Research, they will report that infusions into the mesolimbic system of tiny amounts of chemicals that block the binding of the nicotine to its receptors also cures rats of their nicotine addiction. "Its the same system that cocaine targets, except that cocaine binds at [receptors] at the ends of the nerves, [and nicotine binds to receptors] in the cell bodies," says Corrigall.

Nicotine's effects on the dopamine reward system may also explain why, despite the unremitting drive to smoke, many smokers find that only the first cigarette of the day truly satisfies. In the rat, at least, too much nicotine results in too little dopamine release, according to studies presented by David Balfour of the University of Dundee, Scotland, at a workshop held in February 1993 by the German Research Council on Smoking and Health in Titisee, Germany. When Balfour and his colleagues gave rats five or six daily subcutaneous injections of nicotine, they found that the animals secreted pulses of dopamine in response to each injection. If, however, the rats receive a constant subcutaneous infusion of nicotine for 10 days prior to, as well as during, the injections, dopamine secretion remains normal. Balfour says that this situation more closely resembles what happens with a human smoker.

"Plasma nicotine levels are rising through the day until it gets to the point where it desensitizes the receptor, and when that happens you no longer get the buzz, the pleasant sensation," says Balfour, a theory with which Dani and Corrigall both agree.

Of course the new studies on nicotine receptors and the mesolimbic system have yet to explain all facets of cigarette smoking. For example, why do people smoke in the first place despite feelings of nausea? And what accounts for the withdrawal symptoms?

Nonetheless, "all these studies will be critical to the FDA's case." predicts Edythe London of NIDA, who also studies nicotine's effects on the brain. "Since the 1980s," she says, "we've shown that when you give the nicotine, it gets into the brain, interacts with specific receptors in the brain, and has distinct effects on the brain. All cigarettes are, are a sophisticated system for delivering the drug." And that is exactly what the FDA wants to prove.

–Rachel Nowak

With reporting by Richard Stone.

ARCHEOLOGY

Professor Slams MIT Over Center Closure

For Heather Lechtman, 1984 was a banner year. In recognition of her work as director of the Massachusetts Institute of Technology's (MIT) Center for Materials Research in Archeology and Ethnology (CMRAE)—a pioneering effort to integrate the usually separate worlds of the physical and social sciences—the MacArthur Foundation awarded her one of its prestigious fellowships: a so-called genius grant. A decade later, however, MIT is about to recognize Lechtman's work in a less auspicious way: It plans to close CMRAE down at the end of June, a move that has sparked a bitter feud on campus.

MIT's provost Mark Wrighton delivered CMRAE's sentence last August, even though all but one member of a seven-person review committee that he had convened to examine the center's future had recommended expanding it into an MIT graduate degree-granting entity. Now, Lechtman, a physicist, anthropologist, and art historian, has launched an unusually fierce and public counterattack. Her principal weapon: More than 400 copies of a 29-page pamphlet, titled *An Institute In Ruins*, that she distributed in the past few weeks to MIT colleagues and staff.

In the pamphlet and interviews with *Science*, Lechtman charges that Wrighton intended all along to shut down the center. The 1993 review was just a "sham," Lechtman contends. As just one piece of evidence, she cites his choice of MIT history professor Peter Perdue to chair the committee. Perdue, she claims, was visibly antagonistic to the center and deliberately ignored the positive consensus of the other six review members. Other MIT faculty, however, suggest the center's troubles result more from something pointedly ignored by the pamphlet: a long divisive battle, over issues such as teaching load and control of the center, between Lechtman and MIT's humanities department, which oversaw the center. After that battle, they say, the center with Lechtman as director was left with no viable home. The humanities department would not support it, no other school wanted to add to its budget, and the provost was reluctant to take CMRAE under his own wing.

> **"The administration has thrown away something unique."**
>
> **—Heather Lechtman**

For his part, Wrighton denies predetermining CMRAE's closure. While praising the center, he says that at a time when MIT is facing a budget deficit, it simply did not garner sufficient interest, compared to other projects, among the school's deans to warrant an expensive expansion that would include the hiring of at least two new faculty members. "I rest comfortable with the review process and the eventual outcome," he told *Science*. (Perdue declined to be interviewed for this story.)

That outcome apparently marks the end of a trailblazing effort in archeometry, the application of materials science techniques to the study of historical artifacts, that began in the 1960s in the lab of MIT metallurgist Cyril Stanley Smith. His interests led to the creation, in 1977, of CMRAE and the selection of Lechtman as its first and only director. Although run by MIT, the center is actually a consortium of eight local institutions, including Harvard, Boston University, Wellesley, and Boston's Museum of Fine Arts. In short, says Lechtman, the center's goal is "to read culture out of technological behavior." Pursuing that goal, CMRAE has held classes and summer symposia and, in general, served as a rigorous training ground for those pursuing the relatively new discipline of archeometry.

CMRAE wins high marks for those efforts from archeologists, who are particularly happy with the center's home at MIT, because it provides access to the school's wealth of lab equipment and materials scientists. It's that access, agreed all the members of the review except Perdue, that could have made MIT one of the top archeology graduate programs in the nation, if the university had decided to expand the center's faculty and resources. "I'm really saddened by the closing," says University of Chicago archeologist Jane Buikstra, who participated in the center's review. So are members of the consortium, who had even offered to help provide classes and faculty to MIT, if that was what was holding back the establishment of a graduate program. Wrighton simply ignored the proposal, says Lechtman.

While her treatise will apparently not change the center's fate, Lechtman says she has achieved some goals by taking the dispute public. One was to explain that "the administration has thrown away something unique in the truest sense of the word," a particularly ironic act, she says, since the school heavily promotes the idea of bridging the arts and sciences. The second goal was to prompt MIT to take a new look at how the school evaluates interdisciplinary centers and to develop better guidelines to ensure the integrity of such reviews. That may be happening: MIT president Charles Vest has already convened a small committee of faculty to review the process by which the school decided to close the center.

–John Travis