

bottomless; there is always something new to discover about the living world around us. Sometimes this aspect of biology seems daunting—there is so much to learn. But that is also what makes this science so exciting. No matter how bogged down I might get with mortgage applications and paint cans, it's nice to know that there'll always be new biological treasures waiting for me and my students.

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Letters

(Continued from p. 398)

vissection the opportunity to continue their work in the biological disciplines, and clarify what steps should be taken in the event that instructor and student cannot agree on a satisfactory alternative? Such policies would not guarantee that the values of the student will always prevail; but it would ensure that those values will at least be taken into account.

What is to be gained by denying students who might otherwise be attracted to the study of biology alternative means of satisfying those academic expectations currently associated with laboratory dissection and/or vivisection?

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Research Reviews

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The diversity of animals is illustrated by the diversity of their methods of obtaining food. This month's column reviews papers dealing with some unusual aspects of animal feeding.

Cannibalism

Meefe, G.K. & Crump, M.L. (1987) Possible growth and reproductive benefits of cannibalism in mosquitofish. *The American Naturalist*, 129, 203-212.

Cannibalism has been reported in many groups of animals. Starvation, overcrowding, behavior stress and availability of victims have all been suggested as factors that might lead to cannibalistic behavior in various animals. Meefe and Crump provide evidence that mosquitofish derive nutritional benefits from cannibalism, and thus nutrition is an additional factor in the evolution of cannibalism.

Meefe and Crump fed mosquitofish (*Gambusia affinis*) a diet of commercial fish food supplemented with meal prepared from a crustacean, an unrelated fish, or mosquitofish. Fish fed unsupplemented food served as a control group. The cannibalistic mosquitofish had a significantly higher reproductive index (a measure of both number of embryos produced and rate of embryo development) than controls and fish fed with other supplements. In a second experiment, cannibalistic fish had the highest dry weight. Thus mosquitofish, which are known to be cannibalistic in nature, derive nutritional benefits from cannibalism. It is presumed that the nutritional benefits are at least partly due to the fact that nutrients required by mosquitofish would be present in exactly the right proportions in other mosquitofish.

Plants Benefit from Being Eaten

Paige, K.N. & Whitham, T.G. (1987) Overcompensation in response to mammalian herbivory: The advantage of being eaten. *The American Naturalist*, 129, 407-416.

It is logical to assume that plants are harmed by the activities of herbivores. They lose energy and photosynthetic tissues, or their reproductive structures may be destroyed. And they may become more susceptible to pathogens. We tell our students about the many defenses plants have against herbivores . . . anatomical ones like thorns and chemical ones like poisons. But strange as it may seem, there appear to be benefits that plants derive from being eaten.

Paige and Whitham report on experiments with biennial scarlet gilia (*Ipomopsis aggregata*), a plant that grows in the mountains of the Western United States. The inflorescence of scarlet gilia is frequently browsed by mule deer and elk; in many cases, 95 percent of the above-ground biomass is consumed. Browsed plants are somehow stimulated and produce an average of four new inflorescences. Thus browsed plants are able to produce 2.4 times as many viable seeds as unbrowsed plants. Such an increase in fitness as a result of browsing is entirely unexpected. The mechanism for this overcompensation is not known, but will be an important topic for future studies. Perhaps this ability to overcompensate can be incorporated into crop plants.

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