was working in the reptile and amphibian department of the National Museum, and while looking over the catalogue I chanced to see there an entry of *B. fowleri* with the remark that the note was that of *B. americanus*.

My interest aroused by this and also by the fact that they were local specimens, I looked them up and examined them. I soon came to the conclusion that they were not *fowleri* at all, but *americanus*. They were much too large for *fowleri*, and they had large warts arranged singly in spots as in *B. americanus*, instead of the small warts, three to five in a spot as in *B. fowleri*. These toads were catalogue number 59692, and were collected by Mr. Allard at Vinson Station, Va., on May 2, 1916. Mr. Allard was probably misled by the fact that they did not have the deeply spotted breast of most *americanus*, but this is not too reliable a character, as some *B. fowleri* have speckled breasts and some *B. americanus* have, as in this instance, immaculate breasts.

Thus there is no reason to believe that Fowler's toad has two distinct notes, and confidence can still be reposed in the calls of toads and frogs as differentiating characters.

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SCIENTIFIC BOOKS

Morphology of Invertebrate Types. By ALEXANDER PETRUNKEVITCH. The Macmillan Company, New York. 1916.

Under this title Professor Petrunkevitch offers us a laboratory guide for representative invertebrate types and, in addition, material of the sort commonly found in our textbooks. "Each chapter consists of two parts: a monograph in which a description is given of the animal selected as representative of its class and instructions for the students to follow in dissection." The purpose of the former is to give the student an account of the morphology of his type form to which he may refer throughout his dissection and to give the teacher more freedom, since the lectures are thus relieved of much detail. The book is frankly morphological, as its name implies, and the author makes no apology for this; but rather contends in his preface that the student who aspires to the work of experimental zoology is often hampered by "a superficial knowledge of the structure, life and development of those very animals which in his later studies