therapy had cut healthcare costs about 25 percent and returned about 150 percent on investment. Because patients weren’t randomly assigned to the treatment, “potential for selection bias in group assignment is inherent,” Locke writes. Still, the results impress.

Although leaping to real-world applications is tricky, Locke estimates, conservatively, that 10 percent of American adults—about 20 million people—are somatizers, hypochondriacs, or other high utilizers who could benefit from behavioral therapy. If just one percent, or 200,000 of these people, enrolled in therapy programs and saved just $500 each (about half the cost of a CAT scan), $100 million would melt off the nation’s healthcare tab.

Cognitive behavior therapy, Locke asserts, can help patients reframe their symptoms and control their spending. And it could prove more effective over time than quick-fix treatments—like psychiatric drugs or a doctor’s verbal reassurances—that glaze over anxiety but can’t erase it. Could this therapy trump psychiatric drugs like Valium? Not so fast, says Locke. Cognitive behavior therapy is “cost effective, it’s clinically effective, but it reaches only a small percentage of the people who could benefit from it.” That’s partly because the disorders it is designed to treat pose tough challenges in modern medical environments where doctor-patient relationships wither under tight schedules and anxious sufferers are herded toward expensive drugs. The other part of the problem lurks in how this country treats mind-body medicine.

“We don’t train doctors to deal with it,” says professor of psychiatry Arthur Barsky, director of psychiatric research at Brigham and Women’s Hospital. “The doctor’s job is to identify ‘real’ diseases and treat them. Everything else is chalk.” Barsky works with hypochondriacs, those more extreme patients who persistently believe they’re sick or constantly fear disease. For a female hypochondriac, worry about breast cancer can lead to obsessive rounds of self-administered breast exams; breasts then become tender, reinforcing the anxiety. “Once you really suspect you’re sick, you pretty much select the information that confirms your worst fears,” Barsky says. His research shows that hypochondriacs also benefit from behavioral therapy. But medical paradigms don’t prepare doctors for symptoms that don’t spring from organic disease or patients who suffer but aren’t sick. “America’s leading medical schools are focused on technological biomedicine,” Locke explains. “The systematic exclusion of the mind-body relationship is a deficiency.”

~NEIL SHEA

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**FLAMSY COURTSHIP TAKES GAS**

**NO on a Summer’s Eve**

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No one knew, perhaps, that the gas nitric oxide (NO) is a constituent of automobile exhaust and a big player in the formation of smog, and is no laughing matter, such as nitrous oxide, N₂O. But who knew that NO is crucial chemistry in the flash of a firefly as it searches for sex (or dinner) in the dark of a summer night?

Sara M. Lewis ’75, BL ’30, associate professor of biology at Tufts University, and spouse Thomas Michel ’77, M.D., associate professor of medicine at Harvard Medical School and chief of cardiology at the Harvard-affiliated West Roxbury VA Hospital, have collaborated with scientists of other disciplines and with their sons, specimen collectors Benjamin and Zachary, to show that a firefly uses nitric oxide to control the flash of its lantern, a spectacular natural phenomenon. This is the same molecule, Michel notes, “that in humans controls blood pressure, penile erection, and the formation of memories, among diverse other roles.”

Nitric oxide, a small, diffusible, highly reactive molecule, is often deployed by the body as a biological signal and regulator. Michel and colleagues at Harvard-affiliated Brigham and Women’s Hospital were able to describe how the gas helps control blood pressure by dilating blood vessels. Naturally, he talked about his work at the dinner table with Lewis, who is an evolutionary ecologist and insect neurophysiologist interested in firesflies. The couple and Barry Trimmer, a biologist colleague at Tufts, wondered whether nitric oxide might have something to do with how fireflies turn their lanterns on and off. The three of them asked June Aprille, a cell biologist at Tufts, for her thoughts on the matter. The four roped in David Dudzinski, a student at Harvard Medical School, to build a tiny gas chamber for firefly research. These four, with three others, in time announced flash findings in Science magazine. “No single one of us could have made the discovery,” says Michel, “and ours is a nice example of the power of interdisciplinary collaboration.”

Thousands of specialized light-producing cells called photocytes in the lantern of the firefly—a beetle, actually, not a fly—have in their inner regions structures that contain chemicals that generate light when turned on by oxygen. But the edges of the photocytes are also densely packed with organelles called mitochondria, “which are quite famous as the oxygen-consuming power plants of...
Thus, release of NO in the kidneys relaxes good works, it functions as a relaxer. In many of its brain, penis, liver, lungs, eyes, and likely in every other human organ. “In many of its brain, penis, liver, lungs, eyes, and likely in every other human organ.” In many of its good works, it functions as a relaxer. Thus, release of NO in the kidneys relaxes the smooth muscle in the walls of blood vessels, increasing blood flow and, thereby, the rate of filtration. Nitroglycerine, often prescribed to reduce the pain of angina, works by generating nitric oxide, which relaxes the walls of the coronary arteries. During sexual excitation, nerve endings near the blood vessels of the penis release NO, allowing the vessels to relax and blood to pool, producing an erection. (Viagra® works by amplifying the effects of nitric oxide.)

According to the self-styled home page of NO (www.academicpress.com/no/), “From diabetes to hypertension, cancer to drug addiction, stroke to intestinal motility, memory and learning disorders to septic shock, sunburn to anorexia, male impotence to tuberculosis, there is probably no pathological condition where nitric oxide does not play an important role.”

—Christopher Reed

WELCOME TO JUNKSPACE

Designed to Shop

Goethe—no doubt inspired by European masterpieces—described architecture as “frozen music.” The Wal-Marts and Home Depots of today’s consumption-based societies might embody instead frozen Muzak. Retail stores, breathtaking only in their warp-speed proliferation and disappearance (they last, on average, about seven years), have come to dominate urban landscapes. Furthermore, as the global economy expands, so does global consumption, and therefore shopping malls—once monuments to a uniquely American materialism—are now ubiquitous. From Xian to Chicago, there is no escape from shopping. Yet retail design is neglected by architects, who strive to build enduring masterpieces like libraries and skyscrapers, not big-box stores.

Thus, despite its lighthearted title, the Harvard Design School Guide to Shopping (Taschen, 2002) is no merry primer on the world’s chic boutiques. Rather, this unusual 800-page book examines all things retail—from the architecture of Niketown, Disneyworld, and airport malls to the histories of escalators, air-conditioning, and bar codes—and, through essays, interviews, pages of photographs, and statistics, identifies shopping as a defining and unsightly feature of urban society. The book reveals the predatory, often dubious tactics (such as customer tracking devices and focus groups) that allow retailers to sustain consumer demand despite volatile markets and trends. And it laments the...