

While it is going on, it looks and feels like aggression: get at it, uncover it, bring it out, grab it, halloo! It is like a primitive running hunt, but there is nothing at the end of it to be injured. More probably, the end is a sigh. But then, if the air is right and the science is going well, the sigh is immediately interrupted, there is another yawping new question, and the wild, tumbling activity begins once more, out of control all over again.

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S-E-S . . .

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students as quickly as possible for immediate feedback. Students were encouraged to discuss all or any portion of the evaluation with the teachers, if they felt the need. Several students did this, and the results were most satisfactory and beneficial to both the teachers and the student.

Conclusions

At the completion of six classes of SES over a three-year period, we reached the following conclusions:

1. A course such as SES is not only feasible but desirable in the curriculum of a senior high school.
2. Although the faddism of the initial environmental movement has abated, the need for rational and responsible environmental education has increased.
3. SES was certainly applicable to the 11th and 12th grades of Lansdowne Senior High School, and such a program would be applicable in most American high schools.
4. The value of having the program team-taught by a social-studies teacher and a science teacher cannot be overstated. Through the planning stage, implementation stage, and evaluation stage the value of this mutualism became more and more apparent.
5. The program was successful, but it was not without its difficulties. Having two teachers scheduled for the same class at the same time presented an administrative difficulty. Because the class was elective, it was sometimes used as a student dumping-ground. Field trips were criticized as being expensive and taking students away from their classes; thus the number was reduced from six to three. Some students tended to take advantage of the available time for student activity. Some students needed more direction and structure than was given.
6. Whatever the disadvantages of SES were, the advantages of the program far outnumbered them.

Letters to the Editor

• Brief letters—one or two pages—are more likely to be printed than are long ones, which may be cut.

HAZARD OF LONG HAIR

The cover of the October 1973 issue (35:7) of *American Biology Teacher* is a poor example of laboratory safety, in my opinion. I am referring to the photograph of girls using a Bunsen burner while their hair is unrestrained. I feel a journal that represents the best in biologic-science education should exemplify, both directly and indirectly, the safest practices in the laboratory. I don't believe this photograph meets this criterion.

Since long hair has come into style, I have become very conscious of the hazard of hair-and-fire. I have not gone to the extreme of requiring long-haired students to wear hair nets, as some states require of students in food-preparation classes; however, I strongly admonish my students to use extreme caution when near an open flame.

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GERBILS IN THE WILD; AND THEIR WATER REQUIREMENT

James Murphy, in "The Gerbils Are Here" (*ABT* [35] 8:451), says that "disinterested gerbils owners turn their unwanted charges loose in the cruel cold world. . . . [Some] areas are hot, arid, and desert-like, and that is home for a gerbil. How will gerbils affect the balance of nature in these areas?" Murphy is remiss in not answering this question and not stating clearly that under no circumstances should these animals be let free into the wild. I agree with Murphy that gerbils make excellent classroom animals, but they are rodents, they are not native to the U.S., and they could become a serious pest if let loose. Gerbils are seed-eaters, and they breed rapidly. In the wild they could soon affect the balance of native plants and animals and could devastate valuable U.S. crops. In recognition of these potential problems, California and Nevada have already enacted state laws to prohibit importation of gerbils. In addition, the U.S. Department of Agriculture cautions that it is inadvisable to take gerbils to western Texas, to Arizona, or to New Mexico.

The ecologic and financial damage wrought by uninformed and unthinking persons letting free non-native species has been amply demonstrated in the

past in the infamous cases of the walking catfish introduced into Florida and now voraciously eating its way through northerly regions, and the gypsy moth, first introduced into Massachusetts from France and now devastating 1.4 million acres of forest and orchard annually in the U.S. Gerbils (and, incidentally, hamsters) hold a similar potential for becoming a pest if let free.

One other point in Murphy's article needs clarification. Although gerbils can subsist for certain periods without water, a study showed that 17% of the body weight was lost during a 13-day period when no drinking water was provided; but when gerbils were provided with water ad libitum, voluntary water intake was 2.3–5.6 ml/day per adult animal (L. R. Arrington and C. B. Ammerman, 1969: "Water Requirements of Gerbils," *Laboratory Animal Care* 19 [4]: 503). Thus, contrary to Murphy's advice, gerbils should be provided with a water bottle so that fresh, clean water is constantly available. It is my experience that they do drink water daily when it is offered, even when they are also provided with fresh vegetables, such as lettuce and cabbage, which are high in water content. So, why deprive them of water if they will use it?

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James E. Murphy comments:

It is likely that gerbils could cause problems in California, Nevada, and other states; but Ms. Orlans does not offer data to support conclusions on the extent of the gerbil problem, so I still consider it an open question, as stated in the article. I also think it is important not to confuse laws restricting gerbil movement with scientific facts. After all, Australia has laws restricting the immigration of Asians; would we conclude from this the scientific fact that Asians are an environmental hazard in Australia? The fact is that laws about people and animals often go against the scientific fact.

As for gerbils and water: the information provided by Ms. Orlans does not state whether during the waterless test period the animals were fed dry food, fresh vegetables, or nothing at all. This is an important point, as I feel the gerbil should get fresh vegetables for a lot of reasons other than water. The fact that the animals showed a 17% weight loss does not mean anything in itself; a weight loss must be linked to other physiologic data if proper conclusions are to be drawn.

The reason for advocating the exclusion of water from gerbil cages has nothing to do with water conservation or lower kidney strain. Rather, it is concern over the fact that excess moisture is the source of the odor that contributes to the extinction of living things from the learning environment. Gerbils

went for years without drinking water before they were discovered by man; hence, why not let them have their way, if such an existence makes classroom survival much more likely? It is well for those of us working at the university level to keep in mind that precollege education gets the short end of the financial stick and lacks the ventilated animal rooms we know.

I would like to hear from anyone who has good scientific references on gerbils.

The Day It Rained Cats

One day in 1969, the villagers in Malaysin, Borneo, looked upward and saw a sky filled with cats. The Royal Air Force had parachuted the cats into the remote mountain village to solve an ecologic dilemma that was literally bringing the roofs down.

The mass feline drop climaxed what had begun as a well-meaning campaign by the World Health Organization to control malaria in the village through the use of insecticides. The DDT did indeed kill disease-carrying mosquitos, but the chemical also accumulated in cockroaches. Some of the cockroaches died, but most built up a resistance to the DDT.

Geckoes, the lizards that ate the DDT-infested cockroaches, were more affected by the chemical. The speedy lizards, long accustomed to scampering up walls and across ceilings to evade hungry cats, began slowing down. They were caught and eaten by the cats, which, in turn, died.

The disappearance of the cats and geckoes was but the beginning in this disrupting ecologic chain of events in the isolated village. Rats, their defiance mounting in direct proportion to the declining feline population, swarmed into the village. Then the caterpillars squirmed their way into this ecologically chaotic scene, and the thatched roofs in the village began to collapse. Without the control formerly exerted by their predators the lizards, the caterpillar population grew out of control.

Parachuting in more cats eventually helped restore the natural balance in the village. But, in other circumstances, the cats may not have been the answer. Earlier in this century, a massive dose of cats was introduced into Australia to help control a fast-expanding nuisance population of rabbits. The cats did help control some of the rabbits, but they were also attracted to the delicious bird population. The native birds, having little fear of this heretofore unknown creature, were easy victims. As the birds declined, insects flourished. In turn the insects destroyed the great eucalyptus forests, which provided sole sustenance for the cuddly koala bear.

"What happened in Borneo is another example of how man's simple attempts to control complex nature have led to disaster as often as to solution," says Jonathan K. Waag, an instructor in biomedical sciences at Brown University.

Conservation News