ENCYCLOPEDIA OF ANIMAL RIGHTS AND ANIMAL WELFARE

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dead-end these lines. Relevant differences make the two as morally distinct as death by natural causes is from murder.

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HOLMES ROLSTON III

ENRICHMENT FOR ANIMALS

During the past 25 years the recognition that captive wild animals are in need of richer environments than those traditionally afforded them has become the accepted norm. Often this recognition has spurred the production of more beneficial behavioral conditions for animals in our care, but in some cases it has resulted in richer-appearing environments that please humans, but do little or nothing to improve the animals' well-being.* The term "enrichment" might better be limited to those circumstances in which there is measurable improvement in the behavioral and physiological well-being of the animal.

Historically, there were distinctions between "behavioral enrichment" and "environmental enrichment." These were based on suggestions that there were two radically different approaches to improving the lot of captive animals. The behavioral enrichment approach focused on engineering environments that provided opportunities that were likely to elicit species-typical behaviors. For example, occasionally producing the sounds of crickets in an otter exhibit and providing means by which the otters could hunt and capture crickets resulted in considerable display of species-typical behaviors. Supporters of environmental enrichment suggested that providing a rich-enough environment precluded the need for engineering artificial "hunts" or other apparatus that rewarded animals for particular responses. For example, if a captive forest with sufficient food was provided for chimpanzees,* this might be sufficient to encourage significant amounts of species-typical behaviors. Today, the term "environmental enrichment" is typically used to refer to all efforts to improve the circumstances of captive animals (*see also* ZOOS). Methods of providing more stimulating environments for animals obviously depend on the species involved, but some examples of simple and inexpensive methods that will serve for many animals include the following:

1. Provide interesting ways for them to hunt for food. Hide their provisions in trees or behind objects in ever-varying ways so that they may have the joy of discovering them.

2. Simple objects such as balls can be rotated with other toys, and where possible, some possibility for their animation can be provided. A ball suspended tetherball style will often lead to greater interaction and entertainment for animals than one simply thrown in their living space.
3. Most young animals love to explore new situations. A trip to the local toy store may yield giant, durably made building elements that may be assembled and reassembled into ever-changing steps to climb and holes to dive into.
4. A simple switch or motion detector can be used to allow animals to control various parts of the environment. The range of opportunities is limited only by imagination and budget. Inexpensive suggestions include allowing animals to control the dimming or brightening of lights in their room; to control radios, televisions, or video recorders (perhaps even with motion pictures of their favorite companions to entertain themselves while humans are at work); to rotate a wheel or perform other exercise to deliver food treats; or to turn on showers or mists in which to play.

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HAL MARKOWITZ

Enrichment and Research

Changes in the conditions under which animals are kept that appear superficially to improve animals' lives do not always have the desired effect. Such contradictory results have most often been found when animals are kept in large numbers under standardized conditions on farms or in laboratories. To measure effects of proposed improvements in living conditions on the welfare of large numbers of animals usually requires carefully designed experiments. If you want to know whether changing the diet of 1,000 rats in a laboratory colony improves their health, you have to keep careful records of the animals' condition before and after the diet change to see if the new diet really improves the health of colony members.

"Enrichment" has potential costs as well as potential benefits. On the surface, it seems likely that an animal living with others or in an interesting environment would be happier than an animal that spends its entire life alone in a standard laboratory cage. But consider the Norway rat, a common laboratory animal. When placed together, groups of male rats will engage in a

series of fights and form a dominance hierarchy with one or more males dominant over the rest. Subordinate individuals are continually harassed by dominant animals, and within the confines of a laboratory cage, subordinate rats are forced into constant contact with their superiors.

Enhancement of the physical environment can also have undesired side effects. Consider the Mongolian gerbil. Gerbils are easy to handle and do not appear stressed by interaction with humans. However, if you provide a breeding pair of gerbils with an environment where they are free to dig tunnels (as they do in nature) and allow them to rear their young in the underground nest chambers they construct, such young behave strangely when they are grown. They flee when you attempt to pick them up. When captured, they frequently have seizures. Here, enrichment seems to decrease, not increase, the well-being* of animals who are going to spend their lives interacting with humans.

Other attempts to improve the well-being of caged animals may have similar paradoxical effects, not because of the nature of the animals, but because of the economics of animal maintenance. Most people seem to believe that the larger the enclosure in which an animal is kept, the better off the animal will be. However, rats in nature spend most of their lives in burrows consisting of small nest chambers connected by even smaller tunnels. Perhaps rats like to be kept in closely confined spaces. In fact, when given a choice between tall cages and short ones, rats are nonresponsive. Similarly, researchers at Oxford University in England have found that domesticated hens raised in the cramped "battery cages" (*see* CHICKENS) used for commercial egg production show no preference when given the choice between a large pen and a battery cage.

Existing standards for animal maintenance have evolved over the years with revisions based on professional judgment and personal evaluations. Such informal development of standards for animal maintenance does not inspire confidence that the procedures in use today are optimal. On the other hand, the equally personal basis for many proposed changes in maintenance procedures suggests that such changes may not have the desired result of enhancing the well-being of animals. Paradoxical consequences of alterations in maintenance conditions intended to improve the well-being of animals in laboratories and on farms are likely. More research on consequences for animals of proposed changes in living conditions is needed. (*See also* LABORATORY ANIMAL USE.)

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ENVIRONMENTAL ETHICS

Anthropocentric (human-centered) environmental ethics bases concern for the nonhuman natural environment (including animals) on the benefits it provides humans. It treats only humans as of direct and intrinsic moral concern. Taking care of a pet (*see* COMPANION ANIMALS AND PETS) or a park is done solely because they are useful to us. Anthropocentrism* is often defended by appeals to biblical passages that give humans "dominion over . . . every living thing that moves upon the earth" (Genesis 1:28). In contrast, nonanthropocentric environmental ethics bases the protection of the environment on its intrinsic value. It conceives of nonhuman nature as important in ways that surpass its instrumental (or use) value to humans.

A sentiocentric (sentience-centered; *see* SENTIENTISM) environmental ethic holds that sentient creatures—those who can feel and perceive—are morally important in their own right. Some of the best-known defenders of animals accept this ethic, including Peter Singer. Because it is likely that only vertebrate animals—mammals, birds, fish,* amphibians,* and reptiles*—consciously feel and perceive, a sentiocentric environmental ethic treats invertebrate nature as solely of instrumental value for sentient creatures. Such an ethic protects trees and ecosystems, for example, not for their own sake, but because they provide a habitat for sentient creatures.

Sentiocentrism ruptures the boundary of the traditional human-only moral club and may have radical implications for animal agriculture, animal experimentation, and hunting.* Nonetheless, from the perspective of broader environmental ethics, sentiocentrism is but a small modification of the traditional ethic. It extends moral concern beyond humans only to our closest cousins, the sentient animals, and denies direct moral concern to 99% of living beings on the planet, as well as species and ecosystems. Sentiocentrists respond that it makes no sense to care directly about trees or ecosystems and that the idea of owing obligations to bacteria is foolish.

Biocentric (life-centered) environmental ethics views all living beings as worthy of direct moral concern. Biocentrists contend that although plants and invertebrate animals do not have preferences, they nonetheless have goods of their own that we should morally consider. Though a tree does not care if its roots are crushed by a bulldozer, crushed roots are still bad for the tree and not just for the homeowner who wants its shade. Insentient living beings have a welfare of their own that should be part of direct environmental concern. Albert Schweitzer's* reverence-for-life ethic is an example of biocentrism.