

# NOSING OUT A MATE

All other mammals rely on chemical attractants to find that special someone. Will human suitors of the future be able to pack the power of pheromones? **By Meredith F. Small**

**IT'S SATURDAY NIGHT** in the year 2030 and time for your night on the town. It doesn't matter much what you wear, just be sure to dab on a little of that stuff you bought from the local pheromone shop. You might reach for a vial of your own essence that's been specially concentrated to make the most of your own attractive powers—or maybe you favor a synthesized version of the movie-star-of-the-moment's *je ne sais quoi*. Perhaps you go for a tube of the chemistry of some unknown person who just happens to be better-looking, more confident or blessed with superior genes to yours. Regardless, it's off to the neighborhood Fern-and-Sniff bar, and good luck!

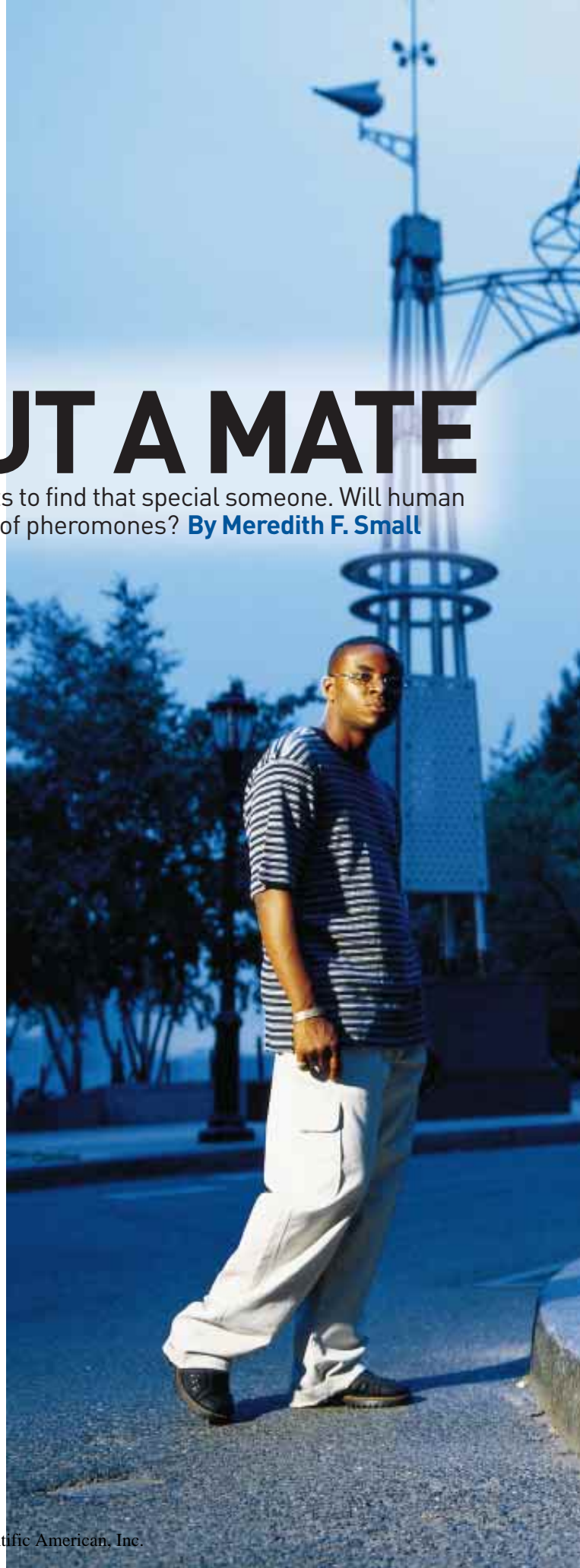
Recent research suggests that humans, like many other organisms, can be sensitive to pheromones, which are thought to be odorless chemicals secreted from the body and picked up by a special organ in the nose. In the animal kingdom and among insects, pheromones convey information to other members of the species about an individual's gender, reproductive status and rank on the social ladder. Contrary to popular misunderstanding, pheromones are not strictly sex attractants, but they do play a role in the mating rituals of everything from moths to mice.

Do humans have pheromones? Right now the jury is still out. But scientists know that something—perhaps a pheromone—in the underarm sweat of some women can alter the menstrual cycles of other women who come in close contact with them. Some investigators even have early indications that such airborne chemicals might unconsciously influence who we choose as mates.

More than a few researchers predict that science will isolate an incontrovertible human pheromone early in the next century—in fact, some contend they already have. How will that change tomorrow's battle of the sexes? Will a chemical advantage in the mating dance be as close as the corner shop?

**There is still debate over whether a human pheromone exists, but some scientists are out to isolate and bottle that "certain something" that seems to bring couples together.**

PETER MURPHY







Other animals have been using their noses to find mates for a long time. Far up in the nasal passages of all mammals—including humans—are receptors that react to odors and pass on the signals we register as smells to the neocortex, the “gray matter” of the brain. But many claim we also possess another nasal sense called the vomeronasal organ (VNO), a pair of tiny sacs that lies closer to the nostrils. Receptor cells in the VNO supposedly pick up pheromones—which generally cannot be detected as a smell—and transmit the information to the hypothalamus and the limbic system, more primitive parts of the brain. These portions control the urges for such things as food and sex.

In the 1970s scientists showed that smell, whether of odors or pheromones, has a powerful role in mate choice—at least in rodents. Rodent urine, it seems, differs in odor and pheromone content according to what type of major histocompatibility complex (MHC) genes the animal has. MHC genes contain instructions for making the proteins that help an organism tell what belongs in its body and what is a potentially dangerous foreigner. Every rat or mouse (and, maybe, human) has its own chemical signature dictated by the MHC genes.

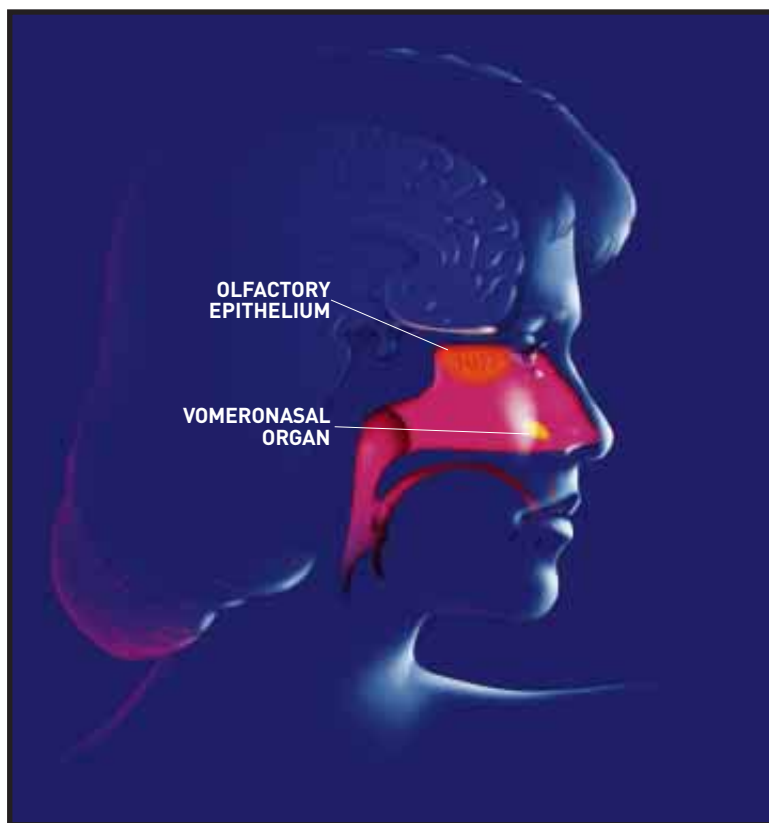
Interestingly, given their druthers, rodents sniff and then select mates with MHC genes that are quite different from their own. Such choices make good evolutionary sense: by choosing a mate whose MHC genes differ most markedly, rats and mice also have a good chance of mating with a partner whose other genes vary from theirs. Going for such variety could translate into offspring that are more equipped to fight off a range of infectious diseases.

If—and how—humans emit and track pheromones is not exactly clear. We belong to the order Primates, whose members are known for their well-developed senses of vision and touch. The trade-off for such visual and tactile acuity has supposedly been a less than keen sense of smell—a drawback that also seems to have blunted our pheromone-sensing abilities. In fact, most medical textbooks dismiss the human VNO as a vestigial structure that appears in the fetus and then nearly disappears later in development. But in the 1980s anatomists found evidence that the VNO exists in most adult people, even though it might not operate as well as it does in other mammals.

### SOMETHING IN THE AIR

More recent behavioral studies, however, suggest that the human VNO functions just fine. Last year Martha K. McClintock and Kathleen Stern, scientists at the University of Chicago, showed that substances isolated from the sweat of women at various phases of the menstrual cycle can modulate the timing of ovulation in women with whom they associate.

McClintock first documented in the 1970s that the menstrual cycles of women who spend a lot of time together eventually synchronize, suggesting that something that can waft from one woman to another must be at work. Researchers then used cotton pads to see if they could swab the substance from female armpits. They first removed any odoriferous compounds from the pads and then wiped the remaining tasteless, odorless liquid onto the upper lips of



JOHN W. KARAPELOU

other women. After a few months, they observed, the periods of the women who agreed to have the potential pheromone dabbed under their nose were in sync.

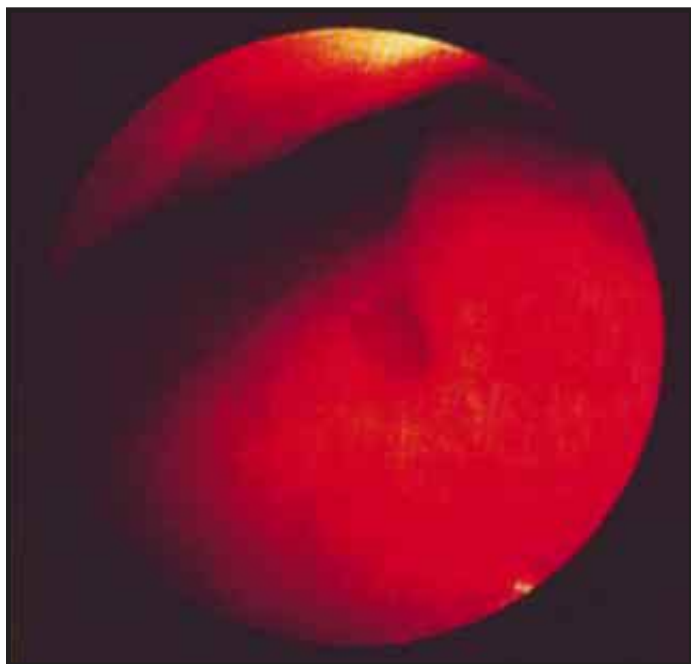
The same research protocol was used to show that men can influence the female cycle as well. A group of men offered up their armpit sweat, which was deodorized and then wiped on the upper lips of women with irregular menstrual cycles. Repeated exposure to the male secretions caused the women to cycle regularly, presumably by making them ovulate in a timely manner. Living with a man is presumed to have the same effect.

Although the studies substantiate the power of putative pheromones on female physiology, they say nothing about the role of the compounds in choosing a mate. For that, researchers have been turning to what might seem the least likely subjects—members of a closed religious sect in the Midwest that proscribes extramarital sex.

Carole Ober of the University of Chicago turned to the Hutterites, who routinely marry within their group, because she was intrigued by the rodent studies done in the 1970s. She wondered if humans, too, might subconsciously tend to mate with someone who has a differing MHC gene profile, which in humans is called the human leukocyte antigen (HLA) system.

Ober found that even though Hutterites as a group have very similar HLA profiles because of their history of intermarriage, the HLA genes of the wives she and her colleagues studied were quite different from those of their husbands. This suggested to Ober that the

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DONALD LANZA

It could be the last human organ to be identified by anatomists. The human vomeronasal organ (*close-up above*) consists of a pair of tiny, saclike structures that are thought to sense pheromones, which usually have no smell. The part of the nose that senses odors, the olfactory epithelium, lies higher up in the nasal cavity.

Hutterites were unwittingly optimizing the genetic diversity of their children by marrying partners whose genes were least like their own.

But how did the Hutterite couples choose partners with such different genes? Ober thinks the answer may lie in pheromones. Other studies have demonstrated that humans can smell the difference between mice with different MHC genes, she notes. So maybe the elusive chemistry that brings certain people together really is a pheromone. "I think this is likely," Ober says. "It would be odd if we could discriminate among the MHC types of another species but not among our own kind."

In 1995 evolutionary biologist Claus Wedekind of the University of Bern tested the possibility. He determined the HLA types of 49 women and 44 men (who were unknown to one another) and then asked each man to wear a cotton T-shirt for two consecutive nights. Next he asked the women, most of whom were ovulating and presumably at their most perceptive for choosing a mate, to sniff the shirts and record their reactions.

Wedekind reported that the women tended to prefer shirts worn by men with HLA types dissimilar from theirs. What is more, the shirts reminded them of current or former boyfriends. The women found T-shirts that had been worn by men with HLA types similar to their own unattractive and commented that they smelled like their fathers or brothers.

### THAT COME-HITHER SMELL?

Did Wedekind's T-shirts contain human pheromones that either attracted or repelled the women? And, as many will want to know, how soon can the substance be bottled and sold?

Whether anyone has identified and purified an actual human pheromone is the subject of heated debate among people who

know about the nose. For his part, David Berliner of Pherin in Menlo Park, Calif., claims that his company has produced two colognes based on human pheromones: one for men and one for women. But even Berliner isn't touting the potions as sex attractants. In fact, the men's cologne contains what he claims are male pheromones and the female scent, female essence. He says the colognes are intended to make the wearer relaxed and self-confident, which will draw in members of the opposite sex—a theory, by the way, that still hasn't been clinically tested. In any case, the current design might work just fine for gays and lesbians, and enterprising heterosexuals might try simply switching bottles.

Berliner isn't the only one purporting to sell human pheromones. Winifred B. Cutler of the Athena Institute for Women's Wellness Research has branched into commercial products as well. Her Chester Springs, Pa.-based company, which also conducts research, advertises vials of odorless synthetic human pheromones as additives to one's favorite scent. These scents are intended to "increase the romantic attention from the opposite sex," according to the ads.

Cutler asserts she has backed up this claim with a double-blind study of her men's solution. Men who used the compound in their aftershave lotion for six weeks reported that they increased the number of times they slept next to a woman and also said they had more sexual intercourse, she says. Because the men didn't masturbate more, she and her colleagues contend that the increase was not caused by heightened sex drive but by increased sex appeal.

What do other scientists think about all this? Even if Berliner and Cutler have isolated human pheromones—a point that is hotly contested—the stuff still might not matter when it comes to picking who to bed down with. "If we do find an effect of pheromones on mate choice," McClintock comments, "I believe the role will be modulatory, that is, in concert with existing mechanisms that are already rich, complicated and dependent on context."

Does this mean that if we can bottle our chemistry and dole it out in the future, the additive will change the way we fall in love? No, flowers and candlelight and sweet-nothings-in-the-ear will still be important, according to most accounts.

We are a behaviorally fickle species. When it comes to finding a mate, we are swayed by culture, pushed by family and locked into traditions. In many places across the globe, people even have their mates chosen for them, pheromones be damned. We also sidestep biology by washing off our body odors and any pheromones or diluting them with soap and perfume.

Perhaps in the future we will be able to better control the messy process of the mating dance with a touch of something that makes us especially appealing to others. That way we could concentrate on projecting the good points about our genetic constitutions and ensure the most biologically appropriate mate. Or more likely, being the smart and adventurous species that we are, we'll experiment with nature and splash on a dab of someone different each night—and find out exactly what the nose knows.

### ABOUT THE AUTHOR

MEREDITH F. SMALL, professor of anthropology at Cornell University, writes frequently about science. She says this is one of her weirdest assignments ever.