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

In projects such as the Parque Ecológico Xochimilco, landscape architects are finding a new role.

longer concerned simply with arranging places for safe, healthful, and pleasant use, landscape architecture has become a means of expressing "individual and societal attitudes toward nature," and it is transforming "our public environments."

Embracing ecology as "a moral compass," landscape architects, says Beardsley, now take up a host of challenges—environmental, social, technological, and artistic. In cleaning up the contaminated site of a former iron and steel plant in Germany, landscape architects Peter Latz and Anneliese Latz made the site's "problematic history" part of their design, Beardsley notes. They preserved the blast furnaces and surrounded them with trees, "making them appear like craggy mountains glimpsed through a forest"—and offering an environmental lesson to park visitors.

Environmentalism and the ethic of "sustainable design," says Beardsley, now encourage landscape architects to develop "'green' infrastructure for improved energy efficiency, storm water management, waste water treatment, bioremediation, vegetal roofing, and recycling." For architect Renzo Piano's DaimlerChrysler complex in Berlin, landscape designer Herbert Dreiseitl devised an unusual plan featuring rooftop gardens that capture and filter rainwater. The water is used in the building and also feeds a big lagoon.

Perhaps the best example of the new role of landscape architecture is the Parque Ecológico Xochimilco, an early-1990s environmental restoration project in Mexico City. Dating to the 10th century, the prized landscape consisted of some 7,400 acres of rectangular artificial garden islands set amid a network of canals. But the canals were clogged with aquatic plants, and the islands were sinking as the aquifers beneath them became increasingly depleted. Runoff from developed areas nearby caused frequent floods.

Landscape architect Mario Schjetnan's design "was guided by hydraulic strategies," says Beardsley. Water was pumped back into the aquifer; polluted surface water was treated, then used to regulate water levels in the canals, which were cleared of harmful vegetation. The eroded islands were built back up, more than one million trees were planted, and agriculture was reintroduced to the islands. Today, the canals of Xochimilco are full of pleasure boats, and the city's people can

wander a 743-acre park "whose different zones emphasize natural, recreational, and interpretive areas."

"The ways in which we meet the challenges of urban sprawl, open space preservation, resource consumption and waste, and environmental protection and restoration are crucial to the quality of our lives—maybe even to the survival of our species," asseverates Beardsley. "It is landscape architecture that confronts these challenges."

EXCERPT

Living Other Lives

It is the curious identity of books in general that history and philosophy, invaluable though they are, cannot, by their very nature, contain novels; yet novels can contain history and philosophy. We need not quarrel about which genre is superior; all are essential to human striving. But somehow it is enchanting to think that the magic sack of make-believe, if one wills it so, can always be fuller and fatter than anything the historians and philosophers can supply. Make-believe, with its uselessness and triviality, with all its falseness, is nevertheless frequently praised for telling the truth via lies. Such an observation seems plainly not to the point. History seeks truth; philosophy seeks truth. They may get at it far better than novels can. Novels are made for another purpose. They are made to allow us to live, for a little time, another life; a life different from the one we were ineluctably born into. Truth, if we can lay our hands on it, may or may not confer freedom. Make-believe always does.

—Novelist and essayist Cynthia Ozick, in *The Yale Review* (Oct. 2000)

A Misunderstood Masterpiece

"The Real Presence of Christ and the Penitent Mary Magdalen in the *Allegory of Faith* by Johannes Vermeer" by Valerie Lind Hedquist, in *Art History* (Sept. 2000), Assn. of Art Historians, 70 Cowcross St., London EC1M 6EJ, U.K.

Allegory of Faith (c. 1671–74), which may have been Johannes Vermeer's last painting, is quite different from all of the Dutch master's earlier, straightforwardly naturalistic works. It shows a woman striking a rhetorical pose, surrounded by religious objects in an otherwise typical Dutch domestic interior. Perplexed, most scholars have dismissed the painting as a crude religious allegory done when Vermeer's artistic sensibilities were growing duller. Other scholars have given incomplete interpretations. But Hedquist, a professor of art criticism at the University of Montana–Missoula, contends that *Allegory of Faith* is "a finely painted masterpiece" that must be understood in the context of the Dutch Roman Catholic community to which Vermeer (1632–75) belonged.

The painting, she says, is a sophisticated allegorical apology for the Catholic doctrine of transubstantiation (whereby the bread and wine in the Mass are miraculously transformed into the real presence of Christ's body and blood). Disagreement about the sacrament of the Eucharist was the main issue dividing Roman Catholics and Calvinists in the northern Netherlands. The Calvinists, who did not believe in transubstantiation, insisted that simple faith, without the special sacrament of communion, was sufficient for salvation. In the Catholic community in Delft, clandestine gatherings to celebrate Mass were not at all unusual, says Hedquist. Indeed, parishioners probably gathered in Vermeer's home for that purpose.

In *Allegory of Faith*, a tapestry curtain (with decorations standing for the outside, secular world) is pulled back to reveal a richly attired woman whose right foot is on a terrestrial globe