

ments are costly and hard to administer, but because they can fatally undermine the research. For example, researchers from the University of Washington and the University of Nairobi who were studying not the efficacy of AZT but how HIV is transmitted from pregnant women to their children, could not have carried out their study if they had given the women AZT.

Some advocates, Rothman notes, contend

“that the tidal wave of AIDS sweeping the world, particularly in southern Africa, is so dreadful that researchers must be given a relatively free hand.” But he disagrees. “When we take account of the misery and stunted hopes of people in Uganda, it is not enough for investigators to say that their research left them no worse off. . . . Do unto others as we do unto ourselves—a principle for researchers everywhere.”

Why Do Horses Sleep?

“Do Horses Gallop in Their Sleep?” by Matt Cartmill, in *The Key Reporter* (Autumn 2000), Phi Beta Kappa Society, 1785 Massachusetts Ave., N.W., Fourth Floor, Washington, D.C. 20036.

Is consciousness unique to humans, or do other animals also possess it? Scientists—who are generally reluctant to deal with so subjective a thing as consciousness—are divided on the question. But Cartmill, a professor of biological anthropology and anatomy at Duke University Medical Center, thinks that the form of unconsciousness known as sleep offers some clues to the mystery.

Like humans—and unlike most animals—horses and other mammals (as well as birds and possibly some reptiles) engage in “true sleep, involving a shift from fast to slow waves in the forebrain,” Cartmill notes. Because such sleep is “dangerous, complicated, and time-consuming,” there must be “a payoff.” It’s not to conserve energy, he says, since “mammalian sleep uses almost as much energy as wakeful resting.” And it’s not to avoid predators, since “birds and mammals that are too big to hide still have to flop down and fall asleep every day, right out there on the prairie, exposed to every predator in the world. They do it as little as possible—a horse sleeps only about three hours a

day, of which only 20 minutes is spent lying down—but they’d be better off if they didn’t do it at all,” like most invertebrates and cold-blooded vertebrates.

It appears to be “the needs of the brain” that make sleep necessary for humans, Cartmill says. “Consciousness damages or depletes something in the waking brain, and we can’t keep it up indefinitely. If we’re forced to stay conscious around the clock, day after day, with rest but no sleep, we soon start manifesting pathological symptoms.” Sleep seems to restore that damaged or depleted “something” in the brain.

If that is so, Cartmill concludes, then “it seems reasonable to think that animals that have to sleep as we do are conscious when they are awake.”

The evidence for animal consciousness “is necessarily indirect,” Cartmill says. But that evidence, in his view, “seems at least as persuasive as the indirect evidence that we have for other unobservable phenomena—for example, the Big Bang, or neutrinos, or human evolution.”

ARTS & LETTERS

Remaking the Landscape

“A Word for Landscape Architecture” by John Beardsley, in *Harvard Design Magazine* (Fall 2000), Harvard Univ., Graduate School of Design, 48 Quincy St., Cambridge, Mass. 02138.

Unlike architecture and the fine arts, landscape architecture seldom appears in the limelight. But that may be about to change. The low-profile discipline is fast

becoming perhaps “the most consequential art of our time,” claims Beardsley, a senior lecturer in landscape architecture at the Harvard Graduate School of Design. No