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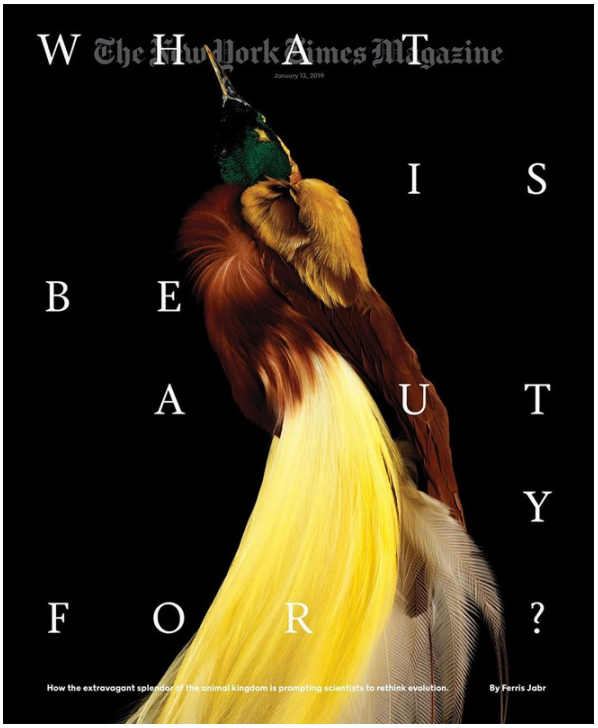

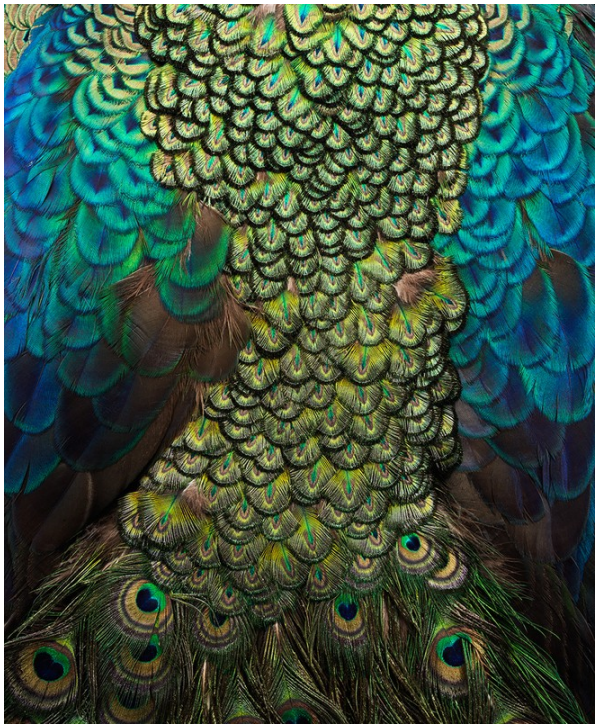

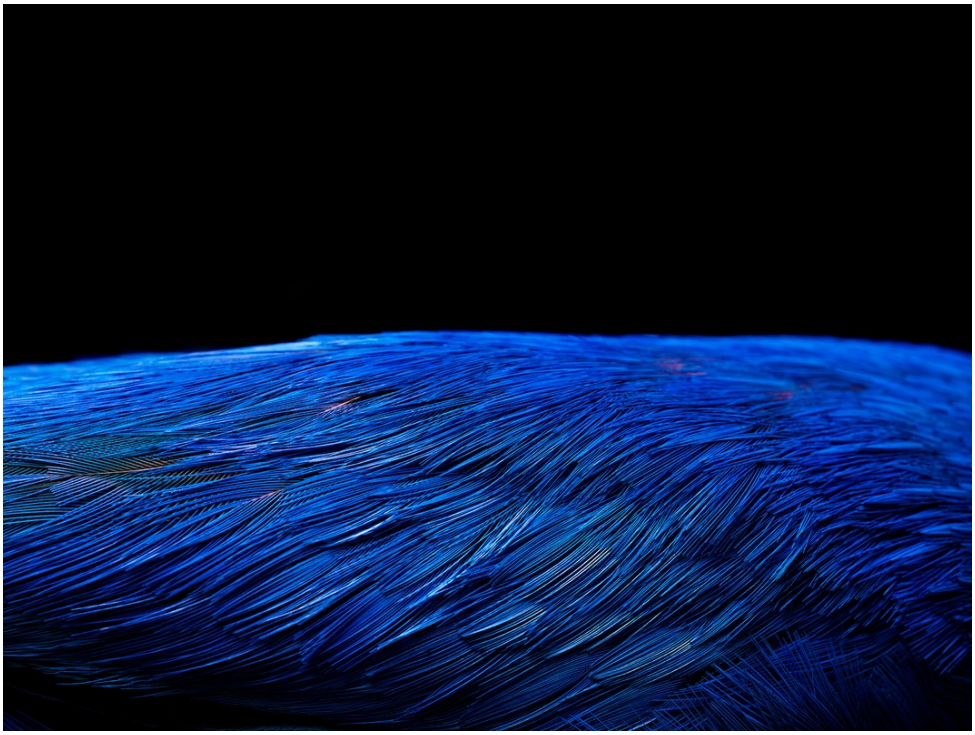

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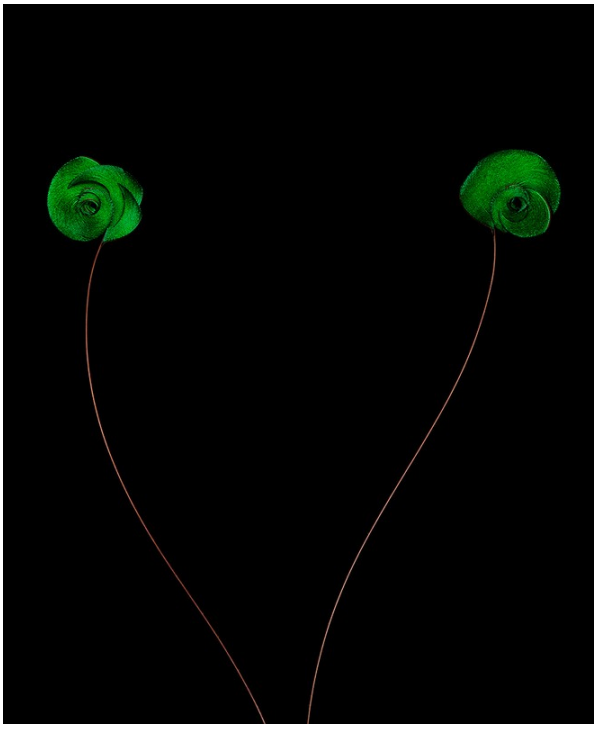

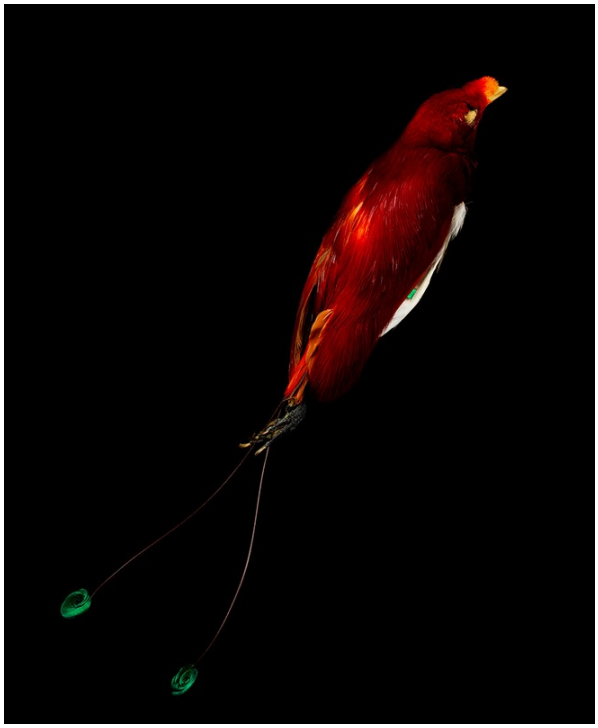

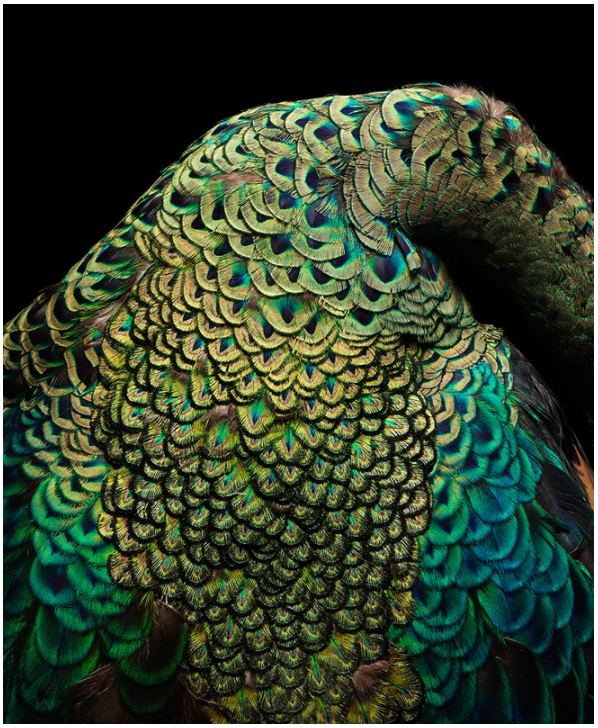

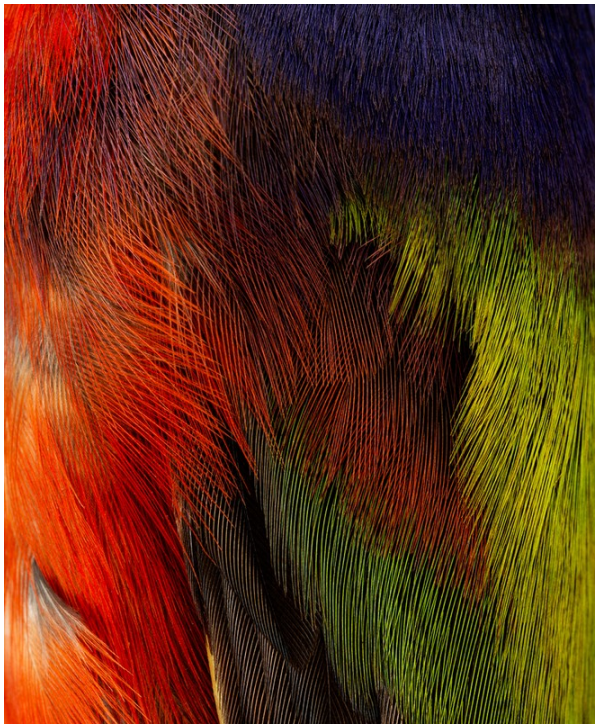

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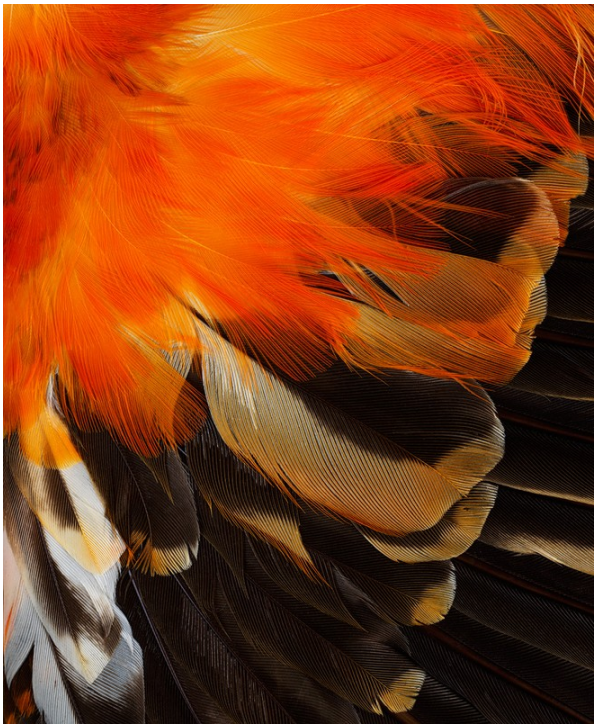

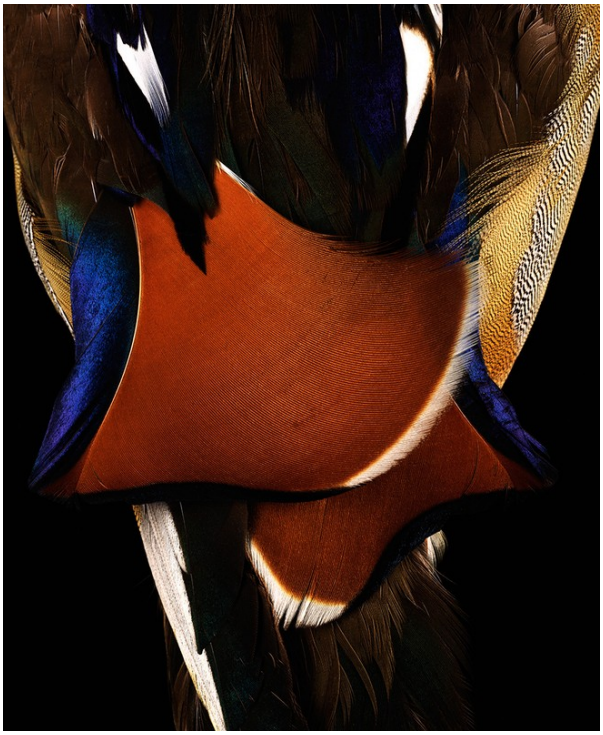

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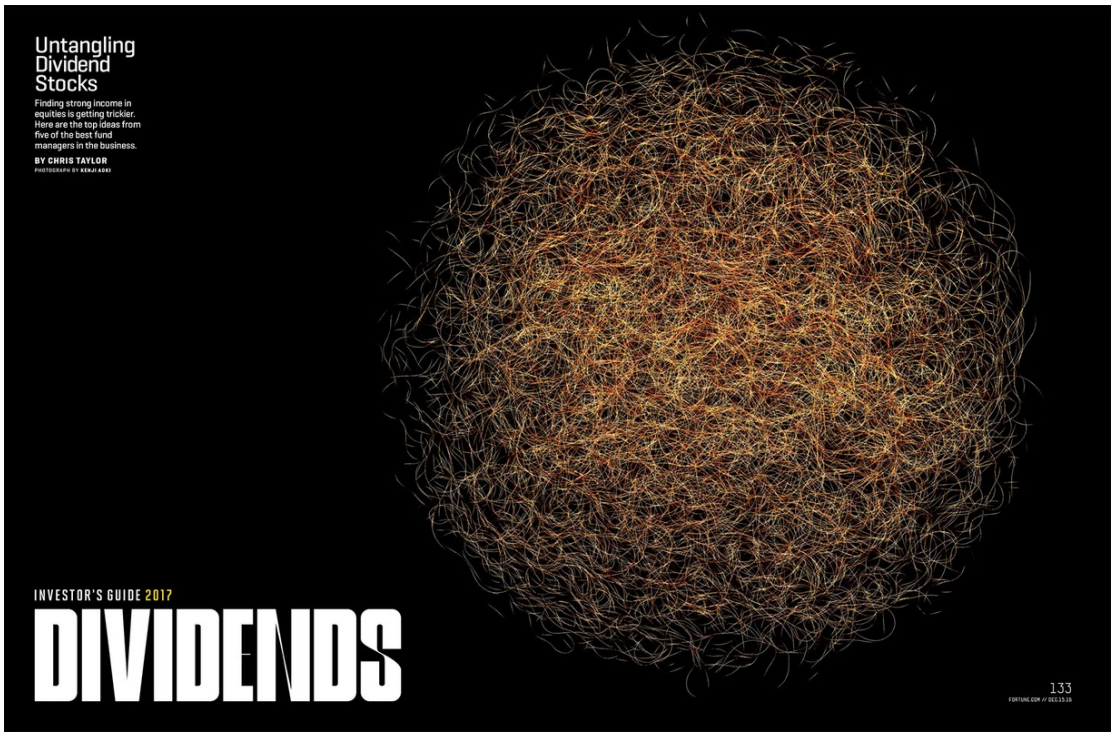

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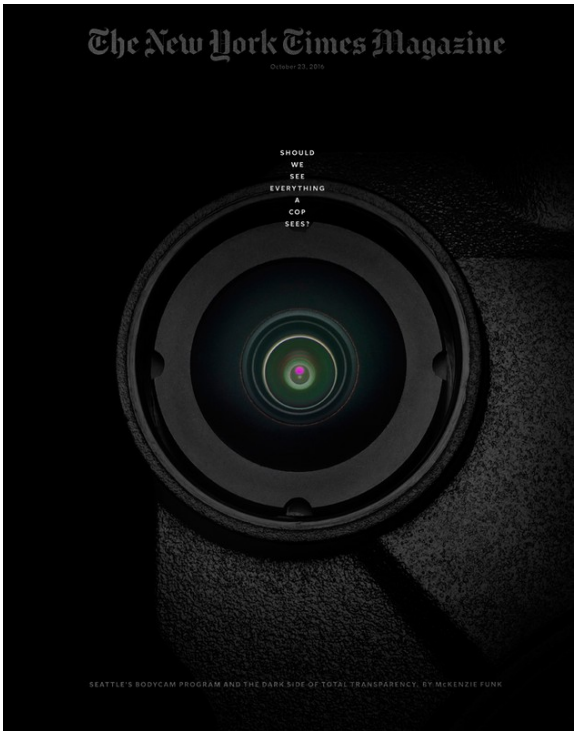

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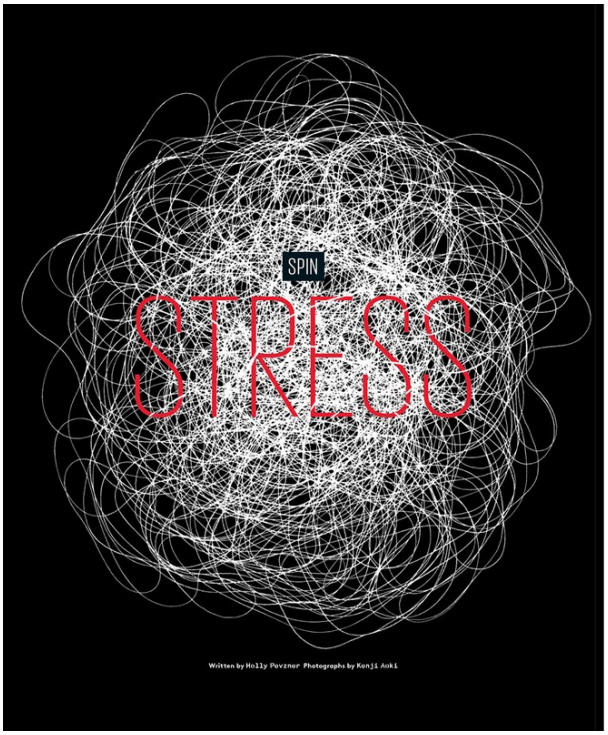

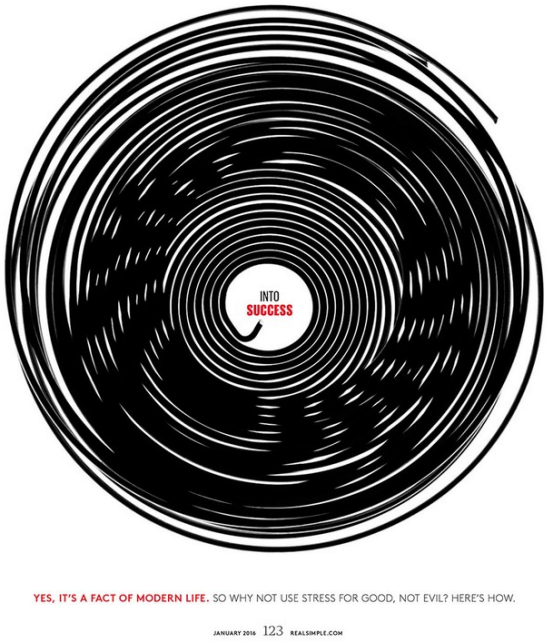

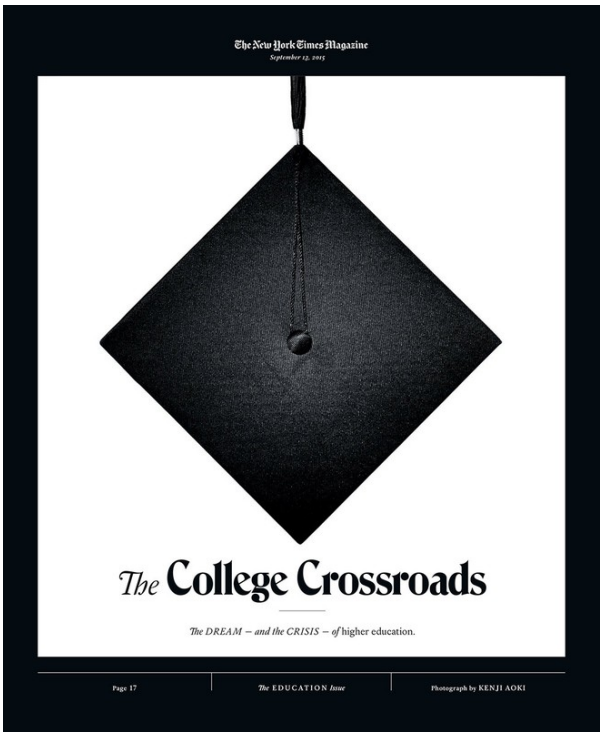

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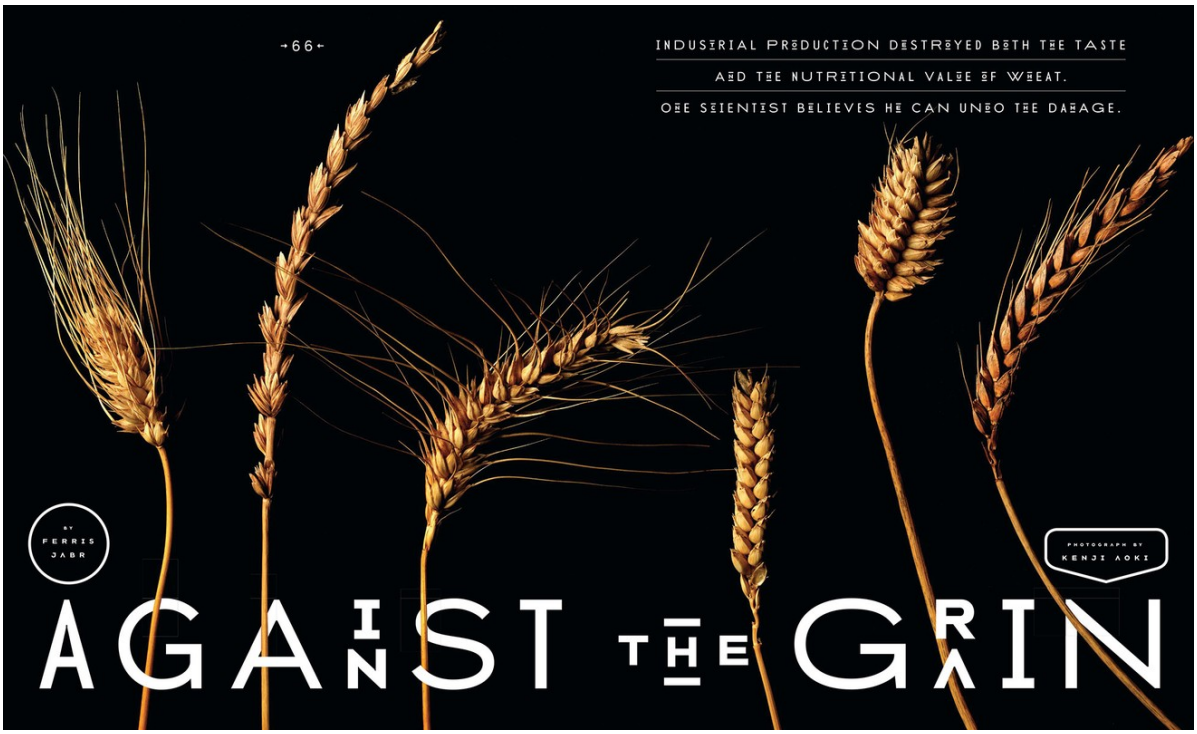

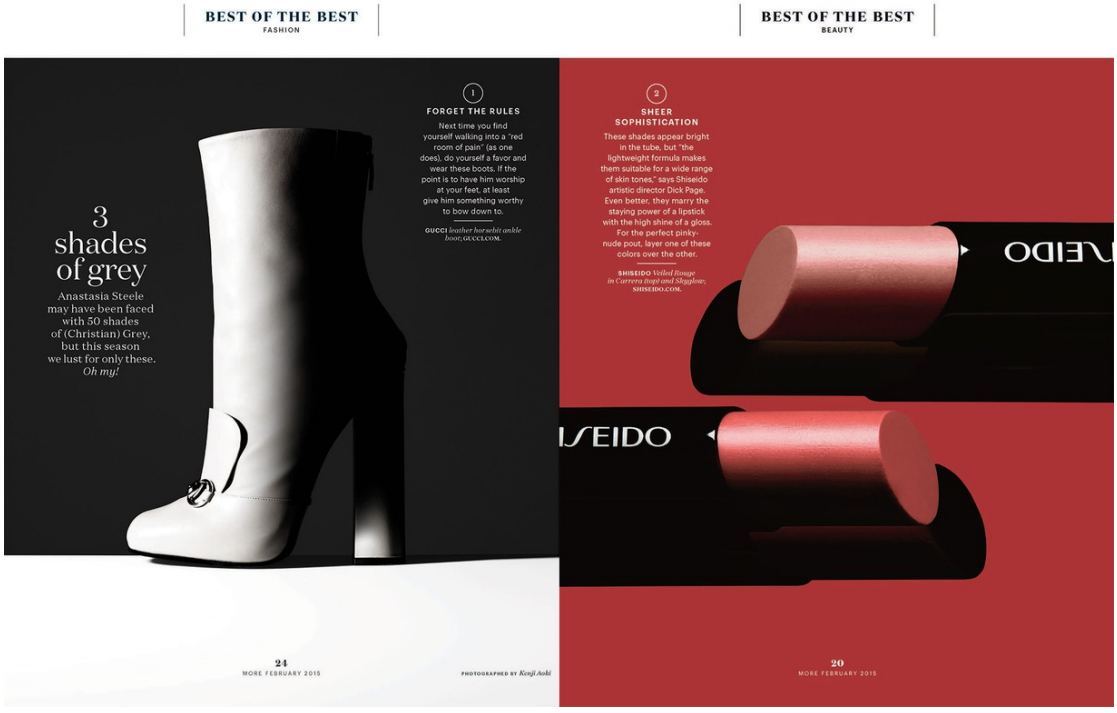

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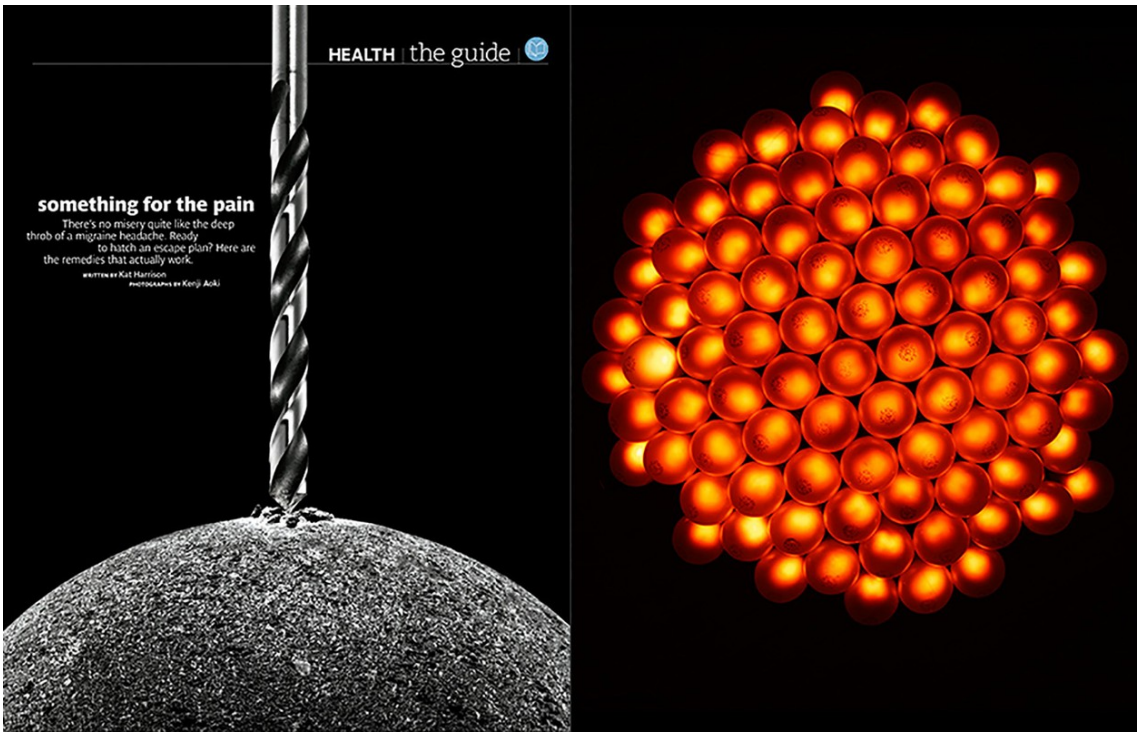

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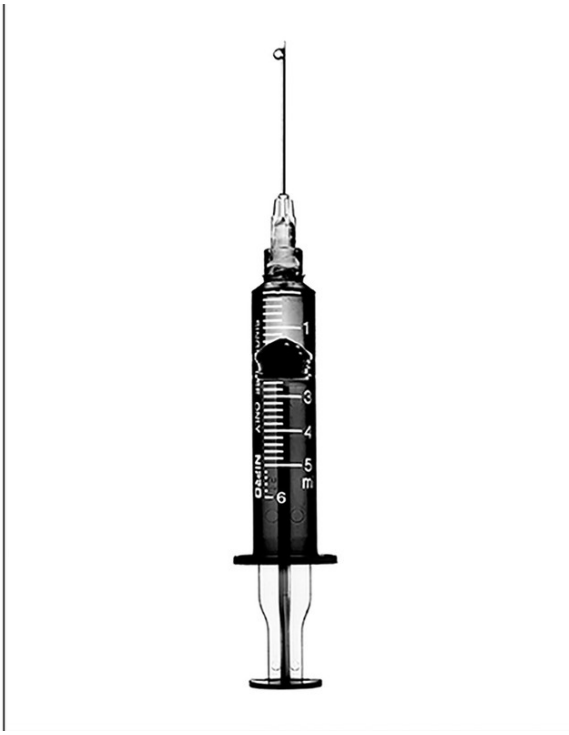


A REPORTER AT LARGE

THE BIG SLEEP

Insomnia drugs like Ambien are notorious for their side effects. Has Merck created a blockbuster replacement?

BY IAN PARKER

One evening in late May, four senior employees of Merck, the pharmaceutical company, sat in the bar of a Hilton Hotel in Rockville, Maryland, wearing metal lapel pins stamped with the word "TEAM." They were in a state of exhausted overpreparedness. The next morning, they were to drive a few miles to the headquarters of the Food and Drug Administration and attend a meeting that would decide the future of suvorexant, a new sleeping pill that the company had been developing for a decade. Merck's team hoped to persuade a committee of seventeen, composed largely of neurologists, that suvorexant was safe and effective. The committee, which would also hear the views of F.D.A. scientists, would deliver a recommendation to the agency. If the government approved suvorexant—whose mechanism, inspired partly by research into narcoleptic dogs, is unlike anything on the market—it would be launched within a year. Some industry analysts had described it as a possible blockbuster, a term usually reserved for drugs with annual earnings of a billion dollars. Merck had not created a blockbuster since 2007, when it launched Januvia, a diabetes drug. The company was impatient. A factory in Las Piedras, Puerto Rico, was ready to start production.

David Michelson, who runs Merck's clinical research in neuroscience, said of suvorexant, "It's huge. It's a major product." He was sitting perfectly still in his chair; his hair flopped a little over his forehead. He looked as if he were waiting in an airport for a very late flight.

For months, in rooms across Merck's archipelago of mismatched buildings north of Philadelphia, Michelson had taken part in role-playing rehearsals for the F.D.A. meeting. The focus had been on readying Joe Herring, another Merck neuroscientist; he would be the primary speaker, having run the later clinical trials of suvorexant. Herring, a straight-backed, athletic-looking man in his fifties, had just gone up to his room, for an early night. "Joe had to find a way to be authentic," Michelson recalled. "He had to find a way to engage with the audience without becoming too informal." During the meeting, Herring would have access to a library of twenty-one hundred and seventy PowerPoint slides.

The Merck team was frustrated. The F.D.A. had just shown them the draft of a presentation, titled "Suvorexant Safety," that would be delivered by Ronald Farkas, an F.D.A. neuroscientist who had reviewed thousands of pages of Merck data. In a relentless PowerPoint sequence, Farkas made suvorexant sound disquieting, almost gothic. He noted suicidal thoughts among trial participants, and the risk of next-day sleepiness. He quoted from Merck's patient notes: "Shortly after sleep onset, the patient had a dream that something dark approached her. The patient woke up several times and felt unable to move her arms and legs and unable to speak. Several hours later, she found herself standing at the window without knowing how she got there." A woman of sixty-eight lay down to sleep "and had a feeling as if shocked, then felt paralyzed and heard vivid sounds of people coming up the stairs, with a sense of violent intent." A middle-aged man had a "feeling of shadow falling over his body, hunted by enemies, hearing extremely loud screams."

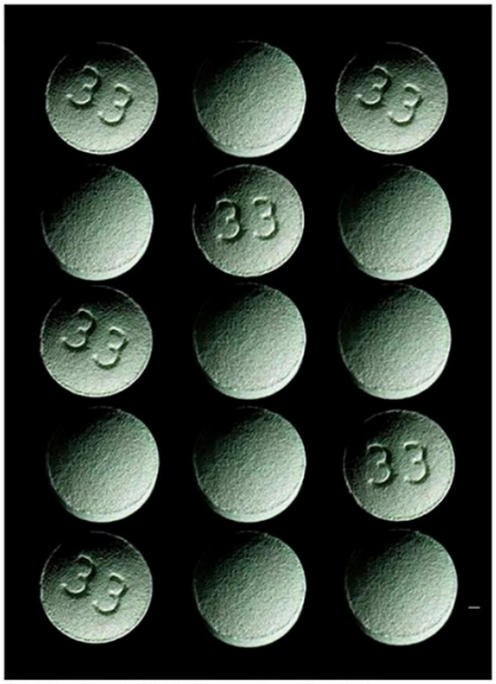
An F.D.A. presentation that focusses on individual "adverse events"—and draws attention to patients feeling "hunted by enemies"—is discouraging to a drug's sponsor. Michelson called the presentation "somewhat unusual," and emitted a dry laugh.

Darryle Schoepp, the head of Merck's neuroscience division, was at the other end of the table. During the human trials of suvorexant, he noted, it had been taken two hundred and seventy thousand times, and "every time you take a drug it's an opportunity for *something* to happen that the user can report." He added, "Go back to the early days of Ambien. I wonder how many patient days of data they had with Ambien."

Ambien, which is now available generically as zolpidem, is one of America's most popular drugs, and it played a role—silent or spoken—in many conversations that I had heard on visits to the Merck offices. Zolpidem was the cheap drug that suvorexant had to take on, if not unseat, in order to succeed in the sleep-medication market. In addition, rising public worry about risks associated with taking Ambien—ranging from amnesiac devouring of Pop-Tarts to premature death—had reduced the F.D.A.'s tolerance for side effects in sleep medications.

John Renger was also at the bar. A forty-four year old neuroscientist, he has a round face, cropped hair, and a neat goatee. He helped lead the company to the suvorexant molecule, and ran the first tests on rats, mice, dogs, and rhesus monkeys. He, too, was politely indignant about the F.D.A. "They've taken the emphasis off efficacy," he said, adding, "They're saying any residual effects are bad. But they're not looking at the balance—'What is the improvement in this mechanism?'"

The central nervous system is in an ever-adjusting balance between inhibition and excitation. Ambien, like alcohol or an anesthetic, triggers the brain's main inhibitory system, which depends on binding between GABA—gamma-aminobutyric acid, a neurotransmitter—and GABA receptors on the surface of billions of neurons. GABA receptors can be found throughout the brain, and when they're activated the brain slows. Ambien encourages the process by sticking to the receptors, holding open the door to the neurotransmitter. Suvorexant, which Merck describes as "rationally designed"—rather than stumbled upon, like most drugs—influences a more precise set of neurotransmitters and receptors. Orexin neurotransmitters, first identified fifteen years ago, promote wakefulness. When suvorexant is in the



Suvorexant, a drug seeking approval from the F.D.A., was inspired by research on narcoleptic dogs.

PHOTOGRAPH BY KENJI AOKI

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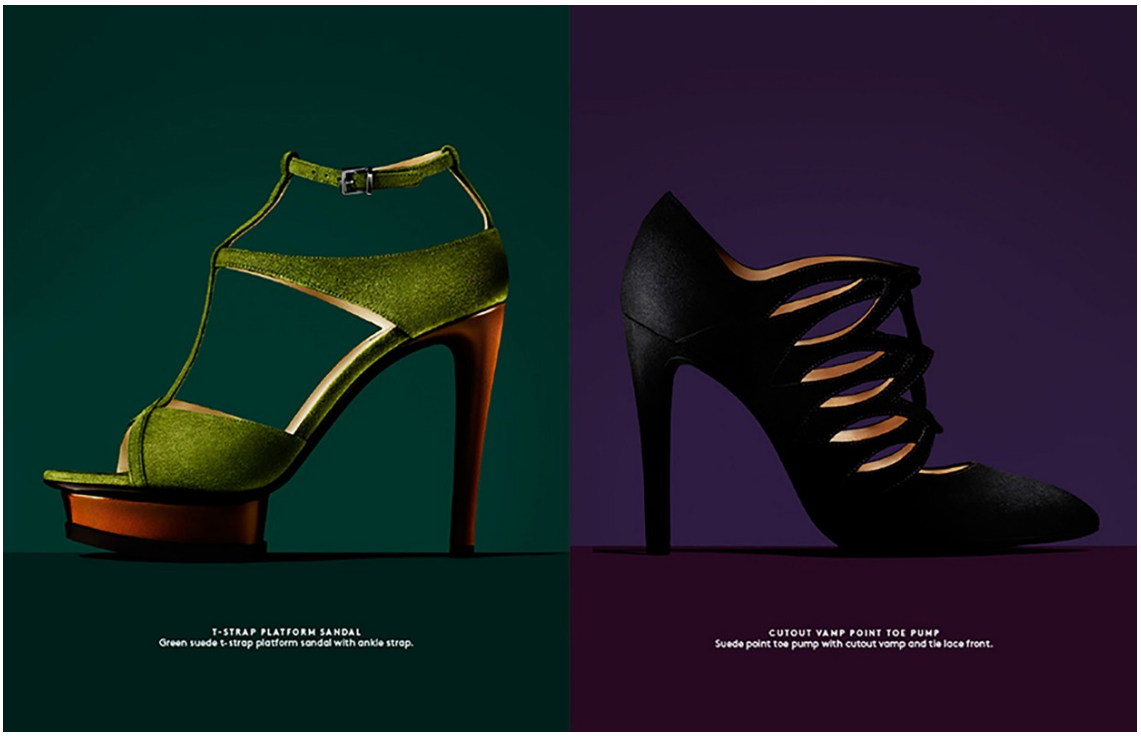

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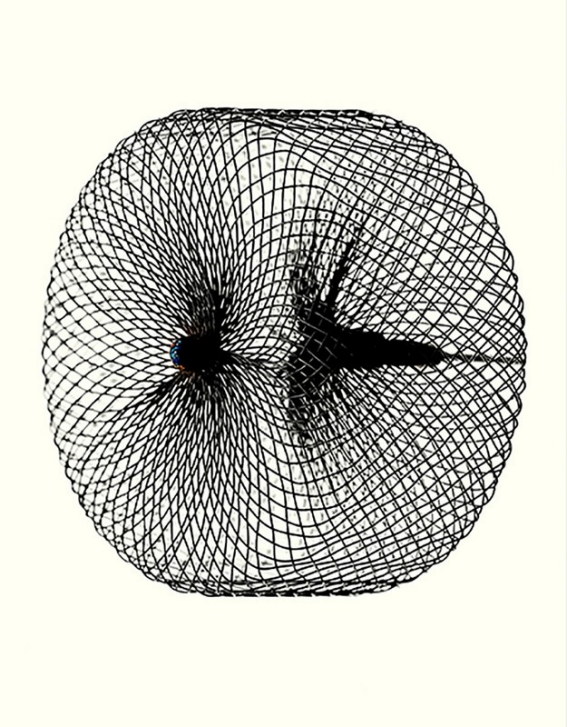

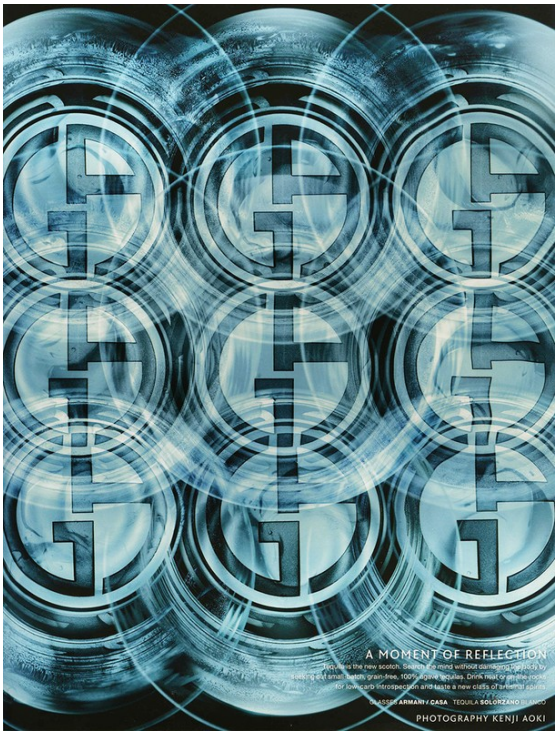

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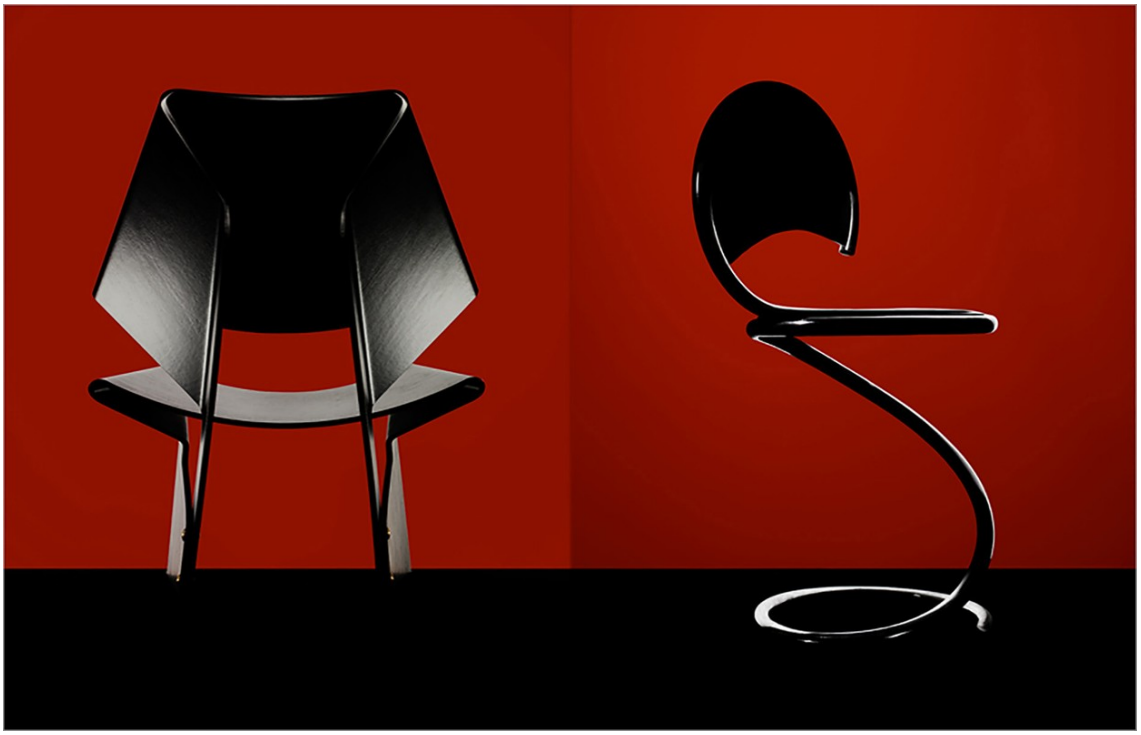

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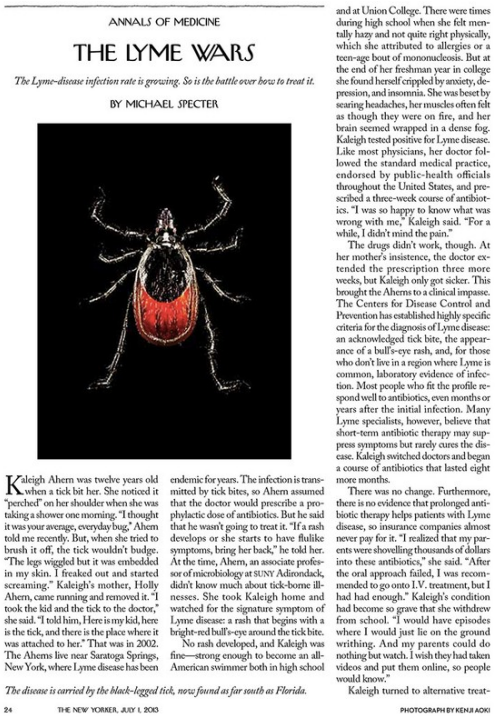

ANNALS OF MEDICINE

THE LYME WARS

The Lyme-disease infection rate is growing. So is the battle over how to treat it.

BY MICHAEL SPECTER

Kaleigh Ahern was twelve years old when a tick bit her. She noticed it "perched" on her shoulder when she was taking a shower one morning. "I thought it was your average, everyday bug," Ahern told me recently. But, when she tried to brush it off, the tick wouldn't budge. "The legs wiggled but it was embedded in my skin. I freaked out and started screaming." Kaleigh's mother, Holly Ahern, came running and removed it. "I took the kid and the tick to the doctor," she said. "I told him, Here is my kid, here is the tick, and there is the place where it was attached to her." That was in 2002. The Aherns live near Saratoga Springs, New York, where Lyme disease has been endemic for years. The infection is transmitted by tick bites, so Ahern assumed that the doctor would prescribe a prophylactic dose of antibiotics. But he said that he wasn't going to treat it. "If a rash develops or she starts to have flulike symptoms, bring her back," he told her. At the time, Ahern, an associate professor of microbiology at SUNY Adirondack, didn't know much about tick-borne illnesses. She took Kaleigh home and watched for the signature symptom of Lyme disease: a rash that begins with a bright-red bull's-eye around the tick bite.

No rash developed, and Kaleigh was fine—strong enough to become an all-American swimmer both in high school and at Union College. There were times during high school when she felt mentally hazy and not quite right physically, which she attributed to allergies or a teen-age bout of mononucleosis. But at the end of her freshman year in college she found herself crippled by anxiety, depression, and insomnia. She was beset by searing headaches, her muscles often felt as though they were on fire, and her brain seemed wrapped in a dense fog. Kaleigh tested positive for Lyme disease. Like most physicians, her doctor followed the standard medical practice, endorsed by public-health officials throughout the United States, and prescribed a three-week course of antibiotics. "I was so happy to know what was wrong with me," Kaleigh said. "For a while, I didn't mind the pain."

The drugs didn't work, though. At her mother's insistence, the doctor extended the prescription three more weeks, but Kaleigh only got sicker. This brought the Aherns to a clinical impasse. The Centers for Disease Control and Prevention has established highly specific criteria for the diagnosis of Lyme disease: an acknowledged tick bite, the appearance of a bull's-eye rash, and, for those who don't live in a region where Lyme is common, laboratory evidence of infection. Most people who fit the profile respond well to antibiotics, even months or years after the initial infection. Many Lyme specialists, however, believe that short-term antibiotic therapy may suppress symptoms but rarely cures the disease. Kaleigh switched doctors and began a course of antibiotics that lasted eight more months.

There was no change. Furthermore, there is no evidence that prolonged antibiotic therapy helps patients with Lyme disease, so insurance companies almost never pay for it. "I realized that my parents were shovelling thousands of dollars into these antibiotics," she said. "After the oral approach failed, I was recommended to go onto I.V. treatment, but I had had enough." Kaleigh's condition had become so grave that she withdrew from school. "I would have episodes where I would just lie on the ground writhing. And my parents could do nothing but watch. I wish they had taken videos and put them online, so people would know."

Kaleigh turned to alternative treat-

The disease is carried by the black-legged tick, now found as far south as Florida.

PHOTOGRAPH BY KENJI AOKI

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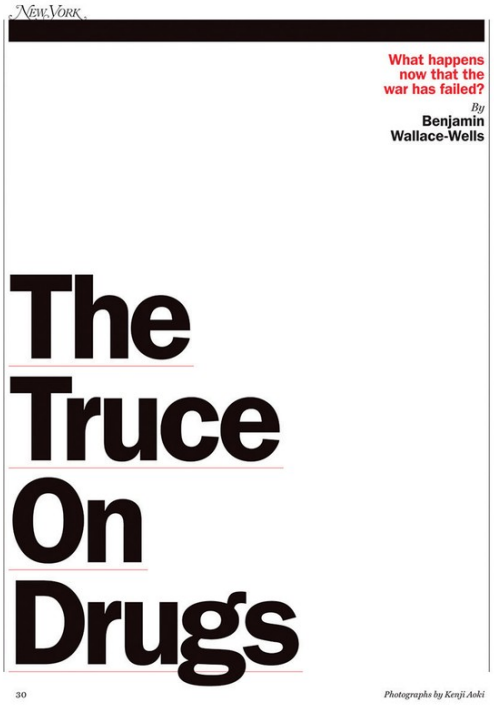


NEW YORK

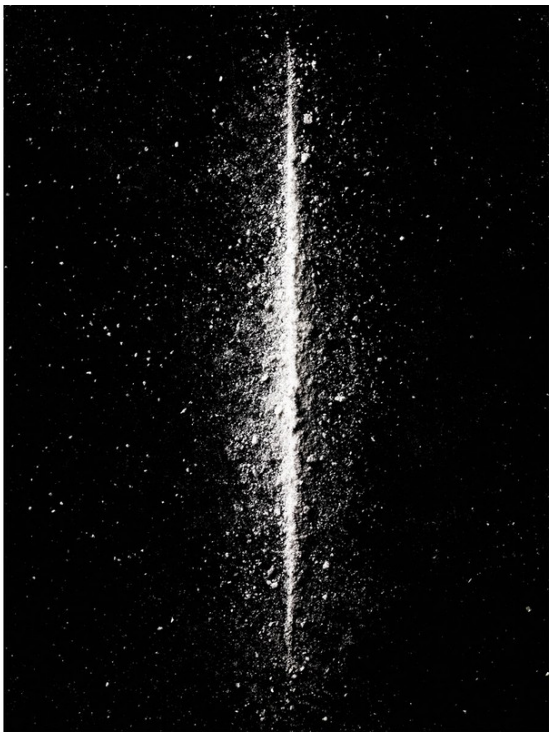
What happens now that the war has failed?

By Benjamin Wallace-Wells

The Truce On Drugs

30

Photographs by Kenji Aoki



CANNABIS is a highly persuadable plant. It thrives in Afghanistan; it grows beautifully in Mexico. It can prosper indoors or outdoors, in contained environments or expansive ones. Even on the essentials, like soil, light, and water, accommodations can be made. Cannabis in the wild will flower only once a year, early in the fall, but it can be tricked. Indoors, artificial light can be timed to mimic the patterns of the early sunsets of autumn, seducing the plant to bud; outside, the same effect is achieved by laying parabolic tarps, each shaped like the St. Louis arch, over the crop to obscure the sun. Nor does cannabis require expert botanists. There is a pattern that has been showing up in the criminal courts of Northern California in which a day laborer, often an illegal immigrant, is picked up for work, driven to tend a marijuana garden growing deep in Mendocino National Forest, and told that he is now in the employ of the Mexican Mafia. The guess, locally, is that the Mexican Mafia is not really involved, that this is just a ghost story to make sure the laborers stay put. But still, an untrained day laborer hired at Home Depot is all you need to manage a large crop. He'll do fine.

Marijuana has remained mostly illegal, even as many Americans have come to consider it harmless and normal, and so it now occupies a uniquely ambiguous place in American law and life. There are a few places in the United States that have been known for decades for marijuana—far-northern California, Kentucky—where people are comfortable with sedition, and willing to live outside of the law. But during the last decade, as growing and selling marijuana began to edge out of the shadows, these places have become the sites of this country's first experiments with tacit decriminalization. And so the business has shifted, too. "We have to face facts," says a veteran California grower named Anna Hamilton. "We are in a commodity business."

The full implications of this first became clear to Kristin Nevedal one day a few years ago, when some neighbors of hers in southern Humboldt County, four hours north of San Francisco, noticed a rainbow, discolored and distended, rising over their yard. This part of California is gorgeous, and hallucinatory, but even here a weird rainbow is an unusual sight, and so they investigated. Next door was a large indoor growing operation, and when they walked over, they saw an abandoned generator leaking fuel into Hacker Creek. Soon there were diesel rainbows up and down the stream. "The gentleman who owned the property was in Thailand," Nevedal says. Nevedal helped found the association of cannabis growers in Humboldt, and she is a bit of an idealist about pot. Everything about the episode—the use of diesel, the indoor growing, the recklessness, but mostly the absenteeism—seemed an affront. She says "Thailand" the way a Sufi mystic might say "Dubai."

That Humboldt County has remained so much a culture apart has something to do with the origami folds of its canyons and hills, which permit a certain isolation, but something more to do with pot. Driving through Myers Flat once, I saw a dreadlocked blonde girl, obese and braless, filling a van with male hitchhikers, like a cross between a community bus and a gender-reversal Manson Family. Most other back-to-the-land communes of the seventies eventually packed up and retreated, their members quietly reabsorbed into the suburban belt. The hippies in Humboldt had cannabis, which meant that though they were in many ways beyond the reach of government, they could pay for their own schools, for fire departments and private roads. They could see a future, and so they stayed.

Still, reminders of their alienation were everywhere. By the early eighties, the California law-enforcement agencies were conducting annual raids (called by their acronym, CAMP). You would walk onto your deck, on a sunny south slope, and suddenly a helicopter would be hovering there, cops with rifles scanning the valley below. Camouflaged SWAT teams jumped out of forest groves pointing guns. "People here can be a little paranoid anyway—there were an awful lot of Vietnam vets here early on," one longtime grower says, and the raids made paranoia seem reasonable. But there were side benefits to this armed form of prohibition. One joke here is that the Campaign Against Marijuana Planting was actually the Campaign to Appreciate Marijuana Prices. If you were savvy enough to dodge through the forest with helicopters overhead, carrying plants on a canvas stretcher, if you knew how to trim a tall tanoak in the forest so that its topmost branches protected the crop from view while still letting in just enough sunlight, then you could really make it. By 1996, marijuana here was going for $4,000 a pound.

That was the year California legalized medical marijuana. At first, nothing much changed in Humboldt. "Initially, the cops were cracking down," remembers one local, Mikal Jakubal. "They would come in and say, 'You've got twenty plants, I think you only need two or three of these. Cut 'em down.'" California hadn't done much to regulate the market or to delineate how much one could grow, and amid a confounding patchwork of local ordinances a quiet accord developed between growers and town cops: Only if you grew much more than their neighbors were you likely to be troubled by police.

Part of the price of building a utopia in America is that eventually you must make some reckoning with capitalism. Soon, each neighbor seemed to be pushing beyond the standard by 5 percent, maybe 10. People noticed what was happening, and the hippies had long, dreamy-angsty conversations about whether this was all too corporate, too big ("'Too big' is always one more plant than you're growing," says one longtime grower), but it wasn't really a hippie game anymore. Now there were out-of-state license plates and landholders who bulldozed their property, crammed it full of cannabis plants, slept in a trailer all summer, and then left after the harvest. (Humboldt's marijuana economy generates more than $400 million each year.) Dealers from the East were coming through, mumbling to people at local grocery stores that they wanted a connection. A kind of crass instinct had infiltrated the dispensaries, too. "Gamblers, pornographers, illegal-drug dealers," says Steve DeAngelo, the founder of the Oakland dispensary Harborside Health Center, remembering his rivals. "One guy had $600,000 in the back of his car. Another guy, in his basement there was a gold throne."

Medicinal marijuana was also altering the basic chemistry of the drug. When pot was illegal, many growers worked to cultivate the drug's basic intoxicant, THC, to produce a more potent high. But many new, medicinal customers wanted a softer sensation or a guard against panic attacks. So the growers reengineered the plant to cushion the drug's effects. (DeAngelo's dispensary offers some 250 strains, one of which was developed to help mitigate the symptoms of epilepsy.) An artisanal middle road seemed to open between working with drug dealers and enduring the ugliness of pot's industrialization. There were meetings held with representa-

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tives from the county government to try to figure out how to brand Humboldt as cannabis country. These have now slowed down, because a group of federal prosecutors have targeted the dispensaries vigorously, but still there is bold talk everywhere about becoming what Napa Valley is to wine.

All of which has made Humboldt County something close to the opposite of what its post-sixties settlers imagined it might be: a model for how drug prohibition in America might evolve in the 21st century. Throughout the country, the once-clear lines of drug law have been steadily blurring into a messy crosshatch of locale and jurisdiction. Slowly, coaxed along on one side by the libertarian streak in the electorate and on the other by the disinterest of cops, we have begun to create many more places that look something like Humboldt County—a bustling economy where many people are growing more than their town allows, everyone is growing more than the Feds allow, and the industry is operating not on the familiar outlaw territory but within a new system whose contours they do not know and can't define. This year's harvest happened about six weeks ago, and Jakubal told me about what he called the "rip-off moon," the full moon in September so bright that cannabis plots are vulnerable to thieves and poachers. Large growers have little recourse to the police. Instead, cameras and guards abound; one of Jakubal's neighbors keeps a machete. And so: this bizarre lagoon. You go to branding meetings with county representatives. You speculate about whether legalization elsewhere will drive the prices down or create new customers. Your friends are arrested for driving the crop to market. At home, you keep a machete.

THREE WEEKS AGO, voters in Colorado and Washington chose to legalize marijuana for recreational use in both states—to make the drug legal to sell, legal to smoke, and legal to carry, so long as you are over 21 and you don't drive while high. No doctor's note is necessary. Marijuana will no longer be mostly regulated by the police, as if it were cocaine, but instead by the state liquor board (in Washington) and the Department of Revenue (in Colorado), as if it were whiskey. Colorado's law has an extra provision that permits anyone to grow up to six marijuana plants at home and give away an ounce to friends.

It seems very unlikely that the momentum for legalization will stop on its own. About 50 percent of voters around the country now favor legalizing the drug for recreational use (the number only passed 30 percent in 2000 and 40 percent in 2009), and the younger you are, the more likely you are to favor legal pot. Legalization campaigns have the backing of a few committed billionaires, notably George Soros and Peter Lewis, and the polls suggest that the support for legalization won't simply be confined to progressive coalitions: More than a third of conservatives are for full legalization, and there is a gender gap, with more men in favor than women. Perhaps most striking of all, an organized opposition seems to have vanished completely. In Washington State, the two registered groups opposing the referendum had combined by early fall to raise a grand total of $16,000. "We have a marriage-equality initiative on the ballot here, and it is all over television, the radio, the newspapers," Christine Gregoire, the Democratic governor of Washington, told me just before the election. When it comes to marijuana, "it's really interesting. You don't hear it discussed at all." A decade ago, legalization advocates were struggling to corral pledges of support for medicinal pot from very liberal politicians. Now, the old fearful talk about a gateway drug has disappeared entirely, and voters in two states have chosen a marijuana regime more liberal than Amsterdam's.

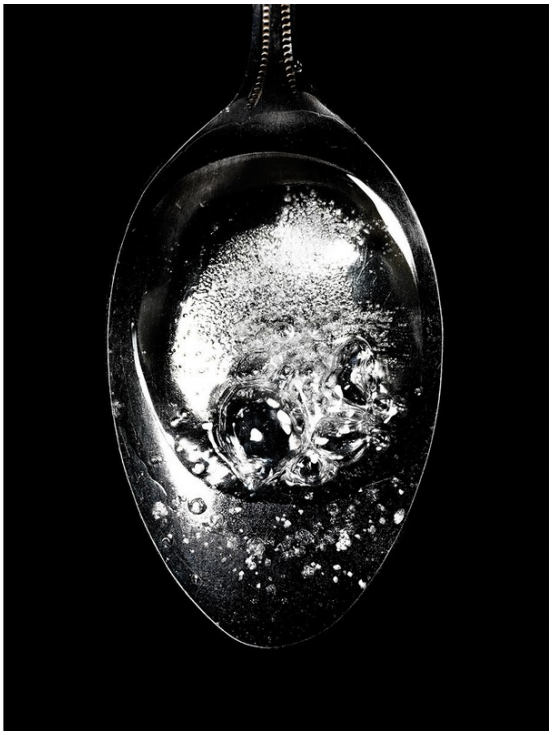
These votes suggest what may be a spreading, geographic Humboldt of the mind, in which the liberties of pot in far-northern California, and the unusually ambiguous legal regime there, metastasize around the country. If you live in Seattle and sell licensed marijuana, your operation could be perfectly legal from the perspective of the state government and committing a federal crime at the same time. It is hard to detect much political enthusiasm for a federal pot crackdown, but the complexities that come with these new laws may be hard for Washington to simply ignore. What happens, for instance, when a New York dealer secures a license and a storefront in Denver, and then illegally ships the weed back home? Economists who have studied these questions thoroughly say that they can't rule out a scenario in which little changes in the consumption of pot—the same people will smoke who always have. But they also can't rule out a scenario in which consumption doubles, or more than doubles, and pot is not so much less prevalent than alcohol.

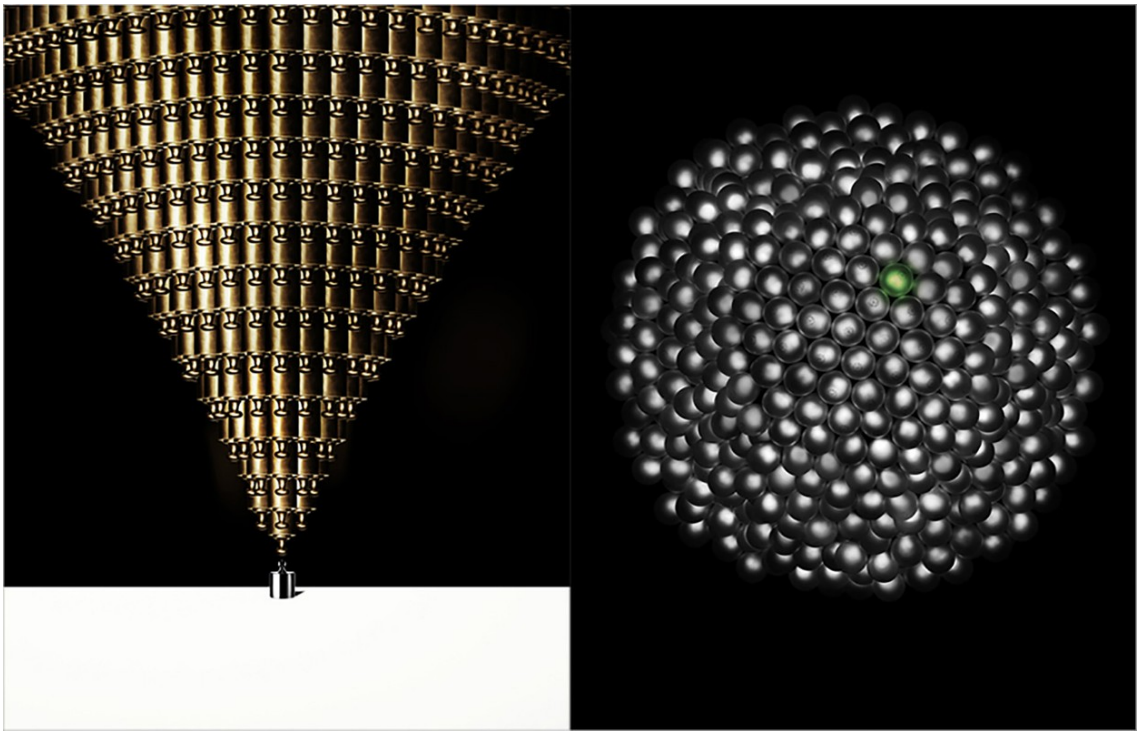
And yet the prohibition on marijuana is something more than just a fading relic of the culture wars. It has also been part of the ad hoc assemblage of laws, treaties, and policies that together we call the "war on drugs," and it is in this context that the votes on Election Day may have their furthest reach. When activists in California tried to fully legalize marijuana there in 2010, the most deeply felt opposition came from the president of Mexico, who called the initiative "absurd," telling reporters that an America that legalized marijuana had "very little moral authority to condemn a Mexican farmer who for hunger is planting marijuana to sustain the insatiable North American market for drugs." This year, the reaction from the chief strategist for the incoming Mexican president was even broader and more pointed. The votes in Colorado and Washington, he said, "change somewhat the rules of the game ... we have to carry out a review of our joint policies in regard to drug trafficking and security in general." The suggestion from south of the border wasn't that cocaine should be subject to the same regime as marijuana. It was: If we are going to rewrite the rules on drug policy to make them more sensible, why stop at only one drug? Why go partway?

Something unexpected has happened in the past five years. The condemnations of the war on drugs—of the mechanized imprisonment of much of our inner cities, of the brutal wars sustained in Latin America at our behest, of the sheer cost of prohibition, now likely past a trillion dollars—have migrated out from the left-wing cul-de-sacs that they have long inhabited and into the political Establishment. "The war on drugs, though well-intentioned, has been a failure," New Jersey governor Chris Christie said this summer. A global blue-ribbon panel that included both the former Reagan secretary of State George Shultz and Kofi Annan had reached the same conclusion the previous June: "The global war on drugs has failed, with devastating consequences for individuals and societies." The pressures from south of the border have grown far more urgent: The presidents of Colombia, Guatemala, Mexico, Honduras, Belize, and Costa Rica have all called for a broad reconsideration of the drug war in the past year, and the Organization of American States is now trying to work out what realistic alternatives there might be.

The war on drugs has always depended upon a morbid equilibrium, in which the cost of our efforts to keep narcotics from users is balanced against the consequences—in illness and death—of more widely spread use. But thanks in part to enforcement, addiction has receded in America, meaning, ironically, that the benefits of continuing prohibition have diminished. Meanwhile, the wars in Mexico and elsewhere have escalated the costs, killing nearly 60,000 people in six years. Together those developments have shifted the ethical equation. "There's now no question," says Mark Kleiman of UCLA, an influential drug-policy scholar, "that the costs of the drug war itself exceed the costs of drug use. It's not even close."

In many ways, what is happening right now is a collection of efforts, some liberating and some scary, to reset that moral calibration, to find a new *(Continued on page 104)*





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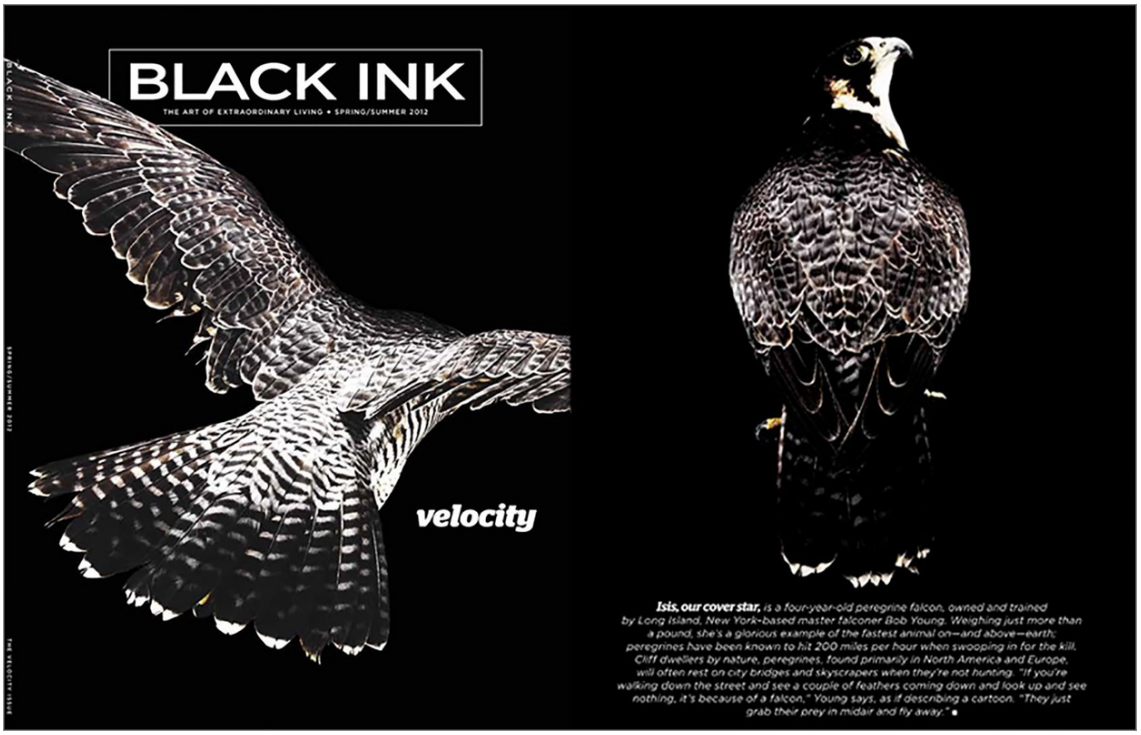

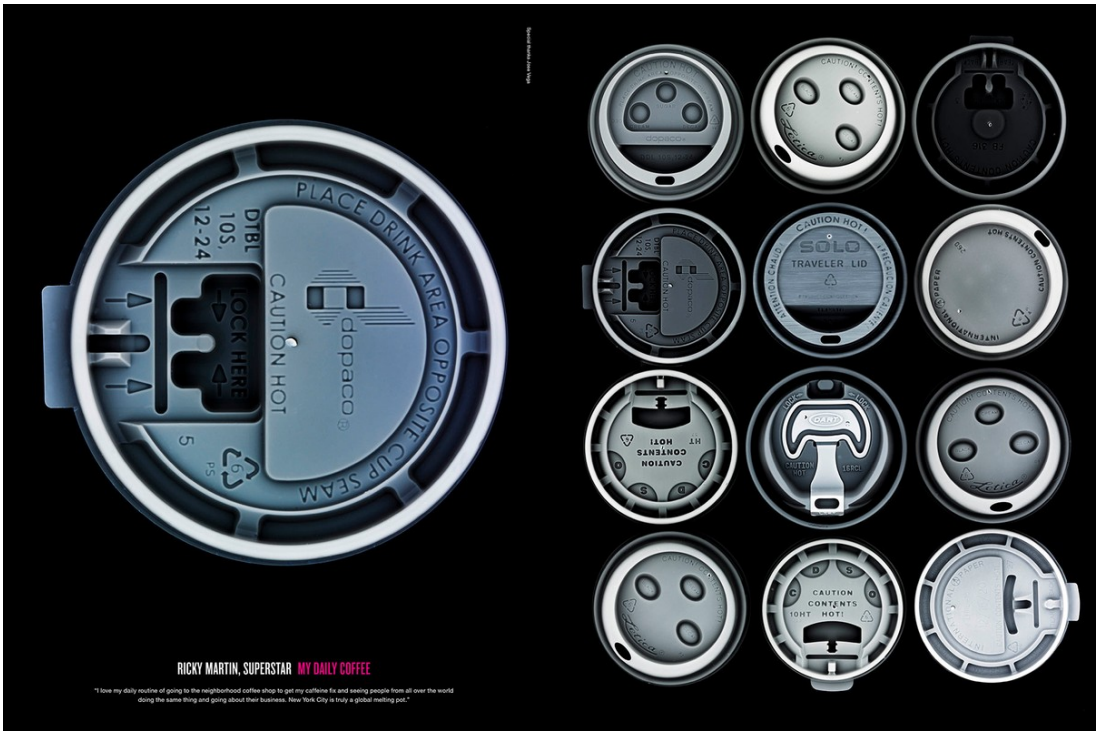

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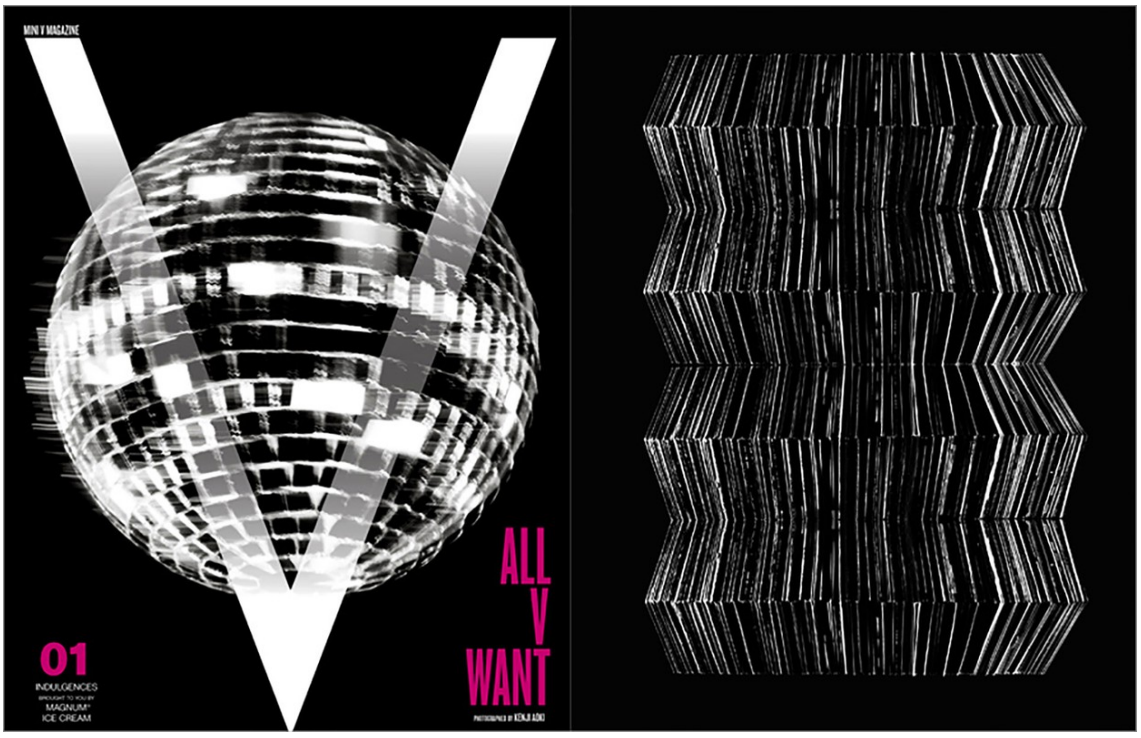

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creativity by a panel of experts. Though performed independently, the judges' evaluations were quite consistent from one to another. In general, they deemed creative those products that were original and surprising, yet also somehow meaningful and coherent.

In several experiments, Amabile told some of the participants that their products would be evaluated for creativity by an expert panel. For others, she then added that their product would be entered into a contest—with prizes for the most creative products. A third group of participants were told nothing.

In experiment after experiment, the **PARTICIPANTS WHO MADE THE MOST CREATIVE PRODUCTS WERE THOSE WHO DIDN'T KNOW THEIR WORK WOULD BE EVALUATED.** They were just playing—not concerned about judgments or rewards.

These findings support the work of another psychologist, Barbara Fredrickson of the University of North Carolina at Chapel Hill. She theorizes that positive emotions broaden our perception and thought—allowing us to put ideas and information together in new, creative, useful ways—while negative emotions narrow our perceptions and thought, because we are focusing primarily on the stimulus that initiated the emotion (for example, an evaluator, or the consequences of failure).

Both these ways of perceiving and thinking are useful; both are products of natural selection. When not faced with immediate threats to our survival, we use our minds to find new ways of doing things and help one another. Faced with immediate threats, we use our minds to deal with the threat (if a tiger is chasing us, it's best to use well-learned ways of escaping from it, not dream up new ways of doing so). Fresh ideas run the risk of failure, so we're biologically constructed to cut creativity off when failure has serious consequences.

Evaluation, when it is not asked for and when it has consequences, as it does in school or at work, is a threat. It inhibits new learning and new insights. Of course feedback from an expert can be helpful in improving any idea or product, especially if it is sought by the creator. But creativity is stifled if the main goal *becomes* feedback—either receiving the positive or avoiding the negative. It's no wonder children are less creative when classrooms are centered on evaluation. For students who take academics seriously, continual testing creates continual threat. Their minds are focused on fears: *How do I deal with this test? How do I please this teacher?*

It's hard to be creative in such conditions. Feedback generally promotes effort—because we want to impress the evaluator—but effort is insufficient for creativity. We can't be more creative just by trying harder. We must relax in a way that permits the full engagement of unconscious mental processes—ones that generate unusual associations and new ideas. These work best when we are playing, not when we are striving for praise or a reward.

PETER GRAY is a research psychologist at Boston College and the author of *Free to Learn*.

CONCENTRATION IS CREATIVITY'S KILLER

HOW TO FIND JUST THE RIGHT AMOUNT OF FOCUS.

by **Sian Beilock**

HOW MANY TIMES have you run up against a roadblock in your thinking about a problem at work, in school, or even in a relationship? Try as you might, you just can't come up with that formidable idea to pitch to a client or a way to extract yourself from the middle of a dispute between two of your closest friends. Yet by zeroing in on the situation in front of you, you may make the task even tougher.

Say you are at work, charged with developing an innovative advertising campaign for a prospective client. You stop everything you're doing, sit down at your desk, and concentrate as hard as you can. Yet, this type of focus may actually make it more difficult to get the creative juices flowing than if you hadn't jumped into the project full force.

Consider the Greek scientist Archimedes, who, as legend has it, was tasked with figuring out whether the King's new crown was really made of solid gold. Archimedes couldn't simply break open the crown, because that would have destroyed it. He didn't know what to do. It wasn't until he was getting in the bath one day—not thinking about much at all—that he noticed that the level of the water rose as he got in. Archimedes realized he could use the amount of water displaced by an object (such as a crown) to determine its volume and, in turn, its density (and ultimately, whether the crown was made purely from gold or whether it also contained silver, which is less dense).

The story of Archimedes exemplifies what

IF YOU WANT TO CHANGE THE WAY YOU APPROACH A CREATIVE PROBLEM, CHANGE WHAT YOU ARE THINKING ABOUT.

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LIPSTICK

1 | BOBBI BROWN CREAMY LIP COLOR IN BLUE RASPBERRY ($24, bobbibrowncosmetics.com), though colorfully named, is a versatile neutral that testers raved about. "It basically just deepens your lips' natural color," said one tester. And the glossy finish adds shine, which complements any complexion.

2 | MAYBELLINE NEW YORK COLOR SENSATIONAL LIPCOLOR IN RED REVIVAL ($7.50 at drugstores) was described by several testers as the ultimate "old-Hollywood red." Says New York City makeup artist Spring Super, "It has a slightly blue base, which transforms any lip tone into a true crimson instead of turning orangey or fuchsia, the way some reds do."

3 | NARS SEMI MATTE LIPSTICK IN SCHIAP ($24, narscosmetics.com) is a shocking pink shade that shocked testers by complementing both pale and dark skin. "I usually go for subtler pinks. Even though this one was bold, it wasn't over-the-top," said a light-skinned tester. "The brightness also stands out nicely against deep complexions," says Carmindy, a makeup artist on TLC's *What Not to Wear*.

LIP LINER
opposite

1 | LAURA MERCIER LIP PENCIL IN NAKED ($20, lauramercier.com) was lauded for its uncanny ability to blend seamlessly with any lipstick on any tester.

2 | STILA LONG WEAR LIP LINER IN ASPIRING ($18, stilacosmetics.com) has a creamy texture ideal for lining and filling in lips. It struck the perfect balance: not too harsh on fair-skinned testers, not too light on those with darker skin.

ONE SHADE *fits all*

Is there really a magic bullet (of lipstick) that looks great on absolutely everyone? Why, yes. *Real Simple* applied hundreds of lip, cheek, and eye colors to virtually every skin tone and found 15 that truly flatter, no matter.

WRITTEN BY Sally Wadyka PHOTOGRAPHS BY Kenji Aoki

Story behind the story: Perhaps you've heard of Clinique Black Honey, the legendary berryish lip color that somehow manages to suit every single woman. (Chances are, you and your mother each own a tube.) *Real Simple* suspected there were even more lipsticks—and eye shadows and nail polishes—that could work shade-shifting magic on all skin tones. To find out, we asked cosmetics companies to send us their top sellers. Then, with the help of makeup artists Carmindy, of TLC's *What Not to Wear*, and Spring Super, we invited dozens of women of every skin color to give them a try. The results of our experiment are here: 15 universally flattering shades and formulas that are legends in the making.

EYELINER

1 | L'ORÉAL PARIS EXTRA-INTENSE LIQUID PENCIL EYELINER IN BLACK ($9 at drugstores)—surprisingly, not in brown or plum or any other softer, seemingly more wearable color—was a standout for its ability to create a deep, smoky statement eye that was more charcoal than jet.

2 | LANCÔME ARTLINER EYELINER IN NOIR ($29.50, lancome-usa.com) won accolades for being the most user-friendly liquid liner in everyone's favorite hue. The foam tip can be held horizontally and gently pressed along the lash lines so lashes look naturally thicker.

BLUSH

1 | NARS POWDER BLUSH IN ORGASM ($28, narscosmetics.com) has already achieved star status, which our testers considered justified. The fusion of cool pink and warm peach, with the slightest hint of golden shimmer, gave everyone's cheeks a natural flush. "The light-reflecting particles diffuse the color, so it doesn't come on too strong," says Carmindy. Said one fair-skinned tester, "It didn't overpower my skin or make me look clownish."

2 | ELIZABETH ARDEN CERAMIDE CREAM BLUSH IN NECTAR ($24, elizabetharden.com) had universal appeal, thanks to its blendability. "I could make it so sheer that my skin's coloring came through," said an olive-toned tester.

3 | SHISEIDO LUMINIZING SATIN FACE COLOR IN PETAL/RD103 ($30, shiseido.com) has a touch of brown, "so it looks like your skin would with a tan," says Carmindy. Testers also liked the smooth texture and the buildable, slightly translucent formula.

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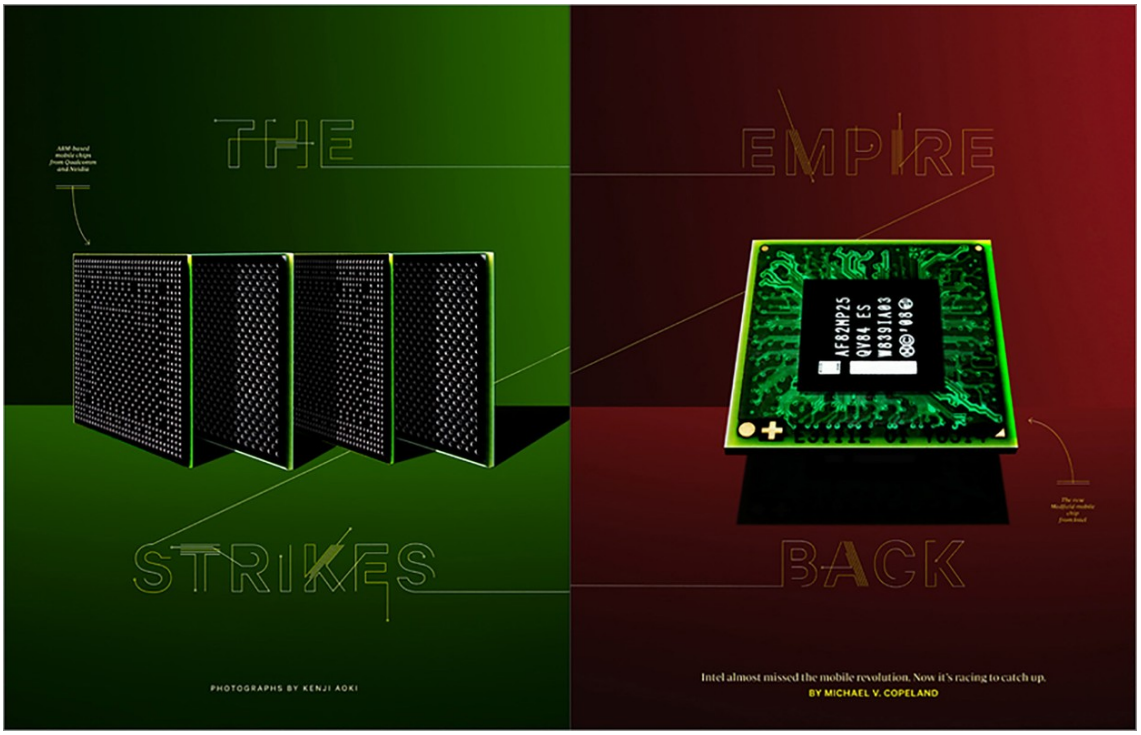

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NATION

Coal, Hard Truths

After policy clashes, coal miners, wildcatters and refiners are fueling the campaign to deny Obama a second term

BY MICHAEL SCHERER

OHIO COAL MINER ROBERT E. MURRAY, 72, is still wearing oversize steel-toe boots and a shirt that reads BOB over his heart when he mispronounces President Obama's name for the third time. Coming from one of the nation's top-producing coal executives, the heavy accent is no accident. "I say *Bear-ick* Obama because I never heard the word *Barack* before," he explains. "My wife keeps telling me, 'It's Barack.' O.K., Barack. It's Barack. To me, it's Bear-ick."

To the 1,600 coal miners Murray employs in Ohio, to the reporters he meets, to the Republican politicians he supports with millions of dollars in fundraising and to just about anyone else who listens, his complaint is the same: Obama is trying to destroy the U.S. coal industry. "Bear-ick Obama is the greatest enemy that these regions of the country have," Murray says from his office overlooking the rolling hills of southeastern Ohio. "If we give Obama a second term, I can't keep it together."

Such predictions would matter less if his firm, Murray Energy Corp., which shuttles millions of tons of coal a year onto river barges destined for nearby power stations, operated in another state. But in every presidential election since 1964, whoever won Ohio also won the White House, a record that looks likely to be extended this year. So for Murray, who sat out the 2008 race because he felt little love for John McCain's energy policies, defeating Obama has become something of a crusade. "This is permanent destruction to America," he says about the Administration's approach to coal. "Obama ain't heard the last from guys like me."

Murray may be Obama's biggest

This rock may stand between President Obama and a second term

Photograph by Kenji Aoki for TIME

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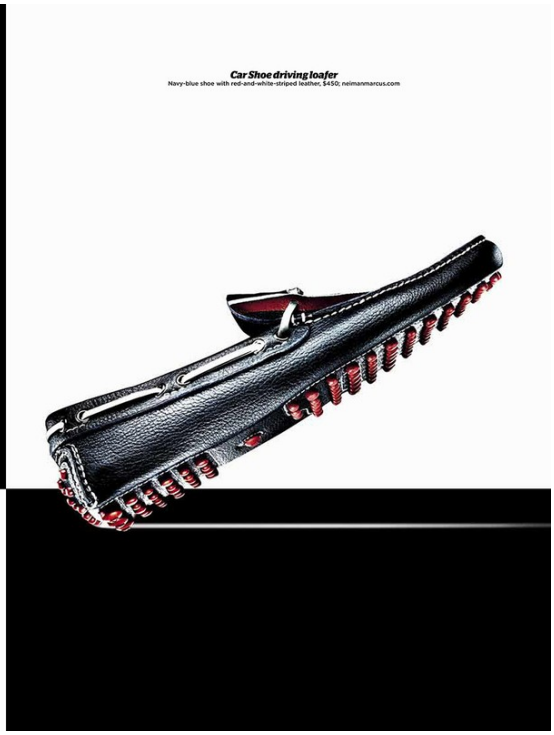

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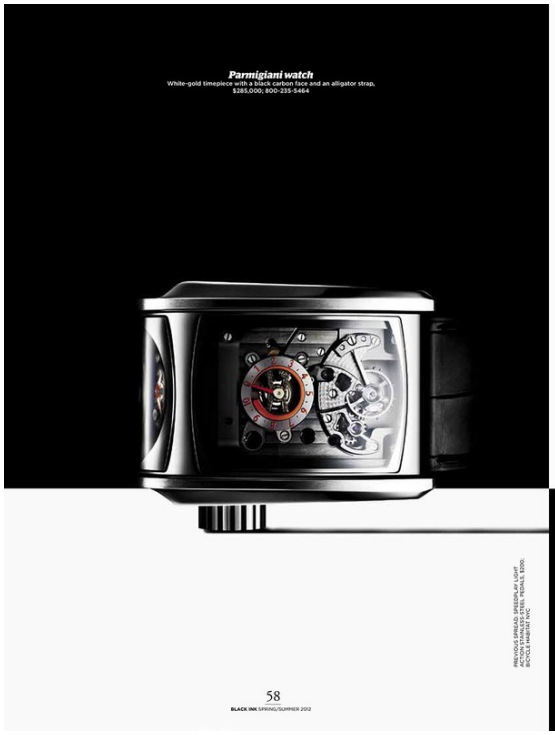

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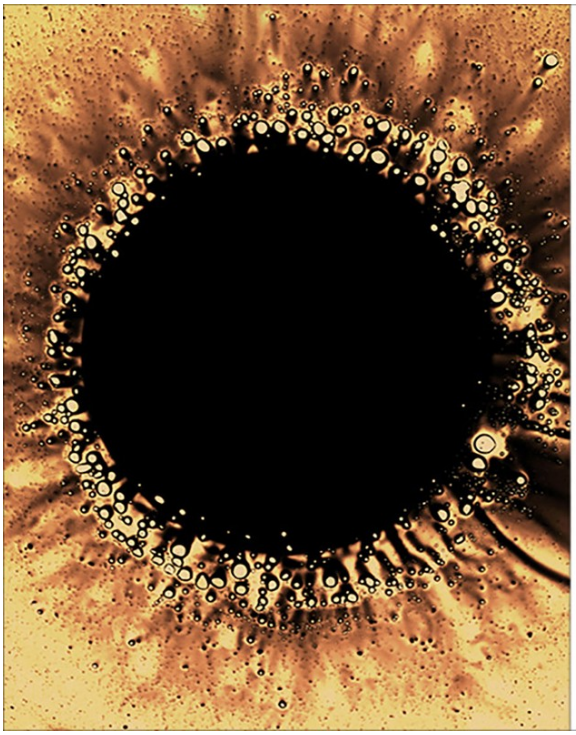

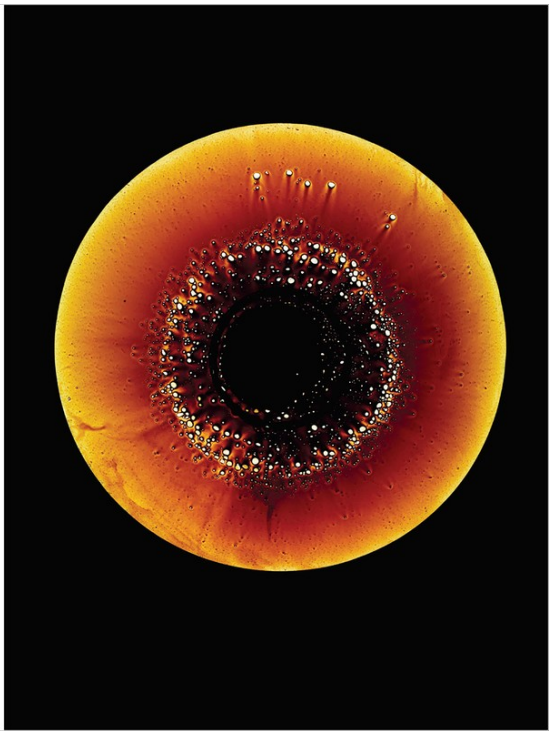

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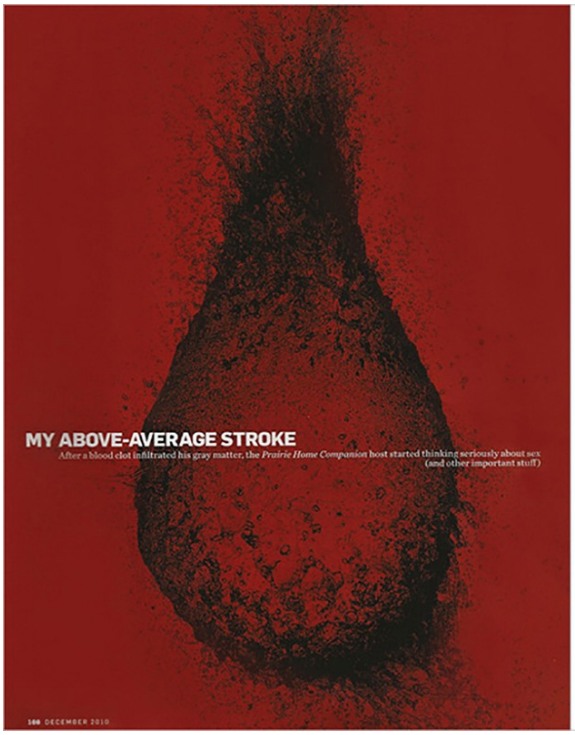

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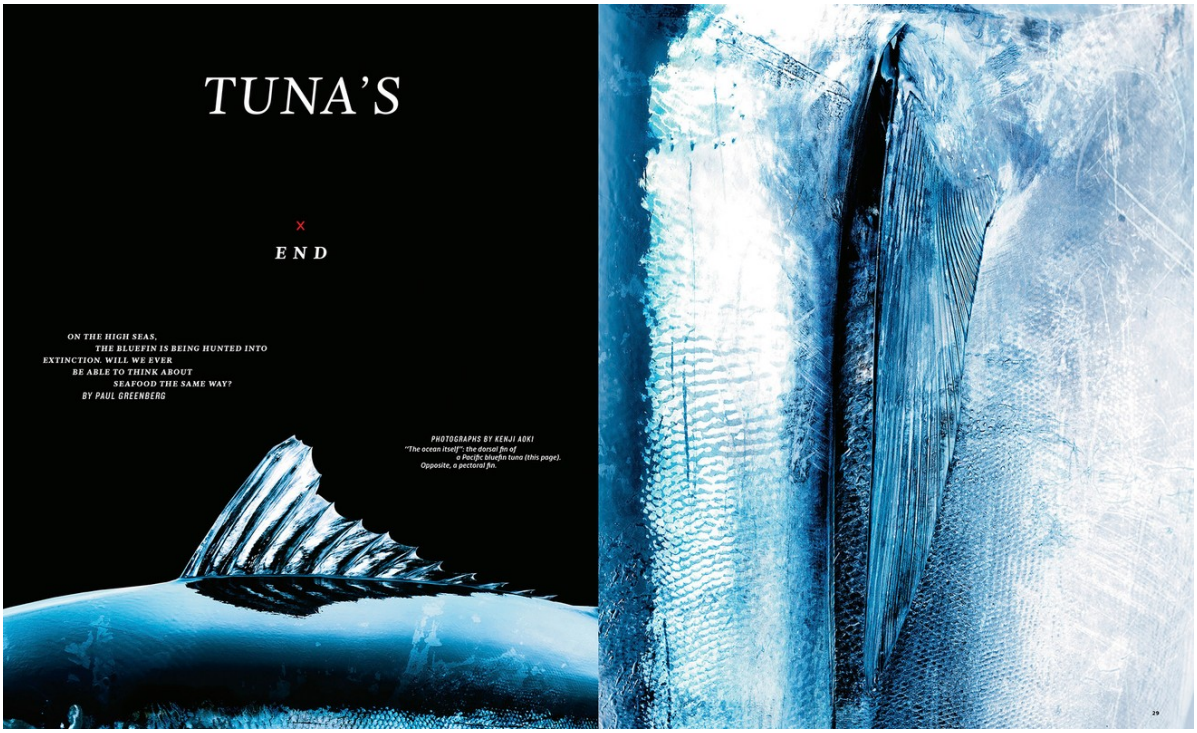

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ing than by sound science. A former chairman of the scientific committee of the International Commission for the Conservation of Atlantic Tunas (or Iccat), the body responsible for Atlantic bluefin, told me, "Even though scientific advice says you should stick to a specific catch number, in order to negotiate a deal they tend to nudge that number over a little bit." That little nudge can be enough to put a population of tuna in jeopardy.

In 2008 Iccat set Atlantic bluefin catch limits that were nearly double what its own scientists recommended. Conservationists howled, and the quotas were reduced sharply. But by the time Iccat met again, in November 2009, environmentalists had come to home in on the historic mismanagement of Atlantic bluefin, many of them arguing that a simple reduction in catch quotas for the coming fishing season was not enough — that in fact a zero-catch quota was the only thing that would stave off the fish's extinction. Iccat rejected the zero-quota idea. This in turn forced a much more high-pitched confrontation this spring between parties like Japan, which seems to feel that fishery-management problems can be resolved within the status quo, and those who are looking to take the high seas in a profoundly different direction.

The debate was joined when delegates gathered this past March in Doha, Qatar, for a meeting of the United Nations Convention on the International Trade in Endangered Species of Flora and Fauna, or Cites (pronounced SY-teez). It was a meeting that, for fish, could have been as important as the 1982 meeting of the International Whaling Commission that voted to establish a moratorium on commercial whaling worldwide. For if conservationists got their way, Atlantic bluefin would be included in the Cites treaty's Appendix One — a result that would ban the international trade of the tuna and put them under the jurisdiction of the same U.N. body that oversees tigers, white rhinos and giant pandas. It would be the beginning of a process that would transition Atlantic bluefin tuna from seafood to wildlife.

It is precisely this kind of recasting that happened with whales in the 1980s, and Japan was intent on avoiding a similar recategorization with Atlantic bluefin tuna. As Masanori Miyahara, the director of the Fisheries Agency of Japan, put it to me: "Cites Appendix One is too inflexible . . . once a species is listed in a Cites appendix, it will never be delisted or down-listed as the history of Cites clearly shows." In other words, once a fish becomes wildlife, it will stay wildlife. A Cites treaty would also allow those countries that happen to have bluefin in their territorial waters to continue to catch them for their own market while excluding all the other treaty member nations — a result that Masanori would surely find not only unfair but also capable of leading to further overfishing. (The European Union has indicated it will continue to catch its allowable quota even if a Cites resolution is passed.)

Japan's touchiness about fairness on the high seas is understandable given its dependence on seafood. Its per capita seafood consumption is among the highest of any industrialized country. And Japan has not been blind to the problems that come with overfishing and excessively large fishing fleets. Indeed, in the last few years it has tried to rein in its industrial fishing effort, decommissioning vessels, literally pulling hooks out of the water. But this has failed to resolve another problem of the Age of Tuna. Just as the industrialized countries are starting to realize the need for more sensible management of the high seas, developing countries are heading in the opposite direction. "Developing countries firmly believe they have a right to expand their fisheries and that developed countries should reduce their fishing effort to compensate," Ziro Suzuki wrote me. "In the process of trying to resolve the conflict of interest, the stocks become overfished, and overall fishing effort grows to an unacceptable level. . . . It's really just another example of the North-South problem, just like CO_2 emissions."

The conflict between the developing and developed world plays an increasingly greater role in tuna negotiations, and at a certain point it is hard to figure out who is manipulating whom in an intrigue involving 175 countries, each trying to game the system. Representatives from both the WWF and the Pew Environment Group told me of a curious imbroglio as the Qatar Cites meeting neared its vote on bluefin. Japanese delegation members supposedly told African representatives that European bluefin fleets would relocate to the coast of Africa and catch African yellowfin tuna if the Cites bluefin motion passed. This despite the fact that European vessels are geared up specifically for bluefin fishing and lack the capacity to pursue yellowfin. Masanori Miyahara of the Fisheries Agency of Japan dismissed this claim as "completely wrong and unfounded. We never told such a thing to anybody. We even haven't thought such an idea, ever."

True or not, African nations lined up with Japan. After Libya and Sudan forced a vote, the Atlantic bluefin's Cites Appendix One listing was rejected by a large majority.

Delegates flew away from Qatar with the status quo in place. The month-long bluefin purse-seining season set earlier by Iccat for the Mediterranean would stand as it was with quotas above what many scientists had recommended. A month after the Cites meeting, BP's Horizon Deepwater oil rig collapsed into the sea and spewed oil into the only bluefin spawning ground in the Americas just as the few remaining North American stock giant bluefin were preparing to mate in the Gulf of Mexico. Though the U.S. National Marine Fisheries Service has been deeply critical of the Mediterranean bluefin catch — in 2007, it went so far as to call for a moratorium — it has been noncommittal about the American fishery. When I asked the Fisheries Service if it would consider closing the bluefin season on the heels of the BP spill, I was offered a statement, part of which, recast in verse form, has an almost Nobu-type haiku quality:

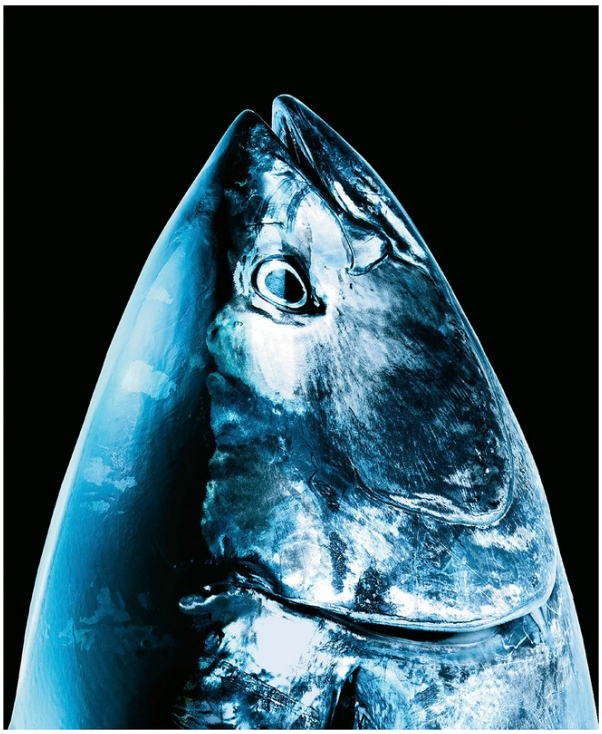
"N.O.A.A. Fisheries is carefully monitoring
The spawning of bluefin tuna in the Gulf of Mexico
By collecting larval samples and analyzing reports from scientific observers."

It seems then that no single nation is ready to commit to a sustainable future for the fish. Some would argue that extirpation might just have to be the bluefin's fate. Other, smaller tuna might be better suited to industrial exploitation. The bigeye and yellowfin tuna generally grow faster and spawn earlier. And indeed these lesser tuna are already starting to fill in for the bluefin's absence. In the United States most Americans usually end up eating bigeye when they order *otoro* — the fatty zebra-striped flesh that fetches the highest price on most sushi menus nowadays. But major populations of bigeye tuna are also declining. Should they go away, it's hard to say what would come next.

HOW THEN DO

we get ourselves out of the Age of Tuna with our moral center and our food supply intact? Can we develop a civilized hunter-gatherer relationship with tuna and indeed with all other fish and reach a point of equilibrium with our last wild food? Can the management bodies that have overseen the collapse of the most magnificent food fish we've ever known be trusted to manage what is left in its wake?

The answer depends on where you fall on the fairly broad political spectrum of the world's different tuna watchers. The Fisheries Agency of Japan



34 THIS PAGE AND PREVIOUS SPREAD: PHOTOGRAPHS BY KENJI AOKI FOR THE NEW YORK TIMES.

23 commercially fished tuna stocks are overfished or depleted. An additional nine stocks are also threatened. The Pew Environment Group's tuna campaign asserts that "the boats seeking these tuna are responsible for more hooks and nets in the water than any other fishery."

Tuna then are both a real thing and a metaphor. Literally they are one of the last big public supplies of wild fish left in the world. Metaphorically they are the terminus of an idea: that the ocean is an endless resource where new fish can always be found. In the years to come we can treat tuna as a mile marker to zoom past on our way toward annihilating the wild ocean or as a stop sign that compels us to turn back and radically reconsider.

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"WE FIND OURSELVES in a precarious situation." So wrote Ritchie Notar, a co-owner of the internationally acclaimed Nobu restaurant chain, to Greenpeace U.K. back in 2008 after Greenpeace intensified its tuna-defense efforts and put forward the idea that bluefin should no longer be served at Nobu's establishments. "We are dealing with thousands of years of cultural customs," Notar continued in correspondence Greenpeace forwarded to me. "The Japanese have relied on tuna and the bounties of the sea as part of their culture and history for centuries. We are absolutely appreciative of your goals and efforts within your cause, but it goes far beyond just saying that we can just take what has now all of a sudden been declared an 'endangered' species off the menu. It has to do with custom, heritage and behavior."

Many nations have contributed to the Atlantic bluefin's destruction. Europeans and North Africans do most of the catching and ranching of the fish in the world today. The United States continues to allow bluefin fishing in its waters even though the Gulf of Mexico–spawned stock is considered by many scientists to have entered into full-scale collapse. But it is Japan, the world's largest bluefin importer, that has taken perhaps the most aggressive pro-tuna-fishing position, sometimes assisted by Westerners like Ritchie Notar, who declaim the country's long tuna-eating tradition. But history shows that Japan's stake in tuna fishing is recent and, more important, part of the same endgame that has dragged all of humanity into the Age of Tuna. Before 1800, Japanese tuna sushi didn't even exist.

Trevor Corson is an East Asia scholar turned popular nonfiction writer and author of the 2007 book "The Story of Sushi," and for select groups he will act as a "sushi concierge," hosting dinners often at the Jewel Bako Japanese restaurant in Manhattan's East Village, one of which I attended this past winter. A Corson-guided meal aims to reveal the historical truth of tuna and to represent the very different fish that were the staples of sushi in earlier times. Plate by plate I watched as Corson walked a group of Manhattan professionals through a traditional Edo-period meal of snappers, jacks and other white-fleshed, smaller fish that most definitely did not include "red" tuna. Afterward, Corson sent me an excerpt from a 1999 Japanese anthology titled "Fish Experts Teach the Secrets of the Deliciousness of Fish" to further underline his point. "Originally, fish with red flesh were looked down on in Japan as a low-class food, and white fish were much preferred," one of the book's contributors, Michiyo Murata, writes. "Fish with red flesh tended to spoil quickly and develop a noticeable stench, so in the days before refrigeration the Japanese aristocracy despised them, and this attitude was adopted by the citizens of Edo [old Tokyo]." Other Japanese scholars like the sushi historian Masuo Yoshino confirm this. Murata, meanwhile, goes on to note that tuna were introduced into sushi only 170 years ago, when a large catch came into Edo one season. On that day a local sushi chef marinated a few pieces of tuna in soy sauce and served it as "night sushi." The practice caught on. Occasionally a big bluefin became sushi, but Corson notes these fish were nicknamed *shibi* — "four days" — because chefs would bury them for four days to mellow their bloody taste.

CITING ITS CULINARY TRADITIONS, JAPAN HAS TAKEN PERHAPS THE MOST AGGRESSIVE PRO-TUNA-FISHING POSITION. BUT BEFORE 1800, JAPANESE TUNA SUSHI DIDN'T EVEN EXIST.

By the 1930s, tuna sushi was commonplace in Japan, but demand could be met by local supplies of tuna, including the Pacific bluefin species, which dwells in Japan's coastal waters. It was World War II that took tuna fishing to the next level. "To recover from the devastation of the war," Ziro Suzuki, formerly of the Japanese Far Seas Research Laboratory, wrote me, "Japanese fishermen needed more tunas to secure food for domestic demand and also to earn more money by exporting tunas for canning industries in Europe and the U.S. Those needs urged the expansion of fishing grounds outside of the historic grounds of the western Pacific." But this next fishing expansion was technological as well as territorial. Throughout the postwar period, the Japanese perfected industrial long-lining, a practice that employs thousands of baited hooks. In the 1970s Japanese manufacturers developed lightweight, high-strength polymers that were in turn spun into extensive drift nets that could be many miles long. Though drift nets were banned in the high seas by the early '90s, in the 1970s hundreds of miles of them were often deployed in a single night. When drift nets and long lines were coupled with at-sea freezing technology invented around the same time, Japanese fishermen were able to fish the farthest reaches of the oceans while keeping their frozen tuna sushi-ready for as long as a year.

A major yield of all of this Japanese fishing effort was yellowfin tuna. Though they ate bluefin, Japanese did not hold them in high regard before the 1960s, and it took a confluence of socioeconomic factors in both Japan and the West to bring bluefin to the fore. By the late 1960s, sportfishing for giant bluefin tuna was starting in earnest off Nova Scotia, New England and Long Island. Like the Japanese at the time, North Americans had little regard for bluefin on the plate, usually discarding them after capture.

Bluefin sportfishing's rise, however, coincided with Japan's export boom. In the 1960s and '70s, Japanese planes stuffed with electronics unloaded in the U.S. and returned empty — a huge waste of fuel. But when a Japanese entrepreneur realized he could buy New England and Canadian bluefin for a song, he started filling up all those empty cargo holds with tuna. Exposure to beef and other fatty meats during the U.S. occupation had already drawn the Japanese to appreciate bluefin's fatty belly (*toro*, in sushi terms). The Atlantic bluefin, the biggest bluefin, became the most favored of all. This appreciation boomeranged stateside when Americans started to develop their own raw-fish habit in the late 1970s.

Added to the already significant fishing pressure from the tuna canning industry, Japan's and now the West's sushi joines has come to stress populations of large tuna around the world, starting with the most environmentally sensitive Atlantic bluefin but with the risk of spreading to other species. In fact, one subpopulation of Atlantic bluefin has already vanished after heavy fishing by Japanese long-liners: The bluefin that used to congregate off Brazil disappeared in the early bluefin boom of the 1970s. The bluefin continues — but perhaps a larger problem is that a large quantity of North American bluefin are caught accidentally as "by-catch" when industrial long-liners deploy their legions of hooks in search of yellowfin tuna over the bluefin's spawning grounds in the Gulf of Mexico. By law, nearly all bluefin caught as by-catch must be dumped back into the sea. Usually by that point they are already dead.

All of this has led the bluefin to become a cause célèbre among conservation groups and the target of several organized "save the bluefin" campaigns. None of them have influenced Japanese consumers. In the case of Nobu, after numerous exchanges with Greenpeace, the sushi restaurant's owners remained unpersuaded of the need to stop serving the fish. Their only concession was a haiku-esque warning on the menus of its London eateries:

"Bluefin tuna
Is an environmentally threatened species
Please ask your server for an alternative."

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Willie Mackenzie of Greenpeace U.K. responded angrily in a note to Ritchie Notar: "Despite the assurances that you take these issues seriously and that you want Nobu to be a leader in this field, you have essentially tried to abdicate responsibility by suggesting that it is down to your customers to decide if they want to eat an endangered species."

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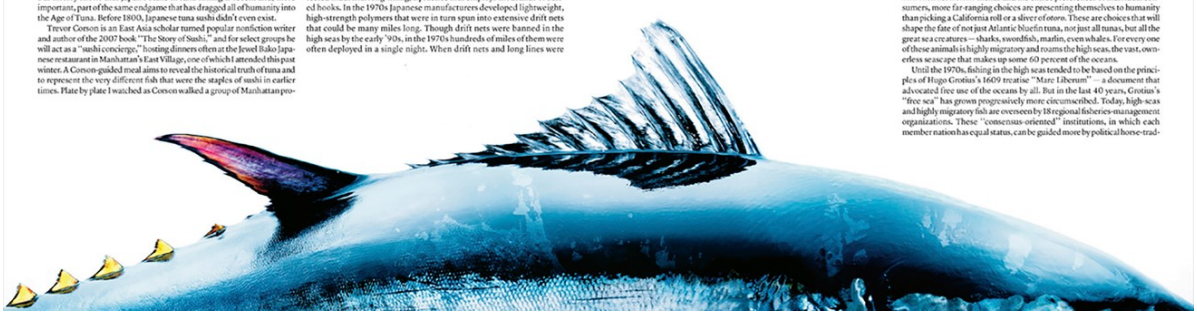
AWAY FROM RESTAURANT menus and the entree preferences of individual consumers, more far-ranging choices are presenting themselves to humanity than picking a California roll or a sliver of *otoro*. These are choices that will shape the fate of not just Atlantic bluefin tuna, not just all tunas, but all the great sea creatures — sharks, swordfish, marlin, even whales. For every one of these animals is highly migratory and roams the high seas, the vast, ownerless seascape that makes up some 60 percent of the oceans.

Until the 1970s, fishing in the high seas tended to be based on the principles of Hugo Grotius's 1609 treatise "Mare Liberum" — a document that advocated free use of the oceans by all. But in the last 40 years, Grotius's "free sea" has grown progressively more circumscribed. Today, high-seas and highly migratory fish are overseen by 18 regional fisheries-management organizations. These "consensus-oriented" institutions, in which each member nation has equal status, can be guided more by political horse-trad-



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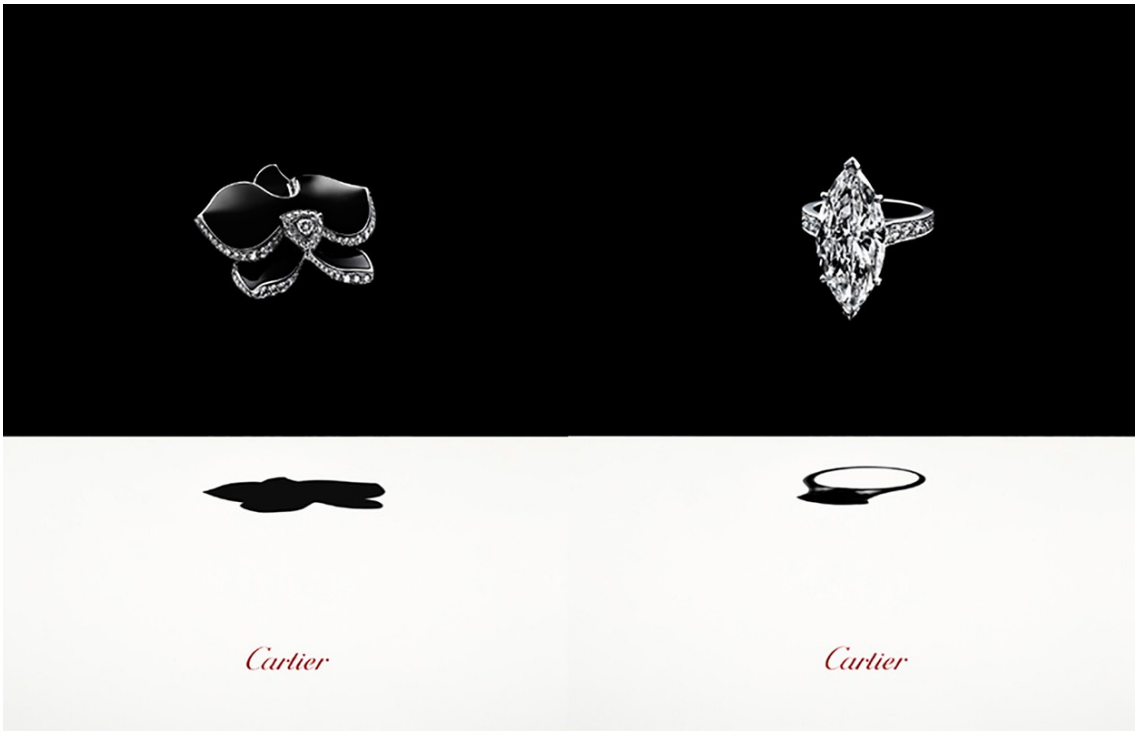

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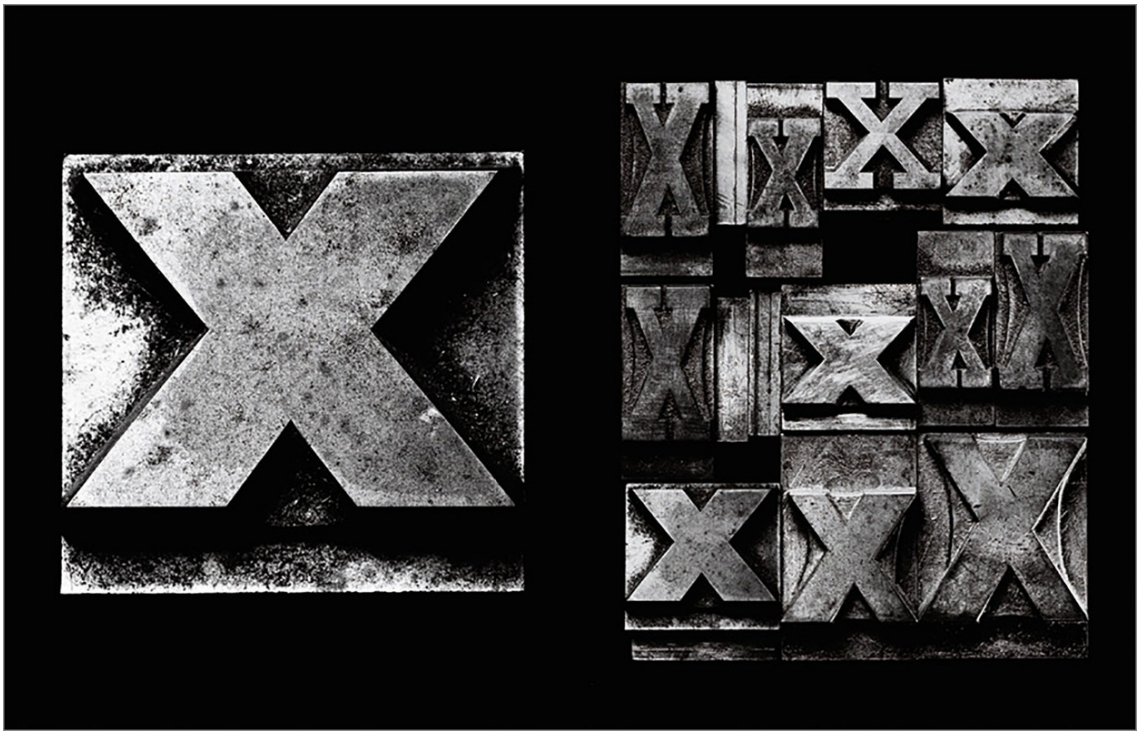

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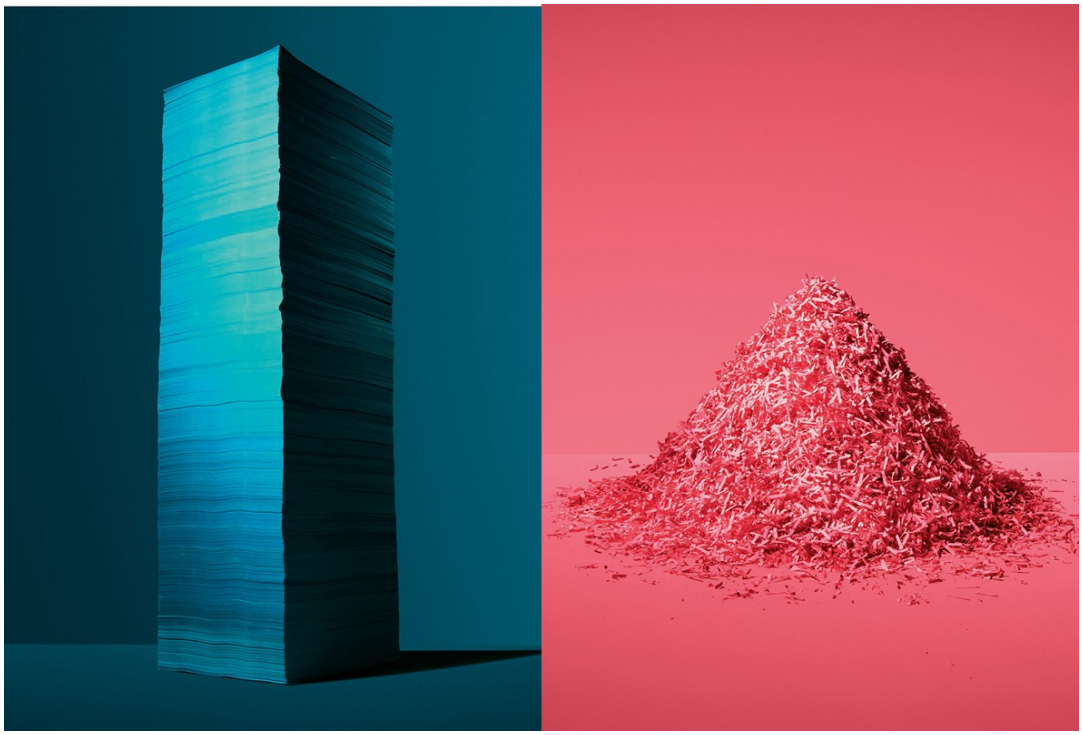

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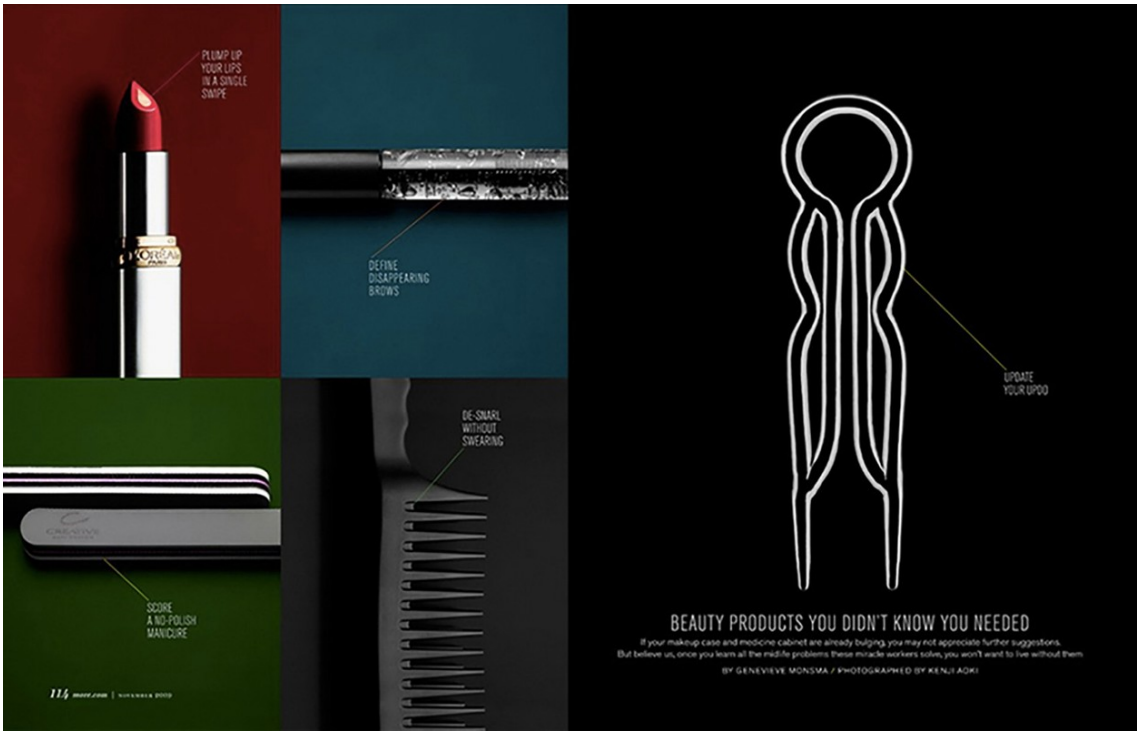

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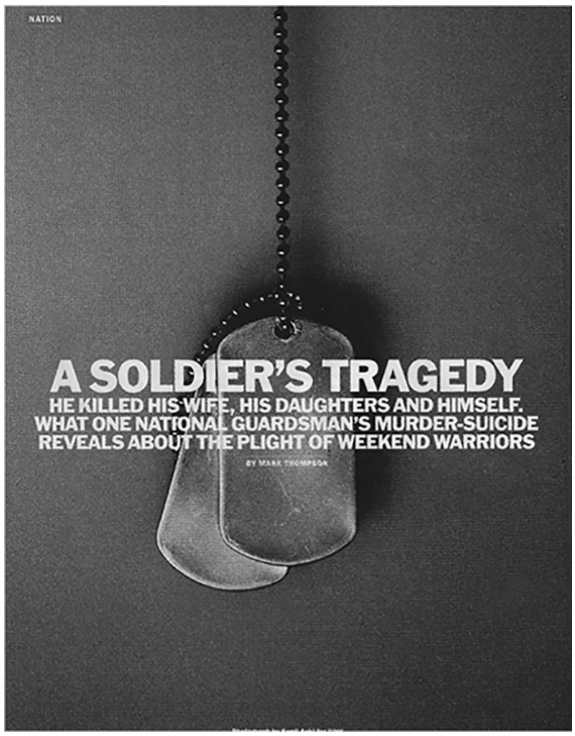

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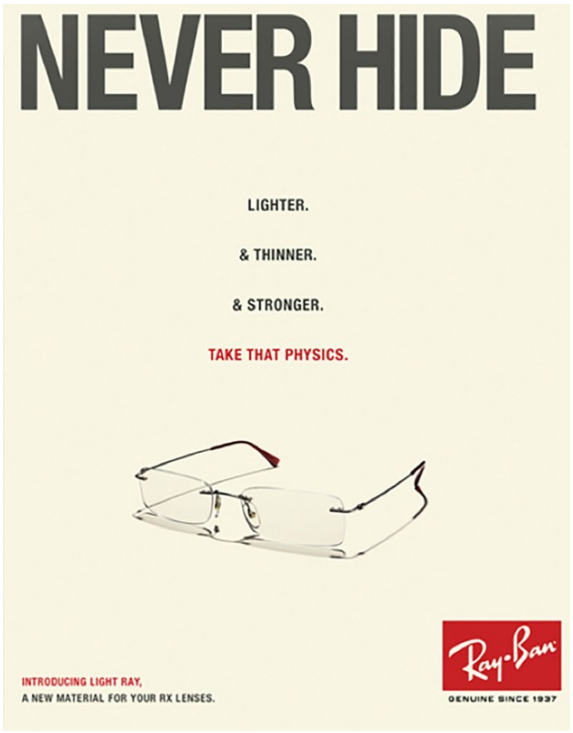

Special Report

Dying for an Appointment

Scanning your skin for suspicious moles is the easy part. Actually finding a dermatologist who isn't too busy to save your life is a lot harder

BY TONY REHAGEN • PHOTOGRAPHS BY KENJI AOKI

DONALD HAMON HAD WORKED CONSTRUCTION all his life. Every weekday for about 45 years, he would wake up, grab his tool belt, and drive to a work site where he'd labor and sweat beneath the sun until it set. Then he'd return to his home in rural West Harrison, Indiana, to enjoy his children and eventually his grandchildren. It was on one of those evenings, in early 2006, while Hamon was wrestling around with his grandson on the living room floor, that the 9-year-old made a discovery.

"Grandpa," said the boy, "you have a spot behind your ear."

Sure enough, as Hamon ran his finger behind his right ear, he could feel the tiny raw patch of skin. It was hidden, so he couldn't see it in the mirror. Nor could he remember ever feeling any pain. His wife confirmed the spot, no bigger than a punch hole, and told him he should have it looked at. So the 62-year-old Hamon did what many men do. He cleaned the wound, let it scab over, and promptly tried to forget about it.

Except the patch never healed. The scabs kept coming off, usually as Hamon slept. Almost a year went by. The spot grew to nearly the size of a nickel. Hamon couldn't wait any longer. He picked up the phone and called a dermatologist in Aurora, Indiana, about 17 miles south of his home.

The doctor booked him for an appointment the following week, and it was then that Hamon learned the patch was cancerous—an aggressive form of squamous-cell carcinoma that had spread to his parotids, the body's largest salivary glands. A team of doctors first removed almost a quarter of his right ear in an emergency surgery to head off the cancer. Later they took out his parotids, along with lymph nodes. Then began the radiation therapy. After 32 grueling treatments, Hamon was finally pronounced cancer-free.

That should have been the end of the nightmare. But then, in May of 2010 as Hamon was mowing the lawn, a tree branch clipped his right ear. It started to ooze blood and never stopped. Having learned from his potentially fatal mistake 5 years earlier, Hamon phoned his dermatologist in Aurora and was told the doctor would be able to see him—in 4 to 6 months.

Four to 6 months? No, no. This was Donald Hamon, *Hamon*, he told them. A former patient with a history of cancer in this very ear.

This was an emergency.

Sorry, they said. The doctor's appointment book was packed.

He called another dermatologist in the same building.

Four to 6 months.

He called a couple of specialists at the Western Hills campus of UC Health Dermatology, 19 miles away.

Six months or longer.

Cincinnati, 25 miles east?

Booked solid into next year.

Hamon went to his family practitioner, but all the doctor could do with his limited dermatological training was assist in trying to find a time, a cancellation, anything with an area dermatologist. Days became weeks that stacked into months without an opening. Hamon's physical state didn't improve. His mental state worsened. All he could envision was a tumor barnacled to his skull. He began to prepare himself for the idea that he might not be around much longer, that he was going to die in the distant, solitary waiting room his life had become.

HAMON WAS LUCKY HE DIDN'T FACE A similar wait back in 2006. That same year, two researchers at the University of California at San Francisco's school of medicine decided to conduct an experiment. Posing as worried patients, they phoned 801 dermatologists across the country for an appointment to have a suspicious "changing mole" checked out. The average wait time: 38 days. In some cities, like Boston, the wait was as long as 73 days. That would have provided a 10-week head start for what could have been aggressive cancer.

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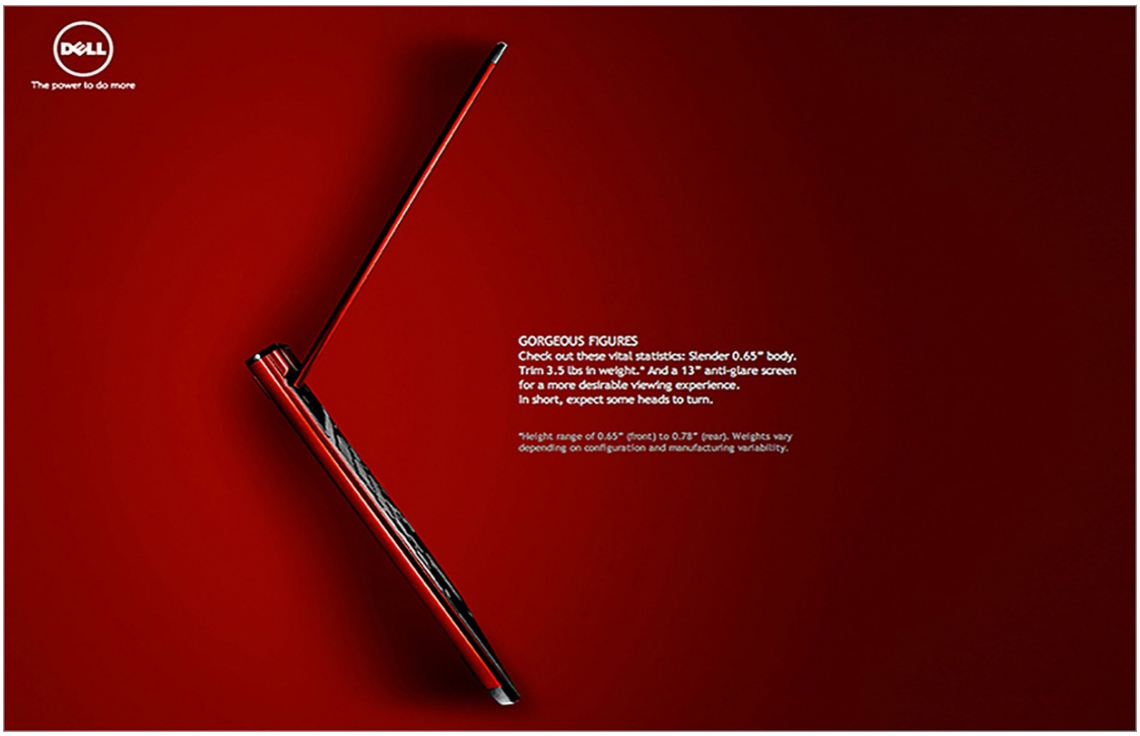

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START

what's inside

TAP WATER

DIHYDROGEN MONOXIDE
The International Union of Pure and Applied Chemistry calls it oxidane. You probably know it as H_2O. Essential for all life, it's the universal solvent as well as a biological lubricant and coolant. But when it comes out of your tap, this simple combination of hydrogen and oxygen atoms is often mixed with stuff that you might be less happy to swallow.

SULFATE
A naturally occurring chemical that leaches into groundwater. Some people drink high-sulfate mineral water at spas for its "cleansing" (laxative) effects. In public supplies, the EPA recommends keeping it to 250 parts per million to minimize the sulfurous smell and taste.

RADIONUCLIDES
Millions of years ago, volcanic ash rich in uranium blanketed what is now the Gulf coast of Texas. Since then, the U-238 has made its way into aquifers, where it decays into radioactive isotopes like radium, thorium, and radon. In Houston, radiation levels in water have been measured as high as 16.9 picocuries per liter, well above the EPA maximum. (Yes, that unit of measure for radioactivity is named after Marie Curie—a fine tribute to a glowing career.)

TRIHALOMETHANES
Like fluorine and bromine, chlorine belongs to the group of intensely reactive "halogen" elements—the home wreckers of the periodic table, capable of breaking up many molecules (like ozone in the stratosphere). That makes chlorine great for killing microorganisms in water, but it can also combine with organic matter to form trihalomethanes, which damage your DNA and liver and may cause cancer.

Contains up to 250 ppm of ***natural laxative!***

BROMATE
No, it's not some chill dude that you share your Old Spice with. This potential carcinogen is another water-purification practice gone awry. When water containing bromine ions from natural mineral deposits is purified with ozone (O_3), bromate (BrO_3) is born.

N-NITROSODIMETHYLAMINE
Labs have actually used this stuff to induce cancer in rats—with as little as one injection. But relax: it's not a conspiracy to taint our precious bodily fluids. NDMA can be formed as a byproduct of water purification with chlorine or chloramine. You might also drink it if you live near a Cold War–era military base. Riverside County, California, has measured levels of this stuff as high as 12 parts per trillion—four times the state's target limit.

LEAD
New York City boasts about the quality of its drinking water, but that upstate freshness means nothing if the water travels through ancient pipes. (Even new "lead-free" pipes can be 8 percent lead.) New York's soft water readily absorbs Pb, which can cause developmental disabilities and neurological problems. City authorities are required to take steps when levels hit 15 ppb, and they've had rates as high as 19 ppb.

CHLORAMINES
You know how ammonia labels say, DO NOT MIX WITH BLEACH—and bleach labels say, DO NOT MIX WITH AMMONIA? Municipal water utilities, in their zeal to kill microorganisms, have been ignoring that advice for most of the past hundred years. The result is cleaner water, plus a few ppm of this stuff—a compound that can damage red blood cells in mice and some humans. —*Patrick Di Justo*

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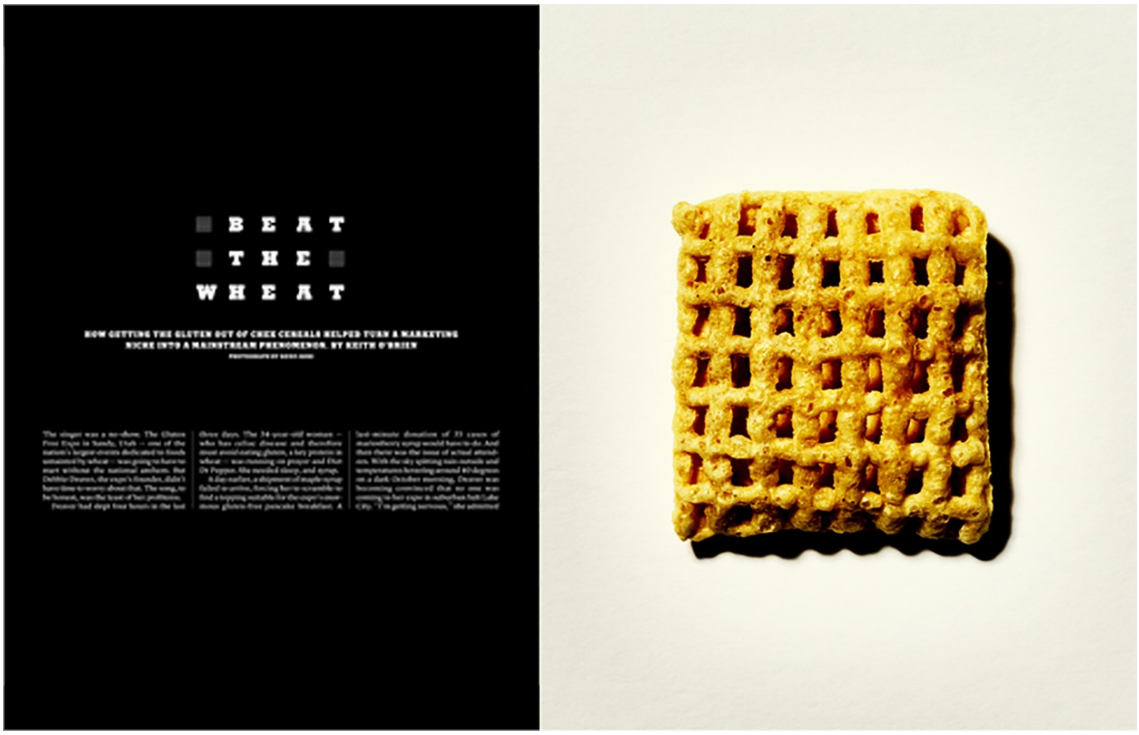
PHOTOGRAPH BY KENJI AOKI



BEAT THE WHEAT

HOW GETTING THE GLUTEN OUT OF CHEX CEREALS HELPED TURN A MARKETING NICHE INTO A MAINSTREAM PHENOMENON. BY KEITH O'BRIEN

PHOTOGRAPHS BY KENJI AOKI

The singer was a no-show. The Gluten Free Expo in Salt Lake City, Utah — one of the nation's largest events dedicated to foods unmistakably wheat — was going to have to start without the national anthem. But Debbie Deaven, the expo's founder, didn't have time to worry about that. The song, to be honest, was the least of her problems.

Deaven had slept four hours in the last three days. The 74-year-old woman — who has celiac disease and therefore must avoid eating gluten, a key protein in wheat — was running on prayer and Diet Dr Pepper. She needed sleep, and syrup.

A day earlier, a shipment of maple syrup failed to arrive, forcing her to scramble to find a topping suitable for the expo's cavernous gluten-free pancake breakfast. A last-minute donation of 33 cases of strawberry syrup would have to do. And then there was the issue of actual attendees. With the city spiking into outside wind temperatures hovering around 80 degrees on a dark October morning, Deaven was becoming convinced that no one was coming to her expo in suburban Salt Lake City. "I'm getting nervous," she admitted

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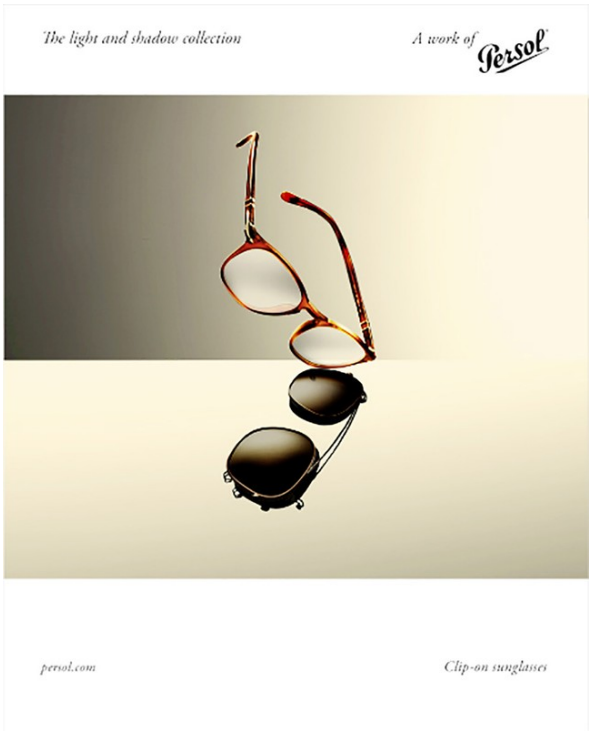

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9.14.08 The Way We Eat By Jill Santopietro

Thank You for Smoking

Barbecue-pit flavor, minus the pit.

New York might not be the country's barbecue capital, but thanks to places like Daisy May's, Dinosaur, Blue Smoke, RUB and new arrivals like Hill Country, Bar Q and Wildwood, pork is smoking in this town. It has also been smoking in my 350-square-foot apartment, where I've been determined to create backyard barbecue flavors using only my ventless oven.

Creating smoke flavors without actual smoke is certainly feasible. Its essence can be sprinkled on using smoked Spanish paprika or smoked sea salt. By rubbing Lapsang Souchong tea over wild sockeye, a traditional salt-and-sugar-cured salmon morphs into a smoky gravlax. And then there's Liquid Smoke — basically concentrated smoke-flavored water — a popular additive in many parts of the country and an ingredient in lots of store-bought barbecue sauces. I brushed some on ribs and dripped a little into sauces. Ugh! It tasted artificial. "It goes right to the roof of my mouth and hangs," says Mike Mills, an author of "Peace, Love and Barbecue" and the owner of the 17th Street Bar & Grill restaurants in Southern Illinois.

Though alternatives exist, smoldering wood produces unrivaled flavors. And real smoke is easy to create at home using a stove-top smoker, essentially a roasting pan fitted with a drip tray and a rack, sold by companies like Camerons and Emeriware. Or make your own: line a large wok with heavy foil, add wood chips, lay a smaller piece of foil over the chips to create a drip pan and set a round rack in the pan. A third piece of foil becomes the lid. Use pure, resin-free, ground wood chips. Elizabeth Karmel, the executive chef of Hill Country and the author of "Taming the Flame," says she likes to think of wood

Photograph by Kenji Aoki

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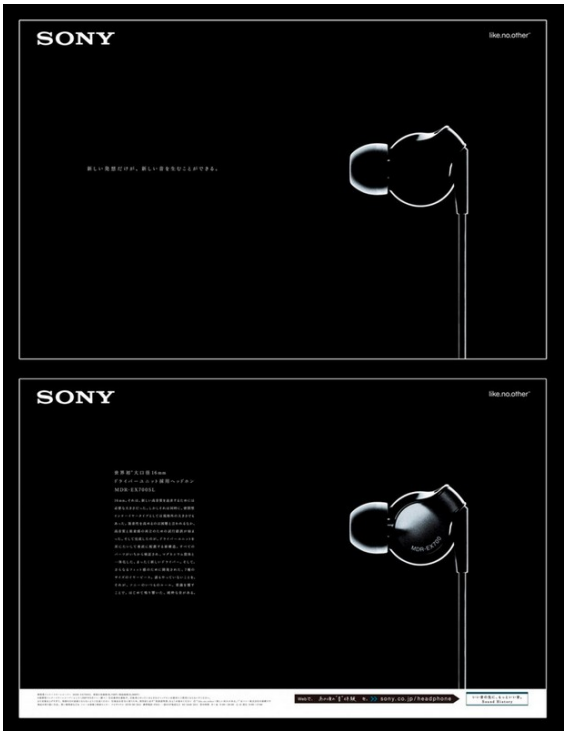

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