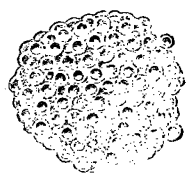
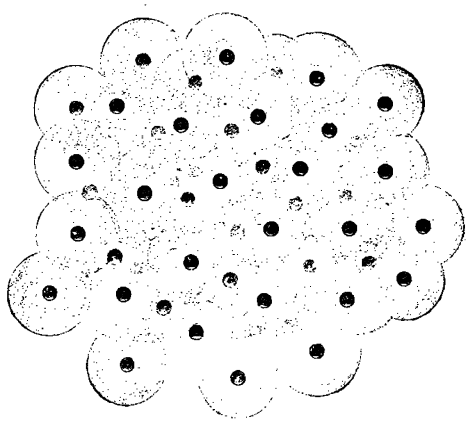
Enough has been said to give some idea of the wealth of information given. As no other has had such opportunities of investigation as Mr. Boulenger, so no one has



Eggs of *Hyla.*



Eggs of '*Rana temporaria.*'

had greater capacity to use his material. Undoubtedly his monograph will long continue to be the standard of nomenclature. Nevertheless, there will be dissenters from some of the taxonomic ideas and some of the names adopted. For example, some may be disposed to differentiate the *Pelobates cultripes* from the genotype and call it *Cultripes provincialis* (with Cope) or *Cultripes cultripes.* Less likely will be the resurrection of *Ammoryctes* or *Epidalea.* Others too may assign higher value to forms designated as varieties of *Bombinator pachypus*, *Alytes obstetricans*, *Hyla arborea*, *Rana esculenta* and *Rana temporaria.*

Again, there may be differences of opinion as to various specific names. *Bombinator igneus* may be replaced by *B. bombinus* or possibly (but not probably) by *B. variegatus.* (The *Rana variegata* of Linnæus was supposed to be a foreigner 'at large'—'*habitat in exteris regionibus.*') For the *Bombinator pachypus* may be revised the name *B. salsus.* The toad may be called *Bufo bufo* or *B. rubeta.* The *Rana arvalis* may be deemed to be entitled to the Linnæan name *R. temporaria* on the ground that it was the species to which the name was limited in the Fauna Suecica. Then the *R. temporaria* of the Tailless Batrachians may be called *R. muta*, as by Camerano and Bedriaga. Finally, for the *R. agilis* the name *R. dalmatina* may be preferred. In reference to the last, Mr. Boulenger has noted, "the strict law of priority would require the adoption of this name * * *. However, this is one of those cases in which, it appears to me, conservatism is desirable." Mr. Boulenger adds: "Similar considerations have guided me in the naming of the two species of *Bombinator*, and I hope, in the interest of the stability of nomenclature, they will commend themselves to future workers."

But whether we agree with Mr. Boulenger or not in his views as to nomenclature, he certainly has given us a work which well deserves to be recognized as a standard and is alike meritorious for text as well as for illustrations. We may be allowed to hope that a companion volume on the remaining Amphibians of Europe will be published in time. From him who has given so freely, much will be expected.

Theo. Gill.

SKELETON LEAVES.

It has for a long time been known that the best method of skeletonizing leaves is to put them in a still pool containing moss, algæ or other living aquatic plants. In a few months, as a rule, all the softer portions of the leaf will disappear, leaving the vascular system perfectly clean from mesophyll and epidermis. The removal of the soft parts will take place more quickly if the leaves are killed before they are put in

the spring or pool. It has been supposed that the disappearance of the softer parts of the leaf was due to decay brought on by bacteria and fungi, and this may in some cases be true.

A few months ago some moss from a pool near the Great Falls of the Potomac was brought into the laboratory of the Division of Vegetable Physiology and Pathology and put into an aquarium. A few leaves of Norway maple affected with a spot disease were also put in to keep them fresh for a few days. It was soon noticed that the mesophyll and epidermis of the brown spots was disappearing, leaving nothing but the vascular bundles. A closer examination revealed numerous minute bivalve crustaceans belonging to the family Cyprididæ and as nearly as could be determined to the genus *Cypridopsis*, probably *C. vidua* (O. F. M.). The shells varied from 1/2 to 1 mm. long and half as broad and high. They are tumid, yellowish green and covered with short hairs. In swimming the plumose antennæ and bristly feet protrude from the shell and by their rapid movement cause the organisms to make a jerky rolling progress through the water or aid them in crawling. The mandibles and mandibular teeth are stout and well adapted for gnawing. (See Figs. A–D.) An examination of the alimentary canal of several of the organisms revealed the presence of numerous leaf cells, palisade and mesophyll, in the process of digestion. Little doubt could, therefore, remain as to the fact that the *Cypridopsis* were the active skeletonizers.

Another aquarium, however, was started, and decay-producing fungi and bacteria were introduced to see if they would alone produce skeletonizing.

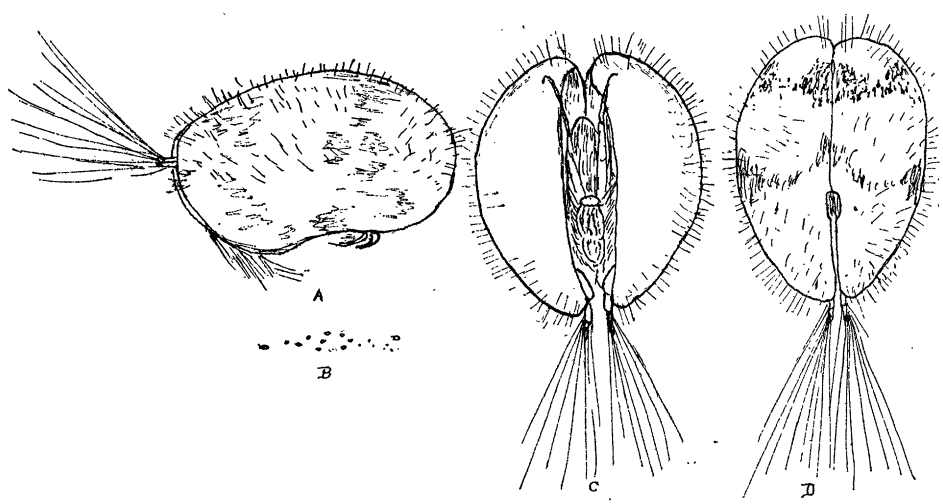


FIG. 1. CYPRIDOPSIS sp.

A. Side view × 50 diam. B. Natural size. C. Ventral view × 50 diam. D. Dorsal view × 50 diam.

Two sets of leaves of Norway maple, Peach, Rose, Elm, Linden and a number of other plants were selected. One set was put in the aquarium containing the *Cypridopsis* and the other put in the aquarium with fungi and bacteria. The process of decay went on very rapidly in the latter aquarium, but there was no sign of skeletonizing a month and a half after the experiment was started. In the aquarium with *Cypridopsis*, however, the work was begun almost immediately. The dead spots in the leaves were skeletonized in 24 hours, and

in six days large areas were cleaned. In four weeks the work was complete.

The little crustaceans will not attack any portion of the vascular system of the leaves mentioned until the mesophyll and palisade cells are all removed and other leaves with mesophyll are lacking. If they are starved, however, they begin on the finer bundles and soon destroy the specimen. It is best, therefore, when all the soft cells have been cleaned off from the bundles to remove the skeleton from the aquarium and press lightly between driers. The figure shows a maple and an ash leaf skeletonized in the experiment described.

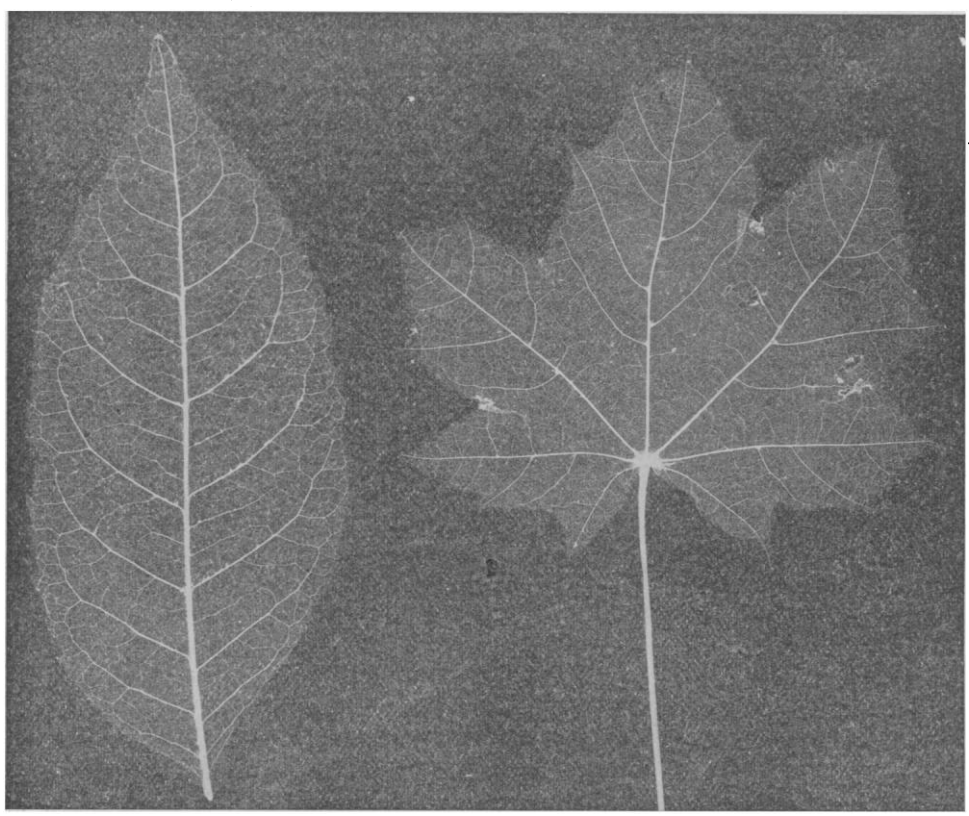


Fig. 2.

Cypridopsis and related genera are widely distributed in fresh and salt water. There is hardly a pool or pond in which some of them are not found. It is quite likely that the food habits of many of them, at least of of the closely related genera, are like the one here described.

Cypridopsis appears to thrive best in water kept fresh by the presence of algæ or other aquatic plants and not inhabited by fish or other animals which prey upon them. They are said, however, to live in dry mud, in a more or less dormant state for long periods.

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