Reader's digest

SEPTEMBER 2016

GENIUS ISSUE

50 Secrets to a Sharper Brain

The Inspiring Science of Boosting Health, Mood & Memory

An **RD SPECIAL REPORT** ... 70

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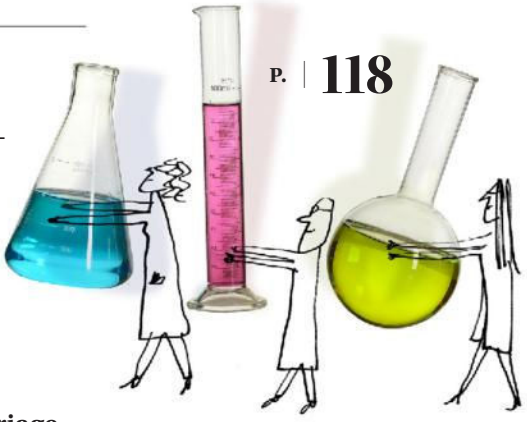
PHOTOGRAPH BY CLAIRE BENOIST. LETTERING BY JOEL HOLLAND

ART OF LIVING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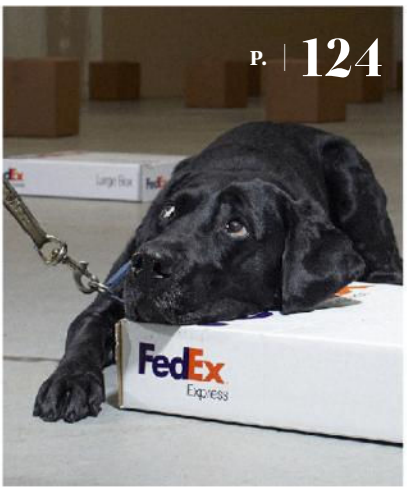
WHO KNEW?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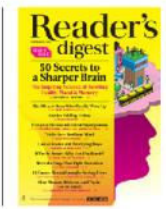


COVER ILLUSTRATION BY QUICKHONEY

Dear Readers

WELCOME TO THE GENIUS ISSUE. It's my first issue writing to you, and I'm honored by the privilege. I could prattle on about why. But I'll stick to the one reason that matters: I'm honored because you are the greatest 18 million readers on earth.

It sounds like fawning, I'm aware. But I've been studying what you write us, and it's very telling about how you read. Whether it's a letter (you send 550 a month), a story (800 a month), a joke or a funny memory (1,600 a month), or a comment on our Facebook pages (4,000), you almost always write with an astute sense of audience that only great readers master. Before I worked here, I suspected *RD*'s editors were making a mountain out of a molehill of reader contributions. But now I find myself living alongside your clear, true, burbling stream of observations and reactions. The mountain is really a mountain.

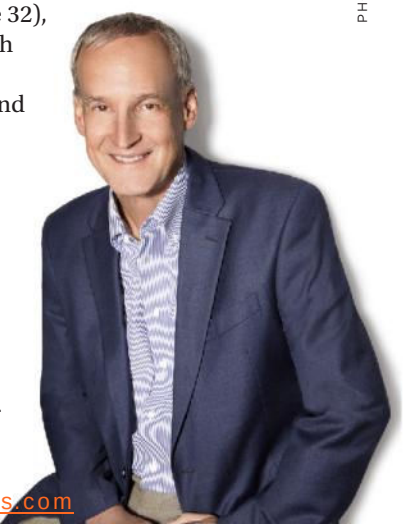
As you read this issue, re-appreciate yourselves. "Reading" today is increasingly click-and-blurt: 60 percent of articles shared on Twitter are never even read by the people sharing them. You, in contrast, read and read carefully. You think about how the story makes you feel. You mull and reflect. And then if you decide to send in a few words, they are witty and moving and worthy. And that reflects the intellect and love you put into the reading that prompted them.

So turn the page to appreciate your work as readers and contributors—to Letters (page 6), to 100-Word True Stories (page 32), to Life in These United States (page 36), to Finish This Sentence (page 18), and to much more. Also take in Liz Vaccariello's new column, I Found a Story (page 29), and if so moved, write her at liz@rd.com to prompt your tale to be her next.

Reader's Digest is nothing without you. R

Bruce Kelley, editor-in-chief

Write to me at letters@rd.com.



PHOTOGRAPH BY ALI BLUMENTHAL. HAIR AND MAKEUP: ALLISON BROOKE

Letters

COMMENTS ON THE JUNE ISSUE

Cover

I am disappointed that *Reader's Digest* has joined the war on men. On your cover, there is a neatly dressed, confident woman. Staring out of the leaves is the man, wide-eyed and confused. Show fairness in your presentation of the American male.

NORMAN GRIESS,
Lancaster, Pennsylvania

A woman facing the world head-on and smiling about her chances—it's a positive way to show survival!

A READER *via our Inner Circle Community**

Everyday Heroes

God bless Mick Polly. When I was a little girl, I wanted a bike more than anything. My heart hurt when I watched other children with their bikes. I bought my first bike in 1972, when I was 20 years old. I still have it! We aren't rich now, but I made sure all my kids had a bicycle.

ARLENE BALL, *Enoch, Utah*

**Interested in our Inner Circle Community? Go to tmbinnercircle.com and click Join Now.*

A Fallen Soldier's Final Salute

I have been reading *Reader's Digest* for over 30 years and have never cried so hard or so completely as I did while reading this story. I'm not sure I even made it to the last line.

AMY HOLDER,
Plantation, Florida

I'm appalled at Cheryl MacDonald's assumption that the fallen hero was the couple's son. Our sacrifices are no less than that of our male counterparts, yet we seem to be invisible in many ways.

SFC. MARLA GEHMAN (RET.), *Oxford, Alabama*

Word Power

I recently subscribed, with memories of reading every single one of my parents' issues. I got my first issue today and turned to my favorite page, Word Power. I've now read the first 46 pages and begrudgingly have to stop to make supper. Thanks for continuing to produce such a timeless magazine.

ANN SHOUP, *Pierre, South Dakota*

PHOTOGRAPH BY ALI BLUMENTHAL

Get Every Last Drop

I read your tips on getting the last bit out of bottles with interest as I ate French toast, with my old syrup bottle standing upside down over my new syrup bottle. Here's one you missed: Pour milk into your almost empty bottle of chocolate syrup for one last delicious serving of chocolate milk.

MICHAEL P. MARSHALL, *Huber Heights, Ohio*

Sorry I'm Late

The author is not just a "CLIP" (Chronically Late Insane Person). He is a "DOO" (Disrespecter of Others).

RICK NELSON, *Burlington, Washington*

When Amy Met Duane Online

This is one of the most important articles you've ever published. As a pastor, I see lives ruined by online romantic scams. They are as mind-numbing as any deadly opiate. This story needs to be read by every divorced, widowed, or single person.

W. J. B., *via e-mail*

The Courage of Nancy Reagan

I have no wish to denigrate nor minimize Nancy Reagan. The difference between her and other sole caregivers like me (my wife has Parkinson's-related dementia) is that Nancy Reagan had virtually unlimited resources at her disposal. I myself and others are struggling with just Social Security and limited savings.

WILLIAM HANSEN, *San Jose, California*

Your article shows me how strong Nancy Reagan really was. This is an article I have to save.

CATHY ILLINGWORTH, *Columbia, Missouri*

WHAT A WONDERFUL WORLD

SEND US YOUR STORY!

In 2011, Michael Shannon, MD, was in a serious car accident. Firefighters and paramedics were called to free him from a burning wreck. After EMT Chris Trokey got to the hospital, he realized that 25 years earlier, Dr. Shannon had slept by his bed in the hospital for two nights when he was an extremely ill infant. **What is the most amazing miracle that has happened in your life? For a chance to win $100, send your story to rd.com/miracles.**

Send letters to letters@rd.com or Letters, Reader's Digest, PO Box 6100, Harlan, Iowa 51593-1600. Include your full name, address, e-mail, and daytime phone number. We may edit letters and use them in all print and electronic media. **Contribute** Send us your 100-word true stories, jokes, and funny quotes, and if we publish one in a print edition of *Reader's Digest*, we'll pay you $100. To submit your 100-word stories, visit rd.com/stories. To submit humor items, visit rd.com/submit, or write to us at Jokes, 44 South Broadway, 7th Floor, White Plains, NY 10601. Please include your full name and address in your entry. We regret that we cannot acknowledge or return unsolicited work. **Requests for permission** to reprint any material from *Reader's Digest* should be sent to magrights@rd.com. **Do Business** Subscriptions, renewals, gifts, address changes, payments, account information, and inquiries: Visit rd.com/help, e-mail us at customercare@rd.com, or write to us at Reader's Digest, PO Box 6095, Harlan, Iowa 51593-1595.

EVERYDAY HEROES

GENIUS EDITION

Heather McHugh won $500,000 and had an intelligent idea:

Giving Caregivers A Vacation

BY ALYSSA JUNG

WHEN SEATTLE-BASED poet Heather McHugh, now 67, won a $500,000 "genius grant" from the MacArthur Foundation, a philanthropy dedicated to supporting creativity, she didn't buy a Maserati or fly to Paris. Instead, she put the money in the bank and continued teaching college courses and writing poetry. "I was just stunned," says Heather.

It wasn't until about two years later, in 2011, that she finally figured out what to do with it.

That year, Heather's godson and his wife welcomed their first child, a beautiful baby girl who was born severely disabled; doctors didn't think she'd ever be able to walk, talk, or feed herself. "I saw how people's lives can change overnight. I started thinking about all the people on this earth who are in the same situation," says Heather.

She discovered there are millions of caregivers in the United States taking care of the chronically ill or disabled 24/7. "It's a heartbreaking contract of love, and who but a poet would be lit up by that notion?" she says. So in 2012, Heather formed ➳

PHOTOGRAPH BY JOHN KEATLEY

A "concierge," Heather often attends Caregifted vacations to ensure her guests don't have a care in the world.

Caregifted, a nonprofit that offers a seven-day all-expenses-paid vacation to Vancouver Island, in British Columbia, to people who have been caregivers for at least ten years. "It's hard physical, psychological, and emotional work. It's clear they deserve and need a respite," she says.

Tricia Elsner from Federal Way, Washington, was one of the first caregivers to go on vacation, in 2013. Heather found Tricia through the Seattle Children's Hospital Autism Center. The now 51-year-old single mother of 19-year-old triplet boys, two of whom have severe autism, had her hands full. Ian would throw tantrums almost daily; he screamed and jumped up and down so hard that it shook the house and knocked nails off the gutters. Every time this happened, it set off Conner, who would lash out at Ian; when anyone tried to stop him, he would bang his head on the floor or try to hurt someone else. "It was not a fun life. I felt overwhelmed," says Tricia, who has never been able to work full-time.

When Tricia got a phone call saying Caregifted wanted to send her to Eastport, Maine (caregivers used to be given the option of four locations), she "couldn't believe" someone would pay for her to go on a vacation; disbelief gave way to concern about leaving Ian and Conner. Caregifted doesn't pay for care for the disabled during the vacation, so Tricia arranged that on her own. But after two days away from her troubles back home, the worry was gone. "Since the boys were diagnosed at three years old, I've felt like there's this big rock wedged in my chest. After being in Maine by myself, with nobody to take care of or think about except myself, I realized that rock was gone," says Tricia.

Tricia went kayaking and exploring, but her favorite parts of the trip were indulging in the simple things.

"I got to eat hot food hot and cold food cold. I could go to bed when I wanted to and wake up whenever I chose to," says Tricia. "I felt free."

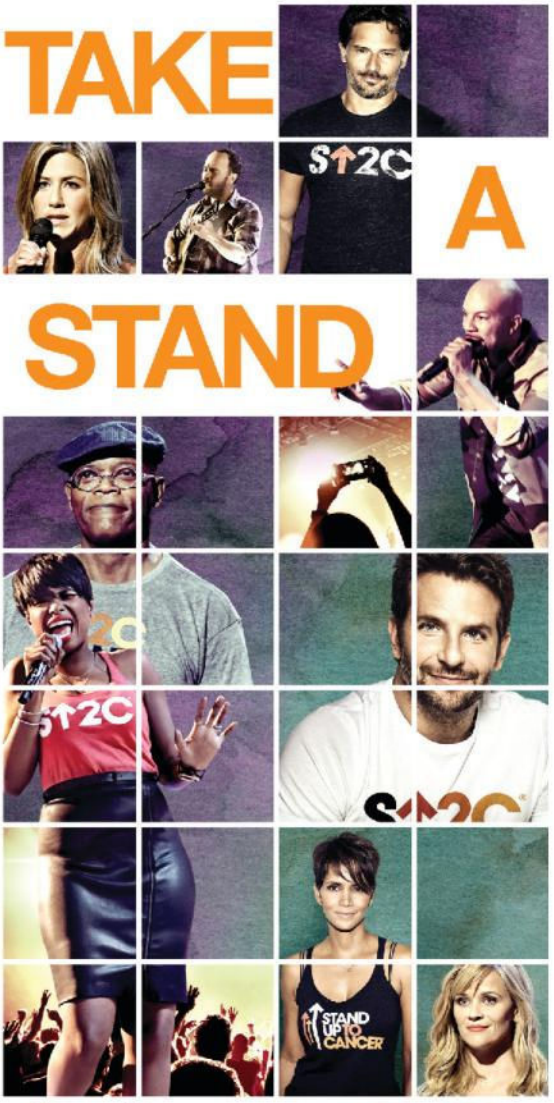
She was afraid the heaviness would return when the week was over, but to her surprise, it hasn't been back since.

Heather says Tricia's story resembles those of the other ten caregivers she helps every year. "They arrive at their hotel suite so crushed, and the transformation is amazing. They reflect and relax. They tell me it feels magically like another world and gives them a chance to see their lives from another perspective," she adds. "Everybody needs restorative time. For some, it's life-extending."

Tricia and the other guests aren't the only ones to benefit from Caregifted; Heather has too.

"I thought I was the queen of love, being a poet," Heather says. "But I didn't know a thing about love until I met these people." R

TAKE A STAND



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For Those in Crisis, A Friend to Text

BY DAVID BORNSTEIN
FROM THE *NEW YORK TIMES*

THE TEXT MESSAGE answered by Aaron Amrich was sent by a 19-year-old woman who wrote that she was feeling hopeless and beginning to give up on life. Aaron, a veteran who served in Afghanistan and Iraq, has himself suffered from post-traumatic stress disorder and depression. He understood the feeling.

For the past year, Aaron has been volunteering with the Crisis Text Line (CTL), a free, confidential 24-hour service that people in need of a lifeline can access via the number 741741. The line currently has 1,500 volunteer Crisis Counselors across the country and has exchanged more than 19 million texts—50,000 messages a day.

As he had been instructed, Aaron "listened" openly and nonjudgmentally to the young woman. He didn't offer advice; he didn't try to help her solve her problems. Mostly, his messages mirrored back what he'd heard from her, occasionally emphasizing a strength that he'd noticed—like the fact that she'd taken this step to help herself even in the midst of her depression.

"A lot of people have an overwhelming loneliness," he says. "Sometimes it takes a stranger to say, 'Hey, you've been through hell, but you've been helping yourself. If you can do that, you can do more.' Many people reply, 'I've never thought about it that way.'"

The CTL is the brainchild of Nancy Lublin.

The goal of a crisis line, explains Nancy Lublin, who runs the CTL, is narrow. It's not therapy; it's meant to bring people from "a moment of hot to a moment of cool," so counselors can suggest ways the texter can move to a place of increased safety.

Researchers are excited about the text line. "Teens have been reluctant to use crisis services," observes Anthony Pisani, a suicide-prevention researcher. "The CTL offers a layer of protection from the shame of expressing your vulnerabilities."

As for the woman with whom Aaron was communicating, the opportunity to share her feelings with an empathetic person appeared to help. "She said she couldn't remember the last time anyone had told her they believed in her," Aaron recalls. She ended the conversation the way people often do, by texting, "Thanks for listening." R

TOM SCHIRMACHER

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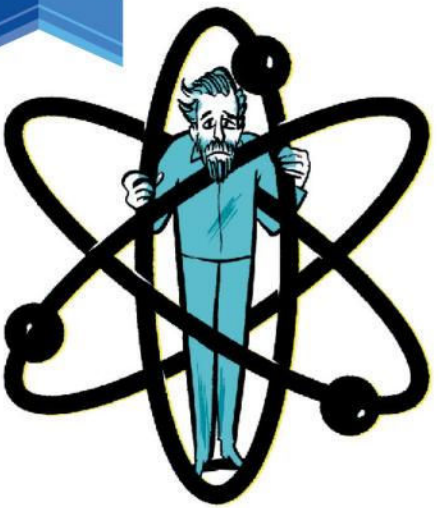

BY RICK ROSNER

RICK ROSNER *has the second-highest IQ in the world (192), according to the World Genius Directory.*

HISTORY REMEMBERS moments of genius. Isaac Newton saw an apple fall to the ground and formulated his theory of gravity. Archimedes was taking a bath when he had his eureka moment: Water displacement can measure the purity of gold. Who knew? But in contrast, over the past 10,000 years, humans have experienced about 100 quadrillion run-of-the-mill, nothing-much-happened moments, which is a lousy ratio of genius to not-genius moments. The fact is, the world is set up for non-Einsteins, not geniuses. The words *tortured, evil,* and *eccentric* are more frequently associated with genius than *bubbly* or *well-adjusted*.

My mom was aware of this. She freaked out when I taught myself to read at age three. But while I crushed IQ tests, I was a playground loner and target of projectiles. A moment of genius at age six: "Here comes a rock, thrown by a bully on the other side of the chain-link fence. The fence is divided into two-inch squares, and the rock is one and a half ➳

ILLUSTRATION BY NISHANT CHOKSI

inches in diameter. The odds that the rock won't be deflected by the fence are negligible (25 percent squared, or one in 16), so I don't have to duck." Then the rock passed clean through the fence and clonked me on the head.

Having the world's second-highest IQ, I can tell you genius has its drawbacks. My less bright friends put it like this: "There's the right way, and there's the Rosner way." The Rosner way includes trying to get a girl to make out with me at a junior high basement party by pitifully asking, "How do you kiss—suction or pressure?" Instead of a kiss, for the rest of the year, I got "Suction or pressure?" yelled at me by kids I didn't even know.

> ***Instead of a kiss, I got "Suction or pressure?" yelled at me by kids in my junior high I didn't know.***

As with many brainiacs, my people skills needed work. I addressed this problem after college by becoming a nightclub doorman. At the doors, I caught thousands of underage people using fake IDs. The challenge of detecting liars within ten seconds of meeting them fascinated me. High-IQ people can easily become gripped by obsessions. I became obsessed with IDs, spending ten years developing a statistical algorithm to help me spot fake or borrowed IDs with 99 percent accuracy. But after a decade of research, I was still getting paid $8 an hour, the same as all the other bouncers who didn't have statistical algorithms.

When I was writing for the quiz show *Weakest Link,* we had a quota of 24 questions a day. This didn't seem like enough for someone with my big brain, so I set my own quota of 60 to 100 questions a day. I didn't know that my bosses were evaluating writers based on how many of our questions were rejected. Writing three times as many questions as everyone else, I made the top of that rejection list and was fired.

For more than a year, I trained to get on *Jeopardy!,* studying hundreds of books and spending dozens of hours clicking a handheld counter to make my thumb faster on the buzzer. After five auditions, I got on the show ... and lost (by chickening out on a Daily Double and then surrendering the lead by failing to identify the flag of Saudi Arabia). I also lost my extra pair of pants, which were mistakenly taken by another contestant.

I studied for almost as long to get on *Who Wants to Be a Millionaire.* For my $16,000 question, Regis Philbin asked me, "What capital city is located at the highest altitude above sea level?" I answered, "Kathmandu." *Millionaire* claimed

PREVIOUS PAGE: ILLUSTRATION BY JOE MCKENDRY (ROSNER)

the correct answer was Quito. However, the world's highest national capital is generally considered to be La Paz, Bolivia, which wasn't included among the possible answers. I sued the show, backing up my claim that the question was flawed with thousands of hours of research, comparing my question with more than 100,000 other *Millionaire* questions. I eventually learned that judges don't have much patience for quiz show lawsuits. I lost in court, appealed the judgment, and lost again. The legal proceedings cost me tens of thousands of dollars, making me the biggest loser in the history of *Millionaire*.

Not everything has backfired because of my genius. I've had a 25-year career as a TV comedy writer. When pumping out thousands of jokes, it helps to be obsessive and have a skewed point of view. I have a lovely wife and daughter who rein in my most unreasonable schemes. Having earned 12 years of college credits in less than a year and graduating with five majors, I'm always able to help with homework. I've even used my research ability to concoct a mixture of 20 medicines and supplements that helped our dog survive for 117.5 dog years.

In 20 years, my mental power will be commonplace. Thanks to our increasingly brilliant devices, we'll all be potential geniuses with access to all the information and wisdom in the world. And just like me, you'll use your vast computational resources to do mostly dumb stuff.

See you at the 2036 Four-Dimensional Candy Crush Championship, everybody! R

* * *

COMEDIANS-IN-CHIEF

My esteem in this country has gone up substantially. It is very nice now that when people wave at me, they use all their fingers.

JIMMY CARTER

Mothers all want their sons to grow up to be president, but they don't want them to become politicians in the process.

JOHN F. KENNEDY

No matter how much cats fight,
there always seem to be plenty of kittens.

ABRAHAM LINCOLN (attributed)

APADANA IELTS Umbrella

FINISH THIS SENTENCE

The time I felt

It dawned on me that no matter how much you know, there's **always more to learn.**

ALLIE POSTOWSKIVICH

Boise, ID

I did the *New York Times* crossword puzzle **in ink.**

ROGER ILLIES

Ellendale, ND

I walked away even though I knew it would hurt.

TRICIA TEOFISTO AVENIDO

Van Nuys, CA

I'd read almost **every book** in our library's kids' section and knew it was time to cross over to the adult section.

DENISE GEMME LOUDEN

Rancho Cucamonga, CA

I approached my 50th wedding anniversary and knew for sure that I had **chosen the right life partner.**

PHILLIP E. PAKER

smartest was when ...

I took my mom out of the nursing home and brought her home with me.
It was humbling.
YVONNE LIS

I learned that I can't change anyone
but myself.
HEATHER DALTON

I realized that I am not that smart at all ...
just blessed.
MARCIA K. SKINNER

Burton, MI

Ledyard, CT

Merrick, NY

Fleetwood, PA

Indianapolis, IN

Pineville, KY

I knew the word for
"hiccup" in French,
and my French teacher didn't. It's *hoquet*.
JOYCE NEVELIK FLIEGEL

My grown children came to me
for advice.
SHELIA MIRACLE

Go to facebook.com/readersdigest for the chance to finish the next sentence.

MAP BY 5W INFOGRAPHICS

When I was young, my father was ashamed of his humble factory job. Years later, when I visited his workplace, I discovered pride.

A Different Kind of Genius

BY CONNIE SCHULTZ FROM *PARADE*

CONNIE SCHULTZ ***is a Pulitzer Prize–winning columnist who lives in Cleveland, Ohio.***

MY FATHER NEVER WANTED his children to know what he did for a living.

Dad worked in maintenance for the Cleveland Electric Illuminating Company, in Plant C. Perched on the shore of Lake Erie, it sucked him in at sunrise and spat him out at dusk. Sometimes my mother would take my siblings and me to the public beach in our hometown of Ashtabula, Ohio. She'd gather us round and point to the smokestacks farther down the shoreline, coughing clouds into the sky.

"Wave to Daddy!" she'd yell.

Four little hands would shoot into the air.

I never knew what Dad did at the plant, but I saw the toll that 34 years of hard physical labor took on him. He had surgery on his shoulder, his hand, his spine. At 48, he had his first heart attack and bypass. He retired in 1993, right after his last kid graduated from college. But the damage was done. A few years later, another surgeon shoved stents into his arteries. The next heart attack killed him. He was 69.

I saw my dad at the plant only once, when I took dinner to him on an overtime shift. He always showered at work after his shift, so I was used to razor pleats in his pants and

ILLUSTRATION BY JOE MCKENDRY

the smell of Brylcreem and Old Spice when he walked through the door. That night, outside the plant, I stared at my father, covered in sweat and coal ash, and for the first time had to consider why he was so often angry for no apparent reason.

The plant closed in 2001. Recently, the local port authority has begun to renovate it for a green energy project. I knew my father had never wanted me to see it. I also knew he would have understood why I had to.

A former supervisor, Toby Workman, walked me through its musty mazes. He talked; I took notes. At every station, he described the job—and the danger. It was like listening to a foreign language: skip cars, pulverizers, fly ash, coal crackers.

"We were working with a continuous controlled explosive: pulverized

PHOTOGRAPH BY ALI BLUMENTHAL

coal," he said. "We're the men the public doesn't see. We're in the hole in the dark, and most people don't know we exist."

Soon Toby started responding before I could ask: "Yes," he said, handing me a 12-pound wrench, "your dad used this ... Yes, he came to this window to check out tools ... Yes, your dad stood right here and sweated until his clothes dripped."

Most of Plant C was windowless; some of it was below sea level. I walked past countless Danger signs, touched rusty bolts larger than my hands, and winced as Toby described times when the thermometer inside could hit 140 degrees. I imagined my father working day after day, year after year, in a place that looked worse than any prison I've visited.

"I had no idea," I said over and over.

Toby put his hand on my shoulder. "Look," he said, "you need to understand something. Your dad was a maintenance mechanic. He knew every square nook of this plant. If it was broke, he fixed it."

I looked at the ground, blinked hard.

"He had to be very smart," Toby said in a softer voice. "He worked the most dangerous jobs. A lot of guys didn't last doing what he did."

> ***I imagined my father working day after day, year after year, in a place worse than any prison.***

A few days later, my daughter graduated from college. I gave her the hard hat Toby had handed to me as I'd left and this note: "Whenever you feel a little shaky, afraid of the next step, put this on, look in the mirror, and remember your roots."

My daughter is the grandchild of a maintenance mechanic. If she remembers that, she can do anything. R

* * *

THE WORLD'S DEADLIEST SONG

In 2004, the Royal Automobile Club Foundation for Motoring deemed Richard Wagner's "Ride of the Valkyries" the most dangerous music to listen to while driving. It's not so much the distraction but the frenzied tempo that challenges drivers' normal sense of speed—and causes them to gun it.

Source: *Nautilus*

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Should e-cigarettes be subject to the same no-smoking laws as cigarettes?

The Case of The E-Cig Rebel

BY VICKI GLEMBOCKI

ON JUNE 8, 2015, Shawn Randall Thomas was standing on a subway platform at the Flatbush Avenue and Fulton Street station in Brooklyn. While waiting for his train to arrive in a nonsmoking area, he was vaping—smoking an electronic cigarette, or e-cigarette, which neither burns nor contains tobacco. (Many e-cigarettes contain nicotine, however.) Thomas was approached by a plainclothes officer from the New York City Police Department, who displayed a gold police shield hanging from his neck and said to Thomas, "Police. Are you smoking? Let me see your ID, please."

Thomas, then 49, said, "I'm not giving you any ID." A second officer, also in plainclothes, joined them, and the confrontation quickly escalated. The officers repeatedly requested ID from Thomas, and he refused, cursing and demanding that the first officer produce his ID.

Although the plainclothes officer gave Thomas his name—Sergeant Eill—Thomas was not assuaged and continued to demand to see that officer's official ID.

Finally, Thomas was cuffed and arrested by the officers. He was arraigned the following day on a complaint filed by the Kings County district attorney charging him with violating smoking restrictions ➳

ILLUSTRATION BY NOMA BAR

under the New York State Public Health Law, obstructing governmental administration, and two counts of disorderly conduct.

Thomas represented himself, and on October 30, he filed a motion to dismiss, claiming that the facts presented by the DA as evidence did not reasonably prove that he had committed the offenses with which he had been charged.

Was Thomas wrongfully arrested by the NYPD when he was vaping in a nonsmoking area on a subway platform? You be the judge.

THE VERDICT

In December 2013, New York City amended its Smoke-Free Air Act to encompass e-cigarettes, making it illegal to use them "in public places and places of employment." However, in Thomas's arrest, the police cited him under state law, which does not include e-cigarettes in its smoking ban; it defines smoking as "the burning of a lighted cigar, cigarette, pipe or any other matter or substance which contains tobacco."

As a result, on February 5, 2016, Judge Laura R. Johnson granted Thomas's motion to dismiss on the charge of violating state smoking restrictions, as well as the charge of disorderly conduct for violating the New York City Transit Authority's rules that prohibit smoking in a subway station. She then explained that Thomas did not obstruct justice, because "ignoring a police officer's request for identification is not a crime." In addition, his use of obscene language with the officers did not constitute disorderly conduct, since "it is not illegal to yell or curse at a police officer."

In the absence of federal laws banning vaping, 507 municipalities in America have enacted their own rules, which may conflict with state law, as in this case. Currently, nine states prohibit vaping everywhere smoking is banned, with some citing the facts that the liquids vaporized by the devices are not regulated by the Food and Drug Administration and that their long-term health consequences are unknown. One in ten Americans has reported using e-cigarettes at least once, and vaping among teenagers jumped from 1.5 percent in 2011 to 16 percent in 2015, prompting the FDA to step in. In May, the FDA expanded its federal regulation of tobacco products to include e-cigarettes, banning sales to people under 18 and requiring adults to show ID to purchase them. R

Agree? Disagree? Sound off at rd.com/judge.

Points to Ponder

Breaking rules isn't interesting. It's making up new ones that keeps things exciting.

CHRISTOPHER NOLAN,
director of the Dark Knight trilogy and Interstellar

WHAT IS IT LIKE to be a baby? It's like being in love, in Paris, for the first time, after you've had three double espressos.

ALISON GOPNIK, PHD,
professor of psychology and cognitive-development researcher

ONE OF THE MOST valuable things one of my art teachers said to me was "Don't get upset by criticism. Value the fact that at least someone noticed what you did."

CHRIS WARE,
comic book artist and cartoonist

THERE ARE three things we cry for in life: things that are lost, things that are found, and things that are magnificent.

DOUGLAS COUPLAND,
author, artist, and designer

LIFE IS NOTHING if you're not obsessed.

JOHN WATERS,
director and writer

AS AN ARTIST, I'd choose the thing that's beautiful more than the one that's true.

LAURIE ANDERSON,
composer, singer, and performance artist

Source: *100 Global Minds: The Most Daring Cross-Disciplinary Thinkers in the World*

SOURCE PHOTO: VCG/GETTY IMAGES

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Best Friends

A Girl, Her Stepdad, and A Purple Bandanna

"**HEY, I HAVE** a Prince story," said Krystal, the woman sitting next to me at a dinner party. And as she began, I kept hearing Prince in my head, singing about this thing called life.

Krystal was ten when her parents divorced. By the time she was 12, her mother had remarried. At 14, Krystal found herself living in Cloverport, Kentucky. "It had fewer than a hundred people, one schoolhouse, and two traffic lights. My mom ran the diner, and in the summer, I picked peppers in the fields to earn extra money."

Danny, her new stepdad, drove a truck. When he was home, he tried hard to be friends. Teenage Krystal was ice. "The divorce was really hard on me. I was such a brat."

Whether he was shoving his stepdad on-screen or singing about a mother who's never satisfied, Prince got what it's like to live with adults who don't get you. For Krystal and me, *Purple Rain* was the movie and the soundtrack of our adolescence. "Dearly beloved," Prince sang, "we are gathered here today to get through this thing called life."

In the summer of '84, Danny had pulled into a Texas rest stop around midnight when he saw a purple tour bus. He'd heard of this Prince and knew Krystal and her friends liked his album. He knocked on the bus door. Prince himself stepped down the stairs and leaned out. "My stepdaughter likes your music. Can I ask you for your autograph?"

With no paper on hand, Prince reached for the purple bandanna on his head and signed it.

Danny jogged over to the pay phone and called Krystal's mom. "Krystal likes Prince, right?"

"Of course, Danny. She'll love it."

Mom hung up the phone and told Krystal. Then Krystal? Krystal told all 13 people in her freshman class.

A purple bandanna signed by Prince. The magnitude of this treasure

LIZ VACCARIELLO *is the editor-at-large of* **Reader's Digest.** *She believes stories are everywhere—you just have to listen. To share yours with her, e-mail liz@rd.com.*

ILLUSTRATION BY JOE MCKENDRY

Liz's purple screen saver got Krystal talking.

was not lost on me even 30 years later. Oh, Krystal, I thought, please tell me you still have that bandanna. That you keep it in a box of treasures, like I keep the ashtray I saw Michael Stanley use once at a Dairy Queen.

By the time Danny pulled up to the house a few days later, the entire population of Cloverport knew about the purple bandanna that was making its way to Krystal.

But no one, not Krystal, her mom, nor anyone else in Cloverport, knew then what had happened after Danny hung up the phone. Eventually, the years passed, Danny and Krystal's mom split up, and Krystal settled in New York, where today she works in the beauty and fitness industries. "Once I stopped being so mean and rotten, I grew to love him not only as a father but as a friend. All he ever wanted was to make me happy."

Arriving home in Cloverport that summer day, his hands behind his back, Danny hopped out of his truck. After meeting Prince, he'd been walking back to his rig when another trucker intercepted him. "Hey, man, my son is a huge fan. Are you willing to make a trade?"

"I hope I made the right decision," her stepdad began. "I know you like Prince, but ..."

With that, Krystal covered her face and fell to her knees, and oh, how she cried and screamed and wailed.

I put my own head in my own hands as I imagined the moment her stepdad presented his offer of love.

"... I thought you'd like a Walkman more." R

PHOTOGRAPH BY ALI BLUMENTHAL

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Your True Stories

IN 100 WORDS

ON THE WING

My husband had passed tragically and unexpectedly the night before. I returned home the next morning with my sister-in-law, my emotional support. We sat in the upstairs loft, sharing stories about a man who'd left us too young. I glanced out the window and noticed a woodpecker on the roof. It appeared to be watching us. A member of a species rarely seen here, the bird sat for almost 20 minutes as we reminisced. I affectionately named it after my late husband. It has been five years since he passed, and a woodpecker continues to appear at my weakest moments.

SHANNON NEUHAUS ROZEWICZ, *Sussex, Wisconsin*

LIKE SON, LIKE FATHER

Caught in a sudden downpour on the last day of a bike-packing trip, I ducked into the lobby of a nearby supermarket for cover. As I waited out the storm with my bicycle and gear, a teenage boy invited me to spend the night with his family. I gladly accepted, and he went to find his parents. While I waited, an older man made me the same offer. I thanked him and said I already had a place to stay. Shortly after, the boy returned with his parents. The man who had approached me was his father.

PHILIP WOOD, *Orlando, Florida*

COLOR ME PROUD

When my granddaughter Bethany was four years old, she visited my home for a few days. I gave her some crayons and pictures for coloring. When I looked down, I saw she had used a crayon to draw purple marks all over her legs. "Bethany, what are you doing?" I asked. "Why, Grandma," she said, "you have such pretty purple lines up and down your legs, and I wanted mine to look just like yours." Since then, I've worn my varicose veins with pride, and they get prettier each year.

MARGIE ANDERSON, *Abilene, Texas*

To read more 100-word stories and to submit your own, go to rd.com/stories. If your story is selected for publication in the magazine, we'll pay you $100.

ILLUSTRATION BY KAGAN MCLEOD

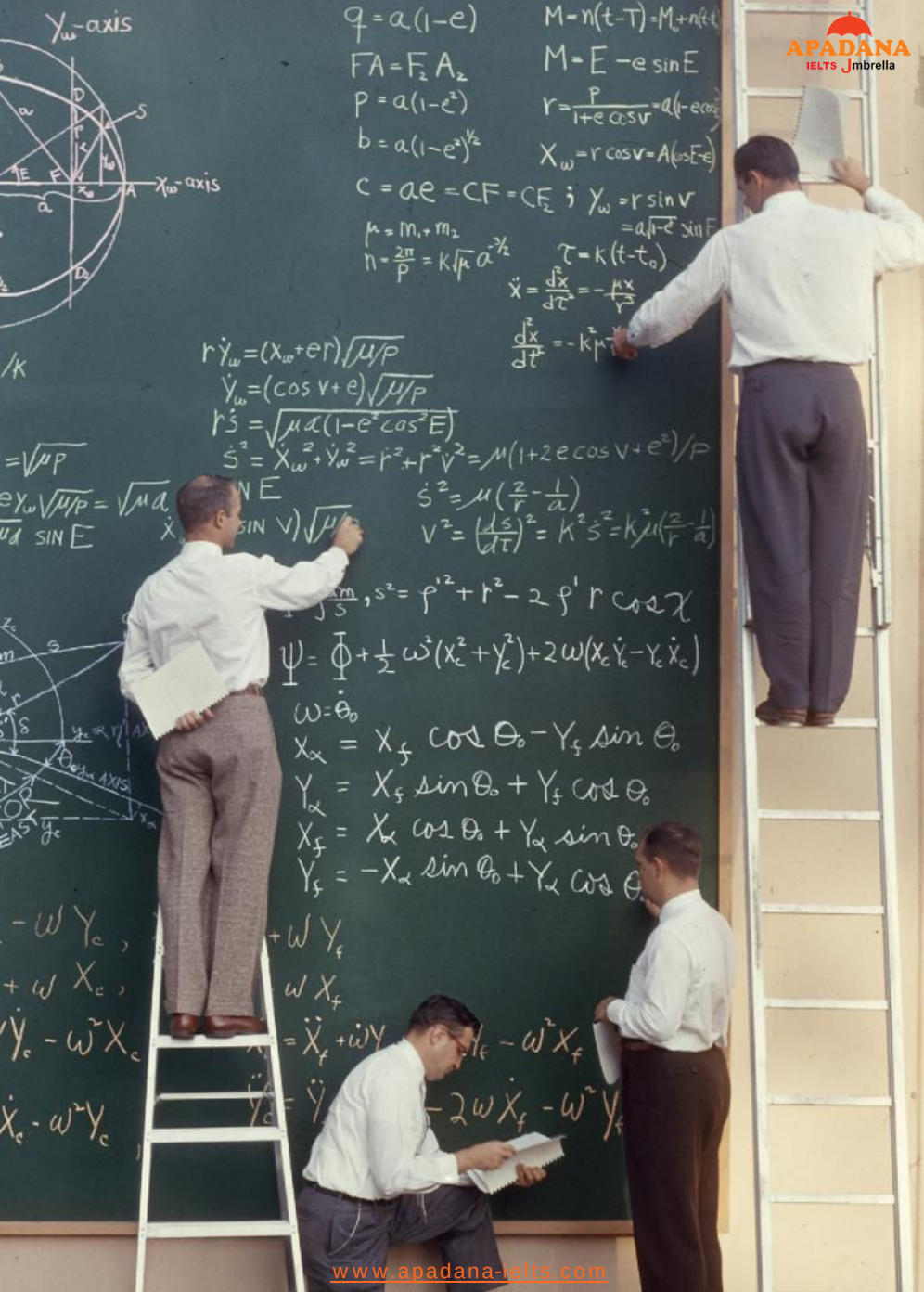
PHOTO
OF LASTING INTEREST

THE *LIFE* PICTURE COLLECTION/GETTY IMAGES

The Space Equation

American scientists pose for *Life* magazine on October 10, 1957, alongside satellite orbit equations drawn up by astronomer Samuel Herrick. The photo was taken just six days after the Soviet Union had launched *Sputnik 1*—the world's first human-made satellite and a win in the earliest round of the space race. NASA was created the following October, and within months, the United States was also in orbit: On January 31, 1958, NASA launched the *Explorer 1* satellite from Cape Canaveral, Florida.

PHOTOGRAPH BY J. R. EYERMAN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X_ω-axis
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$FA = F_2 A_2$
$p = a(1-e^2)$
$b = a(1-e^2)^{1/2}$
$c = ae = CF = CF_2$
$\mu = m_1 + m_2$
$n = \frac{2\pi}{P} = K\sqrt{\mu}\, a^{-3/2}$
$M = n(t-T) = M_0 + n(t-t_0)$
$M = E - e\sin E$
$r = \frac{p}{1+e\cos v} = a(1-e\cos E)$
$X_\omega = r\cos v = A(\cos E - e)$
$Y_\omega = r\sin v = a\sqrt{1-e^2}\sin E$
$\tau = k(t-t_0)$
$\ddot{x} = \frac{d^2x}{d\tau^2} = -\frac{\mu x}{r^3}$
$\frac{d^2x}{dt^2} = -k^2\mu\frac{x}{r^3}$
$r\dot{Y}_\omega = (X_\omega + er)\sqrt{\mu/p}$
$\dot{Y}_\omega = (\cos v + e)\sqrt{\mu/p}$
$r\dot{s} = \sqrt{\mu a(1-e^2\cos^2 E)}$
$\dot{s}^2 = \dot{X}_\omega^2 + \dot{Y}_\omega^2 = \dot{r}^2 + r^2\dot{v}^2 = \mu(1+2e\cos v + e^2)/p$
$\dot{s}^2 = \mu\left(\frac{2}{r} - \frac{1}{a}\right)$
$v^2 = \left(\frac{ds}{dt}\right)^2 = k^2\dot{s}^2 = k^2\mu\left(\frac{2}{r} - \frac{1}{a}\right)$
$s^2 = \rho'^2 + r^2 - 2\rho' r\cos\chi$
$\Psi = \Phi + \frac{1}{2}\omega^2(x_c^2 + y_c^2) + 2\omega(x_c\dot{y}_c - y_c\dot{x}_c)$
$\omega = \dot{\theta}_0$
$X_\alpha = X_f\cos\theta_0 - Y_f\sin\theta_0$
$Y_\alpha = X_f\sin\theta_0 + Y_f\cos\theta_0$
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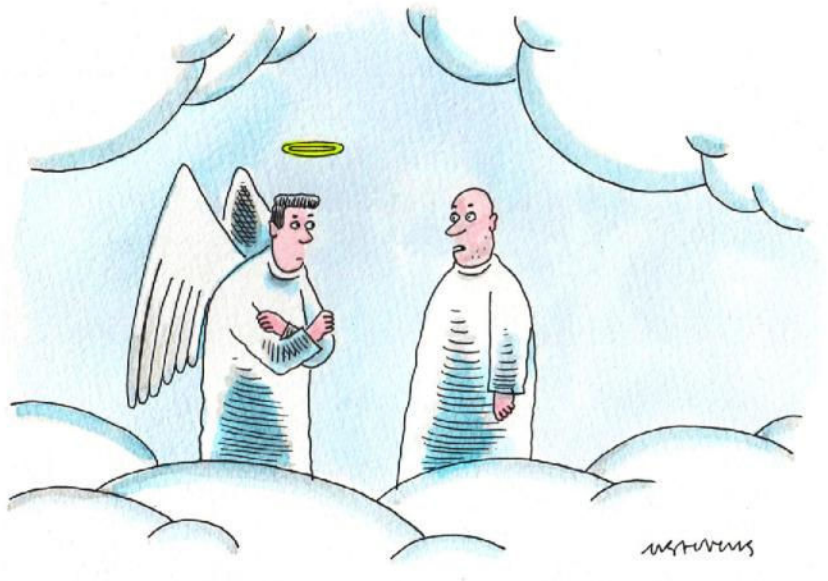


"I was good, but not 'halo and wings' good."

WHILE TEXTING with my brother about our family vacation plans, I expressed concern regarding my asthma and the fact that he lives at such a high elevation. But autocorrect sent this: "We have talked about coming to visit you, but between my asthma and your attitude, I'm not sure if that will be possible."

SUSAN FINNEGAN, *Louisville, Kentucky*

IT WAS THE FIRST TIME my four-year-old granddaughter had ever been to church. The celebrant came out, flanked by the lector and the deacon. My granddaughter leaned over to her dad and whispered, "Which one is God?"

WILLARD JANSSEN, *De Pere, Wisconsin*

ON TWITTER, people sometimes say, "Why don't you keep your opinions

ILLUSTRATION BY MICK STEVENS

to yourself?" I go, "You're following me. I didn't tweet at you." That's like going to a notice board in the middle of town, seeing a sign for guitar lessons, and yelling, "I *don't want* guitar lessons!"

RICKY GERVAIS, in *GQ*

IT'S SOMETIMES DIFFICULT to distinguish sounds. Case in point: The other day, I blew my nose. From another room, my wife yelled out, "What?!" **PAUL SWETS,** *Holland, Michigan*

WHEN MY SON was visiting, I complained that my TV wasn't as bright and as sharp as usual. He worked on it during the afternoon, and that night, we turned the set on. "What did you do?" I said happily. "Everything looks great."

He replied, "I wiped the screen."

BETTY BISHOP, *Hampton, Florida*

Got a funny story about friends or family? It could be worth $100. For details, see page 7 or go to rd.com/submit.

WHAT WERE WE TRYING TO MAKE, AGAIN?

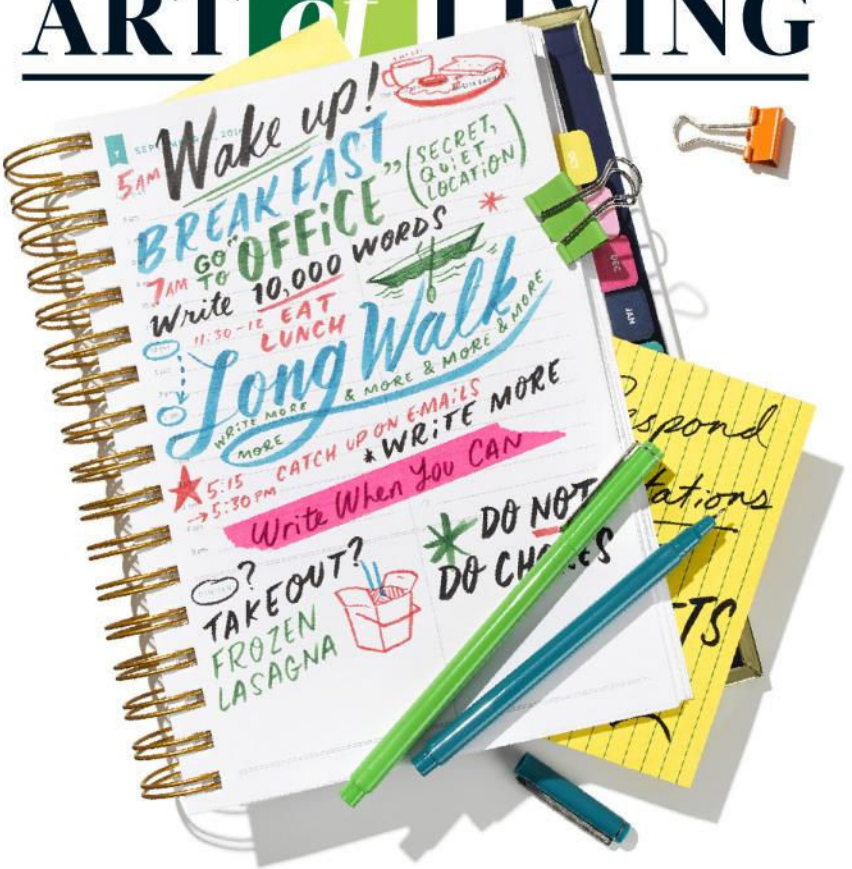
Craft sites make it look so simple, but we know differently, as these epic fails prove.

	Heart-shaped wreath	Melted-crayon canvas rainbow	Angry Bird pizza
When they did it			
When we did it	 We got all Joan Crawford on that craft's butt. No more burlap-covered wire hangers! Ever!	 Someone got too close with the heat source.	 Surprise! It's a sad, cross-eyed, beakless mess.

From *CraftFail* by Heather Mann (Workman Publishing)

COURTESY *CRAFTFAIL*/WORKMAN PUBLISHING

NOTE: Ads were removed from this edition. Please continue to page 40.



LETTERING BY JOEL HOLLAND

The Daily Routines Of Geniuses

Why scheduling a walk every day might not be a bad idea

BY SARAH GREEN CARMICHAEL FROM *HARVARD BUSINESS REVIEW*

PHOTOGRAPH BY CLAIRE BENOIST

JUAN PONCE DE LEÓN spent his life searching for the fountain of youth. I have spent mine searching for the ideal daily routine. But as years of color-coded paper calendars have given way to cloud-based scheduling apps, routine continues to elude me; each day is a new day, as unpredictable as a ride on a rodeo bull and over seemingly as quickly.

Naturally, I was fascinated by the recent book *Daily Rituals: How Artists Work*. Author Mason Currey examines the schedules of 161 painters, writers, and composers, as well as philosophers, scientists, and other exceptional thinkers.

As I read, I became convinced that for these geniuses, a routine was more than a luxury—it was essential to their work. I began to notice common elements in the lives of the healthier geniuses (the ones who relied more on discipline than on, say, booze and Benzedrine) that allowed them to produce the works for which they are still famous.

■ **A PRIVATE WORKSPACE** Jane Austen asked that a certain squeaky hinge never be oiled so that she always had a warning whenever someone was approaching the room where she wrote. William Faulkner, lacking a lock on his study door, detached the doorknob and brought it into the room with him. Mark Twain's family knew better than to breach his study door—they'd blow a horn to draw him out. Graham Greene went even further, renting a secret office; only his wife knew the address and telephone number.

■ **A DAILY WALK** For many artists, a regular stroll was essential creative inspiration. Charles Dickens famously took three-hour walks every afternoon, and what he observed on them fed directly into his writing. Pyotr Ilich Tchaikovsky made do with a two-hour jaunt but wouldn't return a moment early, convinced that doing so would make him ill. Ludwig van Beethoven took lengthy strolls after lunch, carrying a pencil and paper with him in case inspiration struck. Nineteenth-century composer Erik Satie did the same on his long hikes from Paris to the working-class suburb where he lived, stopping under street lamps to jot down notions that arose on his journey; it's rumored that when those lamps were turned off during the war years, his productivity declined too.

■ **ACCOUNTABILITY METRICS** Anthony Trollope wrote for only three hours a day, but he required of himself a rate of 250 words per 15 minutes. Ernest Hemingway

SARAH GREEN CARMICHAEL *is a senior editor at* **Harvard Business Review.** *Follow her on Twitter: @skgreen.*

ILLUSTRATION BY JOE MCKENDRY (GREEN CARMICHAEL)

tracked his daily word output on a chart "so as not to kid myself." American psychologist B. F. Skinner started and stopped his writing sessions by setting a timer, and he carefully plotted the number of hours he wrote and the words he produced on a graph.

■ **A CLEAR DIVIDE BETWEEN IMPORTANT WORK AND BUSYWORK** It amazed (and humbled) me to see the amount of time each genius allocated to answering letters. Many did their writing, composing, or painting in the morning and did the "busywork" of answering letters in the afternoon. Others would write letters when the real work wasn't going well. But these historical geniuses did have one advantage: The post would arrive at regular intervals, not constantly, as e-mail does.

> *"I believe in getting up from the typewriter, away from it, while I still have things to say."*

■ **A HABIT OF STOPPING WHEN THEY'RE ON A ROLL, NOT WHEN THEY'RE STUCK** Hemingway put it thus: "You write until you come to a place where you still have your juice and know what will happen next and you stop and try to live through until the next day when you hit it again." Arthur Miller said, "I don't believe in draining the reservoir, do you see? I believe in getting up from the typewriter, away from it, while I still have things to say." With the exception of Wolfgang Amadeus Mozart—who rose at 6 a.m., spent the day in a flurry of music lessons, concerts, and social engagements, and often didn't get to bed until 1 a.m.—many would write in the morning, stop for lunch and a stroll, spend an hour or two answering letters, and knock off work by 2 or 3 p.m. "I've realized that somebody who's tired and needs a rest, and goes on working all the same, is a fool," wrote Carl Jung. Or, well, a Mozart.

■ **A SUPREMELY SUPPORTIVE PARTNER** Martha Freud, wife of Sigmund, "laid out his clothes, chose his handkerchiefs, and even put toothpaste on his toothbrush," notes Currey. Gertrude Stein preferred to write outdoors, looking at rocks and cows—and so on trips to the French countryside, Alice B. Toklas would shoo a few cows into the writer's line of vision. Jane Austen's sister, Cassandra, took over most of the domestic duties so that Jane would have time to write: "Composition seems impossible to me with a head full of joints of mutton & doses of rhubarb," Jane once wrote. And Andy Warhol called friend and collaborator Pat Hackett

PROP STYLIST: MEGUMI EMOTO. PLANNER COURTESY EMILYLEY.COM

every morning, recounting the previous day's activities in detail. "Doing the diary," as they called it, could last two full hours—with Hackett dutifully jotting down notes and typing them up every weekday morning from 1976 until Warhol's death in 1987. (*The Andy Warhol Diaries,* edited by Hackett, was published in 1989.)

AN OFTEN LIMITED SOCIAL LIFE

One of Simone de Beauvoir's lovers put it this way: "There were no parties, no receptions ... It was an uncluttered kind of life, a simplicity deliberately constructed so that she could do her work." Pablo Picasso and his girlfriend Fernande Olivier borrowed the idea of Sunday as an "at-home day" from Stein and Toklas—so that they could "dispose of the obligations of friendship in a single afternoon."

THE ROUTINES of these thinkers are strangely compelling. Perhaps it is because they are so unattainable. The very idea that you can organize your time as you like is out of reach for most of us, so I'll close with a toast to all those who worked within constraints. Like Francine Prose, who began writing when the school bus picked up her children and stopped when it brought them back; or T. S. Eliot, who found it much easier to write once he had a day job in a bank than he had as a starving poet; and even F. Scott Fitzgerald, whose early writing was crammed in around his strict schedule as a young military officer. Those days were not as fabled as the gin-soaked nights in Paris that came later, but they were much more productive—and no doubt easier on his liver. Being forced to follow the ruts of someone else's routine may grate, but they do make it easier to stay on the path. Whether we break that trail ourselves or take the path of least resistance, perhaps what's most important is that we keep walking. R

* * *

WHAT DO THESE 50 WORDS HAVE IN COMMON?

A, am, and, anywhere, are, be, boat, box, car, could, dark, do, eat, eggs, fox, goat, good, green, ham, here, house, I, if, in, let, like, may, me, mouse, not, on, or, rain, Sam, say, see, so, thank, that, the, them, there, they, train, tree, try, will, with, would, you.

ANSWER: They are the only words used in Dr. Seuss's *Green Eggs and Ham.*

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Folding Like a Genius Will Change Your Life

BY MARIE KONDO FROM THE BOOK *SPARK JOY*

MARIE KONDO ***is a bestselling author and was named one of*** **Time** ***magazine's 100 Most Influential People of 2015.***

THE SECRET TO FOLDING CLOTHES is this: Never give up. Clothes are simply rectangular pieces of cloth sewn together, and regardless of how it looks, any garment can be folded into a rectangle—the ideal shape, even for your pants, underwear, and socks.

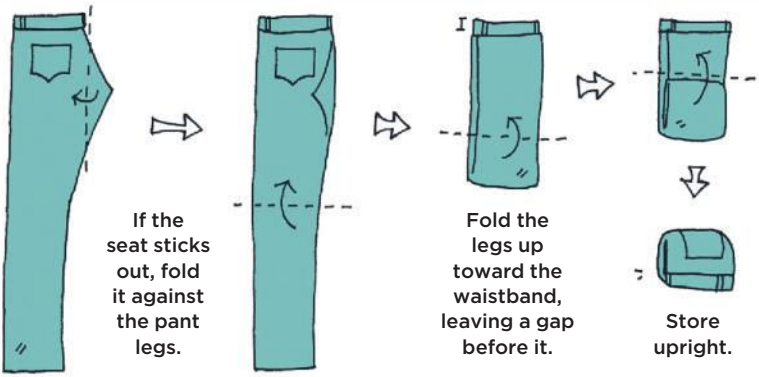
Does folding these items sound like too much work? Try it once. Folding properly deflates clothes and maximizes the amount you can store. Anything that can be stood on edge should be stored upright in a drawer. That way, you'll take full advantage of the height of your storage space and be able to tell at a glance what is stored where.

Having folded clothes properly once, you'll find the next time that much easier, as if the fabric remembers the shape.

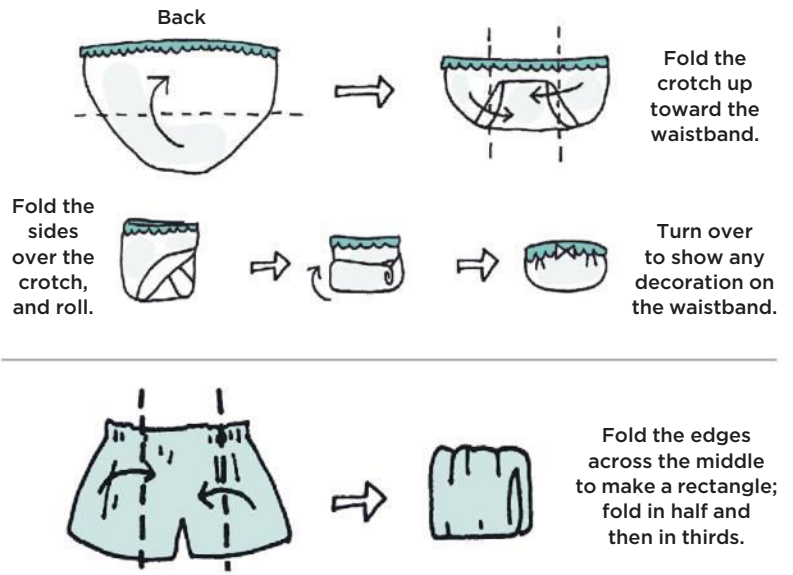
ILLUSTRATION BY JOE MCKENDRY (KONDO). PROP STYLIST: MEGUMI EMOTO

PHOTOGRAPH BY CLAIRE BENOIST

1. HOW TO FOLD PANTS



2. HOW TO FOLD PANTIES AND BOXERS

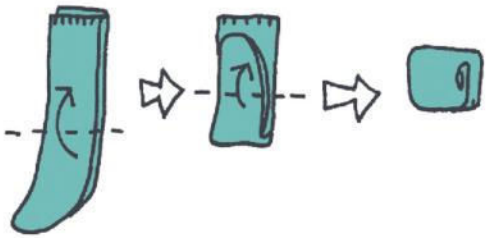


MASAKO INOUE/*SPARK JOY*

3. HOW TO FOLD SOCKS

Place short socks together, and fold in half.

Place regular socks together, and fold in thirds.



Place kneesocks together, fold in half, and fold in half again or in thirds, depending on the length.

* * *

HEALTHY CHOICES

Please stop arguing with me about my choice to be vegan. It takes a lot of energy, and I get winded easily.

@THEWOODENSLURPY (ALEXA)

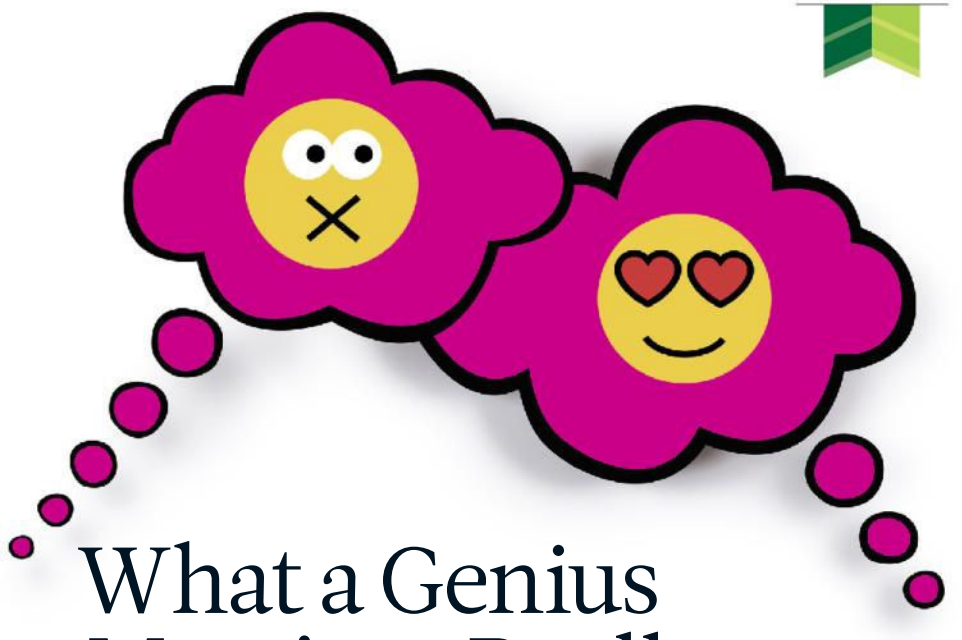
I've stopped going to the gym now that I've realized I can just watch CNN on mute at home.

@LIZHACKETT

Do people who run know that we're not food anymore?

@IAMENIDCOLESLAW (MARY CHARLENE)

NOTE: Ads were removed from this edition. Please continue to page 52.



What a Genius Marriage Really Looks Like

BY CHARLOTTE ANDERSEN

BUBBLES: EPOXYDUDE/GETTY IMAGES
EMOTICONS: ALEXDNDZ/GETTY IMAGES

ANALYTICS AND data don't sound like a formula for romance, but John Gottman, PhD, has devoted 40 years to figuring out the math that makes relationships work. In his "Love Lab" at the University of Washington, he has analyzed how couples communicate verbally and nonverbally and followed them for years to find out if the relationships survive. More than 200 published articles later, he claims to be able to predict the outcome of a relationship with up to 94 percent accuracy. Dubbed "the Einstein of Love" by *Psychology Today,* Gottman—along with his wife and research partner, Julie Gottman—now teaches other marriage therapists the most common misunderstandings about love based on observations from the Love Lab.

■ **MYTH: MARRIAGE SHOULD BE FAIR.** Couples who engage in quid pro quo thinking—if I scratch your back, you should scratch mine—are usually in serious trouble, John Gottman says: "We become emotional accountants only when there's something wrong with the relationship."

He cites a 1977 study by Bernard Murstein as the first to find that quid pro quo thinking was a characteristic of ailing relationships rather than happy ones. "We've found in our research that the best marriages are the ones in which you are really invested in your partner's interests, as opposed to your own," Julie Gottman says. The happiest couples have a high level of trust, which lets them give without expecting anything in return because they know their partner has their back.

■ **MYTH: YOUR PARTNER ISN'T A MIND READER, SO YOU SHOULD TELL HIM OR HER EXACTLY WHAT YOU WANT.** Make no mistake: Open communication is an essential tool for a happy relationship. But the Gottmans have found that successful couples also understand each other's feelings and needs without having to be told all the time. One of John Gottman's studies found a link between satisfied marriages and a husband's ability to interpret his wife's nonverbal cues.

■ **MYTH: COUPLES WHO HAVE SCREAMING FIGHTS ARE HEADED FOR DIVORCE.** "Volatiles" have been flagged by the Gottmans as one of three types of "happy-stable" relationships. (The other two, if you're curious, are "validaters" and "avoiders.")

In fact, the average happy volatile couple has at least a five-to-one positive-to-negative ratio during conflict—meaning they have five times more positive interactions than negative ones—which John Gottman has found to be the marker of a healthy relationship. In contrast, couples who end up headed for divorce have a ratio of 0.8 to one. The key is that even though happy volatile couples can have intense fights, they still balance arguments with kindness and attentiveness.

John Gottman notes that each style has its pros and cons. "Conflict avoiders have a very peaceful life, but on the other hand, they can wind up leading parallel lives in which they're very distant," he says. "The very passionate couples who argue a lot—they run the risk of devolving into constant bickering."

JOHN GOTTMAN *is co-founder of the Gottman Institute, which uses research to strengthen relationships and give real-world insight to mental health providers.*

ILLUSTRATION BY JOE MCKENDRY (GOTTMAN)

■ **MYTH: TALK THINGS OUT UNTIL YOU AGREE WITH EACH OTHER.** Sixty-nine percent of marriage problems are managed rather than solved, according to John Gottman's research. "The common lore is that conflict avoidance is a bad thing, but it really works for a lot of people to just 'agree to disagree,'" he says.

The key is to avoid a "gridlocked conflict," in which you can't make headway in a recurring fight. At the bottom of these issues, the Gottmans have found, are core-value differences that take couples by surprise. For instance, a fight about finances isn't just about the cash but about the meaning of money, power, freedom, and security. You might not be able to find the perfect compromise, but by creating an open dialogue, you can discuss the issue without hurting feelings.

■ **MYTH: GENDER DIFFERENCES ARE BEHIND YOUR MEGA FIGHTS.** Men aren't from Mars, and women aren't from Venus; we're all just from Earth. As it turns out, "men are just as in touch with their emotions as women," Julie Gottman says. "On the other hand, some women are very reluctant to express their negative emotions. So it balances out. There are more similarities than the culture generally believes."

A study in *Cognition and Emotion* found that when women ➳

thought long term about their lives, they reported themselves as more emotional than men. But when participants rated their emotions on a moment-to-moment basis, the gender differences disappeared. Your cultural upbringing and family environment have a much bigger influence on your willingness to express your emotions than your X or Y chromosome, the Gottmans say.

■ **MYTH: YOU REPEAT YOUR PARENTS' RELATIONSHIP PROBLEMS.** How you carry your childhood baggage is more important than the fact that you have any. "Nobody escapes childhood without some crazy buttons and triggers, but it doesn't mean you can't have a great relationship," John Gottman says.

Tom Bradbury, PhD, a psychologist at the University of California, Los Angeles, coined the phrase *enduring vulnerabilities* for these historical triggers. Certain words and actions might dig up old feelings and provoke a reaction. Make sure you and your partner understand what sets the other off, and avoid those weaknesses.

Circumstances from your past could also prompt what psychologists call projective identification—an example is taking something you resent from your childhood and applying it to your partner. If you had a distant, cold parent, for instance, you might assume your partner is being distant and cold too. Instead of blaming your partner's character, explain how the actions make you feel and what he or she can do to help you feel better.

> *"You can have a happy, stable relationship despite any emotional baggage."*

■ **MYTH: OPPOSITES ATTRACT.** The idea that one partner's strengths compensate for the other's weaknesses and vice versa sounds good at first, but the Gottmans say that their research provides no support for this. You can be opposites on some smaller subjects (you're on the sand reading a book; he's hitting the waves), but when it comes down to the core issues, it's best to be similar. "The major incompatibility that we've found that is really predictive of divorce is how people feel about expressing emotion," John Gottman says. For instance, if one person wants to talk about anger and sadness while the other thinks you should keep negative feelings to yourself, each partner will start to resent the other. R

Advertisement

Notice: Medical Alert

Dear Reader,

Medical related emergencies are on the rise. More seniors are seeking an independent lifestyle and better quality-of-life. **Over 1 in 3 people over the age of 64 will fall this year**. Nearly half will not be able to get up without support.

Medical expenses can escalate when a person is not given timely support. You can prevent a medical catastrophe with our 24 hour emergency response system. Our solution is highly recommended by doctors, healthcare professionals, and hospitals.

We are offering a **FREE Medical Alert System** to seniors or their loved ones who call now. For a limited time, there will be no set-up fees and the medical monitoring starts at less than a dollar a day. The system is Top-Ranked and easy-to-use. The pendant is 100% waterproof and it can travel with you. Our new system can detect falls automatically.

Call Toll-Free **1-800-360-0405** and gain peace of mind. There is no long term contract. Our medical alert professionals can walk you through everything over the phone.

The first 100 callers to order will receive:

- Free Medical Alert System ($300 Value)
- 24 Hours a Day/ 7 Days a Week LIVE Monitoring and Support
- Free Waterproof Necklace Pendant or Wristband
- No Long-Term Contract
- Free Shipping (Mention Reader's Digest)

Don't wait until after a fall to give us a call. Take advantage of this special offer now to protect yourself or a loved one.

Call Now Toll-Free 1-800-360-0405 and mention "Reader's Digest"

Sincerely,

Jim Nelson
President

Medical Guardian
Medical Alert Systems
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NEWS FROM THE

World of Medicine

BY SAMANTHA RIDEOUT

High-Fat Diet Hurts Sleep

Men with high-fat diets were more likely to suffer from daytime fatigue and poor nighttime slumber than men with low-fat diets, according to an Australian study. The scientists speculated that fat intake affects hormones, metabolism, and the central nervous system, all of which interact with the circadian clock that regulates shut-eye. In turn, the lead author noted, sleeping poorly makes people crave rich, fatty foods, thus creating a vicious cycle. *The Dietary Guidelines for Americans* recommends that adults get no more than 20 to 35 percent of their total calories from fat.

Medical Errors a Leading Cause of Death

Medical mistakes are the third-most-common cause of death in the United States, after heart disease and cancer, according to an estimate from Johns Hopkins Medicine researchers. These mistakes can include incorrect diagnoses, preventable complications, and medication mix-ups (including poisonous overdoses). The lesson isn't to avoid health care but rather to encourage hospitals and public health authorities to make patient safety a bigger priority. For information on how to protect yourself, check out nonprofits such as the National Patient Safety Foundation (npsf.org).

New Side Effects of Proton Pump Inhibitors

Used to treat acid reflux and indigestion, proton pump inhibitors (PPIs) are among the most prescribed drugs in the United States. However, they carry risks: Chronic kidney disease was recently added to the list of possible harms from long-term use. (Other suspected effects include bone fractures and mineral deficiencies.) Take a break once in a while from PPI use, advised an editorial in *JAMA Internal Medicine*; Americans take PPIs for longer than needed, the authors said. Talk to your doctor first to determine whether the drug is still useful. R

PHOTOGRAPH BY THE VOORHES

“what did i want?”

Audrey’s memory is letting her down. Even her lists are not helping her these days.

Audrey wants an answer.

If you find that forgetfulness is becoming a problem for you, people comment on your memory loss, or you have difficulty solving problems and planning, these could be early signs of Alzheimer’s disease.

The AMARANTH clinical research study is testing an investigational medication to see if it is safe and effective in slowing the decline in memory and mental functioning caused by Alzheimer’s disease. You may be eligible to join.

To find out more call 855-930-7546,
or, visit **www.theamaranthstudy.com**

the AMARANTH study

Six simple games that tap your innate genius to build a happy and resilient brain

Mind-Body Magic Tricks

BY JANE MCGONIGAL FROM THE BOOK *SUPERBETTER*

IN THE SUMMER of 2009, I got a concussion. It didn't heal properly, and after 30 days, I still had constant headaches, nausea, and vertigo. My doctor told me I should avoid triggering my symptoms. That meant no reading, no writing, no running, no video games, no work, no alcohol, and no caffeine. I joked to my doctor at the time, "In other words, no reason to live."

There was truth in that joke. I didn't know it then, but suicidal ideation happens with many traumatic brain injuries, and it happened to me. My brain started telling me, *Jane, you want to die.* This voice became so persistent that I started to fear for my life.

And then, 34 days after

Play "palms up" to open your stuck mind.

I hit my head, I had one crystal clear thought that changed everything: *Either I am going to kill myself or I'm going to turn this into a game.*

You see, I knew that when we play games, we tackle challenges with more creativity, more determination, and more optimism. I knew this because I'd been the first person in the world to earn a PhD studying the psychological strengths of gamers—and how those strengths can translate to real-world problem solving.

So I created a simple recovery game called Jane the Concussion Slayer. To win the day, I invited my twin sister, Kelly, to call me once daily and give me a quest for the next 24 hours. The first quest she gave me: "Look out the window near your bed, and tomorrow, tell me at least one interesting thing you saw."

I don't remember what I saw that day, but I do remember I felt like I had a purpose. And when I told my sister that I had succeeded, I felt fantastic. Within days, the fog of depression went away. It wasn't a miracle cure for the cognitive symptoms; they lasted more than a year, and it was the hardest year of my life. But even while I was in pain, I stopped suffering.

Taking purposeful action every day sparks your motivation and expands your sense of what you're capable of. Every time you set your mind to do something—and then do it—you remind yourself of the power you have over what you do, think, and feel.

But don't just take my word for it. Here are six simple quests you can try right now to feel just a little better.

JANE MCGONIGAL, PHD, ***is the director of games research and development at the Institute for the Future and a*** **New York Times** ***bestselling author.***

ILLUSTRATION BY JOE MCKENDRY

1 FOR AN OPEN MIND, PLAY: PALMS UP

What to do: Hands open, turn your palms to face the ceiling, and count to 15. Before you finish, you should start to notice a more open mind-set.

Why it works: Researchers credit a phenomenon called embodied cognition for this powerful mind-body effect, in which our brains take mental cues from physical gestures. When we offer someone a helping hand, ask for help, or prepare to receive something, our palms are upturned; when we reject something or push someone away, our palms face out. Thousands of years of these human interactions may leave us biologically primed to draw openness from upturned palms.

2 FOR MORE WILLPOWER, PLAY: MUSCLE UP

Need to resist an impulse? Want to steel yourself to do something difficult? Here's how to get instant mental resilience.

PHOTOGRAPH BY CLAIRE BENOIST

What to do: Squeeze one or more muscles as hard as you can for five seconds. Any muscles will work—your hands, biceps, abs, buns, calves. The more muscles you tense up, the more mental strength you'll summon.
Why it works: As with "palms up," the brain looks to the body for cues here. A strong body cues a strong brain, making it easier to muster courage or stick to resolutions.

3 FOR CLOSER FRIENDSHIPS, PLAY: PLUS ONE

What to do: Send a text or an e-mail to someone who might be surprised to hear from you, asking, "On a scale of one to ten, how is your day going?"

If he or she messages back a number, reply, "Is there anything I could do to move it from a six to a seven?" (or "from a three to a four," etc.).

My friend Michael, a philanthropist and an entrepreneur, poses these questions to almost everyone he talks to. After a while, I realized it's awesome. Consider this reply from my friend Chris after I sent him the "one to ten" question: "Better now that you asked. Truly makes a difference. Was a five, just became a seven."
Why it works: This trick is an easy way to reconnect with old friends, and as with online games, you don't have to be face-to-face to do it. By offering to make someone's day plus-one better, you're communicating that you care and that the person can count on you for support.

4 FOR A MOOD BOOST, PLAY: PREDICTION

What to do: Make a prediction about something—anything—that you can personally verify the outcome of in the next 24 hours. It can be big or small, silly or serious. Just make a prediction—and see if you're right!
Why it works: Making a prediction is one of the most reliable ways to prime the reward circuitry of the brain. "Every prediction you make triggers an increase in attention and dopamine," says neuroscientist Judy Willis, MD. That's because every time you make a prediction, two highly rewarding outcomes are possible. You might be right—which will feel good! Or you might be wrong—which will give you information that will help you make a better prediction next time. In fact, "the dopamine boost is often greater when you learn something new and useful than when you succeed," Dr. Willis says.

5 TO FEEL MORE POSITIVE, PLAY: SUPERHERO

What to do: Take at least two full minutes to list everything you can think of that describes superheroes in general: what motivates them, how they treat others, what they do in the face of danger, etc. For the biggest impact, write down your answers or record them with your phone.
Why it works: Psychologists know that when we're asked to think about the positive traits of a particular group,

we invariably compare ourselves with the group—and in a phenomenon known as positive bias, we usually start by looking for similarities. MIT and NYU researchers found that study participants who made a superhero list were far more altruistic afterward. When asked to tutor local youth, twice as many participants who thought about heroes volunteered as participants who did not; they signed up for double the hours to boot.

6 FOR INSTANT RELAXATION, PLAY: POWER BREATH

What to do: Breathe in while you count slowly to four. Exhale while you count to eight. Repeat for one minute. The trick is to always exhale for twice as long as you inhale. Try it now.

Why it works: Breathing at this rhythm increases your heart rate variability—the slight differences in time from one heartbeat to the next. In the long term, high heart rate variability protects against stress, anxiety, and pain. In the short term, it shifts your body from an anxious state to a calm-and-connected one. Muscles relax, heart rate decreases, and your mood improves. In other words: You're ready to win the day. R

ALL IN

A Day's Work

"Want to get in one last constructive criticism before we lose him?"

KRAMER VS. KRAMER was a Dustin Hoffman/Meryl Streep film about a bitter divorce. During a break in the filming of the courtroom scene, Dustin Hoffman approached an actual court reporter who had been hired to sit behind the stenography machine. "Is this what you do?" he asked. "Divorces?"

"Oh, I did them for years," the woman said. "But I burned out. I couldn't do it anymore. It was just too painful." She added cheerfully, "I really love what I'm doing now."

"What?" Hoffman asked.

"Homicides." From *Vanity Fair*

CLUELESS CLIENTS are a workplace menace, as these e-mails to various graphic artists prove:

■ "I want a website just like YouTube, but without videos."

ILLUSTRATION BY P.C. VEY

■ "Can you make the 'plus' sign less religious?"
■ "If I hire you, do I really have to pay you?" Source: clientsfromhell.net

THE PHONE RANG. I answered with the name of our company, only to be told by the caller that he had the wrong number. A minute later, he called again, this time sounding agitated. By the third time, he'd lost it. "Quit answering the phone!" he yelled. "I'm trying to call Austin High School!" **EVELYN WILKINS,** *El Paso, Texas*

MY CUSTOMER was not happy with her breakfast. "What's wrong with it?" I asked.
"It's the hash browns," she said. "They taste potato-y." **J. H.,** *via mail*

HERE ARE SOME of the adult-league softball teams that have visited our batting cages:
■ We've Got the Runs
■ Sons of Pitches
■ Saints & Sinners—My Drinking Team Has a Softball Problem
SARANA PLACKER, *Las Cruces, New Mexico*

WHEN A YOUNG WOMAN came to our urgent-care clinic, I asked to see her insurance card and photo ID. The insurance she had, but not her driver's license. "That's OK, though," she said, pulling out her phone. "I can show you my Instagram, if that helps."
DANA THAYER, *Lafayette, Louisiana*

HUNGRY?

Actual meals and blunders spotted on menus from around the world. Bon appétit!

APPETIZERS
White or Whole-Meat Toast
Bacon Butty
Thai-Style Uterus Salad

SOUPS
Cups $3, Bowel $5

MAIN COURSE
Chickenpox Pie
Shrimp and Pest Quesadilla
Milan Stake (served in dried dread)
Fried Kid with Pork Sauce
Strange Flavor Chicken
Shakey Beef (cubed demonic steak)
Convolutions Veal

SPECIAL OF THE DAY
From the Chef's Crack
Irritable Scalloped Kidney

DESSERTS
Chocolate Puke

DRINKS
Scothch

Free toothpick with ad!

Anything funny happen to you at work lately? It could be worth $100. For details, see page 7 or go to rd.com/submit.

IS YOUR BLADDER ALWAYS CALLING THE SHOTS?

Ask your doctor about Myrbetriq® (mirabegron), the first and only overactive bladder (OAB) treatment in its class. It's approved by the FDA to treat OAB with symptoms of:

Urgency Frequency Leakage

In clinical trials, those taking Myrbetriq made fewer trips to the bathroom and had fewer leaks than those not taking Myrbetriq. Your results may vary.

TAKING CHARGE OF OAB SYMPTOMS STARTS WITH TALKING TO YOUR DOCTOR.

Visit **Myrbetriq.com** for doctor discussion tips. Ask your doctor if Myrbetriq may be right for you, and see if you can get your first prescription at no cost.*

*Subject to eligibility. Restrictions may apply.

USE OF MYRBETRIQ (meer-BEH-trick)

Myrbetriq® (mirabegron) is a prescription medicine for adults used to treat overactive bladder (OAB) with symptoms of urgency, frequency, and leakage.

IMPORTANT SAFETY INFORMATION

Myrbetriq is not for everyone. Do not use Myrbetriq if you have an allergy to mirabegron or any ingredients in Myrbetriq.

Myrbetriq may cause your blood pressure to increase or make your blood pressure worse if you have a history of high blood pressure. It is recommended that your doctor check your blood pressure while you are taking Myrbetriq. Myrbetriq may increase your chances of not being able to empty your bladder. Tell your doctor right away if you have trouble emptying your bladder or you have a weak urine stream.

Myrbetriq may cause allergic reactions that may be serious. If you experience swelling of the face, lips, throat or tongue, with or without difficulty breathing, stop taking Myrbetriq and tell your doctor right away.

Please see additional Important Safety Information on next page.

astellas

IMPORTANT SAFETY INFORMATION (continued)

Tell your doctor about all the medicines you take including medications for overactive bladder or other medicines such as thioridazine (Mellaril™ and Mellaril-S™), flecainide (Tambocor®), propafenone (Rythmol®), digoxin (Lanoxin®). Myrbetriq may affect the way other medicines work, and other medicines may affect how Myrbetriq works.

Before taking Myrbetriq, tell your doctor if you have liver or kidney problems. In clinical studies, the most common side effects seen with Myrbetriq included increased blood pressure, common cold symptoms (nasopharyngitis), urinary tract infection and headache.

For further information, please talk to your healthcare professional and see Brief Summary of Prescribing Information for Myrbetriq® (mirabegron) on the following pages.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088.

Myrbetriq®
(mirabegron)
extended-release tablets
25 mg, 50 mg

astellas

Myrbetriq® (mirabegron)
extended-release tablets 25 mg, 50 mg
Brief Summary based on FDA-approved patient labeling

Read the Patient Information that comes with Myrbetriq® (mirabegron) before you start taking it and each time you get a refill. There may be new information. This summary does not take the place of talking with your doctor about your medical condition or treatment.

What is Myrbetriq (meer-BEH-trick)?

Myrbetriq is a prescription medication for **adults** used to treat the following symptoms due to a condition called **overactive bladder**:

- urge urinary incontinence: a strong need to urinate with leaking or wetting accidents
- urgency: a strong need to urinate right away
- frequency: urinating often

It is not known if Myrbetriq is safe and effective in children.

Who should not use Myrbetriq?

Do not use Myrbetriq if you have an allergy to mirabegron or any of the ingredients in Myrbetriq. See the end of this leaflet for a complete list of ingredients in Myrbetriq.

What is overactive bladder?

Overactive bladder occurs when you cannot control your bladder contractions. When these muscle contractions happen too often or cannot be controlled, you can get symptoms of overactive bladder, which are urinary frequency, urinary urgency, and urinary incontinence (leakage).

What should I tell my doctor before taking Myrbetriq?

Before you take Myrbetriq, tell your doctor if you:

- have liver problems or kidney problems
- have very high uncontrolled blood pressure
- have trouble emptying your bladder or you have a weak urine stream
- are pregnant or plan to become pregnant. It is not known if Myrbetriq will harm your unborn baby. Talk to your doctor if you are pregnant or plan to become pregnant.
- are breastfeeding or plan to breastfeed. It is not known if Myrbetriq passes into your breast milk. You and your doctor should decide if you will take Myrbetriq or breastfeed. You should not do both.

Tell your doctor about all the medicines you take, including prescription and nonprescription medicines, vitamins, and herbal supplements. Myrbetriq may affect the way other medicines work, and other medicines may affect how Myrbetriq works.

Tell your doctor if you take:

- thioridazine (Mellaril™ or Mellaril-S™)
- flecainide (Tambocor®)
- propafenone (Rythmol®)
- digoxin (Lanoxin®)

How should I take Myrbetriq?

- Take Myrbetriq exactly as your doctor tells you to take it.
- You should take 1 Myrbetriq tablet 1 time a day.
- You should take Myrbetriq with water and swallow the tablet whole.
- Do not crush or chew the tablet.
- You can take Myrbetriq with or without food.
- If you miss a dose of Myrbetriq, begin taking Myrbetriq again the next day. Do not take 2 doses of Myrbetriq the same day.
- If you take too much Myrbetriq, call your doctor or go to the nearest hospital emergency room right away.

What are the possible side effects of Myrbetriq?

Myrbetriq may cause serious side effects including:

- **increased blood pressure.** Myrbetriq may cause your blood pressure to increase or make your blood pressure worse if you

have a history of high blood pressure. It is recommended that your doctor check your blood pressure while you are taking Myrbetriq.
- **inability to empty your bladder (urinary retention).** Myrbetriq may increase your chances of not being able to empty your bladder if you have bladder outlet obstruction or if you are taking other medicines to treat overactive bladder. Tell your doctor right away if you are unable to empty your bladder.
- **angioedema.** Myrbetriq may cause an allergic reaction with swelling of the lips, face, tongue, throat with or without difficulty breathing. Stop using Myrbetriq and tell your doctor right away.

The **most common side effects** of Myrbetriq include:
- increased blood pressure
- common cold symptoms (nasopharyngitis)
- urinary tract infection
- headache

Tell your doctor if you have any side effect that bothers you or that does not go away or if you have swelling of the face, lips, tongue, or throat, hives, skin rash or itching while taking Myrbetriq.
These are not all the possible side effects of Myrbetriq.
For more information, ask your doctor or pharmacist.
Call your doctor for medical advice about side effects. You may report side effects to the FDA at 1-800-FDA-1088.
How should I store Myrbetriq?
- Store Myrbetriq between 59°F to 86°F (15°C to 30°C). Keep the bottle closed.
- Safely throw away medicine that is out of date or no longer needed.

Keep Myrbetriq and all medicines out of the reach of children.
General information about the safe and effective use of Myrbetriq
Medicines are sometimes prescribed for purposes other than those listed in the Patient Information leaflet. Do not use Myrbetriq for a condition for which it was not prescribed. Do not give Myrbetriq to other people, even if they have the same symptoms you have. It may harm them.
Where can I go for more information?
This is a summary of the most important information about Myrbetriq. If you would like more information, talk with your doctor. You can ask your doctor or pharmacist for information about Myrbetriq that is written for health professionals.
For more information, visit **www.Myrbetriq.com** or call (800) 727-7003.
What are the ingredients in Myrbetriq?
Active ingredient: mirabegron
Inactive ingredients: polyethylene oxide, polyethylene glycol, hydroxypropyl cellulose, butylated hydroxytoluene, magnesium stearate, hypromellose, yellow ferric oxide and red ferric oxide (25 mg Myrbetriq tablet only).
Rx Only

PRODUCT OF JAPAN OR IRELAND – See bottle label or blister package for origin

Marketed and Distributed by:
Astellas Pharma US, Inc.
Northbrook, Illinois 60062

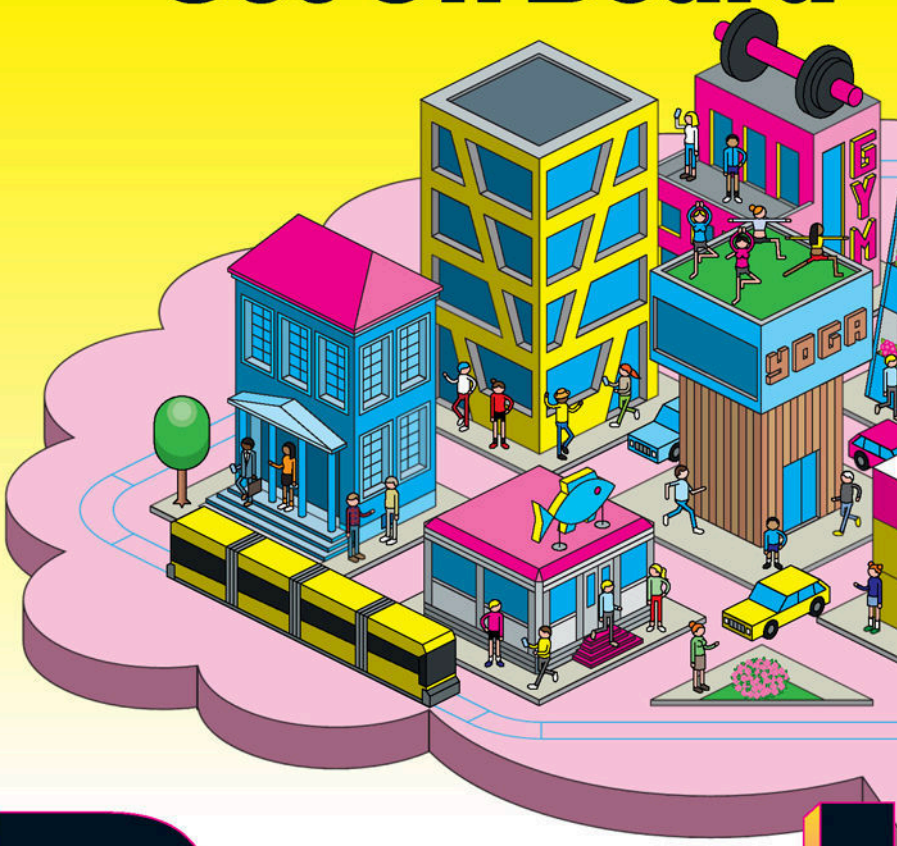
Myrbetriq®
(mirabegron)
extended-release tablets
25 mg, 50 mg

Revised: December 2015
15L110-MIR-BRFS
057-0912-PM

COVER STORY

Science now says we can power new brain-cell

Get On Board



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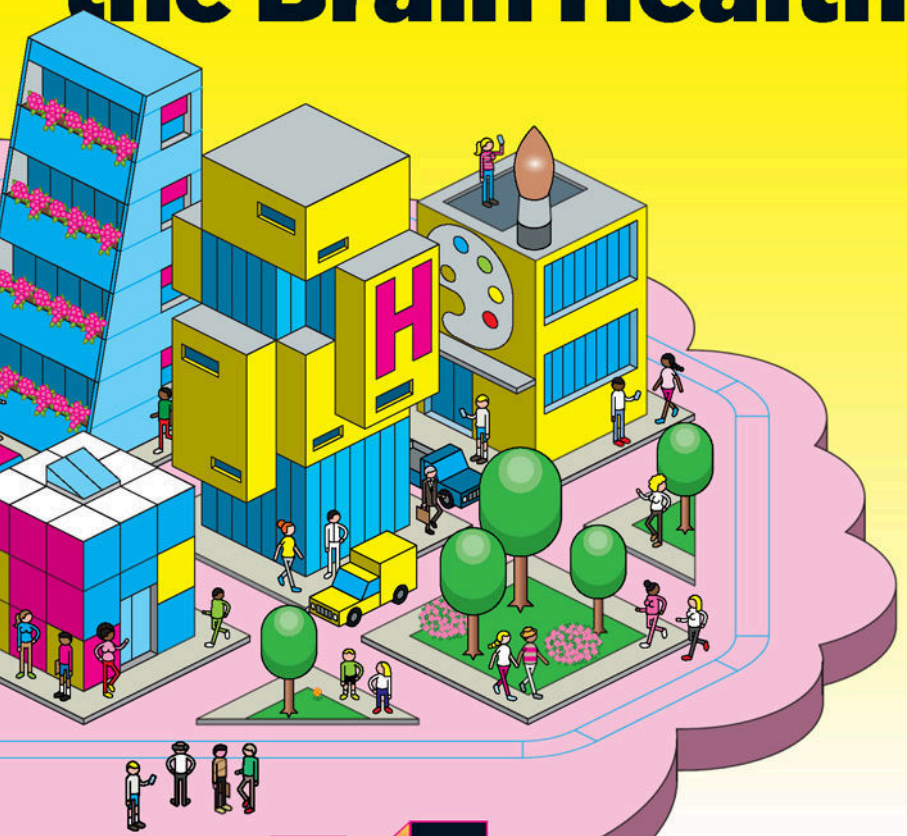
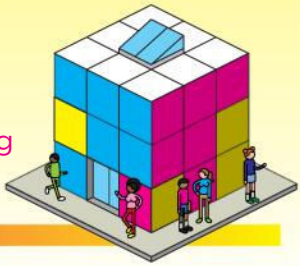
connections, avoid Alzheimer's, and never lose sharpness

the Brain Health



ution

New research reveals that every life experience changes your brain. Here's what landmark studies say about staying sharp—and, dare we say, wise—for life.



BY DAVID EAGLEMAN

FROM *THE BRAIN: THE STORY OF YOU*

Every human being enters the world with a remarkably unfinished brain. Dolphins are born swimming; giraffes learn to stand within hours. But we humans? We're helpless for years.

However, this seeming limitation actually signals our greatest advantage. Baby animals develop quickly because their brains wire up according to a preprogrammed routine. But that preparedness trades off with flexibility. Imagine if some hapless rhinoceros found itself on the Arctic tundra or on top of a mountain in the Himalayas or in the middle of urban Tokyo. It would have no capacity to adapt—or thrive.

In contrast, humans have thrived in all these environments. Instead of arriving with everything hardwired, a human brain is shaped by life experience. It's "livewired."

Our brains' flexibility derives not from the growth of new cells but from how those cells are connected. A baby's neurons form two million new connections every second as they take in information. By age two, a child has over 100 trillion synapses—double the number an adult has.

This peak represents far more connections than the brain will need. The incredible blooming is then supplanted by neural "pruning." As you mature through the teen years and into your 20s, 50 percent of your synapses will be pared back.

Which synapses stay, and which go? When a synapse successfully participates in a circuit, it is strengthened; synapses that aren't used are weakened and eventually eliminated. Just as with paths in a forest, you lose the connections that you don't use.

By age 25, our brains appear to be fully developed. But even in adulthood, the brain can form new connections. London's cabdrivers show just how impressive this can be. They undergo intensive training to pass the "Knowledge of London," a mem-

DAVID EAGLEMAN *is a neuroscientist at Baylor College of Medicine and a* **New York Times** *bestselling author.*

ILLUSTRATION BY JOE MCKENDRY (EAGLEMAN)

orization test of London's extensive roadways: 320 routes, 25,000 individual streets, and 20,000 landmarks. A group of neuroscientists from University College London scanned the brains of several cabdrivers. Each driver's posterior hippocampus—an area vital for memory, in particular spatial memory—had grown physically larger than the hippocampi of the control group. The longer a cabbie had been doing the job, the bigger the change.

Similarly, everything you've experienced thus far has altered the physical structure of your brain. Your family of origin, your culture, your friends, your work, every movie you've watched, every conversation you've had—these have all left their footprints in your nervous system. As you age, too, your brain's flexibility, and what you choose to expose it to, matters deeply.

This was revealed by the Religious Orders Study, a research project following more than 1,100 clergy members across the United States. Since 1994, this group has undergone regular psychological and medical tests. So far, David Bennett, MD, and his team at Rush University in Chicago have collected and examined tissue from over 350 brains.

The team expected to find a clear-cut link between cognitive decline and the three most common causes of dementia: Alzheimer's, stroke, and Parkinson's. Instead, here's what they found: Some people were dying with a full-blown Alzheimer's pathology—brain tissue ravaged by the disease—without having cognitive loss. What was going on?

The team went back to its data for clues. Dr. Bennett found that cognitive exercise (keeping the brain active through doing crosswords, reading, driving, learning new skills, and having responsibilities) was protective. So were social activity, social networks, and physical activity.

The participants with diseased neural tissue but no cognitive symptoms had built up what is known as cognitive reserve. As areas degenerated, other well-exercised areas took over those functions. The study demonstrates that it's possible to protect our brains and slow the aging process.

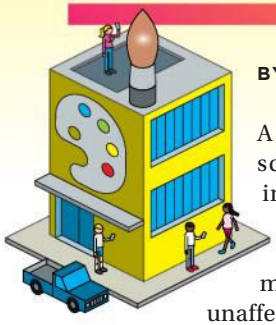
We're at an unprecedented moment in history, one in which brain science and technology are coevolving. We can now hack our own hardware, and as a result, our brains don't need to remain as we've inherited them. We're now just discovering the tools to shape our own destiny. Who we become is up to us.

Your Amazing Brain

The brain generates the equivalent of about ten to 15 watts of energy, enough to power an LED bulb.

Source: northwestern.edu

Genius Brain Habits



BY KIMBERLY HISS

A rich new area of science is analyzing which healthy habits best keep your mind and memory blithely unaffected even when a brain scan would reveal the inflammation, free radical damage, and weakened synapse connections that often cause "senior" moments in the 40s and beyond. Kenneth S. Kosik, MD, codirector of the Neuroscience Research Institute at the University of California, Santa Barbara, has studied which habits most powerfully boost our cognitive function. Here he shares the most up-to-date research from innovative labs plus the best tips from his book *Outsmarting Alzheimer's* (Reader's Digest, $24.99; outsmartingalzheimers.com).

Play Games with Your Frontal Lobe

Whether you're deliberating a chess move or bluffing at cards, you're also giving the frontal lobe, the area of your brain that handles executive function, a workout. "The frontal lobe is particularly vulnerable to degeneration and the effects of aging," says Dr. Kosik. According to a 2014 University of Wisconsin study, older adults who routinely worked on puzzles and played board games had higher brain volume in the area responsible for cognitive functions, including memory, than those who didn't play games.

Stay Young with *Saa, Taa, Naa,* and *Maa*

Dharma Singh Khalsa, MD, president and medical director of the Alzheimer's Research and Prevention Foundation, has spent many years studying the meditative tradition called Kirtan Kriya and has found that daily 12-minute sessions of the practice can improve blood flow to the brain and possibly even increase levels of telomerase, an enzyme that slows cell aging. The practice is simple: While breathing deeply, chant the Sanskrit words *saa, taa, naa, maa* (which mean "my divine self") while moving your thumb to touch your index, middle, ring, and pinkie fingers with each new sound. Like any meditation, it may help to lift anxiety and fatigue.

Protect Your Mind from Your Heart

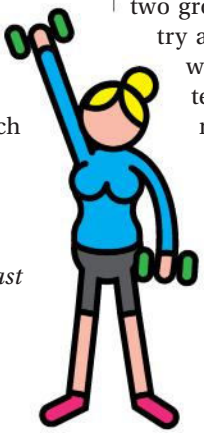
Scientists surveyed volunteers on seven familiar heart-health factors and tested their cognitive performance

at two points over eight years. The results found that the more heart-healthy habits people had, the less cognitive decline they exhibited. A stronger cardiovascular system means a stronger pipeline of nutrients to the brain, says lead author Hannah Gardener, ScD, an epidemiologist in the Department of Neurology at the University of Miami. The seven heart-health ideals to strive for may be familiar (if they seem overwhelming, Gardener points out that "each one helps"):

- *Not smoking (or quitting)*
- *Healthy body mass index (under 25)*
- *Physically active (for at least 150 minutes a week)*
- *Healthy total cholesterol (under 200 mg/dL)*
- *Healthy blood pressure (under 120/80 mmHg)*
- *Healthy blood sugar (under 100 mg/dL)*
- *Balanced diet (rich in fruits, veggies, and whole grains; low in sodium and sweets)*

Lift the Quality of Your White Matter

As the brain ages, its white matter often develops small lesions because of disrupted blood flow, leading to impaired cognitive function and mobility. Researchers at the University of British Columbia wanted to determine whether strength training might offer protection. Women ages 65 to 75 who already had lesions were divided into three groups: once-a-week strength trainers, twice-a-week strength trainers, and those who did other exercise. The results: Women who strength trained twice a week showed significantly less progression of white matter lesions than the other two groups did. Key moves you can try at home (using soup cans for weight): biceps curls, triceps extensions, calf raises, mini squats, mini lunges, and lunge walks; aim for 45 minutes a session.



Make Moves Directly Against Alzheimer's

Exercise benefits the brain by improving vascular health—but newly published research suggests it also combats the chronic neuroinflammation observed in Alzheimer's, depression, and other brain diseases. In such neurological conditions, the inflammation that normally clears tissue damage doesn't shut off and starts to interfere with communication between neurons. Exercise has proven anti-inflammatory effects against diseases like diabetes and rheumatoid arthritis, so that could be why it protects brain health as well, says assistant professor Jonathan Little, PhD, in a review article in *Brain Research Bulletin*. "Any type of moderate-intensity exercise, such as walking, cycling, and swimming, can

have anti-inflammatory effects," says Little. Aim for about 30 minutes a day.

Get Brain Circuits Singing

Listening to or playing music can activate the motor cortex (touching a piano key or guitar string), the auditory cortex (hearing the notes you make), and the emotional center, or limbic system (feeling moved by a beautiful passage). "Circuits and networks are stimulated by these activities, which help keep the brain healthy," says Dr. Kosik. Older adults who had at least ten years of musical experience did better on cognitive tests, according to a 2011 Emory University study.

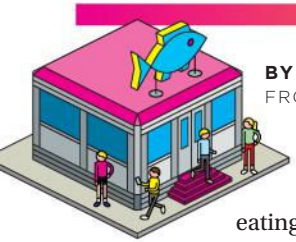
As Jon Lovitz Would Say, "Acting!"

Learning lines for a production or an acting class engages the hippocampus, the temporal cortex, and the frontal lobe, says Dr. Kosik. So follow the lead of one of Jon Lovitz's *Saturday Night Live* characters, Master Thespian: In one study, those who went to acting classes twice a week for four weeks boosted their ability to remember words, numbers, and short stories. A follow-up study found they improved word fluency by 12 percent and word recall by 19 percent.

Draw Out Your Neural Connections

When you draw, paint, or sculpt, you have to make spatial calculations and focus attention on details, Dr. Kosik says. Engaging in these activities helps protect octogenarians from mild cognitive impairment, according to a 2015 Mayo Clinic study. Also, 60- and 70-year-old art-class participants boosted scores on psychological resilience tests; MRI images showed their synapses had formed new connections.

A Genius Eating Plan



BY ALEX MLYNEK
FROM *BEST HEALTH*

Scientific efforts to develop a new eating plan to substantially reduce Alzheimer's risk may be working. Researchers at Rush University Medical Center in Chicago developed the MIND diet over a two-year period. They took elements of two proven heart-healthy regimens—the Mediterranean diet and the blood-pressure-slashing DASH diet (aka Dietary Approaches to Stop Hypertension). Then they consulted the latest human and animal nutrition studies and tailored a combo

designed to boost brain health. (MIND is short for Mediterranean-DASH Intervention for Neurodegenerative Delay.) Finally they tested the eating plan on 960 volunteers over four and a half years. The MIND diet reduced Alzheimer's risk by 53 percent among those who followed the plan strictly and by 35 percent for those who followed it moderately well, according to research published in *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*.

The brain-boosting benefits come down to two general principles: Limit foods that are high in saturated fats and calories but have low nutritional value, and eat more foods that offer nutrients that help your brain, says Martha Clare Morris, the plan's chief creator and the director of nutrition and nutritional epidemiology at Rush. "The top nutrients are vitamin E; B vitamins; omega-3s; some of the carotenoids, lutein in particular; and flavonoids," she explains. Here are the ten foods to eat and five foods to limit every week, which make up the core of the MIND diet.

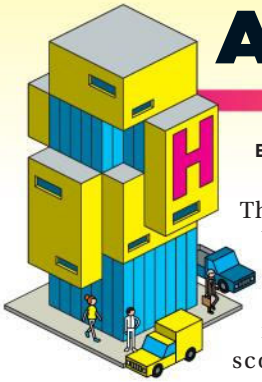
Do Eat ...

- Six or more servings of leafy-green vegetables every week. (That's almost a salad a day.)
- At least one serving of another vegetable every day.
- More than two servings of berries every week.
- More than five servings of nuts every week. (Try them as a daily snack.)
- Extra-virgin olive oil instead of butter and as your primary cooking oil.
- More than three servings of whole grains every day.
- Fish that hasn't been fried for at least one meal every week.
- Beans for more than three meals every week (that is, eat beans roughly every other day).
- Poultry for more than two meals every week.
- A glass of wine every day (though Morris says there's no need to drink this if you're avoiding alcohol).

Do Limit ...

- Butter to one tablespoon every day.
- Cheese to less than one serving every week.
- Red meat to fewer than four meals every week.
- Fried foods and fast food to less than one serving every week.
- Sweets and pastries to fewer than five servings every week.

Genius Medical Advance Stories



BY KIMBERLY HISS

The most prominent brain researchers in the country are on a quest not to merely cure the scourges that steal our minds—they seek to understand the very fibers of our humanity, housed in the gray matter behind the once (but no longer) impenetrable fortresses of our skulls. Their investigations read like mini–medical detective tales, replete with out-of-the-box ideas, questions that lead to more questions—and the serendipitous happenstance through which great discoveries are made.

The Holy Grail of Alzheimer's Research

Andres Lozano, MD, PhD, can pinpoint the moment that he stumbled upon a therapy to potentially reverse Alzheimer's disease. In 2003, when Dr. Lozano, the chair of the division of neurosurgery at the University of Toronto, placed electrodes in the brain of an obese patient with the hope of controlling his appetite, the patient experienced a vivid memory of a trip to a park with a girlfriend decades earlier. Over the next month, the patient's memory improved tremendously as Dr. Lozano continued deep brain stimulation (DBS) via electrodes controlled by a remote pacemaker. The odd side effect prompted Dr. Lozano to ask a game-changing question: What if this chance observation could lead to a new therapy for Alzheimer's?

Dr. Lozano is now conducting a phase-two trial in 42 adults who have a mild form of the disease. In Alzheimer's, abnormal protein deposits are thought to disable certain circuits, creating "blackout" areas that have stopped burning glucose—the fuel of the brain. The theory: Stimulating the fornix, a key area for memory, will reestablish power to shut-down circuits. So far, Dr. Lozano's work indicates it's possible to get these blackout spots to use glucose again, suggesting the areas could resume function. "We want to find out if we can put the brakes on the progression of the illness and stop it in its tracks," Dr. Lozano says. "It might mean hanging on to a parent longer or not needing to send a loved one to a nursing home." He compares the exploration to going on a spaceship to a faraway galaxy. "These experiments

are the first time a human being with these disorders has had these areas of the brain stimulated. We're getting to the very core of what the brain does."

A Miracle Treatment for Stroke

Few medical conditions strike faster and with more finality than the brain death caused by stroke. But a new procedure has had such success that hospitals around the country are changing their protocols.

Normally, large-vessel strokes—big clots in big arteries that jeopardize blood flow to huge brain territories—are deadly. Existing blood-thinning medications aren't effective at dissolving large clots.

But this treatment vacuum recently was flooded with five major clinical trials demonstrating the effectiveness of mechanical thrombectomy, in which a catheter is threaded through an artery in the groin and up to the blockage in the brain, where a stent pulls the clot from the vessel.

"This is the penicillin era in stroke treatment," says Alexander A. Khalessi, MD, vice chairman of clinical affairs in the department of neurosurgery at UC San Diego Health. The chance of a full recovery from a large-vessel stroke goes down each minute it's left untreated; with mechanical thrombectomy, that number soars to above 60 percent if treatment is started within six hours, says Dr. Khalessi. "Patients go from literally dying to going home to their families—it's about as miraculous a thing as you can encounter in medicine."

Your Amazing Brain

Your brain comprises about 2 percent of your weight but uses 20 percent of the body's blood, oxygen, and glucose.

From the book *Transcend* by Ray Kurtzweil and Terry Grossman, MD (Rodale, Inc.)

From Paralyzed to Playing Guitar Hero

When Ian Burkhart broke his neck diving into a wave in 2010, he had no idea that about four years later, he would make history as the first quadriplegic to regain control of his limbs using his own thoughts. At the time, the devastated 19-year-old knew only that an experimental study at nearby Ohio State University Wexner Medical School offered hope. Burkhart's spinal injury had severed the communication pathway between the motor cortex in his brain and the muscles in his limbs, but this study proposed a detour.

Doctors had Burkhart think about moving his hand while researchers took fMRI scans to light up key brain areas. Based on those coordinates, in April 2014, Ali Rezai, MD, director of Ohio State's Center for Neuromodulation, placed a microchip smaller than a pea in the motor cortex, which controls the hand. The chip was connected via a computer to an electrode-studded

sleeve on Burkhart's arm that stimulated his muscles. Burkhart's thoughts now had a new bypass to his hand.

Two months later, Dr. Rezai was standing behind his patient in a lab crowded with cameras, physicians, engineers, and family, all eyes on Burkhart's right hand. When it moved for the first time, Burkhart made history. "It was a surreal moment," Dr. Rezai remembers. "The whole team was amazed, but then we said, 'OK, the work is just beginning. He's got to be able to pick up a cup of coffee.'"

In the years since, subject and software have been learning from each other. "The machine is continuously improving its algorithms, and Ian is able to think about things with more fluidity," says Dr. Rezai. "It's phenomenal seeing the brain and computer coming together." Burkhart is now able to swipe a credit card and play Guitar Hero.

Finding the Cause of—and Cure for—Depression

Dawn Ionescu, MD, a psychiatrist at Massachusetts General Hospital, will never forget the first time she saw the drug ketamine in action. "Within hours, a severely depressed patient was talking to other people in the dayroom, eating dinner, and looking brighter," says Dr. Ionescu. "I decided: I want to know how this is working."

Ketamine was FDA-approved in the 1970s as an anesthetic and has since been hijacked as a hallucinogenic "club drug." Recently, researchers noticed it can lift depression quickly, possibly by fixing damaged neurocircuits. "If you think of neurons as trees, depression looks like branches in winter—thin and unhealthy. After treatment with ketamine, the branches look like spring—flowering and plump," says Dr. Ionescu, based on her observations of animal studies.

The grand research plan: Scan the brains of depressed patients before and after ketamine triggers relief. "If we can see the brain changing, we may be able to understand the actual neurobiology of depression and discover new antidepressants," Dr. Ionescu says. "I would say it's one of the most hopeful times we've had in decades."

Your Amazing Brain

It's possible to get half of your brain surgically removed without affecting your memory or personality.

Source: *Scientific American*

Creating Calm with Healthy Belly Bugs

When Stephen Collins, MBBS, received his first clue that the gut bacteria found naturally in our intestines might both heighten and relieve anxiety, he dismissed it. Lab techs reported that the mice on antibiotics were acting strangely, and Collins, the director of the Farncombe Family Digestive Health Research Institute at McMaster University in Ontario,

thought nearby construction must be upsetting the animals. It was only after a repeat experiment produced the same anxious behaviors—and animals on probiotics seemed calmer—that Collins realized he might have uncovered a centerpiece of all-too-common mood disorders.

Since then, Collins's investigations have continually found that altering rodents' gut microbiota can change mood and behavior. For example, mice raised "germ-free" showed abnormally hyperactive behaviors that calmed down after they were colonized with bacteria from healthy mice; and if the gut bacteria of normal mice were perturbed through prolonged antibiotic use, the mice became anxious.

Collins cautions that it's too early to eschew antibiotics or give yourself a fecal transplant, as demonstrated on YouTube. But research on humans has bolstered the connection, and Collins is now studying whether bacteria can soothe depression in patients with irritable bowel syndrome.

A New Era of Treatment for Schizophrenia

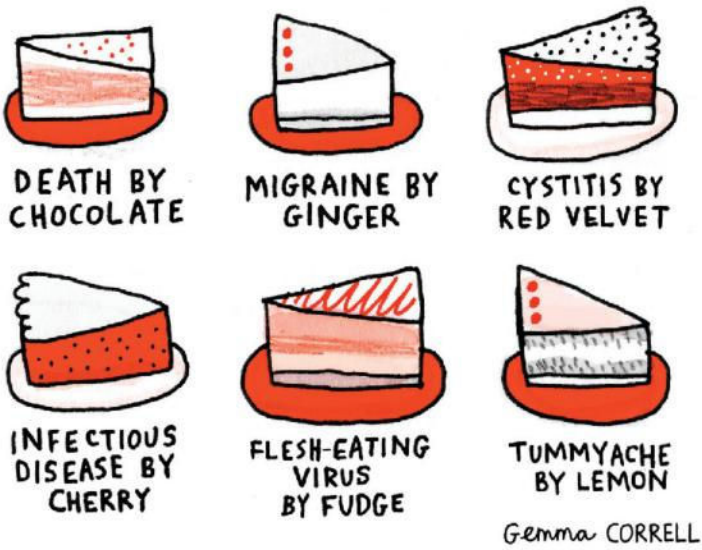
Our efforts to develop better medications for schizophrenia have been stymied by our inability to uncover the condition's source. Researchers already knew that genes and the immune system are involved in the disorder but could not say how. Now a groundbreaking study seems to have solved the mystery.

Researchers at Boston's Broad Institute analyzed one of the largest repositories of schizophrenia DNA samples and found that a mutation in the C4 gene is strongly correlated with the disease. This mutation causes the production of too much C4A protein, which regulates the pruning of synapses by a process that is also shared by the immune system in fighting pathogens and eliminating waste. This finding links a gene with a long-observed disease-causing process. "That was like bingo—you found the genetic key that explains all these historic observations in people with schizophrenia," says Jeffrey Lieberman, MD, professor and chair of the Department of Psychiatry at Columbia University. The likely next frontier: development of new treatment strategies that seek to modulate the C4 gene. R

Laughter

THE BEST MEDICINE

DESSERTS TO DIE FOR



A YOGA INSTRUCTOR in Canada offers "rage yoga" sessions, in which participants are free to curse, drink, and listen to heavy metal. The *Week* asked its readers to name the New Age book the teacher might pen.

- *The Sound of One Head Banging*
- *Raja Against the Machine*
- *Downward Hair of the Dog*
- *Zen and the Art of Motörhead Maintenance*

MIKEY, A PAINTER, limps into the bar, covered in bruises, cuts, and bloodied scrapes.

"Mikey, what happened to you?" the bartender asks.

"Oh, I fell off a 50-foot ladder," Mikey says.

Your funny joke, list, or quote might be worth $$$. For details, see page 7 or go to rd.com/submit.

ILLUSTRATION BY GEMMA CORRELL

"You're pretty lucky. You could have been killed."

"Not really," says Mikey. "I was only on the first rung."

MY IQ TEST RESULTS came back. They were negative.

SOME PASSING THOUGHTS ...

■ Snails have a five-day rule for food that has fallen on the ground.

■ Worst wine: Vin D'iesel.

■ If there's a spate of it, it's never good news.

JAMES THOMAS,
from *Why the Long Joke?* (St. Martin's Press)

TEN LIGHTBULB JOKES THAT MAKE YOU SOUND SMART

1. How many fatalists does it take to screw in a lightbulb?
What does it matter? It's just going to burn out again anyway.

2. How many psychiatrists does it take to change a lightbulb?
Only one, but the bulb has to really want to be changed.

3. How many Harvard students does it take to change a lightbulb?
Just one. The student holds the lightbulb, and the universe revolves around him.

4. How many bureaucrats does it take to change a lightbulb?
One hundred. One to change the bulb and 99 to write the environmental-impact report.

5. How many mystery writers does it take to change a lightbulb?
Two. One to screw it in most of the way and another to give it a surprise twist at the end.

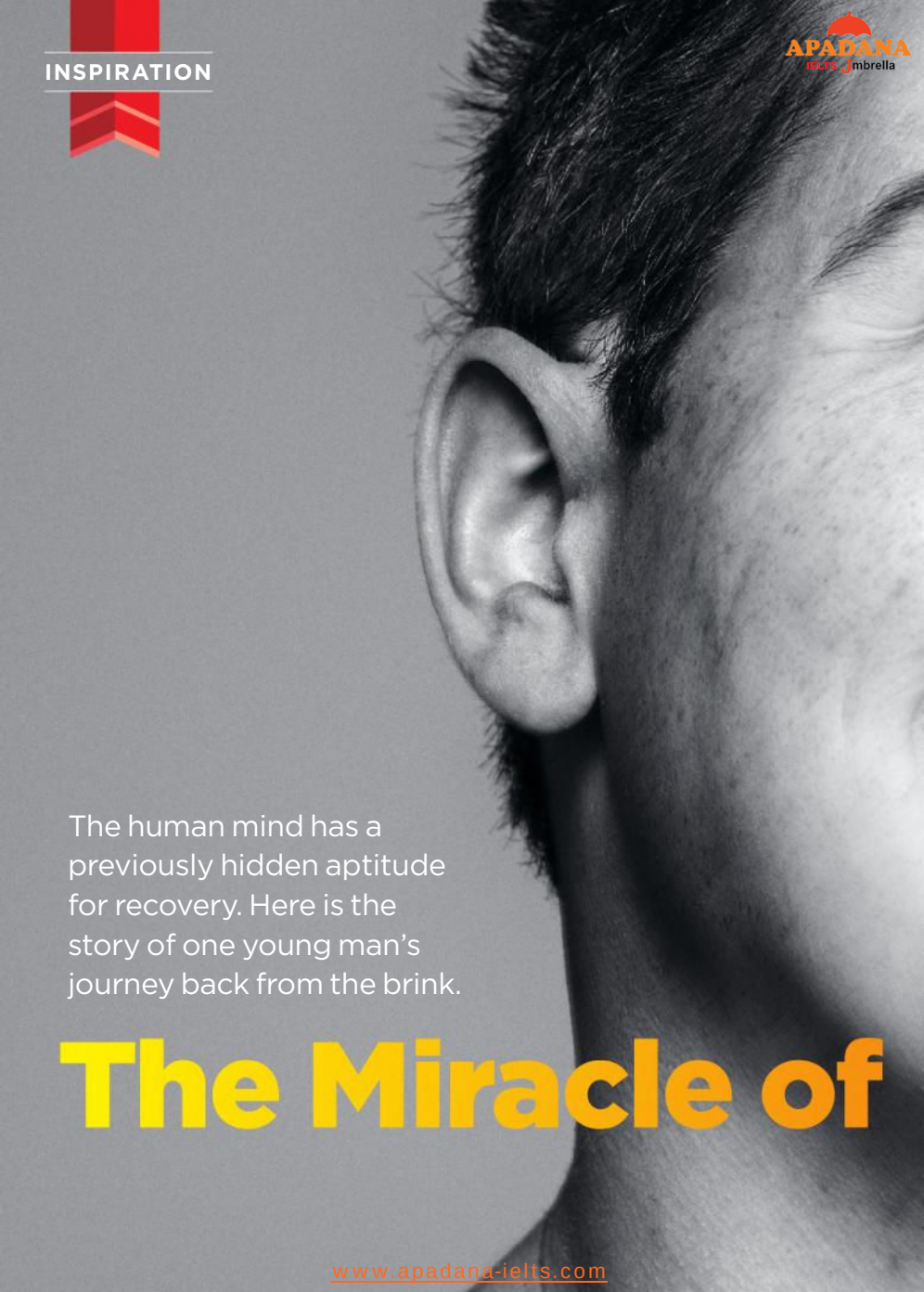
6. How many board meetings does it take to get a lightbulb changed?
This topic was resumed from last week's discussion but is incomplete pending resolution of some action items. It will be continued next week. Meanwhile ...

7. How many college football players does it take to change a lightbulb?
One, and he gets three credits for it.

8. How many chiropractors does it take to change a lightbulb?
Only one, but it takes six visits.

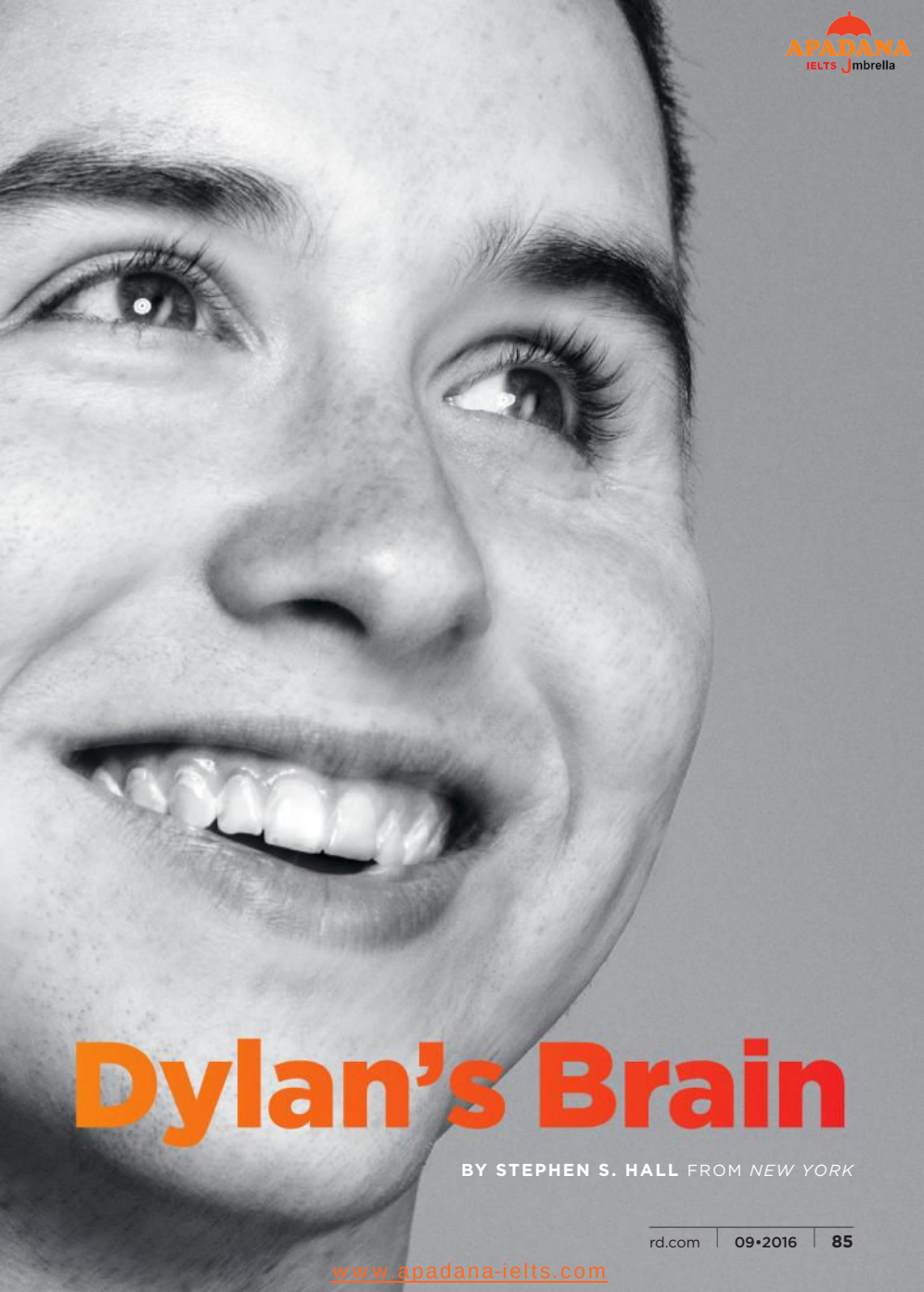
9. How many Apple vice presidents does it take to change a lightbulb?
That's proprietary information. The answer is available from Apple on payment of a license fee.

10. How many archaeologists does it take to screw in a lightbulb?
One team, but they'll label every piece of the old one, mark its location in the room, and write a detailed description before determining that it was used to store cornmeal.



The human mind has a previously hidden aptitude for recovery. Here is the story of one young man's journey back from the brink.

The Miracle of



Dylan's Brain

BY STEPHEN S. HALL FROM *NEW YORK*

Day Zero

Despite its encircling fortress of bone, the human brain is especially vulnerable to physical insult. There are approximately 1.7 million traumatic brain injuries in the United States every year, and although most are mild or moderate, thousands result in severe brain damage. Those injuries always happen on the same day: day zero, a day that marks the start of a fateful and often flawed prognostic calendar.

For 19-year-old Dylan Rizzo, day zero was December 28, 2010. Tall and slender, with a sly sense of humor, Dylan was a sports nut, playing hockey and competing in the high jump for his high school in Lynnfield, Massachusetts, and rooting for the Boston Bruins.

At 8:30 p.m., as Dylan was driving to play video games at his friend Ryan's house, he called his mother. He couldn't find his Xbox controller.

"You always move my stuff!" he said.

"No, I don't," Tracy Rizzo replied. After hanging up, she found the controller in her car. "I called Dylan," she recalled. "He didn't answer." She texted Ryan: "When Dylan gets there, just tell him I got the controller."

A few moments later, Ryan called Tracy Rizzo back. He said there had been an accident.

Day 1

Emergency responders found the driver's-side door of Dylan's SUV crunched into a telephone pole. Dylan was unconscious. His breathing sounded like the gurgling of a straw in a near-empty cup. He had traveled barely 200 yards before striking the pole, possibly after hitting black ice. He wasn't wearing a seat belt.

It took responders eight minutes to pull him out. There was so much blood and lacerated flesh that medics could not insert a breathing tube during the 29-minute ambulance ride into Boston. At Massachusetts General Hospital, Dylan had a CT scan and was rushed into surgery, where neurosurgeons removed the left side of his skull and part of the right to stop multiple brain hemorrhages. By the time he was transferred to the neuro intensive-care unit, he was a swollen-faced sphinx—his eyes closed, his head wrapped in bandages, pincushioned with needles, and on a ventilator. His face had been shattered; his left leg was broken. And he was in a deep coma.

To gauge Dylan's chances of recovery, doctors would rely on standard timelines, and their prognosis would inform treatment. But as neurologists acknowledge, early prognosis is very

PREVIOUS SPREAD: DYLAN COULTER

difficult, diagnosis is often flawed, and the timelines that guide recovery are defied by patients who don't obey the statistics. New research also suggests that many seemingly unconscious patients have more consciousness than previously believed and, despite the severity of their injuries, a significant chance of meaningful recovery. Put simply, neuroscience is changing the meaning of "hopeless."

Day 2

Dylan came from a small town and a big family. To keep everyone informed, his parents, Tracy and Steve Rizzo, issued daily updates on the website CarePages. "Dylan was recently involved in a car accident," the initial entry began. "He is currently stable, but still in critical condition ... The next 3 days will be tough, but he is fighting hard to get through this."

In the neuro ICU, the definition of *consciousness* boils down to two conditions: being awake (or aroused) and being aware. A coma is the loss of both of these qualities. One recent revelation is that disorders of consciousness are dynamic—patients can travel back from a coma through a series of way stations that are increasingly well marked, although some are still contested by doctors and researchers.

Day 5

At the ICU, the Rizzos played an iPod filled with Dylan's favorite music. Some nurses thought Dylan didn't need stimulation, but it probably didn't matter. At the neurological level, a coma is like a deep sleep. The unaroused brain is dormant, awaiting a kick from an internal generator. That generator resides in several "arousal nuclei" in the brain stem, clusters of cells barely bigger than grains of salt. When we're conscious, those clusters are our neural pacemaker, keeping the lights on when we're awake and shifting us down to sleep.

That same area controls other autonomic functions of the body, such as breathing, heartbeat, and temperature regulation. The gurgling Dylan had made suggested the accident had disrupted the function of his brain stem, which might prevent him from waking up. His doctors wouldn't know

Day 31: Incisions show where parts of Dylan's skull were removed during surgery.

COURTESY THE RIZZO FAMILY

until they could do an MRI, when he became more stable.

Day 8

On the same day as Dylan's first MRI, neuropsychologist Joseph Giacino administered a test known as the Coma Recovery Scale. He pried Dylan's eyes open to see if there was any sign of visual tracking. There wasn't. Dylan scored a 1 on the scale, out of 23.

The director of rehabilitation neuropsychology at Spaulding Rehabilitation Hospital and an authority on disorders of consciousness, Giacino had been called in to consult on Dylan's case. He is among a growing number of experts warning of what he calls a rush to judgment in predicting an outcome for brain-trauma patients. In a study of Canadian trauma centers, researchers reported that one third of the patients who went into the ER with severe traumatic brain injuries died. Half died in the first 72 hours. Nearly two thirds of those early deaths had life support withdrawn, suggesting that the cases were deemed hopeless in the first few days. According to Giacino, it can take much longer than that for a person's chances of recovery to become clear. Recent literature suggests that if a patient displays any form of conscious awareness within 60 days, his or her chances are considerably better. As a realist, Giacino knows hardly anyone—families, doctors, insurers—can wait that long.

When doctors pored over images from Dylan's MRI, they were shocked by the damage. In a car accident, the impact sends the brain banging around inside the skull. "It shears or literally tears the axons, the wires that send signals from one part of the brain to the other," said neurologist Brian Edlow, a member of Dylan's treatment team. The MRI showed frayed wires everywhere. In his notes, Giacino wrote that "the probability of recovery of functional, vocational, and social independence is low."

Day 10

Dylan's family members sat in a conference room with doctors, who showed them the scans. Steve recalled, "They kept saying—it was like 90 percent of what we were looking at—'This [area] will never recover, this will never recover.'"

"They told us they didn't think he would ever be able to live at home, that he would probably be institutionalized and have moments of clarity where he would recognize us," Tracy recalled as tears welled up. "But they didn't think he would even have that."

About the only factor in Dylan's favor was his youth. After the doctors left, Dylan's father ran out and buttonholed one of them. "Lookit," he said, "we don't need time to think. You need to do whatever you can do ... What would you do if it were your kid?" He got no disagreement from the doctor, who replied, "We want to do everything."

Tracy and her sister stayed in the

conference room and cried for half an hour. Then Tracy said she told her sister and her husband, "'When we go out there, we're not going to tell anybody this.' And we didn't. We came out, and [our family and friends] said, 'How did the meeting go?' We said, 'It was good. And we're going to do everything we can do for Dylan.'"

Day 15

Dylan wore a hairnet of electrodes to monitor brain activity. No poke or prod penetrated his neural darkness, but that didn't prevent him from "storming," or displaying what's called paroxysmal sympathetic activity—brain-injury patients often sweat profusely, spike fevers, and move their limbs spastically. Another disorder causes extreme thirst and urination. His parents read him messages and told him the Bruins had sent him a signed jersey. And they waited. "We knew that he was not likely to stay in a coma much longer," Giacino said, "because hardly anybody stays in a coma after 14 days. And then the question is: What do we have at that point?"

Day 17

Dylan opened his eyes.

He'd passed from a coma into a vegetative state, a condition of wakeful unconsciousness—eyes open wide but mind shut down. His brain stem had begun sending pulses of arousal to the rest of the brain, but he still lacked awareness.

For decades, researchers, including Giacino, have found evidence that subtle signs of consciousness are often missed in supposedly vegetative patients. They've proposed a new diagnostic category, the minimally conscious state. Many clinicians had regarded both vegetative and minimally conscious patients as "hopelessly brain damaged," but that view is shifting as technology allows researchers to detect conscious activity in people who show no outward signs of awareness.

Minimally conscious patients are mistakenly diagnosed as vegetative in roughly a third of all cases, according to two studies. "Thirty to 40 percent of people who are believed to be unconscious actually retain some conscious awareness," Giacino said.

Day 25

One great tension in monitoring a patient's struggle to regain consciousness is the gap between the expertise of doctors, who observe the patient intermittently, and the observations of the family members, who hover nearby for hours, seeing everything without knowing how to interpret what they are seeing. There was always a family member with Dylan. Tracy quit her job to spend nights with him; Steve, a contractor, left work early. At one time or another, three grandparents and some 70 other relatives maintained a round-the-clock vigil.

Day 27

Dylan had been storming for several days. Tracy and her mother sat at his side, while Tracy wiped sweat off his forehead. Then something remarkable happened: Tracy went to wipe his head, and Dylan raised his hand. When he did it a second time, she put the cloth in his hand and said, "Dylan, wipe it yourself." He started to wipe his mouth and nose.

Day 33

During his fifth week, Dylan began to show more signs to his team that he was becoming aware of the outside world. His eyes followed a moving mirror. When a doctor pinched Dylan's nails, he tried to push away his hand. He had passed into the minimally conscious state, instantly increasing his chances of meaningful recovery.

Day 43

How did Dylan's brain make the transition to conscious awareness? Research suggests that consciousness begins to reemerge when the parts of the brain that receive sensory information reestablish contact with the frontal lobes, which interpret and act on the information. Once Dylan moved from the ICU and into a regular room, the Rizzos tuned the TV to programs they knew their son would like, usually a Bruins hockey game or a Celtics basketball game. One evening, the Bruins were playing, and the two goalies got into a fight. Dylan perked up. "He hasn't taken his eyes off the TV," the family reported. "He's moving his mouth, trying to say something."

Day 44

Dylan's doctors performed a second MRI. Remarkably, the scan suggested that some of his damaged wiring had begun to mend. "To our knowledge," the doctors noted later, "this type of reversal has not been previously described with serial neuroimaging or in a case with such a widespread extent of axonal injury." The repair process, referred to as plasticity, is much more robust in a young brain than in an old brain, neurologist Edlow explained. One revelation of recent research is evidence that severe injury can activate mechanisms of neural development that normally deploy during childhood.

Day 45

Dylan was still in and out. Sometimes he seemed to pay attention; other times he seemed lost. In mid-February, the Rizzos brought in his Xbox controller. When they placed it in his hands, he stared at it for a few minutes. Then he started to push the buttons and move the joystick. A nurse handed him a tube of ChapStick. He lifted it to his lips. But the biggest breakthrough, to his family, arose from the spontaneous confluence of medical equipment and juvenile humor. Dylan had been tugging at the plastic tubing that connected to his trachea. The family

gave him a short rubber tube to distract him. At one point, Steve reached for the other end of the tube and blew into it. The noise sounded like a fart. Dylan laughed. To Tracy, this was a glimmer not only of consciousness but of personality: "We were like, Oh my God! Like, he knew what a fart is, right? He's still in there!"

One Friday, physical therapists came in to get Dylan on his feet. Steadied by them, Dylan took a few halting steps toward Steve. When father and son were face-to-face, Dylan reached out, and the two hugged. "Dylan was stroking Dad's back, up and down, and then patted him on the shoulder," the family blogged. "You could hear a tear drop." Emotional responses are another early clue of emerging consciousness, Giacino says.

The following day, Dylan crashed and stormed so badly, there was talk of moving him back into intensive care.

Day 60

At the end of February, Dylan was transferred to Spaulding Rehabilitation Hospital. Still considered minimally conscious, he could sit up in bed with assistance; he could nonverbally answer biographical questions with about 75 percent accuracy; and he could follow one-step commands about 40 percent of the time.

Day 65

Dylan began to stall. He was agitated and restless. He had bouts of "toning"—muscles in his arms and feet would involuntarily clench until the pain became unbearable, which the family realized when doctors attached a speaking valve to his trach tube so Dylan could vocalize. The first thing he did was cry.

Day 45: Taking steps to his mother with the help of two therapists

Day 97

At the request of his parents, Dylan was transferred to the pediatric floor. He began to do better. Rehabilitating a minimally conscious brain is a bit like recapitulating childhood. Dylan relearned basic activities: how to stand up, how to walk, how to put on a shirt. Some days he participated avidly; on others, he had no focus.

COURTESY THE RIZZO FAMILY

Day 1,460: Shopping at a craft beer specialty store

Day 142

The physical therapy nurses stood Dylan in front of a mirror and wrote "Dylan loves the Yankees" and "Bruins stink" with a marker on the glass. Dylan picked up an eraser and wiped away the insults—"very quick," his parents reported, "even for Dylan."

Day 198

Dylan had entered the posttraumatic confusional state. He recognized his dog, but he didn't know the time or year. He could steer his wheelchair outside (wearing a helmet), but he didn't know where he was. An MRI showed his white matter continued to heal, but he remained disoriented.

His parents screened movies that Steve called awful but that Dylan had liked: *Beerfest. Ace Ventura: Pet Detective. Anchorman.* Dylan laughed at the right parts, just as he responded to hockey games when goals were scored. Once, when Dylan appeared to be sleeping, an aunt told his mother a dirty joke. Dylan erupted in laughter.

Day 208

Nurses, patients, doctors, and well-wishers gathered at the reception desk for a send-off party. In a video, Dylan sits in a wheelchair, waving and smiling. His smile has the megawatt quality it had before the accident, but the wave is on a two-second delay, almost slow motion. That day is the first thing he remembers since the day of the accident. "Coming out of it, it was like I was asleep, and I was just back alive," he said later. "The last day at Spaulding, that's when I felt alive."

Before he left Spaulding, he hit another milestone: He said his first word since the accident.

Day 271

Dylan spent two months at another rehab center before returning home. He began to walk with a walker and could climb a few steps, but he struggled with cognitive tasks. A brain scan on day 366 confirmed the extent of his recovery and the permanence of other injuries. In the left frontal lobe, some tissue had atrophied and would never come back. Still, at a fund-raiser in July, he danced.

COURTESY THE RIZZO FAMILY

Day 746

Dylan went rock climbing, working his way up a climbing wall. The Rizzos sent the video to Giacino, who includes the clip when he gives talks about recovery in patients who reached a minimally conscious state within 60 days of their injury. It is a vivid embodiment of his argument for patience. "What this tells us," Giacino said, "is that the story doesn't end at 12 months." Dylan is among a growing number of patients who defy the odds. "We don't know how many exceptions to the rule there are," Giacino said. "So I don't believe in the rule anymore."

Day 1,541

"It's impeccable," Dylan was saying. We were sitting in the Rizzo home, and he was describing his bedroom. His mother talked about how her son had changed. "He's still the same person," Tracy said. "Just neater. He was a slob before the accident." Dylan smiled.

The most conspicuous reminder of his injury was a slight indentation in his left temple and two shiny lanes of hairless skin that run back from the crown of his forehead. Now 23, he is functionally independent. He volunteers as an assistant track coach at his old high school, helps his father on construction projects, and hopes to attend community college. He continues to need speech and cognitive therapy. "Dylan still has memory issues, organization issues, and time-management issues," Tracy said. He does not remember a single thing about the six months prior to the accident or the seven months after.

Not only is he functional, but he's functional in a red-blooded 20-something way. When we went out for lunch, Dylan ordered a sampler of microbrews ("His neurologist says he can have one or two beers," Tracy said). Back at home, I asked to see his room. Dylan effortlessly climbed the stairs and led me there. Inside was a flat-screen TV, and a lacrosse stick was propped in one corner. The bed was made, and Steve opened the closet to reveal T-shirts, each hung and color-sorted. "There was nothing in here before the accident. Everything was on the floor," he said, then laughed. "Reprogramming the brain works." R

EXTRA CHEESE

I turned the welcome mat around this morning and went outside for the first time in eight years.

@MANDA_LIKE_WINE (AMANDA)

The Disney megahit was almost a failure, until a series of creative brainstorms saved the day

Unfreezing Frozen

BY CHARLES DUHIGG FROM THE BOOK *SMARTER FASTER BETTER*

In 2014, the Disney movie *Frozen* became the top-grossing animated movie of all time. It won the Academy Award for Best Animated Feature Film, and "Let It Go" won the Oscar for Best Original Song. The film contained all the elements of a traditional Disney plot—princesses and ball gowns, a handsome prince, a wisecracking sidekick, and a stream of upbeat songs. But throughout, these elements had been disturbed, just enough, to let something new and different emerge. We assume such original storytelling comes from the innate genius of its creators, but here's how *Frozen* really got its fairy-tale ending.

PHOTOGRAPH BY CLAIRE BENOIST

It's 2012, and the screening-room audience is all Disney employees. As the lights dim, two sisters appear on the screen against an icy landscape. Anna, the younger character, quickly establishes herself as bossy and uptight, obsessed with her upcoming wedding and her coronation as queen.

Elsa, her older sister, is jealous, evil—and cursed. Everything she touches turns to ice. She was passed over for the throne because of this power, and now she wants revenge. She plots with a snarky snowman named Olaf to claim the crown for herself, and she floods the village with vicious snow creatures. The monsters, however, are soon out of her control. They begin to threaten everyone, including Elsa herself. The only way to survive, Anna and Elsa realize, is for them to join forces. Through cooperation, they defeat the creatures, and everyone lives happily ever after.

The name of the movie is *Frozen,* and it is scheduled to be released in just 18 months.

Often, when a movie screening ends at Disney, people cheer or shout. This time, there are no cheers. As everyone files out, it is very, very quiet.

After the screening, the director, Chris Buck, and about a dozen other filmmakers gather to discuss what they saw. This is a meeting of the studio's "story trust," a group responsible for providing feedback on films as they go through production.

Disney's chief creative officer, John Lasseter, begins. "You've got some great scenes here," he says. "The dialogue between the sisters was witty. The snow monsters were terrifying. The film had a good, fast pace." And then he begins listing the film's flaws. After detailing a dozen problems, he says, "There's no character to root for. Anna's too uptight, and Elsa's too evil."

Others chime in: There were logical holes in the plot. There were too many characters. The plot twists were foreshadowed way too much.

Buck isn't surprised. His team had sensed the movie wasn't working for months. The film's screenwriter had restructured the script repeatedly. The songwriters were exhausted from writing and scrapping song after song.

"There's a lot of really good material here," Lasseter tells Buck, "but you need to find the movie's core." Lasseter rises from his seat. "It would be great if it happened soon."

From the beginning, the *Frozen* team members had known they couldn't simply retell an old fairy tale. "It couldn't just be that at the end, a prince gives someone a kiss, and that's the definition of true love," Buck told me. They wanted the film to say something bigger, about how girls don't need to be saved

PROP STYLIST: MEGUMI EMOTO

by Prince Charming, about how sisters can save themselves. They wanted to turn the standard princess formula on its head.

"It was a really big ambition," said Jennifer Lee, who joined the team as a writer after working on Disney's *Wreck-It Ralph*. "And it was particularly hard because every movie needs tension, but if the tension in *Frozen* is between the sisters, how do you make them both likable? The movie needed to connect emotionally."

"Creativity is just problem solving," Disney Animation Studios (and former Pixar) leader Ed Catmull has said, and so each morning, Buck and his team of writers and artists assembled with their coffee cups and to-do lists. Songwriters Bobby Lopez and Kristen Anderson-Lopez would videoconference in from their home in Brooklyn.

"Instead of focusing on the things that aren't working," Peter Del Vecho, the producer, said the morning after, "I want you to envision your biggest hopes. If we could do anything, what would you want to see on the screen?"

People started describing what excited them about *Frozen*. Some were drawn in because it offered a chance to upend the way girls are portrayed in films. Others were inspired by the idea of two sisters coming together.

"WE CAN ALWAYS FIND THE RIGHT STORY WHEN WE START ASKING OURSELVES WHAT FEELS TRUE."

"My sister and I fought a lot as kids," Lee told the room. Then, when Lee was in her 20s, her boyfriend drowned in a boating accident. Her sister was there at a time of need. "There's this moment when you start to see your sibling as a person instead of a reflection of yourself," Lee said. "I think that's what has been bothering me the most about this script. Siblings don't grow apart because one is good and one is bad. They grow apart because they're both messes, and then they come together when they realize they need each other."

Over the next month, the *Frozen* team focused on the relationship between the movie's sisters. In particular, the filmmakers drew on their own experiences. "We can always find the right story when we start asking ourselves what feels true," Del Vecho told me. "The thing that holds us back is when we forget to use our lives, what's inside our heads, as raw material."

A few months later, songwriters Lopez and Anderson-Lopez were walking through a park in Brooklyn, and Anderson-Lopez asked, "What would it feel like if you were Elsa? What if you tried to be good your entire life and it didn't matter, because people constantly judged you?"

Anderson-Lopez knew this feeling

as a busy working parent. She felt other parents' looks when she let their daughters eat ice cream instead of healthy snacks. She'd felt glances when she and Lopez let their girls watch an iPad in a restaurant because they wanted a moment of peace. It wasn't her fault that she wanted to be a good mom, wife, and songwriter and that things like home-packed snacks and sparkling dinner conversation sometimes fell by the wayside.

She didn't think she needed to apologize for not being perfect. And she didn't think Elsa should have to apologize either. "Elsa is being punished for being herself," Anderson-Lopez said to Lopez. "The only way out is for her to stop caring, to let it all go."

They riffed, singing snippets of lyrics. What if they wrote a song that started with a fairy-tale opening? Then Elsa could talk about the pressures of being a good girl.

"She could change into a woman," Anderson-Lopez said. "That's what growing up is, letting go of the things you shouldn't have to care about."

She began singing, trying out lyrics for Elsa to convey that she doesn't care what anyone thinks anymore.

Let it go, let it go.

That perfect girl is gone.

"I think you just figured out the chorus," said Lopez.

Back in their apartment, they recorded a rough draft. The next day, the *Frozen* team put "Let It Go" on

THE TRUTH ABOUT CREATIVE GENIUS

Creativity is a process, productivity experts say—something that can be broken down by anyone willing to embrace upheaval and look at things differently. Three guiding steps to follow are:

1. Trust your experiences. Be sensitive to how things make you think and feel. That's how we distinguish clichés from true insights.

2. Recognize that the stress you feel as you try to create isn't a sign that everything is falling apart. Rather, it's a condition that helps make you flexible enough to see old ideas in new ways.

3. Maintain some distance from what you create. Without self-criticism, one idea can quickly crowd out competitors. But you can regain that distance by forcing yourself to critique what you've already done, by making yourself look at it from a different perspective, or by changing the power dynamics in the room.

WALT DISNEY PICTURES/EVERETT COLLECTION

the sound system at the Disney headquarters.

"Finally, it felt like we had broken through," Lee said to me later. "We could see the movie. We needed someone to show us ourselves in the characters, to make them familiar. 'Let It Go' made Elsa feel like one of us."

> "*FROZEN* ISN'T A MOVIE ABOUT GOOD AND EVIL, BECAUSE THAT ISN'T REAL ... IT'S A MOVIE ABOUT LOVE AND FEAR."

Seven months later, the *Frozen* team had the first two thirds of the film figured out. They knew how to make Anna and Elsa likable while driving them apart to create the tension the film needed. They had transformed Olaf into a lovable sidekick. Everything was falling into place.

Except they had no idea how to end the film. The group was so comfortable with its vision of the sisters that it had lost the ability to see other paths.

"We had to shake things up," said Catmull, the studio's president. "So we made Jenn Lee a second director."

Lee was already the film's writer. Naming her as a second director, with equal authority to Buck, didn't add any new voices to meetings. But sometimes the best way to spark creativity is by disturbing things just enough to let some light through.

"The change was subtle but at the same time very real," Lee told me. "I felt like I had to listen even more closely to what everyone was saying because that was my job now." She understood that people were asking for clarity, for every choice to reflect a core idea.

A few months after her promotion, Lee received an e-mail from Anderson-Lopez. "Yesterday I went to therapy," the songwriter wrote. "I was discussing dynamics and politics and power and who do you listen to and how do [you] start," she typed. "Then my therapist asked me, 'Why do you do [what you do]?'

"It all really comes down to the fact that I have things I need to share about the human experience," Anderson-Lopez wrote to Lee. "I want to take what I have learned or felt and help people by sharing it. What is it about *Frozen* that you, Bobby, and I *have* to say? For me, it has something to do with not getting frozen in roles that are dictated by circumstances beyond our control."

Lee herself was an example of this. She had come to Disney as a new film-school graduate with a young daughter, a fresh divorce, and student loans, and now she was the first female director in Disney's history. Anderson-Lopez and Lopez had fought to build the careers they wanted, even when everyone said it was ridiculous that they could support themselves by writing songs.

Now here they were, with the lives they'd wished for. For *Frozen*'s ending, Anderson-Lopez said, they had to find a way to share that sense of possibility with the audience.

"What is it for you?" Anderson-Lopez typed.

Lee replied 23 minutes later. All the members of the team had their own ideas. However, *Frozen* could have only one ending. Someone had to make a choice. And the right decision, Lee wrote, was that "fear destroys us; love heals us. Anna's journey should be about learning what love is; it's that simple. Love is a greater force than fear. Go with love."

Later that month, Lee sat down with John Lasseter. "We need clarity," she told him. "The core of this movie isn't about good and evil, because that doesn't happen in real life. And this movie isn't about love versus hate. That's not why sisters grow apart.

"This is a movie about love and fear. Anna is all about love, and Elsa is all about fear. Anna has been abandoned, so she throws herself into the arms of Prince Charming because she doesn't know the difference between real love and infatuation. She has to learn that love is about sacrifice. And Elsa has to learn that you can't be afraid of who you are; you can't run away from your own powers. You have to embrace your strengths. That's what we need to do with the ending—show that love is stronger than fear."

"Say it again," Lasseter told her.

Lee described her theory of love versus fear again, explaining how Olaf, the snowman, embodies innocent love, while Prince Hans demonstrates that love without sacrifice isn't really love at all; it's narcissism.

"Say it again," Lasseter said.

Lee said it again.

"Now go tell the team," said Lasseter.

In November 2013, *Frozen* was released. The prince wasn't charming; in fact, he was the villain. The princesses weren't helpless; instead, they saved each other. Finally, true love came from siblings learning to embrace their own strengths. R

* * *

HIDDEN FEES

In 2012, a Los Angeles restaurant owner discovered a neon light on his property that had been walled over but never disconnected. After 77 years of uninterrupted use, it had amassed $17,000 in electric bills.

Source: gizmodo.com

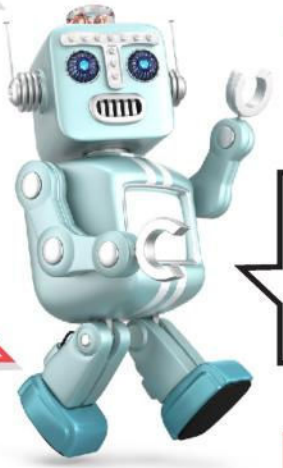
Laugh Lines

SMART BOMBS

Somebody ought to cross ballpoint pens with coat hangers so that the pens will multiply instead of disappearing.
ANONYMOUS

Now that robots move their limbs smoothly and with grace, I wonder how we're supposed to imitate them on the dance floor.
NEIL DEGRASSE TYSON

When you sit with a nice girl for two hours, you think it's only a minute, but when you sit on a hot stove for a minute, you think it's two hours. That's relativity.
ALBERT EINSTEIN



Scientists tell us that the fastest animal on Earth, with a top speed of 120 feet per second, is a cow that has been dropped out of a helicopter.
DAVE BARRY

A computer once beat me at chess, but it was no match for me at kickboxing.
EMO PHILIPS

College graduates look awfully happy for people who'll never have an entire summer off again.
@GOLDENGATEBLOND (SHAUNA)

Have my doubts about this "smart water," considering how easily it's captured and bottled.
@HMITTELMARK (HOWARD MITTELMARK)

CHESKY_W/GETTY IMAGES

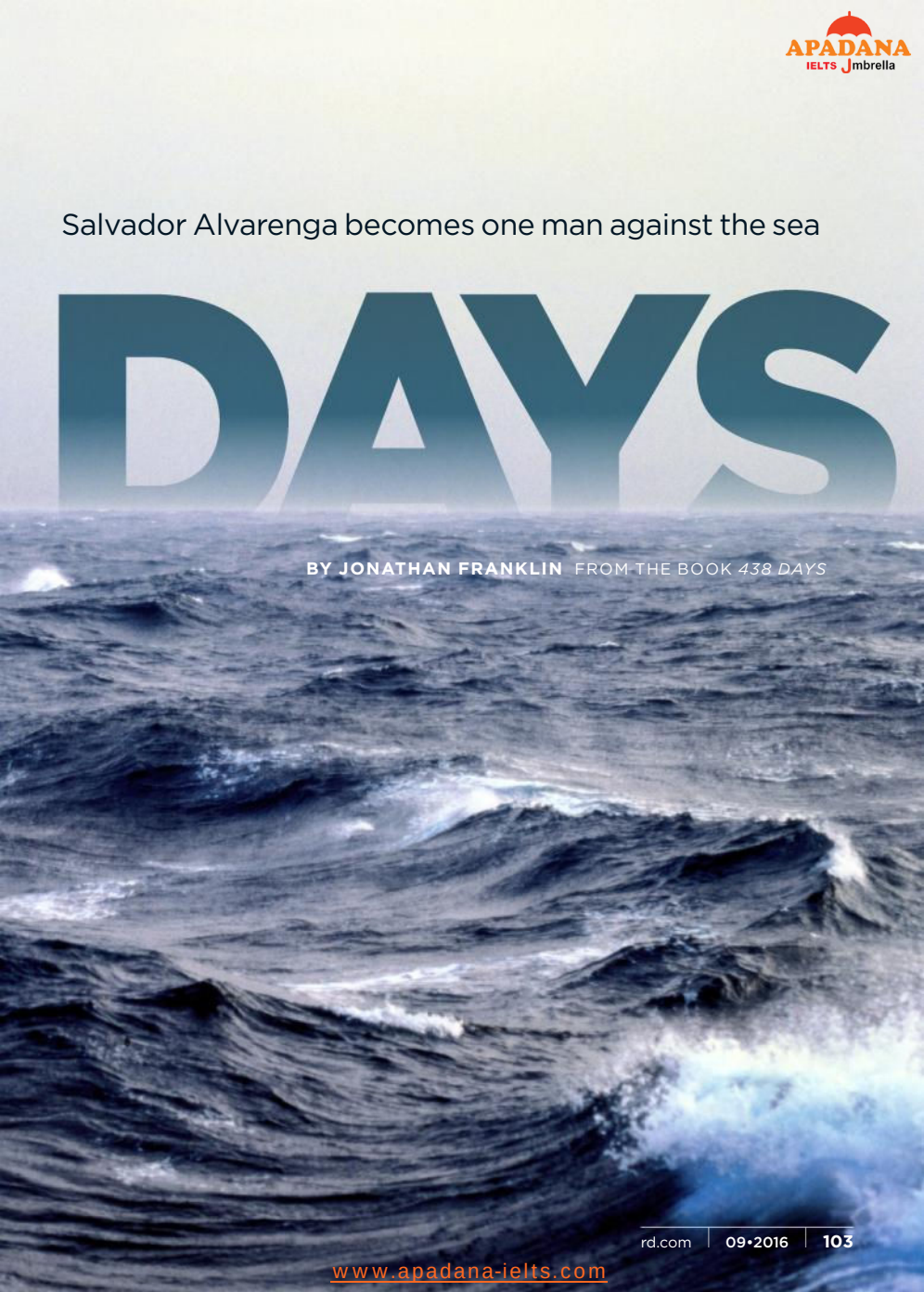
A fishing trip turns into a terrifying test of survival after

438

Salvador Alvarenga becomes one man against the sea

438 DAYS

BY JONATHAN FRANKLIN FROM THE BOOK *438 DAYS*



Salvador Alvarenga loved the simple lines of the fiberglass craft. No cabin or roof. Just a 25-foot-long narrow, canoe-shaped boat designed to carve up the waves like a huge surfboard, agile and fast, with the engine mounted on the back.

Alvarenga was a 37-year-old Salvadoran fisherman living and working in Mexico. A heavy drinker quick to pick up the tab, he had no family tying him down—his 13-year-old daughter lived with her mother in El Salvador. On this day, November 18, 2012, Alvarenga planned to head out into the Pacific at 10 a.m. and work straight through until 4 p.m. the next day. His crewman was Ezequiel Córdoba, a 22-year-old rookie. Loading the boat involved over a thousand pounds of equipment, including a five-foot-long and four-foot-high icebox that would soon be filled with tuna, shark, and mahimahi.

Alvarenga had been warned that a storm was coming, but there was little that would keep him from embarking. In one day, he'd make enough money to survive for a full week.

As he blasted through the waves some 75 miles from land, Alvarenga let out his two-mile-long fishing line. The storm was gaining strength on land but had yet to reach the men far offshore. That changed around 1 a.m. Waves rocked the small boat, which began to tilt sideways like an amusement park ride. "Get us out of here!" Córdoba screamed to Alvarenga. "Let's go back!"

With the winds and waves kicking up, the boat began to fill with water. Alvarenga had Córdoba bail, while he pulled in the fishing line. But the crashing waves filled their boat with water faster than they could empty it, forcing Alvarenga to make a radical decision. He cut the line, dumping thousands of dollars' worth of equipment and fish into the sea. He then pointed the boat toward his home port, Chocohuital, six hours away. Then Alvarenga called his boss, Willie, to report his position.

With the coming dawn, Alvarenga spotted the rise of the mountains on the horizon. He was figuring out a route through the vicious shoreline surf when the motor coughed. "I couldn't believe it," says Alvarenga. "We were 15 miles off the coast, and the motor died."

He yanked on the cord of the outboard motor. Then he yanked again and again until the cord snapped.

High waves raised and dropped the

PREVIOUS SPREAD: ARNULF HUSMO/GETTY IMAGES

Salvador Alvarenga's home for over a year, which he nicknamed the Titanic

STR/AFP/GETTY IMAGES

boat, sending the men crashing into the sides. "Willie, Willie!" Alvarenga yelled into the radio. "If you are coming to get me, come now!"

"We're coming!" Willie shouted back. Shortly after that, the radio died. The wind continued to rip straight offshore, driving the men farther out to sea.

It was five days before the winds finally eased. Alvarenga and Córdoba were now around 280 miles offshore. The only likely rescue was by being spotted by another boat. But that was difficult, as the craft sat low in the water. From more than a half mile away, they were virtually invisible. "We are going to die," moaned Córdoba.

"Stop it. Don't think that way," said Alvarenga. "A rescue mission will find us." But the men had no flare gun and no way to call for help. "That's when I knew. We were very far from the coast," says Alvarenga. "A place where no fishermen go."

The sun during the day made it feel as if they were being cooked alive. During the cold nights, they would climb inside the icebox and huddle for warmth. Thirst had become an obsession, as had starvation. "I was so hungry that I was eating my own fingernails," says Alvarenga.

When the rain finally came, four days later, the men stripped off their clothes and showered in a glorious deluge of freshwater, laughing and lapping it up. By the time it stopped, they had collected five gallons of freshwater in plastic bottles they'd found floating in the ocean. It was enough for at least a week if rations were kept to a minimum.

Roughly 11 days after losing the engine and subsisting on small, bony triggerfish he caught by hand, Alvarenga heard a thunk in the night. It was a turtle. He eagerly hauled it aboard. They could eat the turtle and drink the merlot-colored blood to quench their thirst.

Alvarenga now spent entire days hunting for turtles. Córdoba, however, was disgusted by the congealed blood and ate sparingly of the meat. Alvarenga seduced his mate into eating by presenting the turtle steaks as

a delicacy. He cut the meat into thin strips, dripped on salt water for flavoring, and toasted them in the sun on the outboard motor housing. Using the vertebrae of triggerfish as toothpicks, he served his meal on a turtle shell.

Turtle meat staved off the worst effects of starvation, but the two men were living off survival rations, which drove their fertile imaginations to run wild.

"Oranges ... Bring me oranges," a delusional Córdoba pleaded.

"OK, I am going to the store. I will see if it is open," Alvarenga answered, striding the length of the boat. After five minutes, he strode back. "The store is closed, but they open in an hour, and they have fresh tortillas."

To his surprise, it worked. Córdoba stopped moaning and fell asleep.

After a couple of months adrift, Alvarenga had settled into a routine. By 5 a.m., he was awake and sitting on the deck. "It was joyous because the sun rose up in the east, and I knew somewhere back there was land," he says. "That was where my world lay." He then hauled in the traps, curious to see if any fish had been caught overnight. Regardless of the haul, he always waited for Córdoba to awake before dividing the meager catch. Naps followed, and then for most of the day, they sat entombed in the icebox.

Despite being strangers when they set out, Alvarenga and Córdoba had formed a friendship. Like adolescents on an adventure, the two men would lie down at night, faces skyward, and doodle with the stars. Night after night, they tried to outdo each other as they invented constellations, each man trying to create a more fantastic drawing. They even fantasized that the planes they tracked across the heavens had been sent to rescue them. At other times, Córdoba sang proud renditions of his favorite hymns, often from inside the icebox, where the acoustics were better. "I loved to listen to him sing," says Alvarenga.

On the evening they estimated was Christmas Eve, the men chatted as they prepared their holiday feast. By now, Alvarenga had expanded their menu by hunting the seabirds that perched on their boat. Suddenly, Córdoba groaned: "My stomach!" Bubbles and liquid dribbled from his mouth, and he looked as if he would be sick. The men dissected the bird Córdoba had eaten part of earlier. Inside the stomach was a poisonous snake. Though Córdoba recovered, in the realm of psychological terror, the venom had taken possession of him. He retched at the thought

January 30, 2014: Alvarenga reaches Ebon Atoll, of the Marshall Islands, after drifting for 6,655 miles.

of eating another raw seabird and withdrew from the world of food.

Over the next two months, as Córdoba withered and shriveled, his arms looked like sticks, and his thighs were reduced to the size of his forearm. He imagined it was better to die in the ocean than starve to death.

"Goodbye, Chancha," he said, using Alvarenga's nickname, then prepared to throw himself over the rail and into the shark-infested waters.

Alvarenga overpowered Córdoba. He dragged him along the floor, stuffed him into the icebox, and sat on the lid. Córdoba bashed and thrashed. "Stop thinking about killing yourself," Alvarenga yelled.

When Córdoba calmed, Alvarenga slid off the icebox and crawled inside. "We have to fight," he told his friend. "To tell our story."

But the depression had sunk in. A few days later, Córdoba announced, "I am dying." Alvarenga put freshwater to Córdoba's mouth, but his mate did not swallow.

"Don't die," said Alvarenga, panicked. "Don't leave me alone!"

Moments later, Córdoba was dead. "I propped him on the bench to keep him out of the water," says Alvarenga.

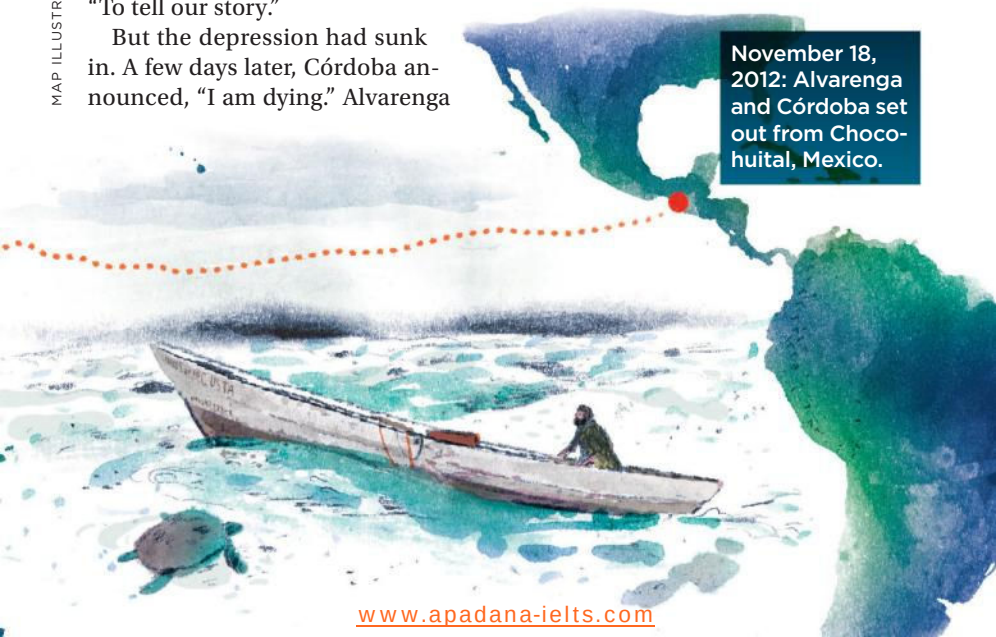
The next morning, Alvarenga climbed out of the icebox and stared at Córdoba, sitting on the bench like a sunbather. "How do you feel?" Alvarenga asked the corpse. "How was your sleep?"

"I slept good. Have you had breakfast?" Alvarenga said, as if he were Córdoba speaking from the afterlife.

"Yes, I already ate."

"Me too. I ate in the Kingdom of Heaven."

Alvarenga had decided the easiest way to deal with losing his companion



MAP ILLUSTRATED BY PETER OUMANSKI

was to simply pretend he hadn't died.

"How is death? Is it painful?"

"Death is beautiful. I am waiting for you."

"I don't want to go," retorted Alvarenga. "I am not headed that way."

Six days after Córdoba died, Alvarenga slid his friend into the water. Alvarenga was alone, a tiny speck in the vast Pacific. "I climbed inside the icebox and cried," says Alvarenga.

After the rescue, Alvarenga's legs were so atrophied, he could barely walk.

With Córdoba gone, Alvarenga concentrated on keeping himself occupied. Hunting distracted him from his daily isolation, as did the fantasy of being rescued. And because his psyche required a change of scenery, he designed a shark-detection system that permitted him to take brief swims. First, he tossed a half-dozen birds' feet into the water. If no sharks appeared, he lowered himself in and went for a refreshing, albeit nerve-racking, swim. When the smaller fish that lived under his boat were relaxed, he was relaxed, and when they panicked, he scampered back aboard. "I would imagine I was at the beach with my friends, going for a swim," he says. "Getting off the boat allowed me to relax, even if it was for five minutes."

But more and more, Alvarenga found strength from the long-abandoned relationship with Fatima, his now 14-year-old daughter whom he hadn't seen in years. "I started thinking about her for entire days. I dreamed that she was screaming, 'Papi!' and that made me so happy."

Alvarenga imagined his life if he could ever make it home. He would be a family man with a clutch of children and a field full of animals. He begged to the heavens for a final chance, an opportunity to salvage the relationship with Fatima.

The container vessel that appeared on the horizon was heading directly toward him. It advanced until it was so close, Alvarenga feared it might slice his boat in half. Fifty yards astern, the ship crossed his path. "Help! Here! Here!" Alvarenga screamed at the three figures standing near the stern, fishing rods in hand. The men waved. He had been spotted.

But the men didn't move. No one ran for help. And not only was the giant ship not slowing, but the casual waving continued even as they pulled away.

"Do you think I'm out here on a day trip?" Alvarenga screamed.

The near miss devastated Alvarenga. His mind began to weaken, and his reflexes slowed. His desire to eat was succumbing to a more basic craving: to close his eyes. Alvarenga remembered Córdoba's bored stare and lack

HILARY HOSIA/AFP/GETTY IMAGES

of interest in food. That same lethargy now contaminated his mind.

In 11 months at sea, Alvarenga had drifted 5,000 miles at an average speed of less than one mile an hour. His clothes were shredded. Only a sweatshirt that had belonged to Córdoba protected him from the sun. From the waist down, he was naked except for a pair of ratty underwear and the random floating sneaker snatched from the sea. Atop his head, a burled mane of copper-colored hair rose in coils. From his face, a thick beard exploded outward.

Alvarenga questioned if his journey was a life lesson sent by God. By all reasonable standards, he should have been dead months earlier. Was he being allowed to live for a reason? Had he been chosen to bring a message of hope to those considering suicide? "What could be worse than being alone at sea? That's what I could tell someone thinking about suicide. What further suffering could there be than this?" he says.

On January 30, 2014, coconuts bobbed in the water, and the sky was filled with shorebirds. A cold rain limited visibility. Alvarenga stood on the deck, staring out. A tiny tropical island was emerging from the rainy mist. It looked wild, without roads, cars, or homes.

His first urge was to dive overboard and swim to shore. But leery of sharks, he waited. It took him half a day to reach land. When he was ten yards from shore, he dived off the deck and let a wave carry him in. As the wave pulled away, Alvarenga was left face-down on the beach. "I held a handful of sand in my hand like it was a treasure," he said.

Alvarenga was discovered by the lone couple who inhabited the island. He had washed ashore on the Ebon Atoll, the southern tip of the Marshall Islands, one of the most remote spots on Earth. Had Alvarenga missed Ebon, the next likely stop was the Philippines, 3,000 miles away.

After 11 days, Alvarenga's health had stabilized enough for him to travel home to El Salvador. When Alvarenga saw Fatima, he grabbed his daughter. "I love you," he said, sobbing. Fatima hugged him even harder. "I know I didn't raise you and that all those years are lost. But Dad is here to give you advice, to help you learn right from wrong."

Alvarenga had completed one of the most remarkable voyages in the history of seafaring. He didn't navigate, sail, row, or paddle—he drifted. Unable to alter course, he had been forced to build a world of survival. He was extremely unlucky and terribly fortunate at the same time.

And now he was home. R

These pioneers prove that extraordinary sensitivity has brilliant implications

Superheroes OF THE Senses

The Cops Who Never Forget a Face

BY KATRIN BENNHOLD FROM THE *NEW YORK TIMES*

On a sticky August afternoon in 2011, as rioters looted and fires burned in the streets outside, police officers gathered in a room in North London. Projected on the wall was the blurry silhouette of a man with a black woolen hat pulled deep over his forehead and a red bandanna covering all but his eyes. Security cameras had tracked the man setting fire to cars, stealing from shops, beating up passersby, and even hurling bombs. But he was always masked. "We need to identify this fellow," the sergeant said. "He's one of the worst." At that moment, Gary Collins, a constable from the local gang unit, walked in. He took one look and said, "That's Stephen Prince."

Friends call Collins Rain Man, Yoda, or simply the Oracle. But to Scotland Yard, London's metropolitan police force, he is known as a super recognizer. He has a special gift of facial recall powers that enables him to match even low-quality and partial imagery to a face he has seen before, on the street or in a database, possibly years

PHOTOGRAPHS BY DAN WINTERS

earlier. The last time he had come face-to-face with Prince was during a fleeting encounter in 2005.

Soft-spoken, Collins carries a baton and pepper spray but no gun. His weapon is his memory. Facial-recognition software identified one suspect of the 4,000 captured by security cameras during the London riots; Collins identified 180. "Computers are no match for the super recognizers," said Detective Chief Inspector Mick Neville, head of the Central Forensic Image Team at Scotland Yard.

With its estimated one million security cameras, London is pioneering a new area of detection, one that could be cheaper than DNA analysis and fingerprinting and relies on human superpowers. Scotland Yard's team of 152 super recognizers is made up of people who scored at the top end of a facial-recognition test devised at Harvard in 2009. It's estimated that roughly 1 or 2 percent of us are super recognizers, and Collins has placed in the top 1 percent of that 1 percent.

Surprisingly, super recognizers' facial recall is rarely matched by photographic memory in other parts of life—Collins, 48, cannot remember a shopping list. As a child, he was oblivious to his ability. "I always recognized people, but as a kid you don't know you have a gift; you just think everybody is like you." It was only when he joined the police in 1995 that he became aware of his talent. The rookie on the beat, he spent hours looking at the worn Polaroid prints of neighborhood villains on the wall. Then, out on patrol for the first time with a senior officer, he'd reel off the names of the people they came across. "How would you know, new boy?" his partner asked him.

An officer sitting with Collins in their office likens his mind to a Rolodex: "You show him a photo; 30 seconds later, the name pops up. And he's always on the mark." Once, in the police van after a raid, a gang leader who had been arrested asked, "Who ID'd me? Who is this Gary Collins?" When Collins put up his hand, the gang leader said, "Man, everyone in prison is talking about you." They still see each other on the street now and again. "He'll test me on his gang mates: 'What's his name?' he'll ask," Collins said. "When I tell them, they cheer and give me a high five."

Collins lives outside London to avoid running into wanted faces from his beat. (Last year, he cut short an outing to the mall with his sons when he recognized a gaggle of gang members while buying sneakers.) He reckons that his eldest son, 11 years old and soccer obsessed, could be a super recognizer. "He knows football players in countries and teams I haven't even heard of," Collins said. "Who knows? He might have the gift."

The Blind Who Can "See"

BY JOE MOZINGO FROM THE *LOS ANGELES TIMES*

The space before the blind man was a riddle he needed to solve. Was he facing a house, a car, a hedge, a fence, a tree, or open space?

Ryo Hirosawa pushed the tip of his tongue hard to his palate and made a sharp click. He tried to focus on the form and timing of the click's echo as it came back to his ears, as fast as a blink. But he couldn't quite decipher the shape of the sound. Was it scattered, as if it'd hit foliage? Was it a clean pulse ricocheting off a stucco wall? Or was it hitting multiple objects and coming back in fragments, milliseconds apart?

"Are there solid objects in here, or are there sparse objects in here?" asked his instructor, Brian Bushway, who is also blind.

Hirosawa clicked; edges in the acoustic landscape slowly emerged. "There is a tree, I think, here, which is tall, and I see a house behind," he said.

They stepped into the yard to find out whether he was right. Bushway, 33, tapped his cane against the tree trunk and reached up to grab a branch and shake the leaves. "Sparse objects," he said. "Feel it; know what it sounds like."

He knocked the wood panel of a wall. "A house," Bushway said. "Awesome, very good."

This quiet cul-de-sac in Long Beach, California, is at the center of an unorthodox movement to teach blind people to navigate using tongue clicks for orientation. Blind pioneer Daniel Kish, 50, founded World Access for the Blind in 2000 and runs it out of his home here. His students learn to better perceive the space before them, sending out sonar, like dolphins or bats, to get an acoustic read on their surroundings—a human form of echolocation.

Kish has worked with numerous scientists to study how the brain accomplishes this. A brain-imaging study on Kish and Bushway by researchers at the University of Western Ontario found that when they were echolocating, they were processing acoustic information in the spatial-visual part of the brain, not the part normally associated with hearing.

Kish had retinal cancer when he was born and lost both eyes soon after his first birthday. He unconsciously began making clicking noises with his tongue to navigate, as blind children often do.

But unlike many parents who worried their children might be ostracized, his mother and father didn't discourage him from clicking, and they let him roam the neighborhood like any other 1970s kid. He rode bikes, climbed trees, and delivered his mom's Avon catalogs to neighbors. He didn't understand

how the clicking was helping him until he was 11, when a friend pointed out that he was doing what bats do.

"I hadn't thought about it," he said. "I was just a squirrelly kid who liked to be active."

Bushway, a Kish acolyte and now a World of Access instructor, is pure Southern California: casual, at home in shorts, enjoys a Mexican beer at lunch. He lost his eyesight from optic nerve atrophy in the eighth grade. But walking through school, he could still "see" columns in the hallway, even count them. He was baffled. When he met Kish in 1996, he told him about this phenomenon. Kish concluded his brain was forming a spatial image from the ambient sound reflecting off and sluicing through the columns.

"I was imaging acoustically," Bushway said. "The brain creates images whether you send it patterns of light or patterns of sound."

Kish worked with him to process those sounds but also taught him to use the click when the ambient sound didn't offer enough information. Bushway was inspired by Kish's breaking through barriers. "Wow, this guy lives his life independently," Bushway recalled thinking. "He does all these fun activities. He could ride a bike. He likes walking and exploring neighborhoods and playing laser tag."

Kish showed Bushway how to skateboard, using a long cane to read the road surface and curbs and clicking to spot parked cars, intersections, and turns. With the help of another instructor, Andy Griffin, who could see, they started mountain ➳

A PAIR OF MEDICAL MARVELS

The Woman Who Can Smell Parkinson's

One woman's keen nose may lead doctors to diagnose a common disease. In the late 1980s, Joy Milne of Perth, Scotland, noticed a shift in the natural scent of her husband, Les. Les was diagnosed with Parkinson's disease in 1995, and when Joy attended meetings for the nonprofit Parkinson's UK, she realized other Parkinson's patients had the same scent as Les did. She mentioned this to a scientist, who tested her by giving her 12 T-shirts to smell: Six had been worn for a day by people with Parkinson's; six by people without the condition. She correctly ID'd 11 but disagreed with researchers about the 12th. She said it was from a Parkinson's patient; they said it wasn't. To their shock, the person received a diagnosis eight months later. Scientists are now using information gleaned from Joy to try to pinpoint the biomarkers behind the scent changes. This could enable them to devise a test for Parkinson's, which is currently identified through observation. "My husband suffered from the disease for 21 years ... but he had it many years before that," Joy told *Scientific American* (Les passed away in 2015). "I would like to see that people don't suffer the same way he [did]."

The Doctor Who Can Feel Your Pain

For most people, watching a horror movie means a chance to enjoy vicarious thrills. But for neurologist Joel Salinas, MD, the experience can seem all too real. Dr. Salinas, of Boston, has a condition called mirror-touch synesthesia. If he sees a person being hugged, punched, or pinched, for instance, he feels nearly the same physical sensations. When he went to see *The Last Exorcism* and the neck of one of the characters was broken, he suffered a flash of intense, near-suffocating pain. Dr. Salinas has had this ability his whole life, but he learned the name for his condition—shared by less than 2 percent of the population—only after he was in medical school. He believes it makes him a better physician, since he's "able to vividly and involuntarily put myself in the shoes of my patients," he said in a forum on reddit.com. But on the job, he's also constantly walking the line between tuning in to a patient's discomfort or distress—when Dr. Salinas performs a spinal tap on a patient, for example, he can feel the needle entering his own back—and being overwhelmed by these feelings. He has developed coping strategies, like focusing his attention on his toes. While it may sound exhausting, Dr. Salinas has little interest in unplugging from his abilities. "Anything else would likely feel abnormal," he said.

biking trails and fire roads. Griffin would lead, with zip ties around his spokes to send out a blizzard of clicks. Kish and Bushway would follow, making their own clicks to locate trees and boulders. In this sonic caravan, they could charge over roots, ruts, and rocks as speedily as most bikers—with a few more scrapes to show.

The National Federation of the Blind is neutral on Kish's work: Spokesman Chris Danielson said many blind people tap their canes for a similar effect. Kish says the click is more effective because it is directional and doesn't change with the surface of the ground or the angle of the cane.

In Long Beach, working with Bushway, Hirosawa was struggling to catch the fast-fleeting echo. If he stood five feet from a wall, the echo followed his click in less than 1/100 of a second. Bushway knows it's difficult. "The hierarchy is: Visual information is the loudest, then tactile information, then acoustic information," he explained. "So we're asking the brain to really start paying attention to really subtle stimuli in the environment."

Hirosawa had traveled here from Japan. It was his second trip. At home, he said, his parents locked him indoors because they were concerned for his safety. He sneaked out when he could, but the main path into town follows a river, and he fell in several times.

He and Bushway walked and crossed a busier street and turned back, aiming their clicks to the corner. The echo was sharp, almost metallic. "There is a house," Hirosawa said. "The surface is really smooth."

Bushway told him to take note of the unique echo so when he was walking back, he'd know to turn down that lane to reach Kish's bungalow. "That's a great acoustic landmark there."

Hirosawa kept clicking, taking in the distinctiveness of the sound. The next time he left his parents' house, he'd listen for similar spots. And he'd have sonic bread crumbs to lead him back home. R

* * *

WHAT'S IN A BRAND NAME?

Adi and Rudi Dassler formed Dassler Bros. Shoes in Germany in 1925. After World War II, Rudi broke off to form his own shoe company called Puma; Adi Dassler formed a competing company named after himself: Adidas.

Source: *RD* India

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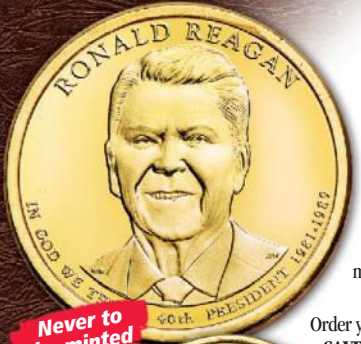

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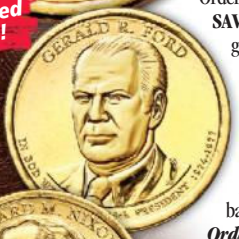

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WHO ? KNEW

13 Things Genius Scientists* Wish You Knew About Cancer

BY MICHELLE CROUCH

1 New treatments are saving lives. The cancer death rate has declined 23 percent since its peak in 1991. Right now, America's biopharmaceutical companies are working on more than 800 cancer medicines. "If you walk the corridors of any hospital studying cancer today, the excitement is palpable," says Daniel Haber, MD, PhD, the director of Massachusetts General Hospital Cancer Center and a professor of oncology at Harvard Medical School in Boston.

2 Please ask for genetic screening. "One of my early ovarian cancer patients told me her mom and grandma had both died of ovarian cancer, yet her doctor had never said, 'Have you considered genetic testing?'" recalls Elizabeth Swisher, MD, a gynecologic oncologist at the University of Washington. "By the time she came to me, it was too late.

**Scientists quoted here are all associated with research teams funded by Stand Up to Cancer.*

SUSAN_SM/GETTY IMAGES

ILLUSTRATION BY SERGE BLOCH

But before she died, I tested her to identify the mutation that had caused her cancer. Afterward, I helped her daughter get that same test and removed her ovaries as a preventive measure. She'll likely be the first person who doesn't die of cancer in four generations of women in her family."

3 Therapies targeting a cancer's individual profile are working. By decoding the thousands of genes in someone's cancer cells, scientists can find out which mutations they carry and then match the important mutations to the right drugs. Dr. Haber began investigating this method a decade ago, when he read the story of a nurse who'd never smoked but had metastatic lung cancer: "She got into a clinical trial for a new targeted therapy (called Iressa). It was failing, but for 10 percent of participants, it worked magically. She happened to be in that magical 10 percent. We found a gene called EGFR in her tumor and in the other patients who had responded well." Today, targeted drug therapy is routinely used for many types of cancer, including lung, breast, colon, and melanoma.

4 Every patient should get his or her tumor profile. "We had an 11-year-old girl with a rare form of leukemia go through chemotherapy four times—yet her cancer kept coming back," says Arul Chinnaiyan, MD, PhD, a pathologist at the University of Michigan. "Finally, we sequenced her tumor cells, and we found a genetic mutation that we knew was sensitive to a particular compound. We gave that drug to her, and she went into remission for more than 18 months. As we develop more and more targeted therapies, there will be hundreds of stories like that."

5 Forget needle biopsies. We've got a "liquid biopsy." In a development that may revolutionize cancer screening, scientists have developed a blood test that can identify biomarkers for a variety of stage I cancers in the bloodstream. "The same technology that can find your DNA at a crime scene can find a cancer's DNA in your body," says William G. Nelson, MD, PhD, director of the Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins University in Baltimore, Maryland. Cancer centers are already exploring the use of the tests, but the hope is that one day, a simple blood draw at your annual physical would detect cancer before you show any symptoms.

6 We can help your immune system kill your tumor. Cancer cells use a type of "brake" to turn off your immune system's natural response. Immunotherapy drugs release that brake, enabling the immune system's T cells to attack. The results have been staggering. In clinical trials, for example, almost 5,000 stage IV

melanoma patients who weren't expected to live more than a year or two were given three immunotherapy drugs. Three years later, 20 percent were still alive. "Many patients from that trial have now lived more than a decade with no sign of disease," says Tak Wah Mak, PhD, an immunologist and molecular biologist at the Princess Margaret Cancer Centre in Toronto, Ontario. "It's a miraculous thing." The FDA has since approved more than a dozen different immunotherapy agents for a range of cancers.

7 Drug combinations may be a patient's best bet. "If we come in with just one drug, the cancer can mutate around it or become resistant," Dr. Chinnaiyan says. "But we're finding that using a cocktail of drugs—similar to the treatment HIV-infected patients receive—can be more effective."

8 Viruses are among our most secret weapons. "When we put a virus into a tumor, it makes cancer cells think they're infected, so they commit suicide or display new antigens that signal your immune system to come in for the kill," says Peter Jones, PhD, chief scientific officer of Van Andel Research Institute in Grand Rapids, Michigan. The FDA recently approved a genetically engineered form of the herpes virus to treat melanoma. And at Duke University in Durham, North Carolina, scientists are fighting brain cancer by injecting tumors with a genetically modified polio virus. Now Jones and his colleagues are working on a solution for tumors that can't easily be injected: epigenetics, a process that wakes up ancient viruses that are embedded in our human DNA. "We are making tumors visible [to your immune system] by turning on the viruses that are already there," Jones says. Early research indicates that combining epigenetics with immunotherapy drugs may be particularly effective.

9 Coming soon (we hope): a Pap smear that can detect ovarian cancer. "We have developed a test that can find genetic markers of ovarian and endometrial cancers in the cervical fluid collected during a routine Pap test," says Dr. Nelson. The research is in its early stages, but it's an exciting development because ovarian cancer kills more than 14,000 women a year, often because it's diagnosed too late.

10 We've built a chip that can find runaway tumor cells. Cancer experts have known for 100 years that malignant cancers send free-floating cells into the bloodstream, creating new tumors in other parts of your body. But because there is about one circulatory cancer cell for every one billion blood cells, we haven't been able to capture the rogue cells—until now. "We have ➤

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CHIP ALLEN

Photography by Becky Davis

a device that can pull out those cells so pathologists can study them," Dr. Haber says. "That's important because the reason most people die of cancer is that it spreads to other places."

11 Diagnosed? Make sure you see a medical oncologist as well as a surgeon. "Surgeons have a financial incentive to recommend surgery," Dr. Swisher says. "Many of us believe that's part of the reason for the huge increase in double mastectomies in the United States." (The rate has tripled over the past decade; more moderate treatments like lumpectomy that preserve the breast can be equally effective.) A medical oncologist can talk to you about the pros and cons of surgery and can share other alternatives such as treatment with just drugs and radiation, chemotherapy, and more frequent screening.

12 Please make this simple change to your diet. If you're overweight or diabetic, you're much more likely to get dangerous cancers. Many researchers believe that eating too much sugar and rapid-release carbohydrates is particularly dangerous. "Sugar makes your insulin levels spike, and insulin activates P13K, an enzyme that we have learned is a major player in many human cancers," says Lewis Cantley, PhD, director of Weill Cornell's Meyer Cancer Center in New York, New York. "The evidence is strong enough that I try to avoid processed foods, especially those with added sugars."

13 For many of us, this is personal. "I decided to become a medical oncologist when I was 16 years old, after I'd lost both my parents to cancer," says Patricia LoRusso, DO, associate director for innovative medicine at Yale Cancer Center in New Haven, Connecticut. "I wanted to go after the thing that had destroyed my childhood." Adds Jones, "I think about my research when I'm in the shower, while I eat lunch, and before I go to bed at night. I dream of actually making an impact on the survival rate of the disease." R

TUNE IN AND JOIN THE CAUSE

Featuring performances from top recording artists and celebrities from film, television, and sports, *Stand Up to Cancer* will appeal to the public for donations to fund cutting-edge cancer research. The star-studded live event, executive-produced by Bradley Cooper, will deliver an unforgettable evening by engaging viewers with powerful patient stories and a moving call to action. The program will include celebrity phone and multimedia banks that will allow viewers to interact with participating talent. Viewers will also be able to donate at standup2cancer.org. One hundred percent of donations received from the general public will support Stand Up to Cancer's collaborative cancer-research programs.

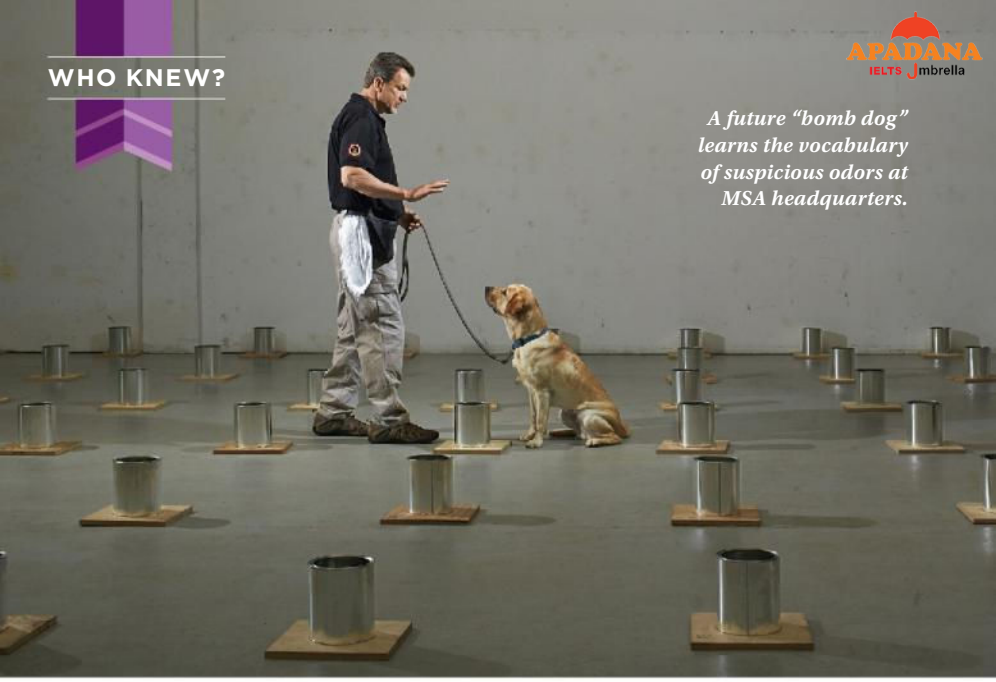
***Stand Up to Cancer* airs Friday, September 9 (8 p.m. to 9 p.m. ET live/PT tape-delayed) on over 40 networks, broadcasters, and cable providers in the United States and Canada.**

NOTICE OF CLASS ACTION LAWSUIT AND PROPOSED SETTLEMENT

THE COURT AUTHORIZED THIS NOTICE. THIS IS NOT A SOLICITATION FROM A LAWYER.

YOU MAY BE ENTITLED TO RECEIVE MONETARY COMPENSATION.

What is this?	This is a notice of a proposed Settlement in a class action lawsuit entitled *Abdeljalil v. GE Capital Retail Bank*, U.S.D.C., Southern District of California, Case No. 12-02078.
What is this lawsuit about?	The Settlement would resolve a lawsuit brought on behalf of a putative class of individuals alleging that, on or after August 22, 2008, Synchrony Bank, formerly known as GE Capital Retail Bank ("Synchrony"), used an automatic telephone dialing system and/or an artificial or prerecorded voice to place non-emergency phone calls to cell phones without the prior express consent of the persons called. Synchrony denies these allegations and any wrongdoing. The Court has not ruled on the merits of Plaintiffs' claims or Synchrony's defenses.
How do I know if I am in the Settlement Class?	If you are not a Synchrony customer and received the calls described above, you may be part of the Settlement Class.
What does the Settlement provide?	Synchrony has agreed to pay a total of $7,000,000 into a Settlement Fund which will pay for the cost of notice and administration of the Settlement, Settlement Class members' claims, attorneys' fees and costs incurred by counsel for Plaintiffs and the Settlement Class ("Class Counsel"), service awards for Plaintiffs, and a possible charitable contribution for uncashed checks, if approved by the Court. Plaintiffs will apply for service awards not to exceed $5,000 to each Plaintiff for their work in representing the Settlement Class and an award to Class Counsel not to exceed 30% of the Settlement Fund plus actual litigation expenses.
How can I receive a payment from the Settlement?	To receive a payment, you must complete and submit a valid Claim Form by November 14, 2016. You can obtain and submit a Claim Form online at www.AbdeljalilTCPASettlement.com. You can also obtain a mail-in Claim Form by calling (844) 448-7075. Mail-in Claim Forms must be sent to the Claims Administrator at the address below.
Do I have to be included in the Settlement?	If you do not want monetary compensation from this Settlement and you want to keep the right to sue or continue to sue Synchrony on your own, then you must exclude yourself from the Settlement Class by sending a letter requesting exclusion to the Claims Administrator by October 14, 2016 at the address below. Your request must contain the specific information set forth on the Settlement Website.
If I don't like something about the Settlement, how do I tell the Court?	You can object to any part of the Settlement. You must file your written objection with the Court and mail it to both Class Counsel and Synchrony's counsel by October 14, 2016. Your objection must contain the specific information set forth on the Settlement Website.
What if I do nothing?	If you do nothing, you will not be eligible for a payment. But you will still be a Settlement Class Member and bound by the Settlement, and you will release Synchrony from liability.
How do I get more information about the Settlement?	This notice contains limited information about the Settlement. For more information, to view additional Settlement documents, and to review information regarding your opt-out and objection rights and the Final Approval Hearing, visit www.AbdeljalilTCPASettlement.com. You can also obtain additional information, a long form notice, or Claim Form by calling (844) 448-7075 or by writing to *Abdeljalil v. GE Capital Retail Bank* Claims Administrator PO Box 43420 Providence, RI 02940-3420.



A future "bomb dog" learns the vocabulary of suspicious odors at MSA headquarters.

It's hard to conceive of a more brilliant tool than a canine's nose for sniffing out danger in public places

Smart Dog!

BY JOSHUA LEVINE
FROM *SMITHSONIAN*

WHEN I FIRST MEET a young Labrador named Merry, she is clearing her nostrils with nine or ten sharp snorts before she snuffles along a row of luggage pieces, all different makes and models. They're lined up against the wall of a large hangar on a country road outside Hartford, Connecticut. This is where MSA Security trains what are known in the security trade as explosive detection canines, or EDCs. Most people call them bomb dogs.

The luggage pieces joined shrink-wrapped pallets, car-shaped cutouts, and concrete blocks on the campus of MSA's "Bomb Dog U." Dogs don't need to be taught how to smell, of course, but they do need to be taught where to smell—along the seams of a suitcase, say, or underneath a pallet, where the vapors that are heavier than air settle.

In the shrouded world of bomb-

PHOTOGRAPHS: REED YOUNG

dog education, MSA is an elite academy. Its teams deploy mostly to the country's big cities, and each dog works with one specific handler, usually for eight or nine years. MSA also furnishes dogs for what it describes only as "a government agency referred to by three initials for use in Middle East conflict zones."

Strictly speaking, the dog doesn't smell the bomb. It deconstructs an odor into its components, picking out the culprit chemicals it has been trained to detect. Zane Roberts, MSA's former lead canine trainer and current program manager, uses a cooking analogy: "When you walk into a kitchen where someone is making spaghetti sauce, your nose says, Aha, spaghetti sauce. A dog's nose doesn't say that. Instinctively, it says tomatoes, garlic, rosemary, onion, oregano." It's the handler who says spaghetti sauce or, in this case, bomb.

MSA's dogs arrive at headquarters when they are between a year and a year and a half old. They begin building their vocabulary of suspicious odors by working with rows of more than 100 identical cans laid out in a grid. Ingredients from the basic chemical families of explosives are placed in random cans.

Merry works eagerly down the row, wagging her tail briskly and pulling slightly on the leash. This is a bomb dog's idea of a good time. Snort, snort, sniff, snort, snort, sniff, snort, snort, sniff. Suddenly, Merry sits down. All bomb dogs are schooled to respond this way when they've found what they're looking for. No one wants a dog pawing and scratching at something that could explode.

"Good dog," says Roberts. He reaches into a pouch on his belt for the kibble that is the working dog's wage.

> ***"Thirty-five percent of a dog's brain is assigned to smell-related operations."***

It would be tough to conceive of a better smelling machine than a dog. Thirty-five percent of a dog's brain is assigned to smell-related operations, whereas a human brain lends only 5 percent of its cellular resources to the task. In her book *Inside of a Dog,* Alexandra Horowitz, a psychologist at Barnard College, notes that while a human might smell a teaspoon of sugar in a cup of coffee, a dog could detect a teaspoon in a million gallons of water—nearly enough to fill two Olympic-size swimming pools.

Where bomb dogs have really proved their mettle is on the battlefield. Before joining MSA as vice president of operations, Joe Atherall commanded Company C of the Marines 2nd Light Armored Reconnaissance Battalion in Iraq's

Al Anbar province. The unit had three dog teams attached to it.

"One day, intel directed us to a school, but we didn't find a lot. Then we brought in the dogs," recalls Atherall. "There were French drains around the outside of the school, and the dogs started hitting on them. When we opened them up, we found an extensive IED cache, small arms weapons, and mortar rounds, along with det cord and other explosive material." Detonation cord is the dog whistle of odors, with nearly unsmellable vapor pressure.

Clove, a black Lab at MSA, stops and lies down after finding a suspicious box.

"I loved those dogs," says Atherall. "They were lifesavers."

It is hard to imagine a more high-hearted warrior than a dog. The canines work for love, they work for praise, they work for food, but mostly they work for the fun of it. "It's all just a big game to them," says Mike Wynn, MSA's director of canine training. "The best bomb dogs are the dogs that really like to play."

This doesn't mean that war is a lark for dogs. In 2007, Army veterinarians started seeing dogs that showed signs of canine post-traumatic stress disorder.

"We're seeing dogs that are over-responsive to sights and sounds or that become hypervigilant—like humans that are shaken up after a car accident," says Walter Burghardt, of the Daniel E. Holland Military Working Dog Hospital at Lackland Air Force Base in Texas. Caught early enough, says Burghardt, half the affected dogs can be treated and returned to active duty. "The other half just have to find something else to do for a living."

Because of the emotional wear on the dogs, scientists have been trying to build a machine that can outsmell the animals. At Pacific Northwest National Laboratory, scientists are working on ionization technology to "see" vapors the way a dog does—the same basic technology used by security officers at an airport but far more sensitive.

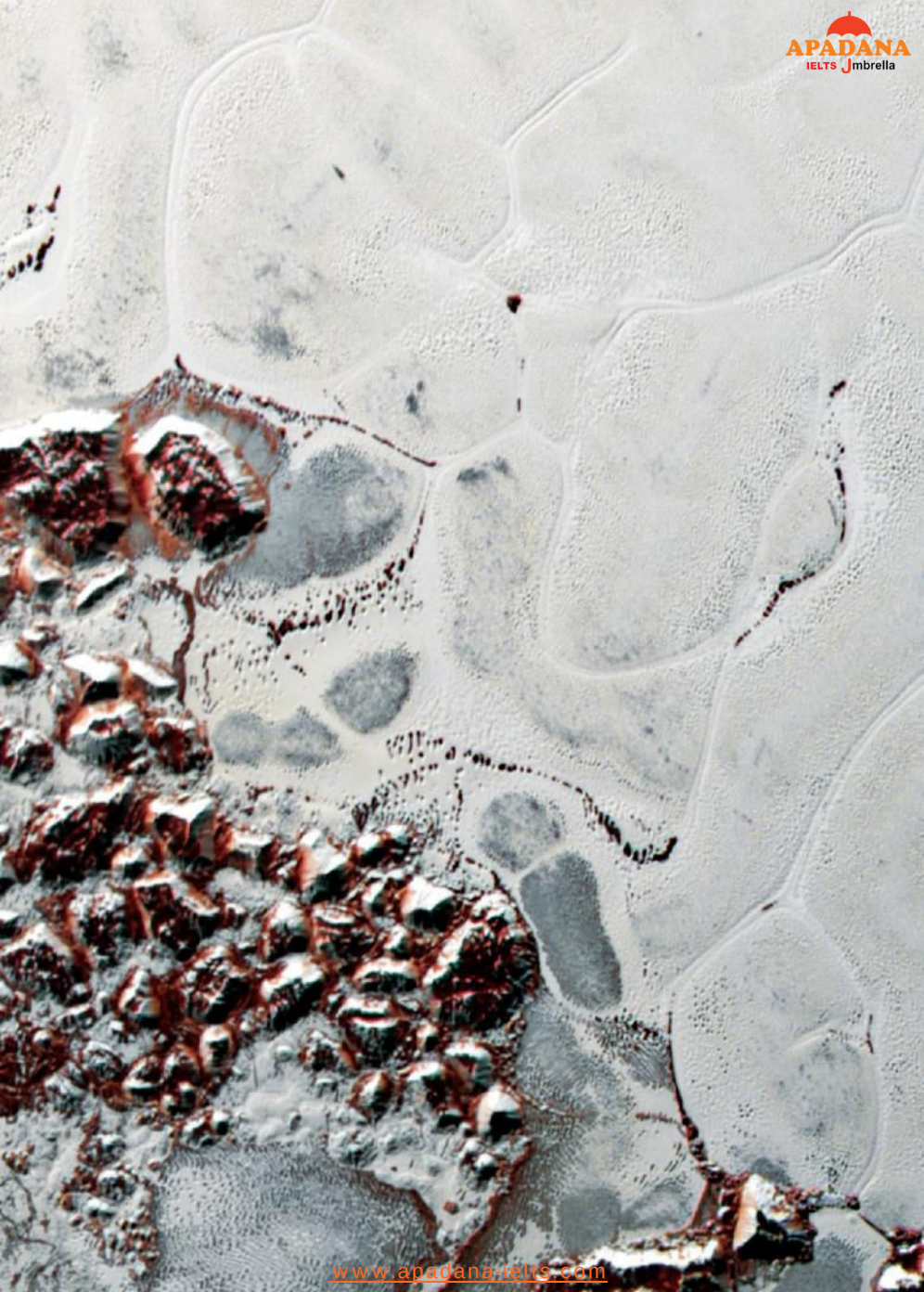
On the other hand, says Robert Ewing, a senior research scientist, dogs have been doing this job for years. "I don't know that you could ever replace them." R

DOGS WON'T QUIT
NEITHER WILL NEW
FRONTLINE® GOLD

Introducing the latest innovation in FRONTLINE flea and tick protection. FRONTLINE Gold's new triple action formula makes it relentless at killing fleas and ticks. With a new easy-to-use applicator, it delivers powerful protection that keeps working just as hard for up to 30 days.[1] Now available at your vet. Learn more at FRONTLINE.com/Gold

GO FOR THE GOLD

1. Data on file at Merial. ®FRONTLINE is a registered trademark of Merial.

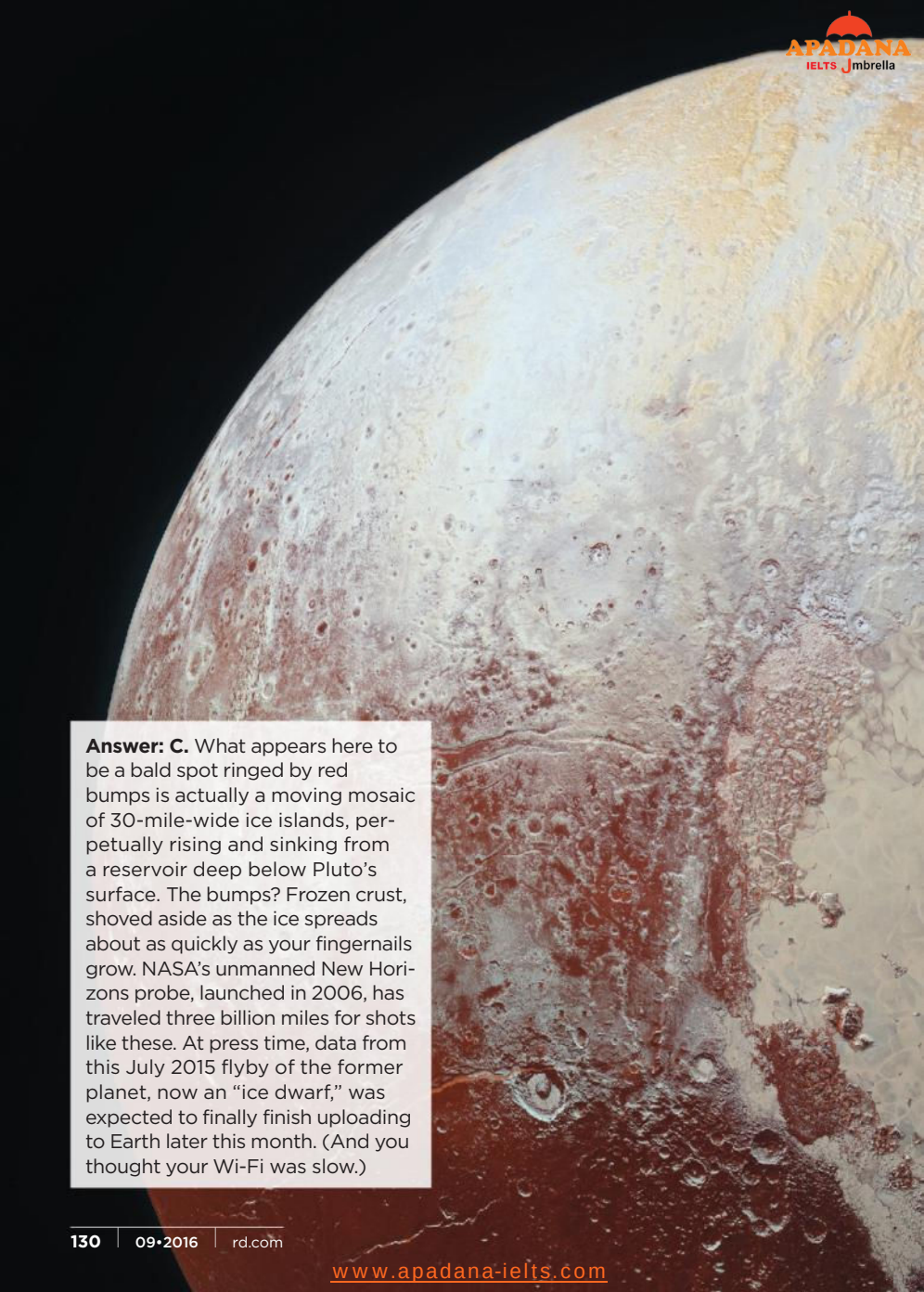


LOOK
TWICE ...

Turn the page

COURTESY NASA/JHUAPL/SWRI

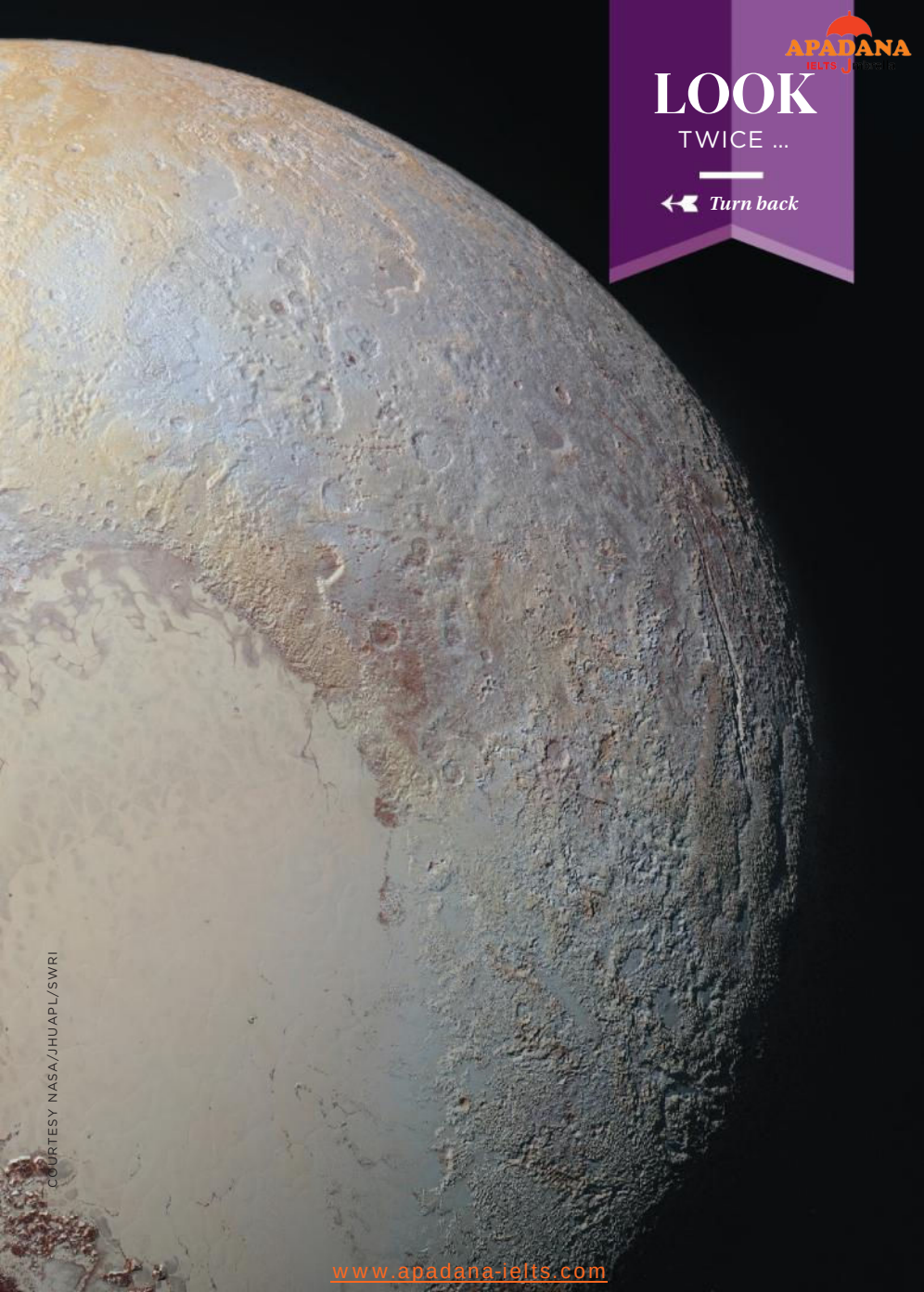
What do you see?
A) The warmest beach in Siberia.
B) Vanilla-caramel ice cream up close.
C) Ice floes on Pluto.



Answer: C. What appears here to be a bald spot ringed by red bumps is actually a moving mosaic of 30-mile-wide ice islands, perpetually rising and sinking from a reservoir deep below Pluto's surface. The bumps? Frozen crust, shoved aside as the ice spreads about as quickly as your fingernails grow. NASA's unmanned New Horizons probe, launched in 2006, has traveled three billion miles for shots like these. At press time, data from this July 2015 flyby of the former planet, now an "ice dwarf," was expected to finally finish uploading to Earth later this month. (And you thought your Wi-Fi was slow.)

LOOK
TWICE ...

Turn back



COURTESY NASA/JHUAPL/SWRI

IT PAYS TO INCREASE YOUR

Word Power

Does your lexicon need a lift? Try these terms guaranteed to impress even the most well-versed wordsmiths—from the vocabulary-building book* Talk Like a Genius *by Ed Kozak. Stumped? Check the next page for answers.

BY EMILY COX & HENRY RATHVON

1. capitulate (kuh-'pih-chuh-layt) *v.*—A: provide funding. B: stop resisting. C: state formally.

2. unequivocal (uhn-ih-'kwih-vuh-kuhl) *adj.*—A: cool under pressure. B: untamed or out of control. C: leaving no doubt.

3. cavalier (ka-vuh-'lir) *adj.*—A: nonchalant or marked by disdainful dismissal. B: dome shaped. C: undefeated or worthy of praise.

4. leery ('lir-ee) *adj.*—A: untrusting. B: odd. C: off balance.

5. levity ('leh-vuh-tee) *n.*—A: taxation. B: merriment. C: departure.

6. penchant ('pen-chunt) *n.*—A: recital. B: strong liking. C: deep thought.

7. bifurcate ('biy-fer-kayt) *v.*—A: tell lies. B: flash like lightning. C: divide into parts.

8. craven ('kray-vuhn) *adj.*—A: chiseled. B: needy or famished. C: cowardly.

9. coterie ('koh-tuh-ree) *n.*—A: exclusive group. B: takeover. C: birdcage.

10. stalwart ('stahl-wert) *adj.*—A: loyal. B: left-handed. C: disguising one's weakness.

11. travesty ('tra-vuh-stee) *n.*—A: wardrobe. B: long journey on foot. C: absurd imitation.

12. hedonism ('hee-duh-nih-zuhm) *n.*—A: espionage. B: sun worship. C: pursuit of pleasure.

13. obviate ('ahb-vee-ayt) *v.*—A: watch over. B: prevent or render unnecessary. C: leave unfinished.

14. excoriate (ek-'skor-ee-ayt) *v.*—A: hollow out. B: criticize harshly. C: sketch in detail.

15. penurious (peh-'nur-ee-uhs) *adj.*—A: given to fits of rage. B: wordy. C: poor.

☞ ***To play an interactive version of Word Power on your iPad, download the* Reader's Digest *app.***

Answers

1. capitulate—*[B]* stop resisting. Only when I wrapped the pill in bacon did my dog finally *capitulate*.

2. unequivocal—*[C]* leaving no doubt. The ump unleashed a resonant, *unequivocal* "Steee-rike!"

3. cavalier—*[A]* nonchalant or marked by disdainful dismissal. Our driver had a shockingly *cavalier* attitude about the steep mountain road ahead.

4. leery—*[A]* untrusting. Initially, Eve was a touch *leery* of the apple.

5. levity—*[B]* merriment. Our family thankfully found moments of *levity* during the memorial.

6. penchant—*[B]* strong liking. Thomas was warned repeatedly about his *penchant* for daydreaming in meetings.

7. bifurcate—*[C]* divide into parts. If anything, Donald Trump has certainly managed to *bifurcate* the nation.

8. craven—*[C]* cowardly. She took a markedly *craven* position against the weak crime bill.

9. coterie—*[A]* exclusive group. Claire's *coterie* consisted entirely of fellow Mozart enthusiasts and violinists.

10. stalwart—*[A]* loyal. Throughout the senator's campaign, Kerrie has repeatedly shown *stalwart* support.

11. travesty—*[C]* absurd imitation. Her lawyer demanded an appeal, calling the jury's decision a *travesty* of justice.

12. hedonism—*[C]* pursuit of pleasure. In Shakespeare's *Henry IV,* young Prince Hal mistakes *hedonism* for heroism.

13. obviate—*[B]* prevent or render unnecessary. Gloria's doctor hoped that physical therapy would *obviate* the need for more surgery.

14. excoriate—*[B]* criticize harshly. Coach Keegan was *excoriated* by the media for the play calling during the game's final minutes.

15. penurious—*[C]* poor. Paul and Carla entered the casino flush and left it *penurious*.

SMART STORY

If you track down the origins of *intelligence,* you find the Latin *inter* ("between, among") plus *legere* ("choose, read"). To be intelligent, then, is literally "to choose among" or "discern." The versatile *legere* also gives us the words *legend, lecture, election,* and *logo*.

VOCABULARY RATINGS

9 & below: prodigy
10–12: mental giant
13–15: genius

Humor in Uniform

"I was a rear gunner in my day—always hit my target."

WE WERE TOLD the Germans added a chemical substance to our drinking water that was designed to suppress the sex drive. I have noticed recently that it is beginning to work.

Nonagenarian World War II veteran and former POW
LOREN E. JACKSON, seen on reddit.com

A GENTLEMAN stood near me at the airport. His uniform bore a mass of medals, and his shoes were spit shined. Filled with gratitude, I stuck out my hand and said, "I'd like to thank you for your service."

"You're very welcome," he said.
"Army?" I asked.
"Yes," he said. "Salvation."

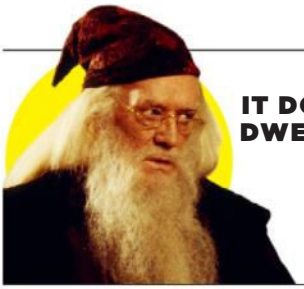
VIRGINIA ROBINSON, *The Villages, Florida*

THE PENTAGON banned the Army from using Chinese-made berets. In a more veiled slap at the Chinese, the Pentagon also banned any alternative form of checkers. **JIMMY FALLON**

Send us your funniest military anecdote or news story—it might be worth $100! For details, see page 7 or go to rd.com/submit.

ILLUSTRATION BY SUSAN CAMILLERI KONAR

Quotable Quotes



IT DOES NOT DO TO DWELL ON DREAMS AND FORGET TO LIVE.
J. K. ROWLING, *Harry Potter and the Sorcerer's Stone*

So many things are possible just as long as you don't know they're impossible.
NORTON JUSTER, *The Phantom Tollbooth*

HOW MUCH LOVE INSIDE A FRIEND? DEPENDS HOW MUCH YOU GIVE 'EM.
SHEL SILVERSTEIN, *A Light in the Attic*

If you have good thoughts, they will shine out of your face like sunbeams and you will always look lovely.
ROALD DAHL, *The Twits*

It is when we are most lost that we sometimes find our truest friends.
WALT DISNEY'S *Snow White and the Seven Dwarfs*

Unless someone like you cares a whole awful lot, nothing is going to get better. It's not.
DR. SEUSS, *The Lorax*

NOTHING IS SWEETER IN THIS SAD WORLD THAN THE SOUND OF SOMEONE YOU LOVE CALLING YOUR NAME.
KATE DICAMILLO, *The Tale of Despereaux*

FROM TOP: WARNER BROTHERS. WALT DISNEY PICTURES. UNIVERSAL PICTURES. (ALL FROM EVERETT COLLECTION)

Reader's Digest (ISSN 0034-0375) (USPS 865-820), (CPM Agreement# 40031457), Vol. 188, No. 1123, September 2016.

1. In between pillows on bed. 2. Underneath wooden bench.

CAN YOU FIND THE CATS?

Fresh Step® with the power of Febreze™ eliminates litter box odors so well, you might start wondering where your cat went.

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