

WIRED

Start

START

Woman of Substance

As the materials guru at design and consulting firm Ideo, Kara Johnson knows her stuff. Need a light magnetic substance? She'll suggest nickel foam. A highly conductive fabric that's soft? Try copper-nylon cloth. To make finding the right materials easier, she's building a master library of samples linked to a database of properties and manufacturing processes. Designers at the firm in Palo Alto, California, can comb through the library to find what they need for, say, a new medical device or a kitchen whisk. "I want to change the materials industry," says Johnson, 28. "Designers need materials to be inspirational, to break a train of thought and break a traditional boundary of a product form or surface."

- Jessie Scanlon

START

Egomania? We Can Rebuild It

You almost have to feel sorry for the post-millennial masters of the universe, those quintessential giants of business and technology. For months, they haven't known what to do with themselves. An era of recession and scandal is no time to strut, so famously self-satisfied titans have been on an enforced holiday from preening overconfidence - at least in public. Is there any good news for them? Actually, yes: With the economy showing signs of life, arrogance is poised for a comeback.

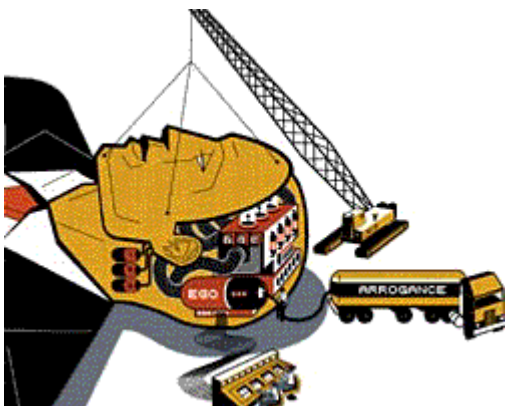


Image by Aaron Piland

As entrepreneurs are fond of declaring, without being asked, unreasonable self-confidence is an often-crucial ingredient to success and innovation. Sure, the trait fell out of favor at the height of the Enron backlash. At one point, observers acted as if they'd found a smoking gun in the fact that the firm called itself "the world's greatest company." The scoundrels! But you don't have to be an overbearing blowhard - much less an apologist for Skilling and company - to recognize that many of our greatest innovators have been, and remain, insufferably arrogant people.

"Larger-than-life leaders" are classic narcissists in the Freudian sense, says anthropologist and psychoanalyst Michael Maccoby, whose book *The Productive Narcissist* will

be published by Broadway Books next year. These egotists are charmers and risk-takers, big personalities with big visions. From business history, he points to Carnegie, Rockefeller, Edison, Ford. His more recent examples are just as familiar: Welch, Jobs, Gates. Writing in the *Harvard Business Review* in early 2000, he noted that such heroes were so popular that many of us had forgotten the "inevitable cons" of this archetype - the "feelings of grandiosity" that success creates, pushing some visionaries to lose hold of reality, then crash and burn. He says dryly: "People are more aware of those downsides now."

What will the next wave of smugness look like? At the moment, any business leader professing wild-eyed confidence might simply sound like a kook. So expect the New Arrogance to remain understated for a while.

How long that lasts will depend, in all likelihood, on how quickly a fresh round of success stories emerges. A new invention, a scientific breakthrough, a suddenly hot sector - these are the things that energize narcissists. Meanwhile, the egocentrism gene now lying dormant is sure to spring back to life. Consider Craig Venter, the departed CEO of Celera Genomics, who recently revealed his DNA was the primary sample used to decode the human genome. Arrogant? He's heard that "so many times, I've gotten over it," he announced.

In other words, egocentrism springs eternal. As one longtime Silicon Valley observer puts it, there's really no way to replace the potentially combustible mix of motivators - changing the world, getting rich, amassing power - that drives entrepreneurs. That's especially so in the technology field, he adds, where the prevailing attitude remains: "It's perfectly fine to be an arrogant jerk, as long as it's in the service of more than getting rich."

Ultimately, though, self-infatuation thrives or falters for reasons that have as much to do with our attitudes toward the leadership class as with the hardwiring of leaders themselves: Pied pipers need a steady supply of willing followers.

James Collins, author of the surprise- hit business book *Good to Great* (which, among other things, makes the case for modesty), hopes that this time people will at least adopt a more thoughtful view of the "great CEO mode" and not simply fall in line behind whatever visionary is blowing his own horn from a hundred magazine covers. But, he acknowledges, "in a complex world, people are going to look for simple answers."

When arrogance makes its certain comeback, those of us in the peanut gallery shouldn't put all the blame on imperious jerks; some of it belongs to us. As success returns to the headlines, we'll remember that innovators must have the courage of their convictions - but we'll forget about the disasters that their delusions of grandeur almost always bring. Then again, those masters of the universe could have told you they were never to blame.

- Rob Walker

START

The New Scream machines

Twenty-story drops, 360 degree loops, speeds up to 76 mph. Thrill-riders have a lot to look forward to this summer, as advances in coaster design defy expectations -- and the strongest of stomachs. Here are four new rides worth the wait in line.

1. X

Six Flags Magic Mountain
(Valencia, California)

The Ride: In two minutes, you do two loops and three flips, drop 200 feet, reach 76 mph, and withstand 4Gs.

The Draw: You won't know up from down as your seat twirls on an independent axis.

Nuts and Bolts: Twenty-foot-wide wing-shaped cars suspend riders beyond the rail's edges. Giant gearboxes control seat spin.

Nauseometer: 10

2. The Wicked Twister

Cedar Point
(Sandusky, Ohio)

The Ride: You rocket between and then up a pair of 215-foot corkscrewing steel towers, hitting the 72 mph maximum in 2.5 seconds.

The Draw: It's like the elevator from hell. You achieve top speed, stall, then fall.

Nuts and Bolts: A linear induction motor draws 34,000 volts for 32 seconds - enough juice to power 400 homes for an hour.

Nauseometer: 8

3. Superman

Six Flags Over Georgia
(Austell, Georgia)

The Ride: Tilt-down seats travel up to 60 mph through a 100-foot drop and 360-degree roll. >

The Draw: It's a bird, it's a plane, it's a three-minute ride that's almost like flying. Big thrill: the first pretzel-shaped inverted loop.

Nuts and Bolts: A dual-station design speeds up the queue. Gravity holds riders in place against padded restraints.

Nauseometer: 4

4. The Flying Coaster

Six Flags Elitch Gardens
(Denver)

The Ride: In a mere 70 seconds, you spiral 66 feet up and twist through a series of high-banking turns -- face-first, at 26 mph.

The Draw: The headfirst free-float makes up for the relatively low speed.

Nuts and Bolts: The clamshell gondolas snap around rider's legs and torsos, then flip down for takeoff. Plus: everyone's in the front row.

Nauseometer: 3

- Heather Bossard and Elizabeth Armstrong

START [exploded view](#)

Playing With Fire

Rockets' red glare. Bombs bursting in air. Sure, the Chinese invented fireworks, but it took Yankee ingenuity to marry gunpowder with technology. Today's explosives are not your dad's bottle rockets, lit with the burning tip of a Lucky Strike. They're armed with electric igniters, sophisticated chemicals, and microprocessors that allow pyrotechnicians to paint the skies with shapes and color in ways impossible a few years ago.

- Mike Drummond

Crack the Shell

On the surface, a firework shell is a study in minimalism - a 6-inch sphere made from cardboard or other paper-based products, sometimes painted, but typically just box brown. But inside, it's packed with high tech gizmos, an assortment of exotic chemicals, and old-fashioned black powder. Marco Polo would recognize the basics packed inside a shell: solid, lightweight pellets known as stars - made from rice hulls, soybeans, or even sawdust, and coated with combustible material. When a shell explodes, the stars ignite, creating the chest-thumping, eye-popping ooh-ah effect. The recent additions of split-second timers and computer controllers have transformed firework displays, allowing for more precision and artistry, more color and choreography. It's not cheap: A typical high-end Fourth of July show runs 30 minutes and includes some 6,000 bursts. Finales can feature more than 1,000 blasts. At up to \$120 a shell, a big show can send a half-million dollars up in smoke.

Design It Onscreen

Forget flares and cord fuses. Top firework-show designers use electronic igniters to trigger detonation. The latest hardware meshes perfectly with software. New this year from Infinity Vision of Bellevue, Washington, is Visual Show Director 4D (the fourth D is time), a WYSIWYG program with OpenGL runtime that allows designers to choreograph, score, and preview their shows on a computer before the real sparks fly. It's not a fireworks show, it's a pyromusical!

Paint the Sky

In the beginning there was black powder - charcoal, potassium nitrate, and sulfur. All alone, it produces one color: pale yellow. *Bor-ing*. Along came the space age, and with it ammonium perchlorate, the stuff of rocket fuel. Today's stars are coated with a mixture of AP and other chlorates. Strontium burns red, barium makes green, and copper throws off blue. Magnalium (magnesium and aluminum) burns brightly, shuts down, then reignites, producing a strobe effect. Cool.

Set It Off

MagicFire of Massachusetts has developed a programmable circuit that fits inside a shell and can trigger a firework to within a millisecond of its coded instructions. A tiny capacitor charged right before takeoff powers the 0.5- by 2-inch circuit. Once launched, the chip begins its preprogrammed countdown, signaling the explosion at the instant of, say, the crash of a Souza cymbal.

Get Into Shapes

The old-style chrysanthemum burst has evolved. All sorts of shapes are now possible. To achieve a ring, for example, manufacturers sandwich a circle of stars between the two halves of the shell, which are filled with semicomcombustible material. A dragline (kind of like a kite tail) keeps the shell pointed in the right direction. The result: a ring writ large. Designers have begun using the technique to spell their names in the sky. Show-offs.

START

Vaporware

What can you build with a low-cost air blower, drinking straws, plastic tubing, cardboard boxes, some liquid nitrogen, and a lot of tape? A video-screen made of fog. Ismo Rakkolainen, a PhD candidate at Tampere University of Technology, and professor Karri Palovuori know that their screen, with its ghostly image, will never replace a traditional CRT or LCD. But the Finnish inventors expect that the technology will have several applications from virtual environments and magic tricks to special f/x and enormous outdoor movie screens.

- *Pete Rojas*

PEOPLE

Bush's Cybersnoop

John Poindexter, head of the Pentagon's new data mining service, the Information Awareness Office.

Master of Delete: After serving as Reagan's national security adviser during the Iran-Contra scandal, Poindexter was found guilty of five felony counts (later overturned on a technicality), including obstructing Congress by erasing more than 5,000 incriminating emails.

Data Hunter: In January, Poindexter, 66, was tapped to lead the IAO. The office, funded by Darpa, works to counter "asymmetric threats" (such as terrorist cells) with IT solutions. It's building a prototype system for collating billions of previously unconnected data points - everything from the classified files of lone-wolf agencies like the FBI, CIA, and DEA to personal Internet communications and credit records.

Background Check: The former Navy admiral has a PhD in physics and experience in IT and international security. He's loyal to Republican presidencies. Besides, who better to monitor email than a guy who faced jail for shredding digital paper trails?

- *Charles Graeber*

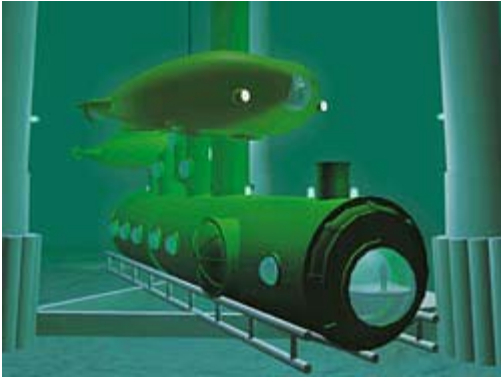
EXPLORATION

Into the Abyss

Building A Deepwater Live-work Lab

Today, his dream of a permanent lab next to Veatch has evolved into a \$75 million project called the Ocean Atmosphere Seafloor Integration Study. Cooper founded a nonprofit in Groton, Connecticut, to direct Oasis and oversee several new research endeavors, including the construction of Ocean Base One - the first deep-sea research facility, which will sit on the continental shelf, a full 550 feet beneath the ocean's surface. (The next-deepest undersea lab is Aquarius, a mere 70 feet below, off Key Largo, Florida.) Cooper likens the concept to the International Space Station. His goal: to build a lab that can support life for weeks in a brutally unforgiving and isolated environment.

Ocean Base One will be immense: 40,000 square feet of



Courtesy Ocean Technology Foundation
550 feet below: Scientists in Ocean Base One will inhabit an underwater station as big as a supermarket.

research and living quarters. A pressurized elevator housed in a watertight shaft will shuttle occupants to and from the lab (imagine an upside-down oil-drilling platform almost as deep as Seattle's Space Needle is high). Workers will inhabit two distinct sectors: one emulates the atmosphere at sea level; another raises air pressure to 19 times that on the surface, matching water pressure outside. After 12 hours in the chamber - breathing an oxygen, nitrogen, and helium mixture - scientists can enter the surrounding ocean wearing nothing more than sophisticated diving gear.

Firsthand observation promises huge improvements in undersea research. "We have robots that can go deep," Cooper says, "but using them is like stumbling through a forest with your eyes shut, then opening them every six hours for 15 minutes." Ocean Base One inhabitants will get

the chance to spy on deep-sea organisms - lobsters, tile fish, ocean pout, rock crab - as they parade along the seafloor. The base will also afford an ideal vista for observing the impact of oil and gas drilling, toxic dumping, and overfishing.

By 2007, Cooper expects to have enough funding from foundations, oil companies, and other sources to break water. Add two more years for construction, and he'll finally get to work from home.

- Michael Behar

START b.f.d.

Say Good-Bye to Plastic

Trash That Melts - Just Add Water

It could be the biggest thing since sliced bread was wrapped in cellophane: biodegradable food packaging that's cheap enough to compete with conventional plastic. Once used, it can be thrown onto the compost heap or even eaten. This year, startup Plantic Technologies will roll out a cornstarch-based bioplastic that can be molded into everything from Twinkie wrappers to cracker trays.



Photos: Chris Chen; Styling: Marcella Hayward/2C

Management

Disappearing act: Bioplastic packaging eventually breaks down into water and carbon dioxide (photos seen at 0 seconds (left), 30 seconds (center) and 1 hour elapsed time).

The technology, developed by the Australian government, could help usher in a 21st-century green revolution. Cornfields rather than oil fields could satisfy much of the enormous demand for plastic. A huge chunk of the 24 million tons of plastic that Americans toss each year would end up in backyard com-posters instead of landfills. And then there's the carnage that would be avoided if the plastic polluting the world's oceans dissolved rather than killing sea turtles, fur seals, and other wildlife.

The road to ecologically safe, consumer-friendly bioplastic is littered with expensive failures and technological dead ends. But those problems are now being overcome, spurred in part by stringent recycling regulations in Japan and Europe. In 100,000 German households, for instance, chemical giant BASF is testing food bags and packaging made from its Ecoflex bioplastic, which contains a biodegradable petrochemical polymer. In the US, Biocorp North America is producing cornstarch-based biodegradable garbage bags, cups, and cutlery.

The latest breakthrough has come in Australia, where scientists have developed an even better bioplastic: It biodegrades at temperatures as low as 33 degrees Fahrenheit - simply by being exposed to moisture and microorganisms in the soil. Your candy bar's bioplastic wrapper accidentally blows out of the car window as you barrel down the highway? Not a problem. With a little rain, it dissolves in an hour. In a matter of weeks, it disintegrates into carbon dioxide and water. Such technology appears to be unique, according to Steve Mojo, executive director of the Biodegradable Products Institute, a New York organization that analyzes compostable bioplastics. (It has yet to study Plantic's products.) Though Plantic closely guards the recipe for its patented polymer, it's happy to show off the result - a material with the look, feel, and flexibility of conventional plastic. It can be used for everything from cellophane and baggies to plant pots and medical devices. The company uses standard industrial extruders to produce cornstarch-based pellets, which are blown into sheets, then cut and molded into specific products. Food-packaging material costs about the same as petroleum-based plastic, approximately 32 cents per pound. The tougher versions of the material can withstand moisture for four to six weeks.

Biodegradability does have its drawbacks. Get caught in a rainstorm with your groceries, and your cookie package could melt. And the more water-resistant, and thus longer-lasting, bioplastic is, the more expensive it is to make. Those costs must come down for Plantic to expand beyond the food-packaging market. "Dry goods packaging for chocolates and biscuits is just the first step," says David MacInnes, CEO of the year-old Melbourne company. "The main drive is to improve strength and reduce costs." Another challenge will be persuading multinational corporations, particularly American ones, to forsake longtime plastic suppliers for the Aussie upstarts.

Why Oz? Chalk one up for government-funded research. A federal center developed the bioplastic and transferred the patent to Plantic. A scientific consulting firm took it from there, selling investors on the idea and hiring a management team.

Already, several multinational food companies, including Cadbury Schweppes' Cadbury unit, are testing Plantic's bioplastic. Small purchase orders are in place for cookie and candy trays, which represent a \$290 million global market. Plantic also has developed a bioplastic version of the agricultural film used by farmers as ground sheeting to grow tomatoes and other crops. Conventional sheeting - an \$845 million global market - must be dug up after harvest, and some 650,000 tons of it end up in landfills worldwide each year. But with bioplastic film, farmers just pick their peppers, and the liner disappears harmlessly into the soil.

Plantic will focus first on the European and Japanese markets, counting on multinational corporations' desire to make their reputations for polluting all but disappear.

- Todd Woody

START

Time Machines

From Atari T-shirts to the iPod, the computer age has generated its share of fetish objects. And like the Mini or miniskirts, They're fetishized first when they come out (*Ooh! How high tech!*) and again when they're so out they're in (*Ooh! How retro!*). Take this Cray-1 supercomputer: Once the most powerful machine on the planet -- with an 8-megabyte memory and a \$9 million price tag in 1976 - - the Cray-1 is now coveted as furniture, its blue leather benches used as ... benches. The new book *Computers: An Illustrated History* celebrates the old boxes that once seemed so ahead of their time. Now they just seem timeless.

- Thomas Goetz

START

Jargon Watch

Heroinware Nickname for multiplayer online games like *EverQuest* - dubbed *EverCrack* by hardcore players - that can become addictive and do serious damage to relationships and careers.

Micestronauts Rodents that would be sent into Earth orbit to study the effects of living - and reproducing - at reduced gravity. The project, proposed by the Mars Society, would yield data that could be used to help plan a long-term trip to the Red Planet.

Vokens Short for virtual tokens, the Web advertising gimmick du jour.

The little rich-media interruptions hover or crawl over a browser window, begging for your attention. Bravo Canada's *Sex and the City* page, for example, includes a floating, twirling pack of Extra Polar Ice gum.

Neo-Creo A person who's part of the neo-creationism, or "intelligent design," movement, which relies on science and logic rather than Scripture to argue that life is too complicated to have arisen by evolution.

- Gareth Branwyn (jargon@wiredmag.com)

FUTUROLOGY

A Crystal Ball for War

Conflict is inevitable, but with the right computational tricks, we ought to be able to see it coming. Social scientists have been trying to build that particular crystal ball for almost a century. Now database records, eyewitness accounts, and other data points are making such predictions look possible. And just in time. After the September 11 attacks, figuring out where the next trouble will be has taken on new urgency. Here's a report from forecasting's front lines.

Correlates of War, U. of Michigan

Encompassing every major conflict from 1815 to the 1990s, this database quantifies size of conflict, countries involved, and political interactions. **Findings:** Small nations are more likely to go to war than big-leaguers. The more alike two countries in a dispute are, the better the chance for shooting.

How good is it? Not very. The project is more dedicated to developing an etiology of war.

The catch: COW's so-called structural data doesn't account for rapid, chaotic action.

State Failure Task Force, U. of Maryland

This database includes nearly every revolution, war, violent regime change, and genocide from 1955 to 2000. The model uses statistical techniques like neural network analysis and genetic algorithms.

Findings: Nations with low openness to trade, weak democracy, and high infant death are vulnerable.

How good is it? Good. The model reproduces - retrodicts? - history with 80 percent accuracy.

The catch: Other researchers have found holes in the statistical methodology.

Integrated Data for Events Analysis, Harvard U.

An AI that can read. Fast. Its algorithms parse the lead sentences of 80,000 Reuters news articles each month to figure out who's doing what to whom.

Findings: Patterns of innocuous events such as nonviolent protests can signal impending violence.

How good is it? Good enough to discern week-to-week patterns. Virtual Research Associates sells the engine to early-warning groups.

The catch: The English-language press has its limits. Other groups are broadening the data set.

Country Indicators for Foreign Policy, Carleton U.

This project combines a structural database of 100 performance indicators from 196 countries from 1985 to 2000, events data from the Swiss Peace Foundation, and reports from on-the-ground observers.

Findings: Five countries in West Africa and three in Southeast Asia are at significant risk for violence.

How good is it? Probably very. CIFP uses simplified stats to help policymakers and NGOs avert trouble.

The catch: If you ensure the predictions don't come true, how do you know you were right?

- Adam Rogers

START

Wired | Tired | Expired

Wired

Folding@home

Tired

Genome@home

Expired

SETI@home

XXX	Xbox	X-files
MMS	SMS	WAP
Restylane	Botox	chemical peel
Chrysler Crossfire	Audi TT	Porsche Boxster
Quorn	Korn	Faith Popcorn

START

The Mind's Eye

Anders Dale can read your mind in minutes, thanks to the MRI-analysis software he and Harvard Medical School colleague Bruce Fischl developed. That's a big improvement over the current one-week time frame. Their system, which analyzes an MRI voxel by voxel, can also detect details invisible by the naked eye -- subtle changes in the cerebellum or in the white matter -- giving doctors a closer look at the progression of diseases like Alzheimer's and schizophrenia.

- *Elizabeth Armstrong*

START **cheat sheet**

How to Disappear

Your inbox is awash in spam, your boss is chuckling over your credit report, and you've got a sneaking suspicion that Uncle Sam counts how many Löwenbräu you chug. Yes, your privacy's shot to hell, and you're tempted to shrug and settle for an open source life. But privacy isn't like virginity, forever lost after the first trespass. With some work, "reprivatization" is possible. Use this three-tiered guide to pick a level of solitude. But be warned: Going all the way off the grid is more Ted Kaczynski than Howard Hughes.

Going

Diss credit: Want to be hard to find? Start by dashing off stern opt-out letters to the big database companies and credit bureaus - Experian, Acxiom, Equifax. These folks may make a mint peddling personal info, but they can be cajoled into stopping. First, though, they'll make you jump through hoops - like filling out a 1040-sized form or idling in toll-free hell. Junkbusters (www.junkbusters.com) has a good list of opt-out addresses.

Anonymize: Ditch your ISP and sign up with a service that lets you surf by proxy, keeping your IP address concealed. Send email via an anonymous remailer like Mixmaster, a digital middleman that scrambles timestamps and message sizes. And if you're going to be advocating the violent overthrow of the government or bragging about your cool new bong, make sure your remailer routes messages through multiple machines.

Grok the fine print: Boring as it sounds, read the privacy statements that clutter your mailbox around tax time and sever ties with companies that admit, "Our privacy policy may change over time" - industry lingo for "We reserve the right to screw you."

Going Further

Ditch the digits: Want to drop out? Start by rustling up a new Social Security number.

The Social Security Administration doesn't accept paranoia as a criterion for granting a new card, but it recognizes cultural objections and religious pleas. One stratagem: Contend that your credit has been irrevocably damaged by a number-related snafu, or that you live in fear of a stalker who knows your digits. Once you switch your SSN, never use it. Instead, dole out 078-05-1120, an Eisenhower-era card that works 99 percent of the time.

Call cell-free: Use the humble pay phone. Mobile phones are being outfitted with global positioning satellite chips to comply with an FCC mandate. By 2006, all wireless networks must feature 911-friendly tracking technology. Marketers are cooking up ways to capitalize, like zapping burger coupons to your Nokia as you stroll by a fast-food joint.

Pay full price: You may relish saving 10 percent on Prell, but deep-six your buyers' club cards. Supermarkets and pharmacies haven't yet perfected the art of data mining, but it won't be long. "If you're having a child custody fight, they could subpoena your frequent-shopper cards and say, 'Look, he's buying too many potato chips, he's hurting the kids,'" says Robert Gellman, a Washington-based privacy consultant.

Gone

Move: Want to go completely off the grid? Start by moving - address changes bedevil databasers. But don't buy a home. All those loan apps will blow your cover. Residential hotels smell like cheap cigars and urine, but at least you can register under a pseudonym. Give a fake address: 3500 S. Wacker, Chicago, IL, 60616 - the front door for Comiskey Park.

Toss your cards: Pay cash for everything, and don't plan on a life of luxury. Any (legal) cash transaction more than \$10,000 triggers government reporting regulations, which means you can forget about that Cadillac Escalade you've had your eye on. Settle for the subway or bus, using coins rather than prepaid fare cards, which keep a record of trips.

Go incognito: Facial-recognition gear will soon be ubiquitous in public spaces. To fool the systems, invest in a pair of bulky aviator sunglasses and a hat. If you fear being tailed, alter your gait every time you hit the street - a pigeon-toed shuffle one day, a bowlegged amble the next. There are also Central American plastic surgery mills, beloved of drug lords, that can alter the loops and whorls on your fingertips. It'll set you back 10 Gs, but then, Costa Rican doctors have been known to accept gold Rolexes in lieu of cash.

- *Brendan I. Koerner*

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