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THE WAY WE LIVE NOW: 1-13-02: SALIENT FACTS: BIOMIMICRY

THE WAY WE LIVE NOW: 1-13-02: SALIENT FACTS: BIOMIMICRY; Super Fly

By Rob Turner
Published: January 13, 2002

Ron Miles wants to put a bug in your ear. More specifically, a bug's ear, or rather a replica of one. Miles, a vibrations and acoustics expert at SUNY at Binghamton, is actually trying to replicate the incredibly accurate hearing mechanism of a rare fly -- the *Ormia ochracea* -- and use it to create everything from the world's most sophisticated hearing aid to tiny microphones that might help catch the future Osama bin Ladens of the world.

GOOD VIBRATIONS

It's all part of biomimicry, an attempt to mold technology on nature (its early successes include Velcro, developed after a Swiss inventor, out hiking, noticed cockleburs sticking to his wool pants). When two scientists -- Ron Hoy of Cornell and Daniel Robert of the University of Bristol -- first discovered that this *Ormia* had ears, they weren't thinking of their market potential. Most flies don't have ears; that they had found them on its underbelly was enough of a coup. What's more this *Ormia*'s ears are extraordinary. They have developed through evolutionary necessity the ability to pinpoint the location of chirping crickets, on whose bodies the female deposits her larva (which then consume the said crickets) to propagate. "We had no idea this ear would be so cool," Hoy admits. When Miles explained its mechanics -- it has two eardrums, the one closer to the sound vibrates more loudly than the other, detecting a noise's direction within one or two degrees -- the team of scientists realized that its supersensitivity could revolutionize hearing aids.

The problem with most hearing aids that fit discreetly inside the ear is that they don't let you "focus" your listening, so that sounds in the front of you are louder than those to your sides and back. But Miles has already created a silicon design based on the fly's uncanny ability to extract the direction of a sound, which will be ready for the masses by 2005. Timing may prove serendipitous, given that baby boomers are reaching that age (former Boomer in Chief Bill Clinton has worn a hearing aid for years). Hoy suspects they'll be prime candidates: "A lot of them spent too much time hanging out in front of the speakers at Grateful Dead concerts."

IF THESE TROOPS COULD TALK

But even before the fly-inspired design hits the market, the U.S. military is likely to benefit. It is hoping to drop from the air marshmallow-size directional listening devices over enemy

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terrain to reveal virtually every whisper, gunshot or footstep in the area, as well as each sound's direction relative to each device. A cluster of them would be able to detect the origin of sounds through triangulation and then wirelessly transmit the information back to a listening station. While Miles's prototype should be ready this summer, the final product is still at least two years off. It's a shame, Miles admits. "It would be a really handy thing to have around right now." Rob Turner

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Photo (Andrew Mason)

A version of this article appeared in print on January 13, 2002, on page 616 of the New York edition.

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