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AN OBSERVATION SHOWING THE BIOLOGICAL  
NECESSITY FOR SIZE SELECTION OF FOOD OBJECTS  
BY YOUNG TOADS

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On July 3, 1947, eight juvenile toads (one *B. cognatus* Say, the others *B. woodhousii woodhousii* Girard) were collected on a roadway near Norman, Oklahoma, and placed in a container of earth beneath a light so that their reactions while feeding on insects attracted by the light at night might be observed.

On July 5, at 9:30 p. m., one female of *B. w. woodhousii* was found dead. Its position in death suggested that violent spasmodic contractions of the body and hindlimb muscles had occurred and its abdomen was misshaped by a large hard lump caused by some object within it.

The toad was dissected. Two beetles were found in the body cavity—the larger, a June beetle (*Ligyris gibbosus* or closely related form), the other a ladybird beetle of the species, *Diplotaxis frondicola* Say. Another June beetle of the same species, a few tiny leaf hoppers, a wing case of a small beetle, and a few sand grains were in the stomach.

The evidence indicated that the large June beetle had clawed its way through the gastric wall tearing a hole 6 mm long in the sinistrodorsoanterior

portion of the stomach. It had then turned posteriorly and dug upward through the peritoneum just posterior to the kidneys, severing the aorta and probably breaking nerves in the region of the sciatic plexus. The kidneys and ovaries were unharmed. A very large blood clot in the abdomen indicated that severe internal bleeding was the immediate cause of death of the toad. The beetle was also dead when removed from the abdomen.

The toad measured 31 mm from snout to vent and weighed (after removal of foreign objects) 2.25 g. The June beetles were 15x7 and 13x8 mm and weighed 0.2 and 0.15 g respectively. This toad had therefore swallowed two thick-bodied beetles each approximately one-half its own length in addition to a smaller beetle and several other tiny insects.

All indications are that usually young toads select only small objects to swallow (Smith and Bragg, ms.) This is the first time I have ever known so small a toad to attack so large an object. Adults of both *B. cognatus* and *B. w. woodhousii* readily feed upon June beetles, as I have observed hundreds of times; but their juveniles do not.

One observation on these same young toads may indicate how this particular individual made its fatal mistake. Throughout July many dozens of June beetles attracted by the light were avoided by the remaining toads. One night in late July, however, the single specimen of *B. cognatus*, after quickly snapping up several small moths and leaf hoppers, reacted to a June beetle which suddenly fell supine before it by starting a strike as in response to its movement. The little toad (about 25 mm in total length) stopped its strike almost in midair and backed away from the beetle as the latter approached later. Perhaps, the young *B. w. woodhousii*, reacting quickly to the movements of the large beetle, struck before recognizing it as too big, and, having started, continued its normal ingestive procedure.

In any event, this whole episode indicates the biological "wisdom" of the size selection usually manifested by young toads when feeding. It also illustrates how such selection may have arisen in evolution: for natural selection could quickly eliminate any young toads that were so foolhardy as to attack too-large beetles, even though able to swallow them.

#### LITERATURE CITED

Smith, C. C., and A. N. Bragg. Ms.

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