almost all cells,” says Aprille. Ordinarily, the mitochondria use up the oxygen piped in through tracheal air tubes to make energy for all cellular activities. But when the firefly wants to flash, it generates a nerve pulse that releases nitric oxide—the team found the enzyme that produces NO lying right next door to the firefly’s light-generating apparatus—and when NO is present, the use of oxygen by the millions of respiring mitochondria comes, say the scientists, to a screeching halt. Oxygen is then able to pass through the mitochondria to the interior of the cell where it reacts with the light-producing chemicals to produce luminescence. Flash. As the NO signal decays, the mitochondria power up again and begin to gobble up oxygen, which turns the lantern off. All of this happens in a fraction of a second.

“What is life? It is the flash of a firefly in the night,” said the dying Blackfoot warrior Crowfoot. Yes, but what is the meaning of the flash? “Fireflies are very romantic beasts,” says Lewis. “Their whole adult life is spent courting.” The courtship system is based on flash communication. A firefly can flash once a second, and each flash lasts about half a second. All of the hundreds of known species of firefly time their flashes differently for identification purposes, and male and female flash patterns within species also differ. Thus, one species will flash at a regular, sedate rate, while another will emit a periodic machine-gun burst of multiple flashes. Flashes, some fireflies learn, aren’t always an invitation to the dance. Female Photuris fireflies know how to imitate the flashes of females of other species, luring males of those species, whom they eat. All that glitters is not gold.

Who knew what a gas is nitric oxide? “Only within the past dozen years have we begun to learn the major role that nitric oxide plays in the internal regulatory system of human beings,” says Michel. “It is at work in the heart, blood vessels, 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

Right Now

WELCOME TO JUNKSPACE

Designed to Shop

G OETHE—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
Right Now

privatization of institutions like museums and airports, which have become shopping destinations. “Not only is shopping melting into everything, but everything is melting into shopping,” writes Sze Tsung Leong, M.Arch. ’98, an editor and contributor to the book.

The Guide to Shopping is a product of the Project on the City, a seminar led by Rem Koolhaas, professor in practice of architecture and urban design. Yearly since 1996, the project has explored a new aspect of the effects of modernization on contemporary cities from Lagos to Las Vegas. Koolhaas and his students spend a semester traveling worldwide for research (itineraries have included Singapore, Tokyo, and Minnesota’s Mall of America) and then develop their findings the following term. (The research-related travel is funded partly by the design school and partly by the students themselves.)

Such exhaustive, cross-disciplinary analysis is new to architectural pedagogy, which has traditionally emphasized building, not research. “The project falls beyond the realm of typical design studies,” says design-school dean Peter Rowe. “It’s a hybrid of discussion and storytelling, design and scholarship.”

The Guide to Shopping integrates sociology, economics, and psychology into its examination of retail. Going beyond the physical appearances and designs of stores, the book scrutinizes ancillary features like frequent-customer cards and artificial rain forests (for example, the extensive tropical plantings inside the Mirage Casino-Hotel in Las Vegas) for their insidious roles in enticing and nurturing consumption. Air conditioning is a prime factor: “By making interior spaces larger, more comfortable, more controlled, and more difficult to escape,” writes Leong, air conditioning “radically altered the way that time was spent in public.”

Furthermore, cities have shifted their priorities from public interest to revenue maximization. “The marketplace is the final arbiter and regulator of life,” contends Koolhaas, who designed Prada’s new flagship store in New York City and clearly believes in the possibility of worthwhile retail architecture. “Architecture now has an increasing responsibility to private interests.” Privatization makes civic and social institutions like museums vulnerable to such woes of retailing as decreased consumer demand and market instabilities. “Shopping has found a way to expand by colonizing the institution,” writes Leong. He cites casinos, theme parks, train stations and airports, universities, hospitals, and even military bases (such as Norfolk Naval Base, revamped as a money-making tourist attraction) as the new shopping beachheads: “The experience of the museum is becoming increasingly seamless with that of the department store.”

“Like a hurricane, globalization is rearranging the features of architecture,” declares the oracular Koolhaas. “Architects now work in contexts, climates, and environments they know nothing about.” Such clueless designers create what Koolhaas calls “junkspace”—the antithesis of Goethe’s frozen music. “Junkspace is what remains after modernization has run its course,” Koolhaas says. Shopping malls, department stores, theme parks, golf courses, and even ballrooms are among the offenders. “Junkspace,” he writes, “can either be absolutely chaotic or frighteningly aseptic...the product of the encounter between escalator and air conditioning conceived in an incubator of Sheetrock.”

Koolhaas detests much of today’s retail architecture and the current trends to super-size, to replicate irrelevant styles, or to dazzle for dazzling’s sake. He disapproves of the hodgepodge—like Roman columns and Deco flourishes—that can jostle together in the same shopping

Two for the money: retail-driven interiors at GUM, Moscow (left, built 1888-93), and The Galleria, Houston (right, 1971). Below: shopping-mall floor plans and mall chronology from 1939 to 1996.
We like to believe we’re fair-minded, democratic, unbigoted. Would it were so. In fact, we readily deceive ourselves about our prejudices, stereotypes, racial profiles, and ingrained biases. Mahzarin Banaji, Cabot professor of social ethics in the department of psychology and Pforzheimer professor at the Radcliffe Institute, can prove it. In collaboration with Anthony Greenwald, Ph.D. ’63, of the University of Washington, she has developed a psychological test that has collected data from 1.5 million website visitors since 1998. It demonstrates that nearly all of us have unconscious, preformed attitudes about race, sex, ethnicity, sexual preference, and obesity. “Yet when we ask people about their attitudes, that’s not what we hear,” Banaji says. “People report holding neutral attitudes. What people say explicitly is quite different from what the tool shows about their implicit attitudes. It’s the dissociation or split between them that’s interesting.”

Banaji, who works in the area of “social cognition,” doesn’t believe people are dissembling about their attitudes. “They truly believe that their attitude is neutral—most of us believe in fairness and egalitarianism,” she says. But unconscious stereotypes are deeply embedded in both individuals and cultures. Common associations, like male: science or female: liberal arts, are stubbornly fixed in the unconscious, even when they run counter to consciously held beliefs. Banaji and Greenwald’s Implicit Association Test (IAT) ferrets out these buried, automatic attitudes. The IAT is available on-line (see below). Its several versions plumb attitudes toward race, ethnicity (Asian American, Arab/Muslim), gender, sexual orientation, age, and body image (fat/thin). The racial IATs have drawn 500,000 responses, more than any other version. For five to 10 minutes (working at top speed to forestall conscious consideration), subjects sort pictures and words (“wonderful,” “agony,” “happy,” “failure”) into categories by using two computer keys. The IAT measures “latencies” (time delays) in response: which association takes longer to make, black—bad or black—good? By computing the average difference in latencies between dozens of such pairings, the researchers quantify the IAT effect. “Speed reveals what is hidden from conscious awareness,” Banaji says. “The architecture of the mind is such that when two things are repeatedly paired in our experience, we will respond quickly to their co-occurrence.”

Even a highly educated professional like Banaji admits, “I was taken aback by my inability to make the intended association, the difficulty in making the counter-stereotypical association between, say, female and career, or male and home.” An analysis of 600,000 completed website tests shows that this incapacity is common. Intellectual knowledge is powerless to change certain drummed-in perceptions.

“The data suggest that our conscious and unconscious thoughts and feelings may be quite dissociated,” Banaji reports.

B U R I E D B I A S A N D B I G O T R Y

Stealthy Attitudes

Because we abhor the utilitarian, we have condemned ourselves to a life-long immersion in the arbitrary...[Junkspace] is flamboyant yet unmemorable,” he writes. Moreover, retail space is rarely designed by so-called High Architects. When Frank Lloyd Wright, I.M. Pei, and Frank Gehry have contributed, the results can be innovative and elegant. Koolhaas might describe his own high-tech Prada store as retail done right. But generally, the discipline’s stars shun such projects. “This vast lacuna...can be attributed to the widely held belief that shopping is a trivial pursuit for any self-respecting architect,” writes contributor Daniel Herman, M.Arch. ’98. The book’s prognosis is not optimistic. “We have built more than all previous generations together,” writes Koolhaas. “But...we do not leave pyramids.”

~CATHERINE D U P R E E

K O O L H A A S WEBSITE ADDRESS:
www.gsd.harvard.edu/people/faculty/koolhaas/index.html
PROJECT ON THE CITY COURSE DESCRIPTION:
www.gsd.harvard.edu/people/faculty/koolhaas/course.html
GUIDE TO SHOPPING WEBSITE ADDRESS:

An escalator, dollar signs, and welcome mat on the book’s back cover say it all.