

02.2020

NATIONAL GEOGRAPHIC

LAST JOURNEY INTO SLAVERY



*In 1860
the CLOTLIDA
became the final
slave ship to reach
U.S. shores. This
is the story of the
people on that
ship and of their
descendants.*

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Kadir Nelson's painting for *National Geographic*'s cover depicts captive Africans being taken by boat to the slave ship *Clotilda* in 1860, at a slave port in what's now Benin.

Nelson's art is in galleries and collections worldwide, and in award-winning picture books. The 45-year-old illustrator and author has used his artistry in a wide range of media, from the Steven Spielberg film *Amistad* to an album cover for recording artist Drake.

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When Flowers Were No Longer Enough

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PHOTOGRAPHS BY
ABELARDO MORELL



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NATIONAL GEOGRAPHIC'S

BRAIN GAMES

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NEW SEASON
MONDAYS
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SCIENCE AND TECHNOLOGY CAN SOLVE THE PLASTIC WASTE PROBLEM.

NEW TECHNOLOGIES CAN TRANSFORM PLASTIC MANUFACTURING AND RECYCLING TO PROTECT THE ENVIRONMENT.

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innovators to break the cycle of plastic pollution. Rethinking how plastic products are designed, manufactured, and recycled will dramatically reduce the amount of waste lost to the environment. We are working towards a day when every piece of plastic is created and re-created in a closed, renewable loop. Breakthrough technologies are already starting to slow the leakage of plastics reaching our ocean, natural areas, and communities. What's next?



DON'T LET IT GO TO WASTE.

To learn more about these initiatives, go to DONT-WASTE.DOW.com

Why has plastic pollution become such a big challenge?

While plastic has revolutionized our lives in many ways, many plastic products have historically been designed to be disposed of, not recycled, when consumers are finished using them. Some products simply weren't recyclable. Even advanced technologies were unable to make certain plastics recyclable—until now.

"We believe the solution is making plastic too valuable to be lost into the environment as waste."

CARSTEN LARSEN
DOW, RECYCLING COMMERCIAL DIRECTOR, EMEA & APAC

Plastics are important materials for so many applications. The key is finding a way to tap plastics' positive benefits without negative side effects. Dow and other companies that are part of the plastics industry say one way to achieve this is by making plastic waste itself a valuable raw material for producing new products and packaging. New design thinking for packaging puts recycling and reuse front and center from the start. This new approach, geared toward recovering, recycling, and reusing plastic, creates a circular loop with nothing lost to waste. As a result, a new generation of technologies are being implemented around the world with remarkable results.

"This new bio-based solution is creating 100% renewable plastic packaging with 57% CO2 savings."

Dow and UPM Biofuels, a company in Finland, have found a solution in trees. UPM produces paper from sustainably managed forests. Dow discovered that a bio-based oil can be extracted from the residue of paper pulp production and used as a feedstock to produce plastic. By replacing the need for fossil fuel resources, the new process cuts CO2 by more than half and has created thousands of tons of virgin-like polymer material for applications like 100% recyclable milk cartons and other food packaging.

"This breakthrough proves we can use waste plastic to make new plastic that's identical to that produced from fossil materials."

Dow and the Dutch company Fuenix Ecogy have advanced the circular loop effort by using an oil made from plastic waste to produce new plastic of such high quality it can even be used in sensitive applications such as packaging for meat and cheese. The process transforms 70% of the used plastic into new, with half the CO2 emissions.

Dow has also launched AGILITY™ CE, a new plastic material that is used by manufacturers of shrink films, the ubiquitous plastic that tightly wraps bottles, cans, and other products together for transport. Previously, recycled shrink film was too degraded to be useful. With AGILITY™ CE plastic, used shrink film can be recovered directly from retailers and turned into new high-quality film made from 70% recycled plastic—significantly curbing waste that is incinerated or sent to landfills.

Dow technologies are helping companies use less materials in their products or packaging, enabling them to incorporate recycled plastics into their design, and helping make previously hard to recycle products recyclable.

"Old design and production methods created today's plastic waste challenge. That means our industry must be responsible for developing new designs to solve it."

New partnerships are yielding another valuable outcome: *social change*. In underdeveloped areas of the world, Dow collaborates with multiple partners to establish modern recycling infrastructure—and create jobs—for vulnerable communities overwhelmed by pollution.

Achieving zero plastic waste is a long-term effort. However, recent breakthroughs now provide a real opportunity to scale up sustainable production and keep waste from reaching our environment.





Living Life Below Zero on an isolated Alaska island

Inhabiting a beautiful but unforgiving landscape known for its punishing weather, the residents of a remote town on Prince of Wales Island, Alaska, make do without roads, law enforcement, or government. To survive, they must rely on natural resources, their community, and themselves. See how they manage in the series *Life Below Zero: Port Protection*. It premieres February 18 at 9/8c on National Geographic.

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NATIONAL GEOGRAPHIC (ISSN 0027-9358) PUBLISHED MONTHLY BY NATIONAL GEOGRAPHIC PARTNERS, LLC, 1145 17TH ST. NW, WASHINGTON, DC 20036. \$39 PER YEAR FOR U.S. DELIVERY, \$44.00 TO CANADA, \$51.00 TO INTERNATIONAL ADDRESSES. SINGLE ISSUE: \$8.00 U.S. DELIVERY, \$10.00 CANADA, \$15.00 INTERNATIONAL. (ALL PRICES IN U.S. FUNDS; INCLUDES SHIPPING AND HANDLING.) PERIODICALS POSTAGE PAID AT WASHINGTON, DC, AND ADDITIONAL MAILING OFFICES. POSTMASTER: SEND ADDRESS CHANGES TO NATIONAL GEOGRAPHIC, PO BOX 37545, BOONE, IA 50037. IN CANADA, AGREEMENT NUMBER 1000010298. RETURN UNDELIVERABLE ADDRESSES TO NATIONAL GEOGRAPHIC, PO BOX 819 STM MAIN, MARKHAM, ONTARIO L3P 9Z9. UNITED KINGDOM NEWSSTAND PRICE £6.99. REPR. EN FRANCE: EMD FRANCE SA, BP 1029, 59011 LILLE CEDEX; TEL. 320.300.302; CPPAP 0720U89037; DIRECTEUR PUBLICATION: D. TASSINARI. DIR. RESP. ITALY: RAPP IMD SRL, VIA G. DA VELATE 11, 20162 MILANO; AUT. TRIB. MI 258 26/5/84 POSTE ITALIANE SPA; SPED. ABB. POST. DL 353/2003 (CONV L.27/02/2004 N.46) ART 1 C. 1 DCB MILANO STAMPA. QUAD/GRAFICHE, MARTINSBURG, WV 25401. SUBSCRIBERS: IF THE POSTAL SERVICE ALERTS US THAT YOUR MAGAZINE IS UNDELIVERABLE, WE HAVE NO FURTHER OBLIGATION UNLESS WE RECEIVE A CORRECTED ADDRESS WITHIN TWO YEARS.

NAT GEO WILD

Make house calls with *Heartland Docs*

Rural Nebraska raises the crops and animals at the heart of the U.S. food chain. Ben and Erin Schroeder, spouses and veterinarians, brave obstacles to care for those animals. *Heartland Docs, DVM* premieres January 25 at 10/9c on Nat Geo WILD.

NAT GEO LIVE

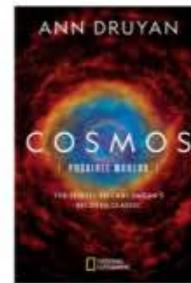
Designed by Nature with Kakani Katija

Attend Nat Geo Live events, coming to a venue near you. This month, explore the ocean's mid-waters as bioengineer Katija seeks breakthroughs in bio-inspired design. Learn more at nationalgeographic.com/events.

BOOKS

Embark for *Cosmos: Possible Worlds*

The long-awaited sequel, companion to the upcoming TV series, continues the *Cosmos* voyage that author Ann Druyan began with her late husband, Carl Sagan, 40 years ago. It's available February 25 where books are sold and at shopng.com/books.



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WOMEN:
A CENTURY
OF CHANGE

Who Gets to Judge What's Beautiful?

BY SUSAN GOLDBERG PHOTOGRAPH BY HANNAH REYES MORALES

WHEN I WAS YOUNG, what my friends and I considered pretty was everything I was not: Tall. Stick-straight blond hair. Blue eyes. We wanted to look like Peggy Lipton from the TV show *The Mod Squad*. Or a 1960s Barbie, with her yellow ponytail and absurdly unattainable figure. But every day, the mirror provided a reflection of how I, and so many others, failed to attain that ideal.

As writer Robin Givhan puts it in “Redefining Beauty,” her story in this issue, “For generations, beauty required a slender build but with a generous bosom and a narrow waist. The jawline was to be defined, the cheekbones high and sharp. The nose angular. The lips full but not distractingly so. The eyes, ideally blue or green, large and bright. Hair was to be long, thick, and flowing—and preferably golden. Symmetry was desired. Youthfulness, that went without saying.”

When *National Geographic* decided to spend 2020 examining the state of the world’s women, we debated whether to write about beauty. Would that be shallow or playing into stereotypes? In the end, we concluded our coverage would be incomplete if we didn’t address the outsize role that beauty plays in women’s lives.

In every country and culture, women are perceived and judged, advantaged or disadvantaged, by their appearance in ways that men are not. Social media ratchets up the pressure, with body shaming and Instagram-filtered ideals. Let’s not even talk about the ubiquity of cosmetic surgery.

Still, humanity’s standards of beauty are expanding; for proof, see the somewhat creepy but highly illustrative photo above. The homogeneous Barbie of the baby boom is gone, replaced by a



multitude that many more girls might appreciate—every color of skin and shape of eyes, every texture of hair; different noses, lips, and body types.

“We are moving toward a culture of big-tent beauty. One in which everyone is welcome,” Givhan writes. Of course, that’s not yet fully the reality. But as someone who’s the same age as Barbie—we both entered the world in 1959—I marvel at the progress. We don’t all have to be Peggy Lipton anymore.

Givhan says it best: “The new outlook on beauty dares us to declare someone we haven’t met beautiful. It forces us to presume the best about people. It asks us to connect with people in a way that is almost childlike in its openness and ease. Modern beauty doesn’t ask us to come to the table without judgment. It simply asks us to come presuming that everyone in attendance has a right to be there.”

Thank you for reading *National Geographic*. □

A crowded headshot of Barbies, at the toymaker’s design center, shows how the doll has been adapted to be more diverse and inclusive. “Every day we’re fed imagery of beauty,” says Hannah Reyes Morales, who photographed this month’s story. But increasingly, says Manila-based Morales, global movements “are seeking to reshape how we define beauty.”



What emotion fits in the palm of your hand?



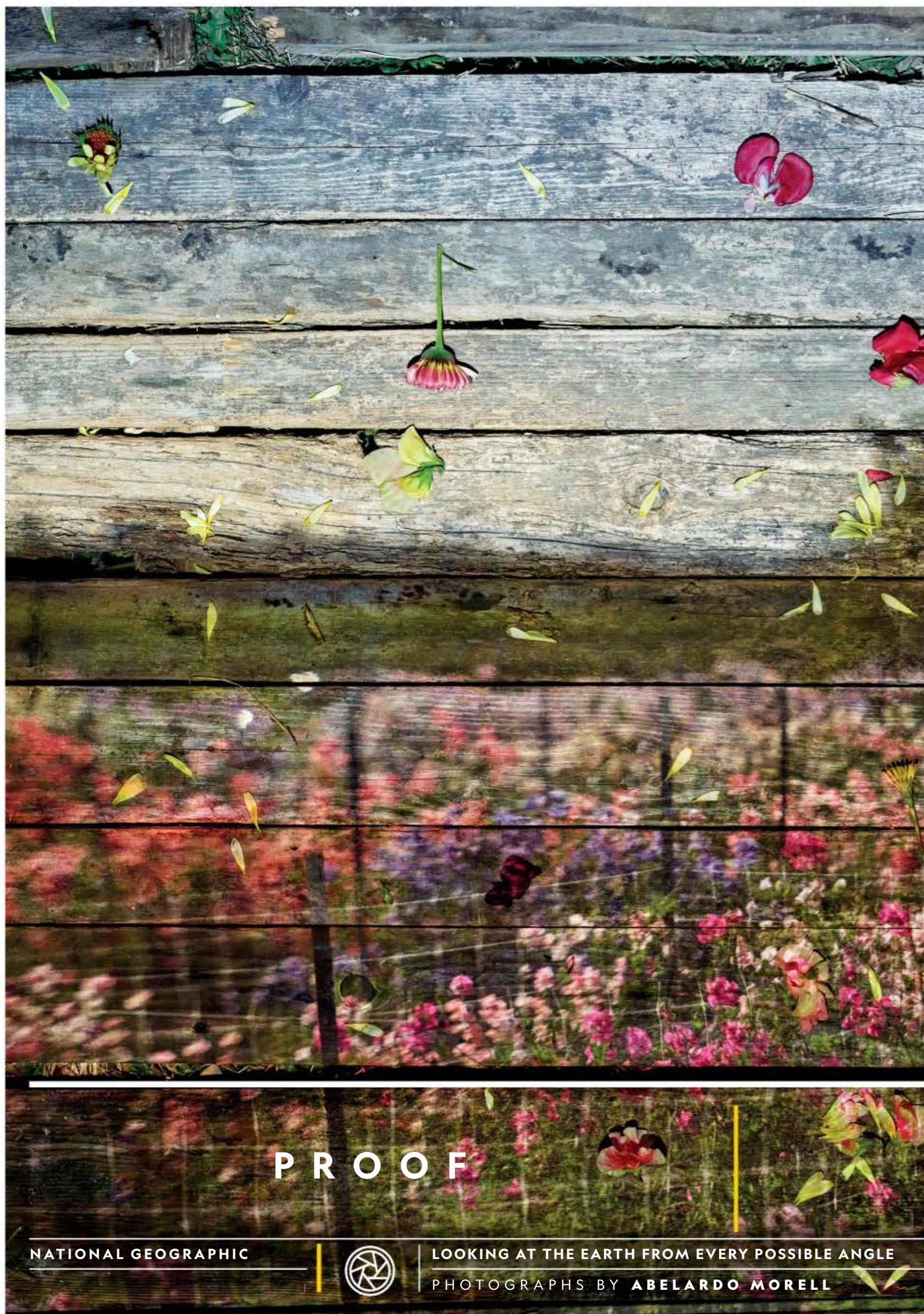
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NATIONAL GEOGRAPHIC



LOOKING AT THE EARTH FROM EVERY POSSIBLE ANGLE

PHOTOGRAPHS BY ABELARDO MORELL



FLOWERS THAT STAY FRESH

A photographer makes bouquets from plants and art materials for images that are ever in bloom.

VOL. 237 NO. 2



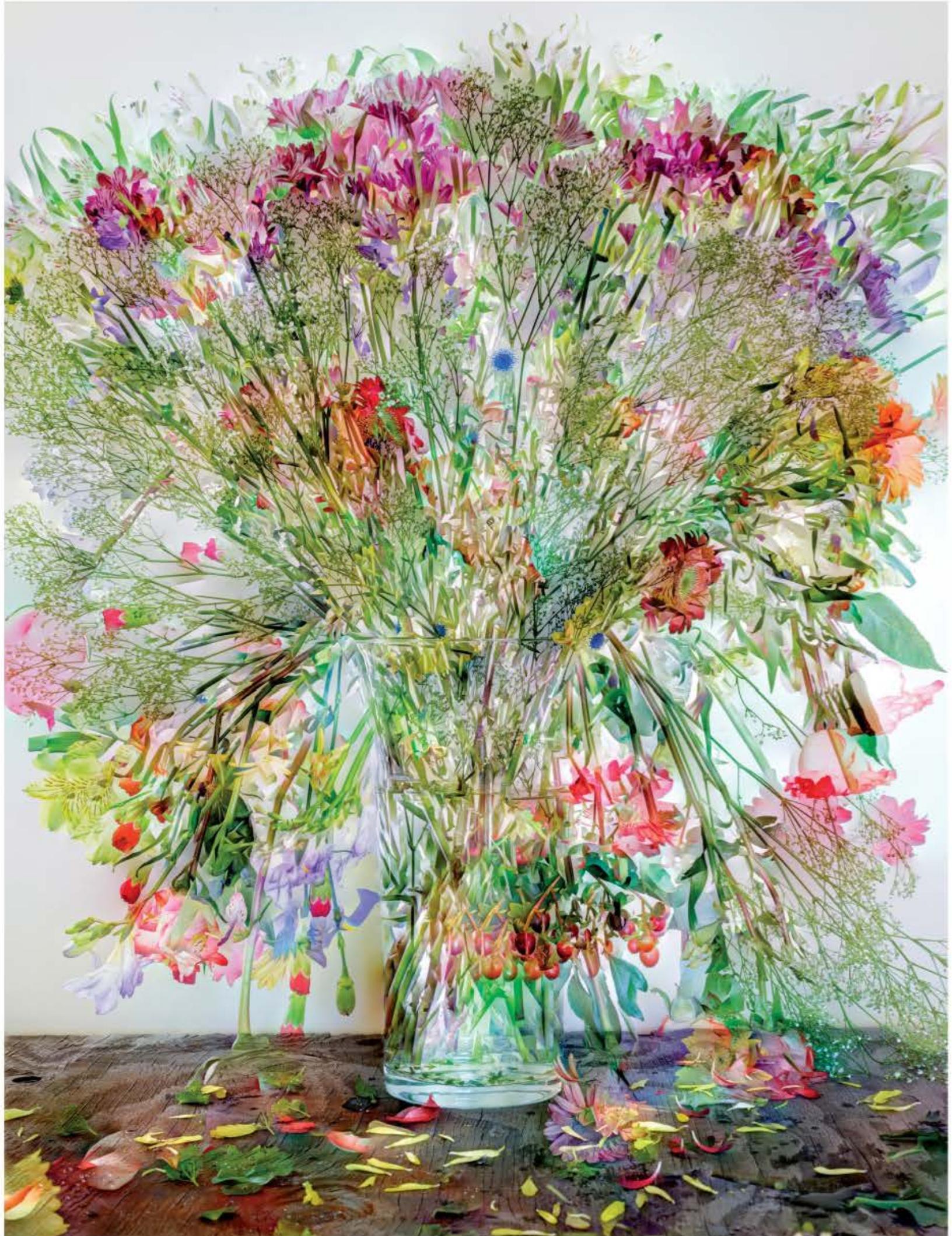
PREVIOUS PHOTO: Searching for original ways to photograph flowers, Abelardo Morell projected a landscape onto an old door. ABOVE: Morell created a profile of his daughter, Laura, with plywood and rose petals.



ABOVE: Paint and props help Morell make flower arrangements that evoke famous paintings and artistic styles, as embellished by his imagination.



Dutch paintings from the 17th century, Morell noticed, often portray vases in precarious places. He cast flowers around on a backdrop, then laid this scene flat to mimic how they fell to the ground.



Multiple exposures give this image the look of a watercolor painting. Photo-editing software allowed Morell to layer numerous, slightly different shots of the same bouquet, producing a ghost effect.

THE BACKSTORY

IN SEARCH OF A BETTER BIRTHDAY GIFT, THIS PHOTOGRAPHER CREATED WILDLY IMAGINATIVE—AND ENDURING—BOUQUETS.

INSTEAD OF GIVING his wife flowers for her birthday, as he did most years, contemporary photographer Abelardo Morell decided to choose something that would last longer. Say, a photograph of flowers.

The Cuban-born, Boston-based photographer started with a still life of a mixed bouquet. He took a photo, then rearranged the flowers and took another photo. He repeated that 20 times, then layered the images together.

Still lifes of flowers are a classic subject for photographers. But Morell is well-known for another distinctive photographic approach: camera obscura, a technique that captures inverted views projected through a pinhole onto a surface in a darkened room. So he saw this very different pursuit, a project he called Flowers for Lisa, as a chance to stretch his creativity as well as to devise gifts for his wife, Lisa McElaney.

Morell also saw the flowers project

as a way to pay homage to his favorite creative artists. He used flowers and petals to craft surreal designs of people and places, and to celebrate the work of Claude Monet, Georges Braque—even the films of Alfred Hitchcock.

Each image inspired another. As Morell recounts it: “I kept thinking, if I can make this, I can make one more.” After four years, he ended the series in 2017 with 76 images united by their floral medium but branching apart with wild offshoots of originality.

The bouquets turned to mulch long ago, but the images live on in *Flowers for Lisa: A Delirium of Photographic Invention*, the 2018 book that chronicles the project. In the book’s afterward, McElaney describes the distinction between her appreciation of the images and Morell’s. “I see them as keepsakes, proof positive that what connects us is real,” she writes. “Abe treats them as tools for tending the fields of love and commitment.” —DANIEL STONE

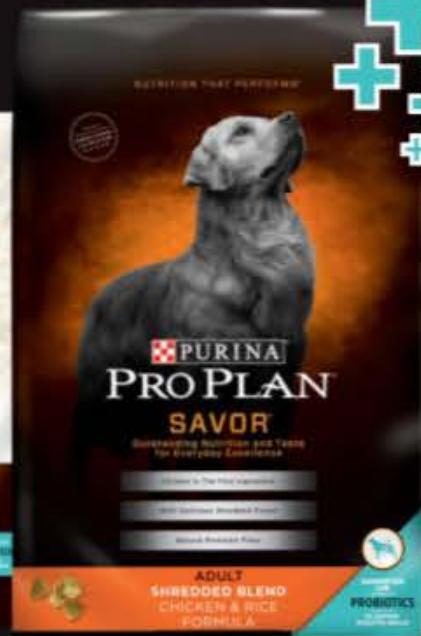


Morell named this image “After Hitchcock’s Vertigo”; the bouquet strongly resembles one in the classic 1958 suspense movie.



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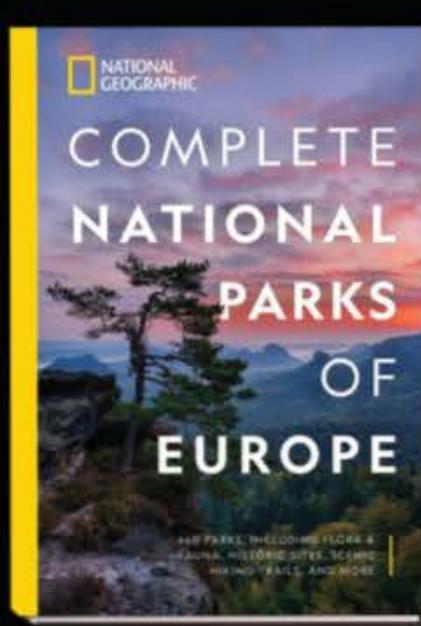
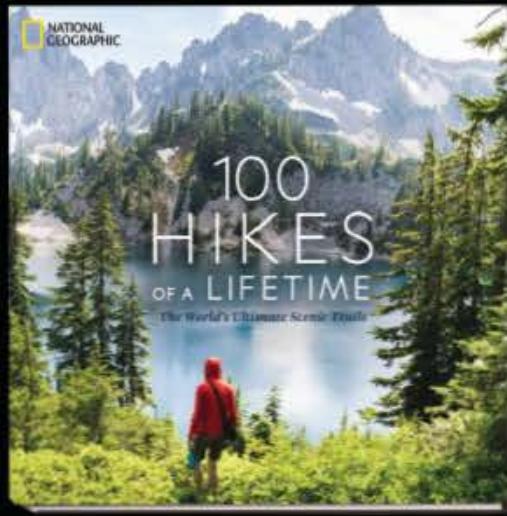
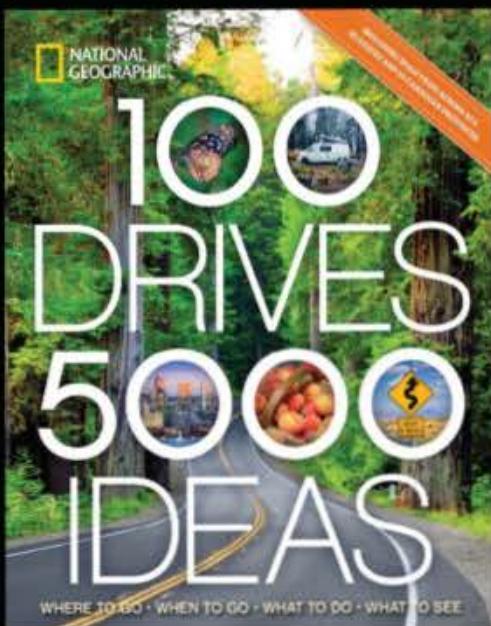
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- Tough Tardigrades
- The Storm Chasers' Tale
- Why Locusts Swarm



ILLUMINATING THE MYSTERIES—AND WONDERS—ALL AROUND US EVERY DAY

NATIONAL GEOGRAPHIC

VOL. 237 NO. 2

Black Inventors: a Broader View

THE LEGACY OF AFRICAN-AMERICAN SCIENTISTS AND INNOVATORS SHOULD BE AS MUCH ABOUT HOW THEY LIVED AS WHAT THEY CREATED.

BY EZELLE SANFORD III

E

EACH FEBRUARY, IN OBSERVANCE of Black History Month in the United States, we revisit the stories of notable African Americans. Lists of these prominent individuals and their contributions serve as powerful testimonials to black ingenuity. And within this impressive group, African-American scientists and inventors hold a special place.

They are a particular interest of mine, as a scholar studying the intersection of African-American history and the history of science. They also were exceptional in their time. Succeeding in science and technology in 19th- and 20th-century America despite the long odds imposed by racial oppression, black inventors represented the epitome of intellectual achievement.

By the early 19th century, James Forten of Philadelphia is believed to have invented a device that improved sailing and was running his own prosperous sailmaking business. He used his wealth to campaign for the abolition of slavery. By the early

FACED WITH SUBJUGATION
AND BRUTALITY, AFRICAN
AMERICANS NEEDED
INSPIRATIONAL EXAMPLES,
MODELS OF ACHIEVEMENT
TO FOLLOW.

21st century, engineer Lonnie Johnson had worked for the Air Force on the stealth bomber program and for NASA on missions to Saturn and Jupiter, and had obtained dozens of patents—including one for the Super Soaker water gun. In the decades bracketed by those two inventors, scientific discoveries by black Americans have helped make this nation and its people what we are today.

These trailblazers lived complex lives in complex times. Yet in our eagerness to honor them, too often we privilege their inventions over their humanity. Imagine how much more we might gain from knowing them as fully realized individuals, not just as the sum of their inventions. The emphasis on the latter took root—with only good intentions—in an early effort to honor African Americans' achievements, about a century ago.

THE EARLY DECADES of the 1900s witnessed the close of the Great War, the greed and opulence of the Roaring Twenties, and the resurgence of vigilante violence targeting African Americans. D.W. Griffith's 1915 film *The Birth of a Nation* stoked racial fears in the United States, even as it was screened twice in President Woodrow Wilson's White House. The film fueled segregation and white supremacy efforts around the country; the Ku Klux Klan terrorized African-American communities and stirred savagery in which fires were set and black citizens killed.

Faced with subjugation and brutality, African Americans needed inspirational examples, models of achievement to follow. Black leaders wanted white Americans to see inspiring figures too, to counter the pernicious stereotypes popularized by the likes of Griffith. Taking on this mission was historian Carter G. Woodson, who in 1926 established Negro History Week, the precursor to today's Black History Month.

By reclaiming a positive role for African Americans in U.S. history, Woodson thought, perceptions of racial inferiority could be challenged. And the effort would encourage African Americans to believe that they too could be productive and valuable in a society that had yet to cede the space for their success.

In the early iterations of Black History Month, successful African Americans were intentionally reduced to their accomplishments—patents, inventions, and contributions easily digested by a wider public. George Washington Carver is one example among many (right).

The Lives Behind the Inventions

These inventors' creations were only part of their legacy to their communities and the world. Clockwise from top left:

Sarah E. Goode (1850-1905) is believed to be the first African-American woman to receive a U.S. patent, for a collapsible bed that converted into a rolltop desk.

James Forten (1766-1842) rose from apprentice to owner of a Philadelphia sail business, where he employed both black and white workers to foster equal rights.

Lonnie Johnson (b. 1949) possesses more than a hundred patents and has more than 20 patents pending.

George Washington Carver (circa 1864-1943) established the Agricultural Wagon to visit farms so rural Southerners could learn about agrarian methods and best practices.

Lewis Howard Latimer (1848-1928) was an office boy for a Boston patent law firm when he taught himself mechanical drawing. Promoted to draftsman, he was hired by Alexander Graham Bell to draw plans for a new invention; he finished the telephone drawings in time for Bell to file for a patent just ahead of a competitor.



And so it is that a figure like Carver—who was born to slaves near the close of the Civil War, developed hundreds of uses for the peanut, sweet potato, and soybean; helped reshape the South's agrarian economy; earned international acclaim for his work; and advised the nation's leading politicians on agricultural matters—is perhaps best known as the man who invented peanut butter. (Contrary to popular belief, peanut butter was *not* among his innovations.) By reducing Carver to the sum of his inventions, we discard many of the lessons his life could teach us.

Likewise, the charismatic Madam C.J. Walker (right) was known first for her hair products, and second for the fortune they made her. But by the time she died in 1919, she was gaining recognition for her philanthropy and political activism as well as her products and business acumen.

THERE ARE SIGNS that, in the 21st century, popular representations of black inventors and scientists are beginning to shift. For instance, Carver has recently been embraced not only as a black historical icon but also as an LGBTQ icon (some biographies suggest he was bisexual)—bringing to light new questions about his legacy and broadening his inspirational appeal.

In a shift of another sort, historians now report that Granville Woods, long heralded as a great African-American inventor, was in fact a native of Australia and did not consider himself to be (in the parlance of the times) “a Negro American.” His legacy raises new questions about racial and ethnic identity and who we commemorate during Black History Month.

With *The Immortal Life of Henrietta Lacks*, author Rebecca Skloot has drawn long-overdue attention to the black patient whose cancerous cervical cells were essential to the biotechnology boom and ensuing developments in the biomedical sciences. Margot Lee Shetterly’s popular book turned movie, *Hidden Figures*, highlighted the cadre of NASA’s black women “computers” essential to the United States’ Cold War pursuit of space exploration. And a Netflix miniseries is telling Madam Walker’s life story based on a book by her great-great-granddaughter, A’Lelia Bundles.

Such popular works depart from the early myth-making projects of black history. They tell black inventors’ success stories—but in the context of their wider lives and their hardships, from interpersonal racial and gender violence to the structural violence of segregation and scientific exploitation.

There is power in human stories. Humanizing our Black History Month icons doesn’t make them any less impressive—only more relatable. Once we do, we may find new historical uses for the black inventor, and breathe new life into human beings that history left behind. □

Historian **Ezelle Sanford III** is a postdoctoral fellow in the Program on Race, Science & Society at the University of Pennsylvania and a graduate of Washington University in St. Louis and Princeton University. He is working on a book titled *Segregated Medicine: The Story of St. Louis’s Homer G. Phillips Hospital (1937-1979)*.



Madam C.J. Walker (at left) and Annie Turnbo Malone

Mothers of Inventions

IN THE EARLY 1900S, two African-American women inventors with both science and business acumen—Madam C.J. Walker and Annie Turnbo Malone—developed products that made them fortunes. Though their rags-to-riches stories are similar, one name is widely recognized and the other is nearly forgotten.

Both were born to formerly enslaved parents. Both got their start in St. Louis, catering to underserved consumers. Skilled in chemistry, Annie Turnbo was in her 30s when she started experimenting with hair products, which led to a hair and scalp formula gentler than other products black women had been using. Sold door-to-door, her products were a hit; she expanded production, opened a school for black cosmetology, and franchised sales in other countries. She married and became known as Annie Turnbo Malone.

Sara Breedlove, a widow who had experimented with treatments for her own hair, got a job selling Malone’s products in St. Louis and then in Colorado. Out West, she developed her own hair product to sell under the new name she took: Madam C.J. Walker. The onetime mentor and mentee became market rivals.

A 1917 *New York Times Magazine* article labeled Walker the wealthiest Negro woman in the city. She’s often remembered as the first U.S. black woman millionaire—even though, at her death in 1919, her estate was valued at about \$600,000. Today Madam C.J. Walker products are still sold.

In 1920 Malone was worth an estimated \$14 million. Tax disputes, lawsuits, and divorce settlements took their toll, and her company fell to creditors in 1951. She died six years later.

Their philanthropic legacy includes support for racial equality, women’s organizations, black colleges and universities, and charities serving black communities. —ES



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Plastic waste is one of the most urgent environmental issues of our time. Less than 10 percent of the plastic we use is recycled, and there are an estimated 100-million tons of plastic in oceans around the world. But what would happen if we stopped thinking of plastic as waste, and instead as a valuable renewable resource?



THE PLASTIC "END-OF-LIFE CHALLENGE"

calls for new ways to recycle and reuse plastics endlessly in a closed loop system, so they never enter the waste stream. One scientist has made a significant advancement. John Layman, head of material science at *Procter & Gamble* and chief technologist and founding inventor of *PureCycle Technologies*, developed a **revolutionary process to remove color, odor, and contaminants from polypropylene plastic waste and transform it into a "virgin-like" resin, which is the basis for plastic products.**

Scott Trenor, a senior polymer scientist at *Milliken & Company*, contributed a key set of plastic additives—chemical substances that modify the properties of plastics—to increase the viability of *PureCycle* materials. Now *Milliken* and *PureCycle* are working together to scale and advance the technology, with plans to start commercial-scale production at *PureCycle*'s first plant in 2021.

Currently, only two kinds of plastic, PET and HDPE, are economically viable for recyclers. Layman focused on polypropylene because it's the second-most used plastic in the world, yet only one percent is recycled. It's found in caps on most bottles. It's in luggage and carpets, computers and phones. In the grocery store, it's everywhere—yet it's hardly the favorite of recyclers looking to make a profit. It holds onto pungent smells and contaminants, and it can only be made into black or gray products. For those reasons, the little that's recycled is usually made into park benches or car bumpers—important but limited applications.

To purify the polypropylene waste, *PureCycle* technology relies on a physical solvent-based

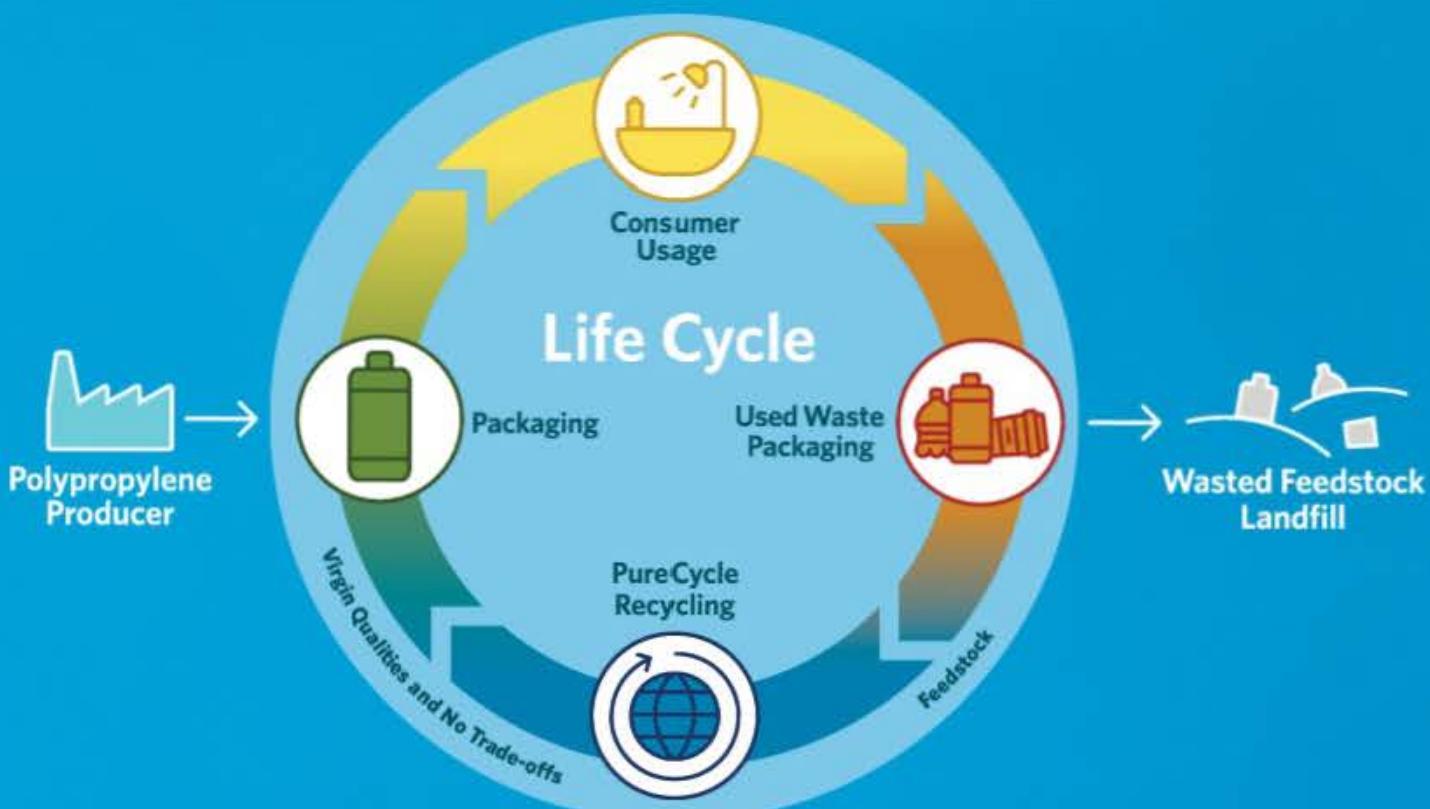
process that uses less energy than a chemical process because it doesn't have to break down and build up the molecule. "It's the combination of the solvent choice, plus specific process steps, that enable us to purify this material in a way that nobody's been able to do before," Layman says.

Once the material has been purified, the question is what to do with it. That's where *Milliken*'s additives come in—they can modify *PureCycle*'s polypropylene resin for use in a diverse set of applications. For the first time, recycled polypropylene doesn't have to become a car bumper. **Purified and modified, the resin can be molded into a variety of products with different properties in a closed loop.**

The first *PureCycle* plant is expected to purify and recycle 119-million pounds of polypropylene and produce 105-million pounds each year. Those numbers sound huge, but Layman puts it in perspective by pointing out that 120-billion pounds of polypropylene were produced globally in 2018 alone. "You can see we have a long way to go," he says.

He compares *PureCycle* with wind and solar energy technology before they scaled up. "We have an ambition to build 25 plants around the world, each one bigger than the last," Layman says. "This is plant number one." **Eventually, he hopes to *PureCycle* at least 10 to 20 percent of all polypropylene plastic.**

"For all of these technologies, it's really more of a marathon than a sprint," says Trenor. He's excited about new innovations in recycling, but he knows it will take more than science. "We need a diverse group of people, companies, NGOs, and governments to work together to solve the problem of plastic waste."



TOP PHOTOS PureCycle's recycling process transforms polypropylene plastic waste into a "virgin-like" resin that's free of color, odor, and other impurities.

INFOGRAPHIC PureCycle technology closes the loop on the reuse of recycled plastics and makes recycled polypropylene more accessible at scale to companies seeking sustainable, recycled resin.

OPPOSITE PHOTO The first PureCycle plant is expected to purify and recycle 119-million pounds of polypropylene and produce 105-million pounds each year.

Milliken.

LEARN MORE AT MILLIKEN.COM



CAN THIS SEED TEACH A CARROT TO SURVIVE?

PHOTOGRAPH BY ROB KESSELER

Using an electron microscope, artist Rob Kesseler captured seeds from 11 hardy plants scientists say may withstand climate-related drought. This *Daucus carota*, a wild relative of the carrot, could hold genetic secrets enabling plants to adapt and thrive. —NINA STROCHLIC



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**DISPATCHES
FROM THE FRONT LINES
OF SCIENCE
AND INNOVATION**

Avocado pits to bioplastic

A Mexico-based company, Biofase, is transforming avocado pits into bioplastic that can replace 60 percent of the plastic in cutlery. The avocado compounds are said to break down like any organic waste, so less plastic ends up in landfills. —DANIEL STONE



Learn more about plastic waste and take the pledge to reduce it at natgeo.com/plasticpledge.

NEUROSCIENCE

What feels your pain?

When a needle sticks you, where does the pain come from? The obvious answer: nerves in skin. But new research in mice suggests the origin might be a previously unknown organ under the skin called the nociceptive glial-neuronal complex (marked in green, below). When glial cells were turned off via gene editing, the mice were less sensitive to pain such as pinpricks. Still to be explored: how the organ works in humans and whether it can be manipulated to help treat pain.

—CATHERINE ZUCKERMAN

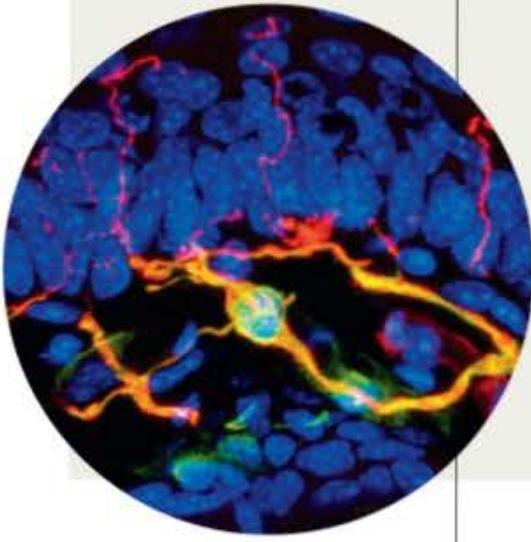


CELL BIOLOGY

TOUGH TARDIGRADES: MIGHT IN MINIATURE

THE TINY MOSS DWELLERS PROTECT THEIR DNA FROM NATURE'S HARSH PUNISHMENTS.

TARDIGRADES—ALSO KNOWN AS water bears for their rotund bodies—are marvels of biology. When dry spells strike their moist homes, such as the film of water atop lichens and mosses, they dehydrate into a protective dormant state that also helps them withstand intense heat, x-ray radiation, and even outer space. Scientists are beginning to learn how they do it. In 2016 Japanese researchers found that a species of tardigrade contains a unique protein, called Dsup, that protects its DNA from damage. Now scientists at UC San Diego have shown that Dsup is in a second tardigrade species, which hints at the protein's ubiquity within the group—and have uncovered more about how the protein works. The team found that Dsup binds to the “spools” that package DNA in cells and that it creates shields against hydroxyl radicals, highly reactive and damaging oxidants that can form when radiation splits water molecules. The discovery could yield new insights for humans, such as how to protect cell cultures used in medical research from radiation and other stressors. —MICHAEL GRESHKO



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Into the Storm

A PHOTOGRAPHER RUSHES
TOWARD THE DANGER
THAT MOST PEOPLE FLEE—
AND CAPTURES SCENES
OF SAVAGE NATURE.

STORY AND PHOTOGRAPH BY
KEITH LADZINSKI

WHEN YOU ARE STORM CHASING, most mornings start off in a cheap hotel sipping bad coffee and trying to remember where you had ended up the night before. If all goes well, you know that later that day you'll be racing headlong into chaos. You hope that you'll also catch a moment of the sublime.

On this particular morning, we were in Wichita, Kansas, midway through a project to photograph the dramatic and destructive weather that barrels across the middle of the United States every spring. Nick Moir, our expedition leader and weather sage, sat stooped on the edge of the bed, poring over a litany of apps and online radars in search of a good storm cell for us to pursue. Nick is fluent in the subtle hieroglyphics of location forecasting, which are incomprehensible to almost everyone else.

"This is it," he said, waving his phone at the rest



of the crew—photographer Krystle Wright, videographer Skip Armstrong, and me. "Let's roll out."

We loaded the car with our gear, and off we went, driving under cloudless blue skies for hundreds of miles. We left that serene day behind when we reached the fringe of our targeted storm and entered a dark scene of clouds, distant lightning, and intermittent rain. As we neared the heart of the cell, we found ourselves contending with high winds, torrential rain, and merciless hail. Krystle, at the wheel, accelerated to get in front of the storm, but it was moving too fast. We could barely keep pace with it.

Then we caught sight of a nightmare whipped up by the storm: a rain-wrapped wedge tornado half a mile to our right. The chaotic conditions made it difficult for us to keep the monster in sight. Its shape flickered in and out of the rain. We lost our cell phone



reception—and all the data we were desperately dependent on for radar apps and communication. We couldn't see beyond 20 feet, and the hail was so loud we had to shout to communicate. Our road was on an intersecting path with the tornado.

That's when Nick called it. "We have to bail," he yelled. "This is too much!"

Krystle abruptly changed direction, punching the car north onto a country road. For the next hour we were battered by large hail as we escaped the madness of that dangerous chase. Purged of adrenaline, disappointed and defeated, we knew that retreating was the right thing to do. But rationality can be gutting.

We weren't done. Nick located another supercell not far from where we were. Off we went in hot pursuit—as if nature hadn't humbled us enough for one

day. After a stretch of clear skies, we found the storm waiting for us—a dreamlike immensity with rotating updrafts, and the "mother ship" supercell above.

This time, we managed to get in front of it. Then we pulled over near the grain silos in Imperial, Nebraska, and watched in awe as the stunning formation surged across the landscape, unleashing hell below. For hours we followed the storm on its brutal path, stopping to photograph its majesty and racing back to the car to avoid its wrath.

A little past midnight, we let the storm go. We watched as the lightning-filled cloud rolled away, illuminating the night sky—a beautiful reward for those reckless enough to seek it. □

Keith Ladzinski has photographed U.S. national parks, China's karst rock towers, France's Verdon Gorge, and Antarctica for *National Geographic*.



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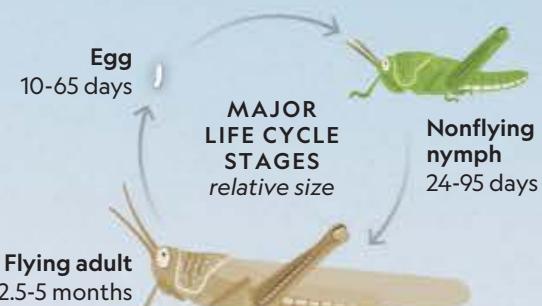
Together with the Chapmans, we're experiencing Alaska like only we know how. And you're invited to join us. *We the Explorers.*



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SAVOR THE JOURNEY

HOW TO SET OFF A PLAGUE OF LOCUSTS

BY TAYLOR MAGGIACOMO



VISUALIZE A SWARM of 70 billion flying insects, covering 460 square miles—about 1.5 times the size of New York City—and devouring more than 300 million pounds of crops in one day. That’s how big a single swarm can get. Plagues, made up of multiple swarms, are referenced in the Bible and the Quran. Of the thousands of grasshopper species, only 22 can be described as locusts. They’re distinguished by their ability to transform from a solitary state—actively avoiding other locusts—into a social, or “gregarious,” state in which masses of them darken the sky, ravage the land, and terrorize inhabitants. In 2004 a million Malians faced famine after locusts consumed 90 percent of their country’s cereal crops. Changes in locusts’ behaviors and physical traits can eventually be reversed if locusts get isolated, or they can persist and be passed on to offspring. —KAYA LEE BERNE

Preventing a plague

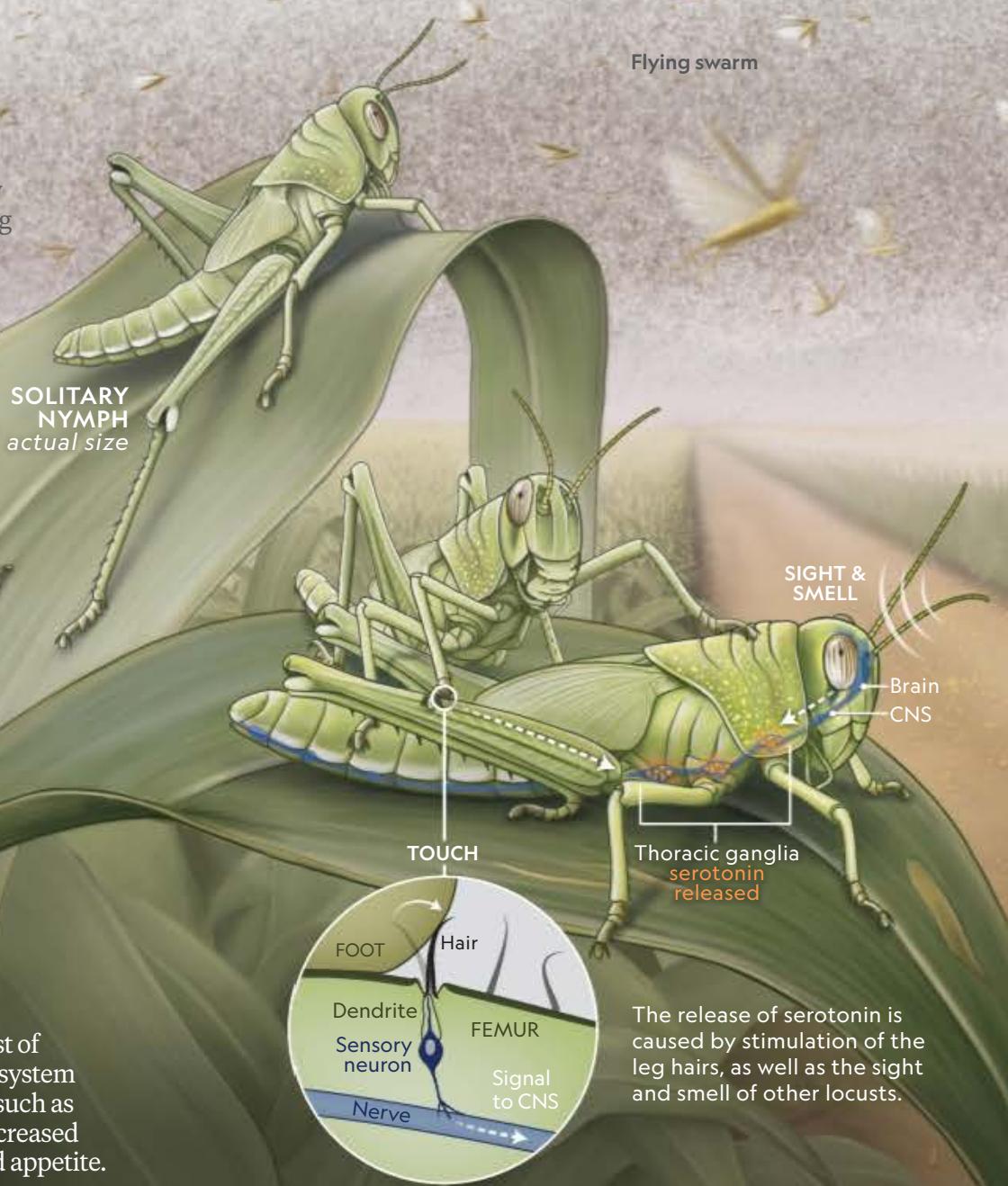
Weather patterns and historical locust records help experts predict where swarms might form. Once identified, an area is sprayed with chemicals to kill locusts before they can gather.



1

An unintentional gathering

Always in search of food, solitary locusts are forced together during dry spells, when vegetation dies off and leaves minimal areas of green within the desert.



2

Sudden transformation

Within hours of crowding, a boost of serotonin in the central nervous system (CNS) spurs behavioral changes such as rapid movements, sociability, increased self-grooming, and a more varied appetite.

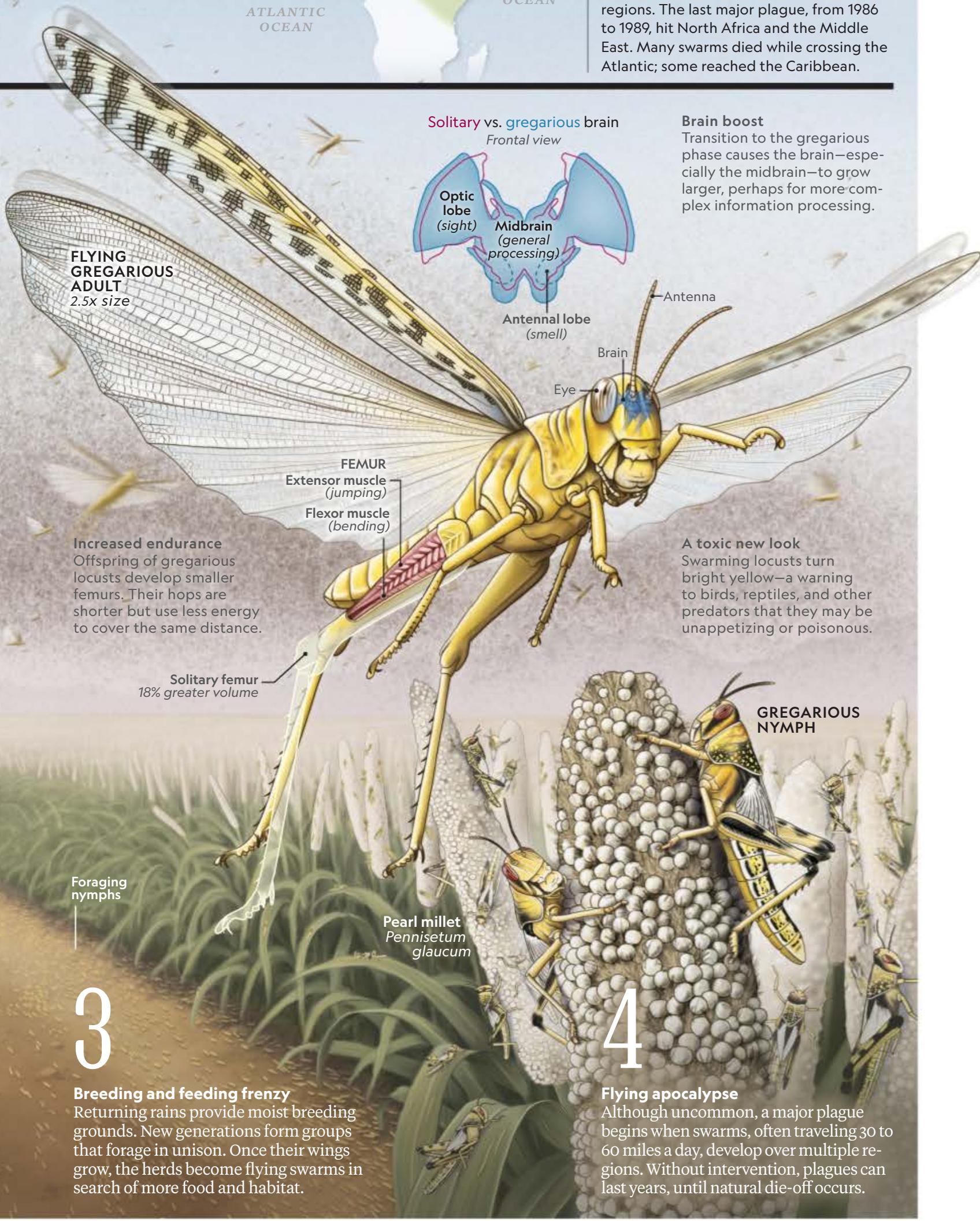
Desert locust
Schistocerca gregaria

- Solitary range
- Swarming range
- Swarm reports
1985–2019



THE DESERT LOCUST

The species with the most economic impact, the desert locust, threatens one-fifth of Earth's land area and one-tenth of the global population. Over 60 countries are susceptible to swarms. Locusts in the solitary phase occupy and breed in smaller regions. The last major plague, from 1986 to 1989, hit North Africa and the Middle East. Many swarms died while crossing the Atlantic; some reached the Caribbean.



Breeding and feeding frenzy

Returning rains provide moist breeding grounds. New generations form groups that forage in unison. Once their wings grow, the herds become flying swarms in search of more food and habitat.

Flying apocalypse

Although uncommon, a major plague begins when swarms, often traveling 30 to 60 miles a day, develop over multiple regions. Without intervention, plagues can last years, until natural die-off occurs.

THE FLU SUCKS EVERYTHING OUT OF YOU.



Feel better in just over 2 days with XOFLUZA.*

When the flu hits, the fever, aches and chills can flatten you fast. Over-the-counter medicines just treat symptoms, but prescription XOFLUZA works differently. It attacks the flu virus at its source with just one dose. But your window for prescription treatment is short, so you need to act fast.

xofluza™
(baloxavir marboxil) tablets 20mg
40mg
ONE DOSE CAN DO IT.™

Ask your doctor about XOFLUZA within 48 hours of your first symptoms.

*On average, patients felt better in 2.3 days versus 3.3 days with placebo.

INDICATION AND IMPORTANT SAFETY INFORMATION

XOFLUZA is a prescription medicine used to treat the flu in people 12 years of age and older who have had flu symptoms for no more than 48 hours.

Do not take XOFLUZA if you are allergic to baloxavir marboxil or any of the ingredients in XOFLUZA. If you develop an allergic reaction, call your doctor immediately.

XOFLUZA is not effective in treating infections other than influenza.

Please see the following page for brief summary.

Brief Summary

XOFLUZA™ (zoh-FLEW-zuh) (baloxavir marboxil) tablets

What is XOFLUZA?

XOFLUZA is a prescription medicine used to treat the flu (influenza) in people 12 years of age and older who have had flu symptoms for no more than 48 hours. It is not known if XOFLUZA is safe and effective in children less than 12 years of age or weighing less than 88 pounds (40 kg).

Do not take XOFLUZA if you are allergic to baloxavir marboxil or any of the ingredients in XOFLUZA.

Before you take XOFLUZA, tell your healthcare provider about all of your medical conditions, including if you:

- are pregnant or plan to become pregnant. It is not known if XOFLUZA can harm your unborn baby.
- are breastfeeding or plan to breastfeed. It is not known if XOFLUZA passes into your breast milk.

Tell your healthcare provider about all the medicines you take, including prescription and over-the-counter medicines, vitamins, and herbal supplements.

Talk to your healthcare provider before you receive a live flu vaccine after taking XOFLUZA.

How should I take XOFLUZA?

- Take XOFLUZA exactly as your healthcare provider tells you to.
- Your healthcare provider will prescribe 2 tablets of XOFLUZA you will take at the same time as a single dose.
- Take XOFLUZA with or without food.
- Do not take XOFLUZA with dairy products, calcium-fortified beverages, laxatives, antacids or oral supplements containing iron, zinc, selenium, calcium or magnesium.

If you take too much XOFLUZA, go to the nearest emergency room right away.

What are the possible side effects of XOFLUZA?

XOFLUZA may cause serious side effects, including:

Allergic reactions. Get emergency medical help right away if you develop any of these signs and symptoms of an allergic reaction:

- | | |
|--------------------------------|--|
| • trouble breathing | • swelling of your face, throat or mouth |
| • skin rash, hives or blisters | • dizziness or lightheadedness |

The most common side effects of XOFLUZA in adults and adolescents include:

- | | | | | |
|--------------|----------|------------|-------------|------------|
| • bronchitis | • nausea | • diarrhea | • sinusitis | • headache |
|--------------|----------|------------|-------------|------------|

XOFLUZA is not effective in treating infections other than influenza. Other kinds of infections can appear like flu or occur along with flu and may need different kinds of treatment. Tell your healthcare provider if you feel worse or develop new symptoms during or after treatment with XOFLUZA or if your flu symptoms do not start to get better.

These are not all the possible side effects of XOFLUZA.

Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088. Keep XOFLUZA and all medicines out of the reach of children.

General information about the safe and effective use of XOFLUZA.

Medicines are sometimes prescribed for purposes other than those listed in a Patient Information leaflet. Do not use XOFLUZA for a condition for which it was not prescribed. Do not give XOFLUZA to other people, even if they have the same symptoms that you have. It may harm them. You can ask for information about XOFLUZA that is written for health professionals.

You are encouraged to report side effects to Genentech by calling 1-888-835-2555 or to the FDA by visiting www.fda.gov/medwatch or calling 1-800-FDA-1088.

For more information, go to www.xofluza.com

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TRAVEL



WHERE TO GO, WHAT TO KNOW,
A
NATIONAL GEOGRAPHIC

HOW TO SEE THE WORLD

VOL. 237 NO. 2

BY THE NUMBERS

11,700

ESTIMATED AGE, IN
YEARS, OF KILIMANJARO'S
GLACIERS

2030

THE YEAR THE GLACIERS
WILL BE GONE, BY SOME
SCIENTISTS' ESTIMATES

19,341

KILIMANJARO'S HEIGHT,
IN FEET



IN THIS SECTION
Mardi Gras Goes Green
A Walk in the Woods
Milan's Tarot Tradition



**'I THINK THE BIGGEST
FACTOR IN STAYING SAFE
ISN'T HOW STRONG YOU ARE,
BUT HOW WELL YOU LISTEN
TO THE ENVIRONMENT.'**

—Will Gadd

GETTING THERE

A VANISHING ADVENTURE

ON KILIMANJARO, MOST CLIMBERS go straight for the Tanzanian mountain's famous summit. But those who take the more dangerous western route have found glaciers up to 100 feet tall. These ancient frozen masses are tropical anomalies—ice doesn't often last long near the Equator. The sun's rays cause the foot of a glacier to melt first, leading to calving, breakaways, and, sometimes, stand-alone towers of ice (pictured at left). Kilimanjaro's ice climbing can be some of the best on Earth, says climber Will Gadd. One reason to go soon: These glaciers—like glaciers everywhere—are melting.

SIX MONTHS OUT GETTING IN SHAPE

Any attempt on this mountain requires serious physical and mental preparation. To build fitness, starting at least half a year in advance, Gadd suggests daily weight and cardio workouts paired with a diet of whole foods and lean red meat. During training climbs, he advises, explorers should be alert to warning signs like sustained winds or impending rain.

TWO WEEKS OUT ESSENTIAL PACKING LIST

High-quality gear is the key to both enjoying ice climbs and surviving them, Gadd says. He's adamant about taking the following:

- Sharp crampons that attach securely to boots
- Handheld ice claws
- A helmet, in case you fall or ice falls on you
- Gloves that are flexible and warm
- A jacket that repels water and blocks wind
- Rope and safety harness: "Never skimp on these."

DAY BEFORE READY FOR LAUNCH

Respect the porters with you on this climb: They're likely dealing with the same altitude sickness that you are. When you arrive at the starting point, take an honest assessment of conditions. Is there too much wind? What's the likelihood of rain? Climbing mountains and glaciers is dangerous even in the best of circumstances, so don't push ahead in subpar conditions, Gadd says.

BY DANIEL STONE PHOTOGRAPH BY CHRISTIAN PONDELLA

FEBRUARY



1

TRINIDAD AND TOBAGO

Revelry in Blue

Festivities get fierce in this island nation as the Jab Molassie take to the streets. These pitchfork-toting devils—just one type of the many Carnival characters—cover themselves with molasses or grease and paint, often blue. Be prepared to give them a Trinidadian dollar (about 15 cents U.S.), or they'll smear you with paint too. The mountain hamlet of Paramin holds an especially wild display.



Here's where to take in the sights and sounds of Carnival season around the world.

BY KAREN CARMICHAEL

VENICE, ITALY

WHAT IS THE ART BEHIND THE MASK? CRAFTSPEOPLE PRESS LAYERS OF WET PAPER ONTO A MOLD. ONCE THE PAPER DRIES, THEY HAND-PAINT THE MASKS AND ADD GOLD LEAF, GEMS, OR FEATHERS.

3



BULGARIA

FOR PERHAPS 4,000 YEARS the costumed Kukeri have been scaring off evil spirits and calling for bountiful harvests. Top spots to see their processions include the town of Pernik and the village of Shiroka Laka.

4

NEW ORLEANS, LOUISIANA

Beads of All Colors Go Green

Mardi Gras parades come with a price: tons of discarded plastic beads. But now there are more sustainable options, such as recycled-paper necklaces by Atlas Handmade Beads.

5

ORURO, BOLIVIA



IN THIS ARID, HIGH-ALTITUDE CITY, PERFORMERS DON HORNED MASKS FOR THE CARNIVAL'S DIABLADA, A DANCE INFLUENCED BY BOTH INDIGENOUS AND SPANISH TRADITIONS.



TREE TIME

BY KELLY DINARDO

TO SKEPTICS, forest bathing looks merely like a slow walk in the woods. But the Japanese practice of *shinrin-yoku* involves a more deliberate, meditative engagement of all the senses immersed in nature.

Introduced in the 1980s, it's now a common discipline in Japan. The Forest Therapy Society started a certification system there in 2008 and currently has more than 1,700 guides. On the wave of the wellness movement, the custom has spread, with certified guides in the United States leading walks anywhere there are trees, from

Acadia National Park in Maine (pictured here) to the Los Angeles County Arboretum and Botanic Garden.

While forest bathing is having a moment, many cultures have long believed in nature as a balm for mind, body, and spirit. It's the idea behind the Norwegian word *friluftsliv*, "open-air life." Or part of what the Germans mean with the word *waldeinsamkeit*, that feeling of solitude when you're alone in the woods. And it's why so many younger Swiss skip church and head to the mountains on Sundays. Outside, arbors provide the amen.



A work in progress at Osvaldo Menegazzi's Milan studio depicts the Eye of Providence, a symbol that appears in tarot.

TAROT'S ITALIAN ROOTS

FOR DEVOTEES OF THIS 600-YEAR-OLD ESOTERIC ART,
A TRIP TO MILAN IS IN THE CARDS.

BY ALEX SCHECHTER

AT HIS TINY STUDIO in Milan, just past the Porta Ticinese, 89-year-old Osvaldo Menegazzi has been creating his own versions of classic tarot decks since the 1970s. The cards are made of thick stock and hand-dyed; the faces seem to gaze at you from across the centuries. Of the countless tarot decks that flood the market each year, those by Menegazzi, a formally trained fine artist, are unique primarily because they feel so personal. "*Le carte parlano*," he has said. "The cards speak."

He is one reason tarot lovers, like me, come to Milan. In the mid-15th century, the Visconti and Sforza families, rulers of Milan for more than two centuries,

commissioned a local artist named Bonifacio Bembo to illustrate a custom tarot deck for them. Painted in tempera, then embellished with gold and silver leaf, the Visconti-Sforza deck attests not only to Bembo's talent but also to the families' keen taste for pocket-size art. Travelers can view 26 of the surviving cards at the Accademia Carrara, a fine-art academy and gallery in Bergamo, an hour northeast of Milan.

Splendid Sforza Castle, with its brick ramparts, is where cards dating from about 1500 were discovered in the early 20th century, at the bottom of a well. Closer to the center of Milan, the Pinacoteca di Brera art gallery houses, along with masterpieces

LEGAL NOTICE

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Kaiser Gypsum Company, Inc. and Kaiser Cement Corporation (now known as Hanson Permanente Cement, Inc.) (together, the "Debtors") made certain products that contained asbestos. These products included various exterior stucco materials, joint compounds for wallboard and radiant heating components, texturizing paint and other related products (the "Products"). A full list of the Products can be found at <https://cases.primeclerk.com/kaisergypsum>. People using these Products (and family members and others who came into contact with these people) may have been exposed to asbestos. The Debtors are now in bankruptcy and people with claims of injury caused by exposure to asbestos in the Products have certain rights that may be affected by the bankruptcy filing.

The Debtors have filed a Joint Plan of Reorganization (the "Plan") and a Disclosure Statement, a document that provides important information about the Plan. The Disclosure Statement has been approved and will be sent to individuals with asbestos-related personal injury claims so that they can vote whether to accept or reject the Plan. A hearing to consider confirmation of the Plan (the "Confirmation Hearing") has been scheduled for March 30, 2020 to April 4, 2020 in the U.S. Bankruptcy Court for the Western District of North Carolina, 401 W. Trade St., Charlotte, NC 28202. Information on the Confirmation Hearing and all Plan-related documents is available at <https://cases.primeclerk.com/kaisergypsum>.

Am I Affected by the Plan?

If you claim to have been injured by asbestos in any of the Products, you are entitled to vote to approve or reject the Plan. The full Disclosure Statement and a ballot were sent to all lawyers representing individuals with current asbestos-related personal injury claims against the Debtors or directly to those individuals. A vote to accept or reject the Plan must be received by **5:00 p.m., prevailing Eastern Time, on February 20, 2020**. If you believe you have an asbestos-related personal injury claim against the Debtors and have questions, then you should contact your lawyer immediately.

What does the Plan do?

The Plan is the result of a settlement between the Debtors and court-appointed representatives of current and future asbestos claimants. The Plan preserves the Debtors' asbestos insurance coverage and permits asbestos personal injury claimants to pursue insurance recoveries in the tort system. The Plan also proposes to create a trust to pay asbestos-related personal injury claims to the extent the claims are not covered by insurance. If the Plan is approved, money can only be received from insurance and the trust; asbestos personal injury claimants will not be able to recover money from the Debtors or other protected parties listed in the Plan. If you have a pending lawsuit against the Debtors, you should talk to your lawyer about how the Plan may affect you.

How to Obtain Documents.

Copies of the Disclosure Statement, which includes the Plan, the voting materials and the notice of the Confirmation Hearing may be obtained by visiting this website: <https://cases.primeclerk.com/kaisergypsum>. You may also obtain copies of these documents by sending a request, in writing, to Prime Clerk, LLC, Kaiser Gypsum Company, Inc. Ballot Processing, c/o Prime Clerk, One Grand Central Place, 60 East 42nd Street, Suite 1440, New York, New York 10165 or by calling (855) 855-7644.

What if I want to Object to the Plan?

If you have a lawyer, you should talk to him or her about any concerns you may have about the Plan. You may object to the Plan if you do not like all or part of it. The deadline for filing and serving objections to the confirmation of the Plan is **5:00 p.m., prevailing Eastern Time, on February 20, 2020**. All objections must comply with the requirements set forth in paragraph 12 of the notice of the Confirmation Hearing, which is posted on the website below.

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by Caravaggio and Raphael, the Sola Busca deck, completed in 1491. Considered the inspiration for the Rider-Waite-Smith deck—a gold standard for tarot users today—the Sola Busca was the first known to put detailed illustrations on all 78 cards. These original cards, which recall an era of knights, knaves, and family crests, fit right in with the frescoes and panels in 15th- and 16th-century churches.

Arnell Ando, a Los Angeles-based expert who leads tarot-themed tours of northern Italy, delights in these parallels. On her itinerary is the Palazzo Schifanoia, near the town of Ferrara, in the Emilia-Romagna region. Its walls teem with astrological symbols. In Tuscany, the Siena cathedral features a tiled floor mosaic depicting what looks like the tarot symbol for the wheel of fortune.

Think of tarot nowadays and you might conjure images of fraudster psychics, but in the late Middle Ages and early Renaissance, before divination ever entered the picture, *tarocchi* was a ripe new medium for artists and poets. Playing cards had just come into fashion, and tarocchi was distinctive: Each 78-card deck had four suits—wands, coins, swords, and cups—plus 22 special *trionfi* (trump) cards with evocative names such as the Devil, the Emperor, and Justice. With their rich illustrations, the cards set the imagination aflame while distilling universal truths about life.

Like the Renaissance paintings of Raphael and Michelangelo, the cards were full of emotion—and magic. To those who knew the references, tarot spoke a secret language that the Roman Catholic Church

wanted to suppress. In code, artists were able to include references to alchemy, astrology, and even kabbalah, a mystical branch of Judaism.

It doesn't surprise me that tarot, in its eloquent beauty, its effortless melding of the religious and the secular, is a wholeheartedly Italian invention. It bears the unmistakable signature of a culture that gave us the "Birth of Venus" and the Sistine Chapel. There's even an urgency in the way the cards communicate (consider the ominous figures of the Judgment card, rising from their graves, for example), as if they can't get the message out fast enough. How Italian is that?

I first studied tarot in my 20s, when I was part of a radical tarot school in New York City called the Brooklyn Fools. The reason I fell in love with tarot then is the same reason people did 600 years ago: It's relatable. We share many of the same concerns as in Renaissance times: We worry about money, get our hearts broken, wonder how to make changes for the better in our lives.

In Menegazzi's Milan workshop, which doubles as a gallery for his paintings, shadow boxes, and every imaginable style of tarot, it's hard not to feel moved by his passion. Surrounded by watercolor brushes, inkpots, and cardboard, he reaffirms what the original tarot artists of the 1400s sought to do: Express ideas in a beautiful way about the complexities of being human.

Six hundred years later, we're still listening to what they have to say. □

Alex Schechter is a writer and sound therapist based in Los Angeles.



Cards in the Visconti-Sforza deck housed at the Accademia Carrara in Bergamo include the Moon (far left), and (clockwise from top left) the Emperor, Five of Coins, Queen of Wands, Four of Swords, the World, Ten of Cups, Page of Coins, and Six of Wands.

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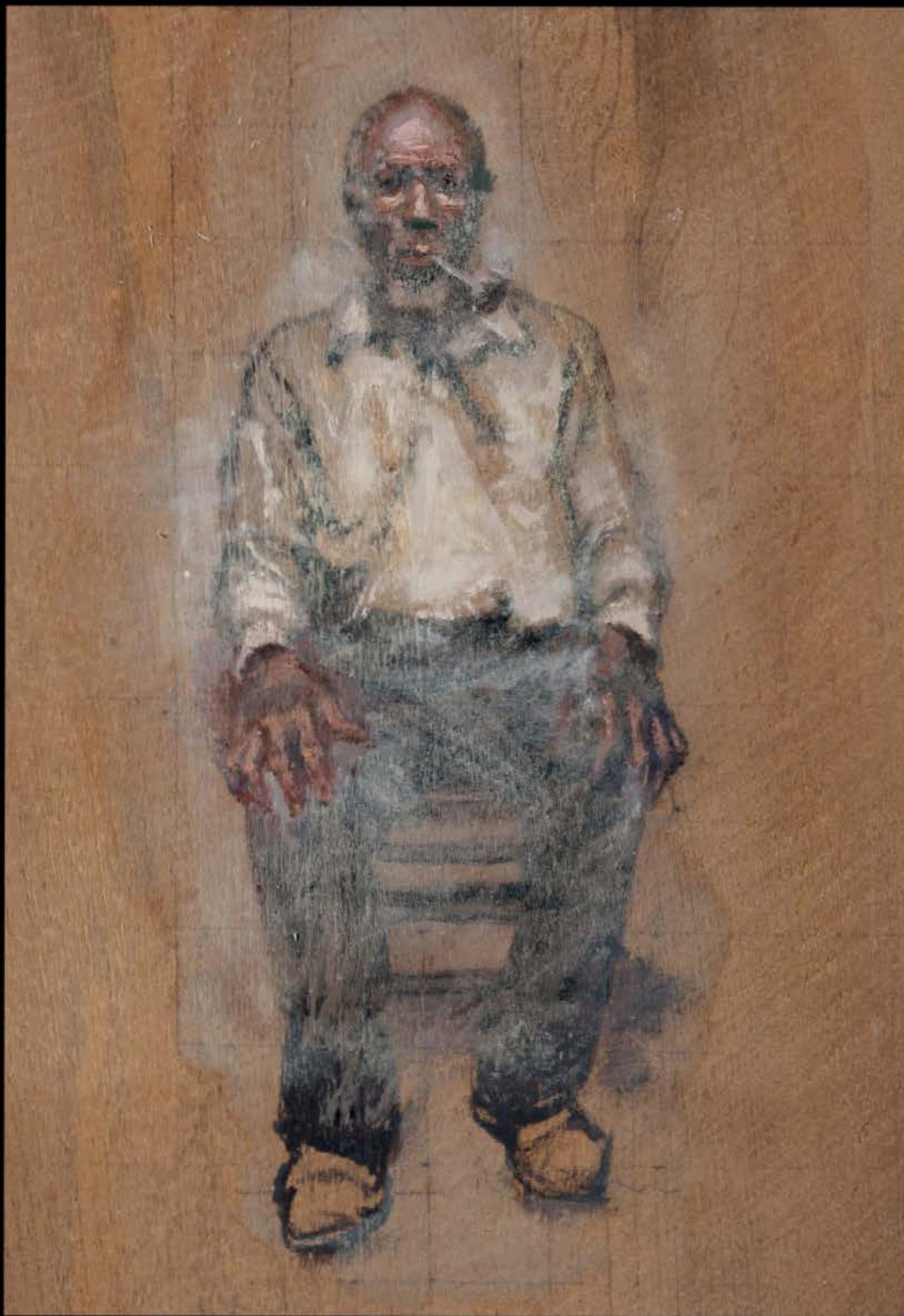
'AMERICAN FLAMINGOS GENERALLY ARE SOCIALE WITH PEOPLE, MAKING RESCUED BIRDS THAT CAN'T BE RETURNED TO THE WILD WONDERFUL AMBASSADORS FOR WILDLIFE CONSERVATION.'

Last May, 400 years after shackled Africans first set foot in the English colony of Virginia, a team of underwater archaeologists announced that the charred, sunken remains of the *Clotilda*, the last known slave ship to reach U.S. shores, had been discovered near Mobile, Alabama. In 1860—52 years after the United States had banned the import of slaves—a wealthy landowner hired the schooner and its captain to smuggle more than a hundred African captives into Alabama, a crime punishable by hanging. Once the nefarious mission was accomplished, the ship was set ablaze to destroy the evidence. The captives were the last of an estimated 307,000 Africans delivered into bondage in mainland America from the early 1600s to 1860, making the *Clotilda* an infamous bookend to what has long been called “America’s original sin.” In 1865 President Abraham Lincoln proclaimed that the Civil War that had devastated the nation was the Almighty’s judgment on that sin.

After the war ended and slavery was abolished, the displaced Africans from the *Clotilda* put down roots as free Americans, but they didn't relinquish their African identities. Settling among the woods and marshes upriver from Mobile, they built simple homes, planted gardens, tended livestock, hunted, fished, and farmed. They founded a church and built their own school. And they created a tight-knit, self-reliant community that came to be known as Africatown. Many of their descendants still live there today. The story of these extraordinary people—their trials and triumphs, their suffering and resilience—is one the people of Africatown are proud to remember, and a legacy they are fighting to save.

The Last Slave Ship

This is the story of the 108 people on board...



PAINTINGS BY SEDRICK HUCKABY PHOTOGRAPHS BY ELIAS WILLIAMS

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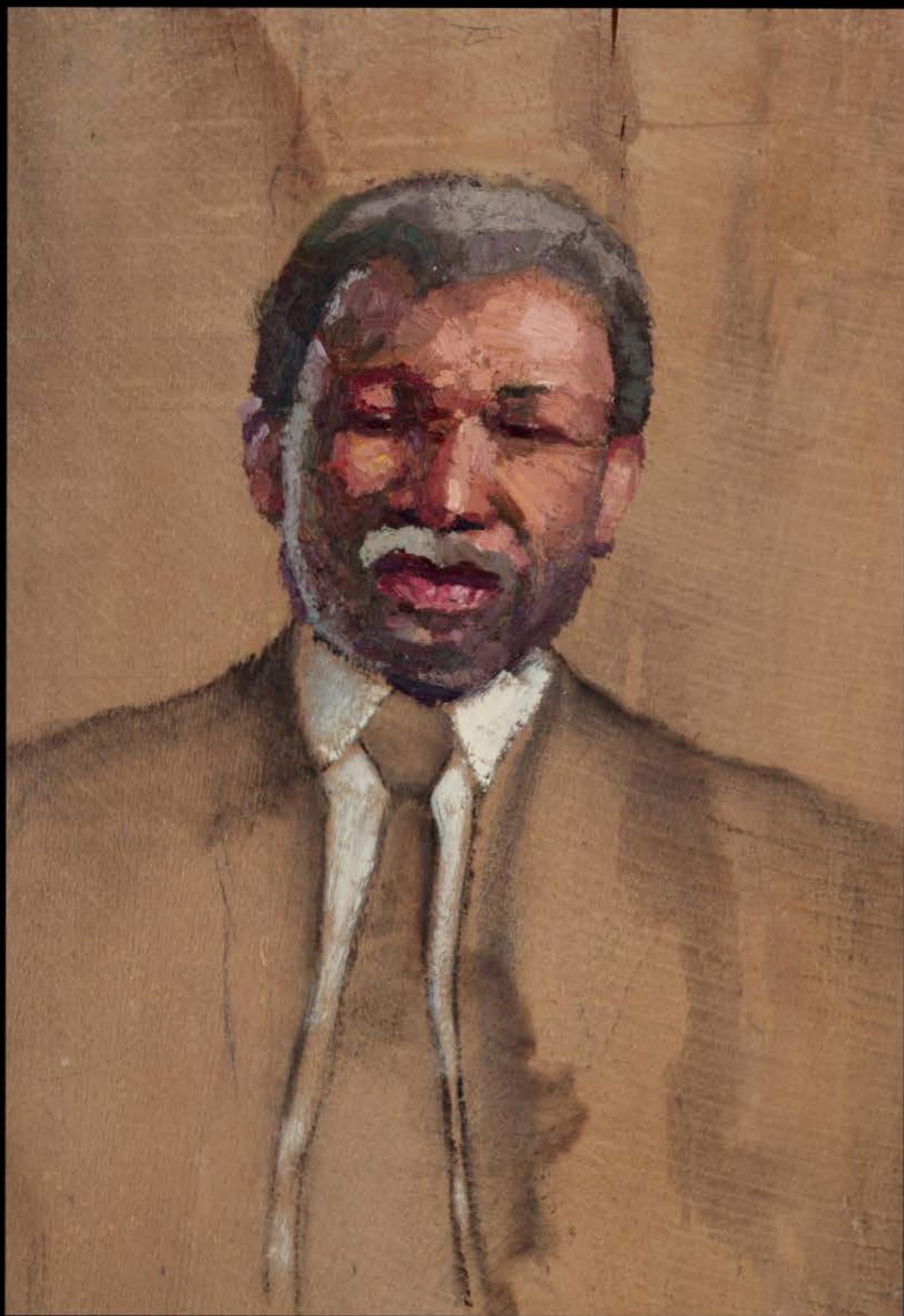


Finding their roots

Cudjo Lewis (far left) and descendants Altevese Lumbers-Rosario (in dress) and Ralphema Lumbers

He was 19 years old when he arrived in chains aboard *Clotilda*. But Kossola, who took the name Cudjo Lewis, never forgot his homeland. Once free, he and his shipmates built their own town and continued many of their African traditions. After the remains of the ship were found, his descendant Altevese Lumbers-Rosario said, "It's very emotional, very exciting for us." Her first cousin Ralphema Lumbers wears a T-shirt with a photo of Lewis taken about 1927.

...and of their descendants.

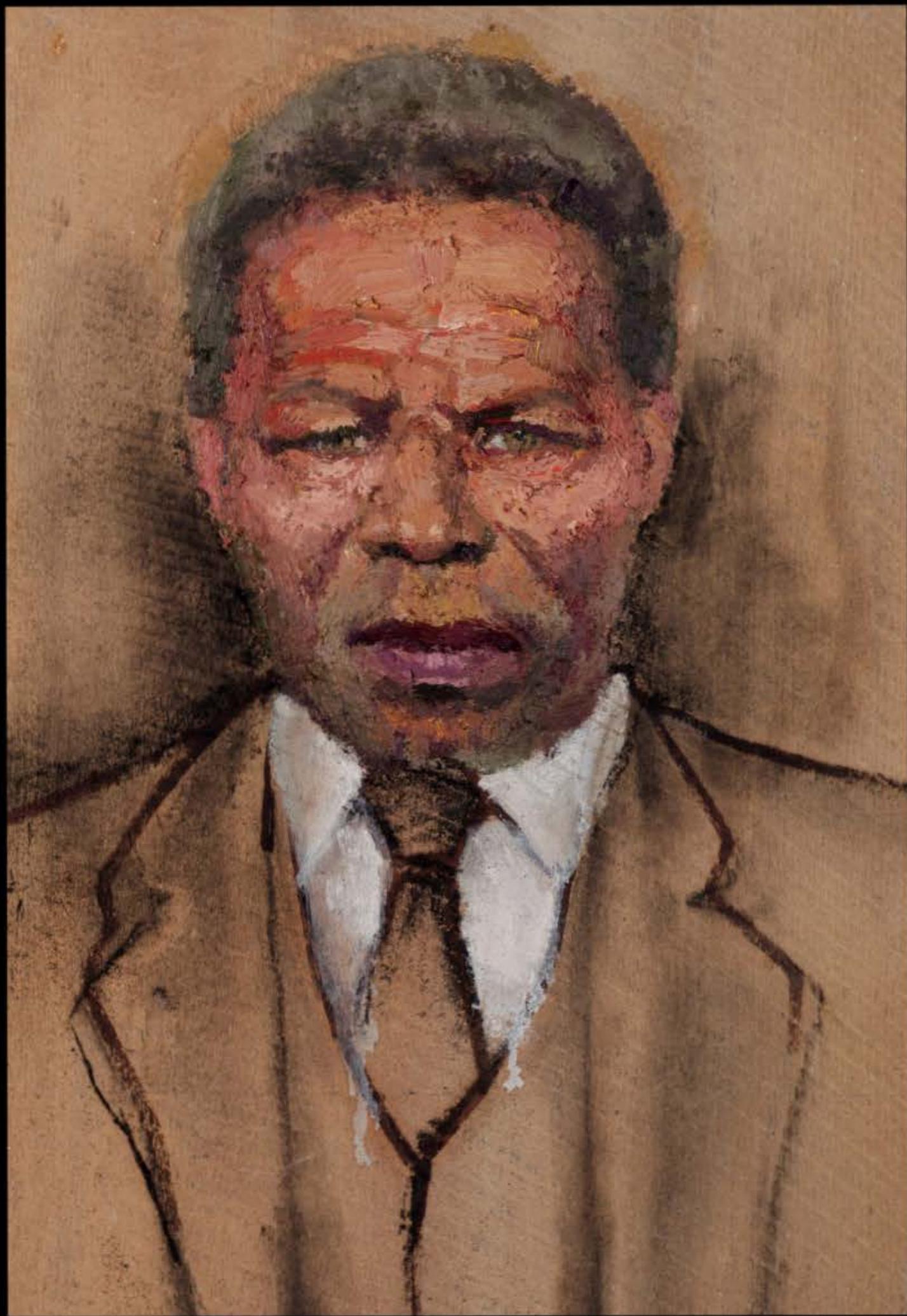




Earned success

Pollee Allen (far left) and Vernetta Henson, his great-great-granddaughter

After laboring 12 hours a day as a lumber stacker, Kupollee, who adopted the name Pollee Allen, would come home and work in his productive garden until dark, providing for his 15 children. It was a work ethic he passed on to his many descendants, says Vernetta Henson. "My grandmother had nine children, and all of them went to college."

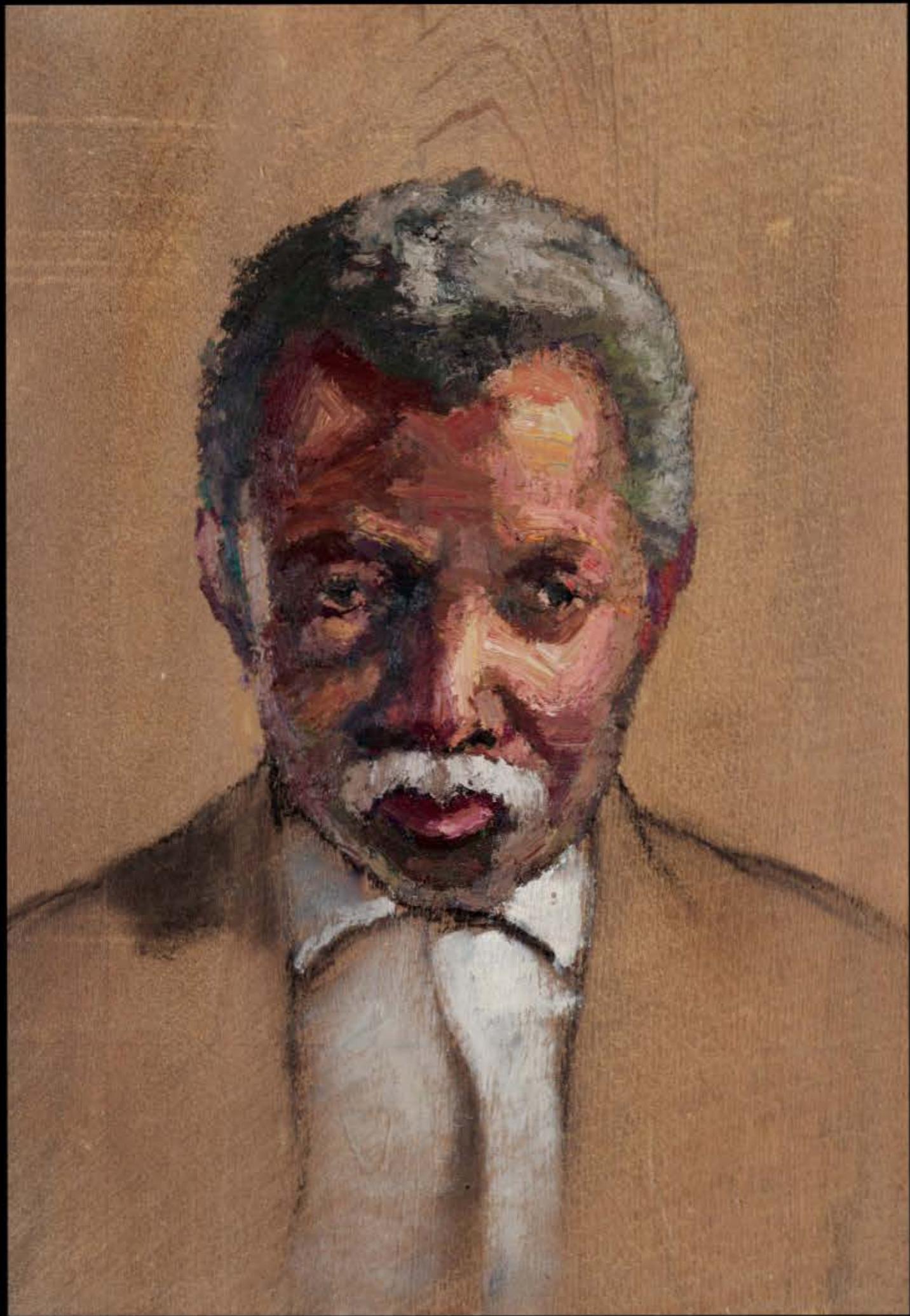




Keepers of the story

Charlie Lewis (far left) and Lorna Gail Woods, his great-great-granddaughter

Oldest of the *Clotilda* captives, Oluale, who took the name Charlie Lewis, settled an area that became known as Lewis Quarters, where some of his 200-plus descendants still live. "Stories about the *Clotilda* were always taught in our home," says Lorna Gail Woods. "Africatown was a proud place to be raised."





Righting old wrongs

Ossa Keeby (far left) and his descendant Karliss Hinton

Ossa Keeby was likely a fisherman on the Kebbi River in north-western Nigeria before he was captured. He and his wife, Annie, became successful farmers, raised nine children, and owned several plots of land. "My grandmother was a Keeby, and she told me all about the ship," says Karliss Hinton, an Army veteran. "It took all these years for folks to recognize my people. It may take time, but a right always overcomes a wrong."

CRUEL COMMERCE

BY JOEL K. BOURNE, JR.

B

BY 1860 ENSLAVED PEOPLE were the foundation of the American economy, more valuable than all the capital invested in manufacturing, railroads, and banks combined. Cotton accounted for 35 to 40 percent of U.S. exports, says Joshua Rothman, a historian of slavery at the University of Alabama.

“Banks in the U.S. and around the world were pouring money into Alabama, Mississippi, and Louisiana, investing in plantations, southern banks, and enslaved people, who could be mortgaged,” Rothman says.

Importing slaves into the United States had been outlawed since 1808, and by 1859 the price of domestic slaves had soared, cutting deeply into planters’ profits and spurring some to clamor for reopening the trade.

One fiery proponent was Timothy Meaher. Born in Maine to Irish immigrants, Meaher and several of his siblings had moved to Alabama and amassed fortunes as shipbuilders, river-boat captains, and lumber magnates. They also owned vast tracts of land worked by slaves.

During a heated argument with a group of northern businessmen, Meaher made a bold wager: He would bring a cargo of African captives into Mobile, right under the noses of federal authorities.

Meaher had little trouble getting investors for his illegal scheme. His friend and fellow shipwright William Foster had built a sleek, speedy schooner named *Clotilda* a few years earlier to haul lumber and other cargo around the Gulf of Mexico. Meaher chartered the boat for \$35,000 and enlisted Foster as captain.

In late February or early March 1860, Foster and his crew set sail for the notorious slave port of Ouidah, in present-day Benin. So began one of the best documented slave voyages to the United States.

Foster left a handwritten account of the trip, while Meaher and several of the Africans later told their stories to journalists and writers. Two of the former slaves who lived into the 1930s appeared in short films.

 The nonprofit National Geographic Society helped fund this article.

JOURNEY OF NO RETURN

BY SYLVIANE DIOUF

THE 110 YOUNG MEN, WOMEN, AND CHILDREN who boarded the *Clotilda* in May 1860 came from Bantè, Dahomey, Kebbi, Atakora, and other regions of Benin and Nigeria. Among them were people from the Yoruba, Isha, Dendi, Nupe, and Fon ethnic groups. Their parents had named them Kossola, Kupollee, Abile, Abache, Gumpa.

Some were long-distance traders, likely carrying salt, copper, and fabric. They may have produced iron. Others may have woven cloth, harvested yams, or made palm oil. Some women were married and had children; they likely worked as farmers or market traders.

One man, Kupollee, had a small hoop in each ear, which meant he had been initiated in an *ile-orisa*—house of the god—into the religion of the Yoruba. Ossa Keeby came from Kebbi in Nigeria, a kingdom renowned for its professional fishermen. Like 19-year-old Kossola (later known as Cudjo Lewis), several were victims of a raid by the slave-trading kingdom of Dahomey. Kossola said he came from modest means, but his grandfather was an officer of a Bantè king. At 14 he trained as a soldier and later began initiation into the Yoruba *oro*, the male secret society. A young girl, Kéhounco (Lottie Dennison), was kidnapped, as were many others. Their forced journeys ended in a slave pen in Ouidah.

Amid the sheer horror and misery, the captives found support and solidarity, until foreign slavers irreparably tore their newfound community apart. According to newspaper interviews and oral histories given by the survivors over the years and detailed in my book *Dreams of Africa in Alabama: The Slave Ship Clotilda and the Story of the Last Africans Brought to America*, when *Clotilda* captain Foster entered the grounds, people were ordered to form circles of 10. After inspecting their skin, teeth, hands, feet, legs, and arms, he selected 125 individuals. In the evening they were told they would leave the next day. Many spent the night crying. They had no idea what loomed ahead and did not want to be separated from their loved ones.

In the morning the dejected group waded

neck-deep across a lagoon to reach the beach, where canoes transported them over the dangerous, sometimes deadly, surf to the *Clotilda*. What happened next haunted them forever. They were forced to remove their clothes. The Africans' total nakedness was a rule of the slave trade, officially—although quite ineffectively—to maintain cleanliness. The last *Clotilda* survivors still bristled years later at the humiliation of being called naked savages by Americans who believed nudity was "African."

Before the transfer was over, Foster saw steamers approaching. Afraid he would be caught, he sailed away, leaving 15 people on the beach. For the first 13 days at sea, every captive remained confined in the hold. Decades later, in 1906, when Abache (Clara Turner) talked of the filth, the darkness, the heat, the chains, and the thirst to a writer from *Harper's* magazine, "her eyes were burning, her soul inexpressibly agitated at the memory." Despair, agony, and horror were compounded for powerless parents unable to alleviate their children's fears and suffering. One woman, later known as Gracie, had four daughters on board; the youngest, Matilda, was about two years old. The lack of water was torture, and the meals—molasses and mush—did not help. The sugary foods only intensified their thirst. "One swallow" twice a day was all they got, and it tasted like vinegar. The rain they caught in their mouths and hands was a fleeting relief. There was sickness, and two people died.

Slave ships were places of unspeakable misery. Solidarity was vital, and those who suffered together forged lifelong relationships that sometimes spanned generations—if they were not separated again. On the *Clotilda*, over a month and a half, such a community was born.

On July 8 the shipmates glimpsed land in the distance. They heard a noise they likened to a swarm of bees. It was the sound of a tugboat towing the *Clotilda* up Mobile Bay. They were transferred to a steamboat owned by Timothy Meaher's brother Burns and taken upriver to John Dabney's plantation while Foster took his



ship to Twelve Mile Island. There was no hiding the squalid remnants of a slaving voyage, and Foster risked the death penalty if caught. He lit loose wood or perhaps lantern oil, and the ship he had built five years earlier went up in flames.

Short of workers for their developing plantations, slaveholders in the Deep South had for years bought people from the upper South at prices they found outrageous. With the international slave trade illegal, some turned to smuggling. In Alabama, despite Foster and Meaher's precautions, the "secret" arrival was all over town and in the press within a day or two. Meanwhile, the young Africans had disembarked into the desolate, mosquito-infested canebrakes of Dabney's Clarke County plantation. Moved

from one place to another to avoid detection, they were fed meat and cornmeal that made them sick. They welcomed the rags, pieces of cornsacks, and skins they were given in lieu of clothes. When federal authorities sent a crew led by a U.S. marshal to find them, the Africans had already been moved to Burns's plantation. They "almost grieved themselves to death," they confided half a century later.

Timothy Meaher, eager to quickly settle his affairs, organized a sale. As their new family was separated once again, the shipmates cried and sang a farewell song, wishing one another "no danger on the road." While about 80 were taken to Mobile, the *Mercury* newspaper of July 23, 1860, reported, "some negroes who never

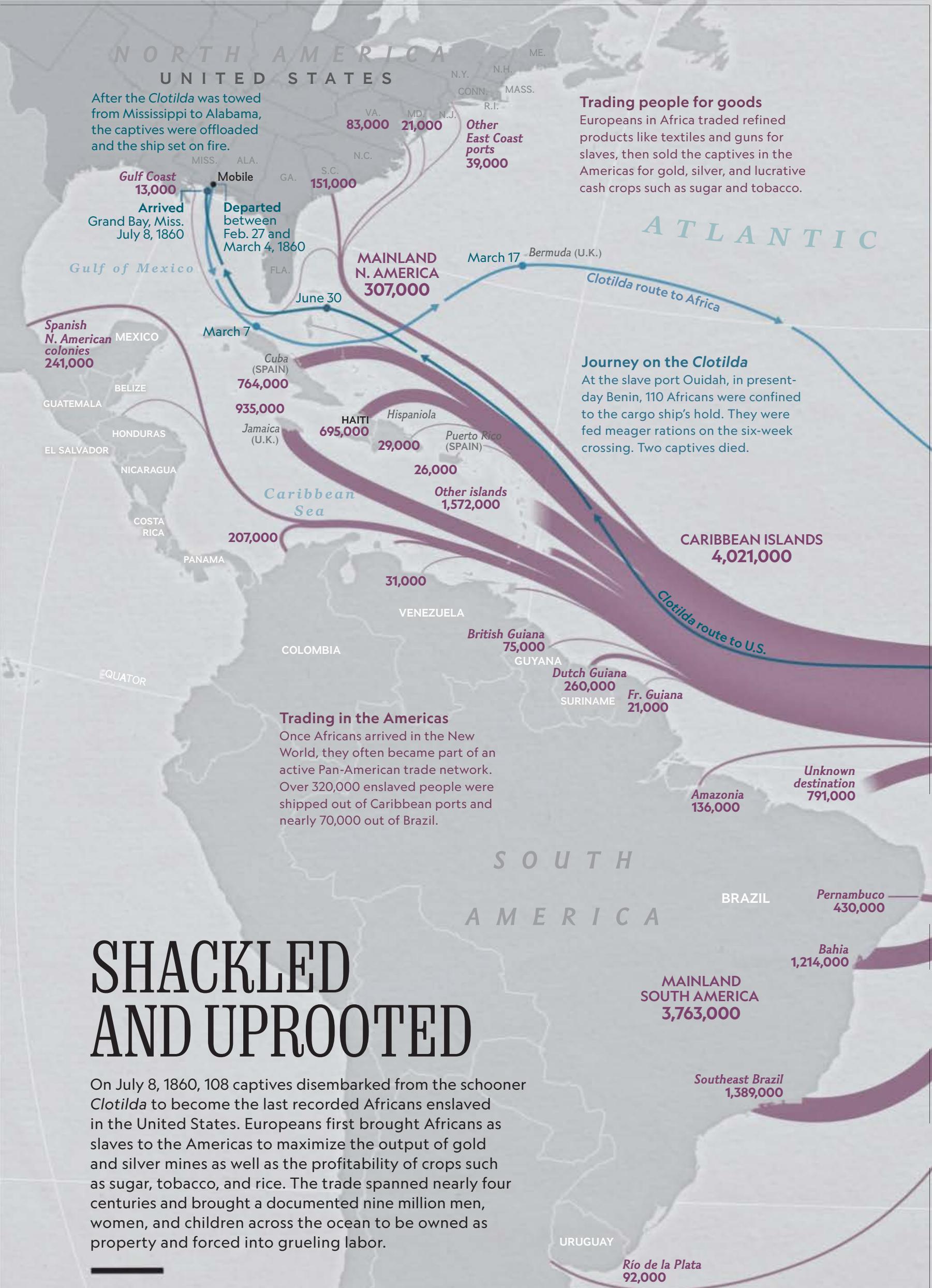


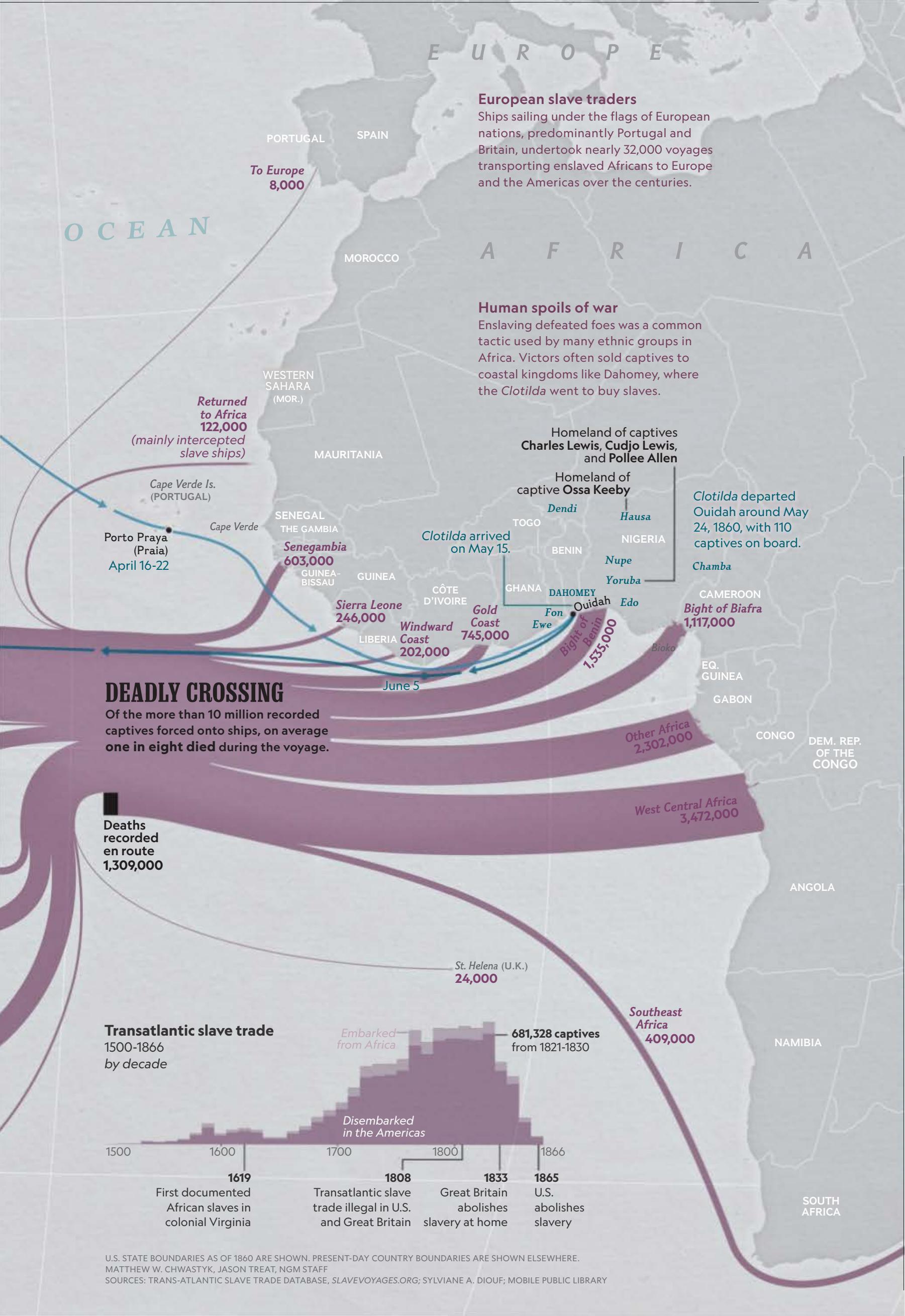
learned to talk English, went up the Railroad the other day... There were twenty-five of them, apparently all of the pure, unadulterated African stock." As the group was walking, a circus passed by, and when the Africans heard an elephant, they screamed, "*Ile, ile, ajanaku, ajanaku*," ("home," "elephant," in Yoruba and Fon). They spent the rest of their lives scattered across the Black Belt of Alabama. Gracie was sold along with two of her daughters, but agonizingly, she never knew what happened to her other two.

Timothy Meaher was arrested, released on bail, tried, and cleared of all charges. Federal cases against Burns Meaher and Dabney were dismissed because "said negroes" were never found. Foster was fined \$1,000 for failing to pay

Clotilda's cargo hold became a hellish dungeon for 110 African captives. Two died during the six-week Atlantic crossing; others longed for death's release. The smell "was enough to kill you," a survivor named Redoshi told an interviewer years later.

ART: THOM TENERY
SOURCE: JAMES DELGADO,
SEARCH, INC.







the duties on his “imports.” Timothy Meaher awarded himself 16 males and 16 females; Burns took 20 of the captives, including Kêhounco; and James Meaher took Kossola and seven of his companions. Foster received 16 individuals, among them Abile (Celia Lewis). Each person bought for \$100 in Ouidah was now worth \$1,000, and once acclimated could be sold for \$2,000, or \$60,000 in today’s dollars.

BONDS OF KINSHIP

THE NEXT PHASE of the shipmates’ tribulation was their entry into the savage plantation world

inhabited by black and white strangers. Up to then they had been Yoruba, Dendi, Nupe, or Fon, with different languages and cultures. At that moment they became Africans. Identifying with a continent was as alien to them as it was to Europeans. But they embraced their new identity with pride, regardless of others’ contempt. Noah Hart, enslaved on Timothy Meaher’s plantation, recalled that they looked fierce, yet they never threatened the African Americans on the plantation or quarreled among themselves. Acting as a group, they “wouldn’t stand a lick” from whites or blacks. Several times they engaged in collective acts of resistance, unafraid of the consequences.

When Meaher’s cook, Polly, slapped one of



the young girls, she screamed like a “wild cat in the darkness,” Hart said. Her shipmates came running from the fields with rakes, spades, and sticks in hand. Polly darted up the stairs to Mary Meaher’s room. They followed her and banged on the door. Polly quit. One day Burns’s overseer tried to whip a young woman. They all jumped on him, grabbed the lash, and beat him up. He never tried to brutalize them again. One of the Africans, Sakarago, argued with a white man and was unconcerned by the high price he could pay for his audacity. But it appears that where the shipmates were isolated, just two or three to a plantation, they were poorly treated. Redoshi (Sallie Smith) told civil rights activist Amelia Boyton Robinson that “the slave masters and

North of Mobile near Twelve Mile Island, the Africans were loaded onto a steamboat and taken upriver, where they were hidden in the swamps until being divvied up among the conspirators or sold. *Clotilda*'s captain set the schooner ablaze to cover his tracks.

ART: THOM TENERY
SOURCE: JAMES DELGADO,
SEARCH, INC.

overseers beat us for every little thing when we didn't understand American talk."

The Africans largely kept to themselves and maintained practices they had grown up with. The people from Atakora, in present-day Benin, buried their dead in deep graves, the corpses wrapped in bark. The Yoruba plunged their newborns into a creek, looking for signs of vitality. One Fon couple tattooed their son's chest with the image of a snake biting its tail, a sacred symbol of the kingdom of Dahomey.

For five years the shipmates labored in the cotton, rice, and sugarcane fields. In Mobile several men worked on the river ships, firing the furnaces with tons of timber, loading and unloading bales of cotton. During the Civil War, forced to build the city's fortifications, they lived in abject conditions.

At last, on April 12, 1865, freedom came when the Union Army entered the city. The Africans celebrated to the beat of a drum.

FOUNDING FATHERS AND MOTHERS

THE MEN FOUND WORK in Mobile's lumber and gunpowder mills and at the rail yards. The women grew vegetables and sold their produce door-to-door. To structure their recomposed community, they chose a chief, Gumpa (Peter Lee), a nobleman related to the king of Dahomey, and two judges, Charlie Lewis and Jabe Shade, who was an herbalist and a doctor. And, as any family would do, they reconnected with their shipmates, about 150 miles away in Dallas County.

Surviving on meager rations, they saved all they could, longing to return home, but it was not enough. So they settled on a new strategy, as Kossola explained to Meaher. "Captain Tim," he said, "you brought us from our country where we had land and home. You made us slaves. Now we are free, without country, land, or home. Why don't you give us a piece of this land and let us build for ourselves an African Town?" They were asking for reparations. Meaher was incensed.

Far from giving up, the community intensified its efforts and succeeded in buying land, including from the Meahers. Pooling their money, four families put down roots on seven acres known to this day as Lewis Quarters, named for Charlie Lewis. Two miles away, the largest settlement of 50 acres was nestled amid pine trees, cypresses,

and junipers. As they would have done at home, the new landowners built their three dozen wood houses collectively. Surrounded by flowers, each had a vegetable garden and fruit trees. They later built a school and church. Old Landmark Baptist Church was adjacent to Abile and Kossola's land and faced east toward Africa. Close by was their own graveyard. They called their hamlet African Town. Africa was where they wanted to be, but they were in Mobile to stay.

The progressive policies of Reconstruction helped freed people, but that was about to change. In the run-up to the 1874 congressional elections, the *Mobile Daily Register* called on whites to "answer to the roll call of white supremacy."

Timothy Meaher had pressured the African men, who had been naturalized in 1868, to vote Democrat, the pro-slavery party. But he doubted they would, so on Election Day, he told the polling station clerks they were foreigners. Charlie, Pollee, and Cudjo were turned away. Meaher jumped on his horse and prevented them from voting at two other locations. The men walked to Mobile, five miles away. They were told to pay a dollar each, almost a full day's wages, to vote. They did. Each received a piece of paper attesting he had voted. They kept them for decades.

Kêhounco and her husband, North Carolinian James Dennison, joined the first reparations movement. When James died, Kêhounco continued to petition for his Union Army military pension. In Dallas County, 72-year-old Matilda walked 15 miles to see the probate judge in Selma and inquire about compensation for Africans who had been torn from their homelands.

The Africans' habit of standing up for their rights took a new turn in 1902. Kossola was hit by a train and badly hurt; six months later, so was Gumpa. They sued the railroad companies. Gumpa passed away before his case was settled—his grandchildren received some money—and the following year, *Cudjo Lewis v. the Louisville and Nashville Railroad Company* went to court. Despite expectations, the jury awarded him \$650 (\$19,000 in today's dollars). But the L&N appealed to the Alabama Supreme Court and won.

By the early 1900s, the shipmates had spent more time in America than in their homelands. Most had taken American surnames and converted to Christianity; several married African Americans. They had adopted local ways while maintaining the cultures that they loved. The children, who went to school, grew up between

these two worlds. Some American-born children spoke their parents' languages; Matilda interpreted for her mother. Each had an American name to use in the outside world, where they were often ostracized and called monkeys and savages. Their African name was for the extended family.

Helen Jackson, a granddaughter of Ossa Keeby, confided, "We were all one family. We were taught to call every other African our own age 'cousin.' We knew they were the same as us—and that we were all different from everyone else." The children felt safe. "We had land, we had family," said Olivette Howze, Abache's great-granddaughter, in a 2003 newspaper article. "We lived well. I'm glad I was raised there."

If their hometown was a nurturing haven, the African homelands were the idyllic places their mothers and fathers dreamed of. "They say it was good there," recalled Eva Allen Jones, Kupollee's daughter. "I seen them sit down and shed tears. I see my father and Uncle Cudjo weep and shed tears talking about going home."

Kossola died in 1935, Redoshi the following year. Others may have lived a while longer. In slavery and freedom, from youth to adulthood, these men and women resisted oppression. They vigorously praised and defended their cultures, and passed on what they could to their children. Those who established African Town—which still exists—created a refuge from Americans, white and black. Their community adapted, but their success was clearly built on the fundamental African ethos of family and community first.

The people of the *Clotilda* endured the separation from loved ones, the Middle Passage, slavery, the Civil War, Jim Crow, and for some, the Great Depression. They never recovered from the tragedy of their youth, but they preserved their dignity, unity, and pride in who they were and where they came from. Their story speaks of immense fortitude and accomplishments. But most of all, it speaks of irremediable loss. Several decades after stepping off the *Clotilda*, Ossa Keeby said, "I goes back to Africa every night, in my dreams."

CHAPTER 3

SAVING AFRICATOWN

BY JOEL K. BOURNE, JR.

THE AFRICANS WERE SOON joined by a few African-American families who were moving off the farm to find work in the nearby mills and port. In 1910 the community built the Mobile County Training School, which over the next decades would graduate dozens of preachers, teachers, entrepreneurs, even some professional athletes. Most famously, alumni Cleon Jones and Tommie Agee helped win the 1969 World Series for New York's Miracle Mets.

By the 1960s two giant paper mills were running night and day, jobs were plentiful, and more

than 12,000 people called Africatown home. Anderson Flen grew up during Africatown's heyday and remembers it as a place where children were sure to speak to elders sitting on their porches and where elders made sure no child went hungry.

As he shows me around town in his pickup truck, Flen tells me that they had a lot more access to the water when he was young. "We caught bream, croaker, mullet, catfish, flounder, blue crabs. There were fruit trees, berries, and fig trees all in here. It was a great place to grow up."





Geraldine Hunter (far left) and Carolyn Harris pass the collection plates during the annual anniversary service at Union Missionary Baptist Church in Africatown. *Clotilda* survivors built the original church, then called Old Landmark Baptist Church, in 1872. The name changed, but the congregation has endured to the present.

Friends gather at the wake of Henry Galloway, a lifelong Africatown resident who died at age 64 from chronic lung disease. His sister, Mattie Galloway, says that he was about to retire before he passed. "I feel that he deserved to live a little longer, but God don't make no mistakes."



The training school was the heart and soul of the community, Flen says, its bell ringing for everything from football victories to house fires to funerals. Students wore uniform shirts and ties or dresses three days a week and were drilled in the "five wells": "Well dressed, well spoken, well read, well traveled, well balanced," says Flen, who was president of his senior class and now leads the school's alumni association.

TODAY AFRICATOWN IS A SHADOW of its former self. Blocks of dilapidated shotgun houses are sprinkled with the occasional neat brick ranch with flowers in the yard. About half the homes

are occupied; the rest are somewhere between vacant and condemned. A large public housing project built in the 1960s that residents called Happy Hills sits boarded up and slated for demolition. Heavy industries—including chemical plants, a petroleum tank farm, and one remaining paper mill—line the riverfront and encroach on the community. The four-lane Africatown Bridge, completed in 1991, was built over the heart of the business district. The busy Bay Bridge Road now bisects the community, separating the historic Union Missionary Baptist Church from the graveyard where several of its African founders are buried.



Environmental justice issues have long plagued the historic community, says Joe Womack, a retired Marine Corps major and founder of Clean, Healthy, Educated, Safe and Sustainable Community, a local group whose name mirrors its aspirations for Africatown. The industries that brought jobs turned out to be a double-edged sword, Womack says, by leaving a legacy of pollution and cancers that many residents think were caused by emissions from the paper mills and other heavy industries.

A few years ago Africatown residents helped forestall a plan to build another oil tank farm directly across from the Mobile County Training

School. Residents are also suing International Paper for contaminating the air, soil, and water during its operation, and for failing to clean up polluted soil, which residents believe continues to contaminate the local groundwater and streams. Meanwhile, Mobile's chamber of commerce is seeking to attract more industry to the area, promoting it as part of the Alabama Gulf Coast Chemical Corridor.

"It's all part of their big-picture plan to build a two-billion-dollar bridge and take out the tunnels under the river so supertankers can get up here," Womack says. "The city has not taken care of the community because they want to industrialize the whole area. They just want to make money. But they could make money with tourism. We just have to bend them the right way."

Womack and other community leaders say the discovery of the *Clotilda* has created an impetus to heal old wounds and breathe new life into the area. The Africatown Connections Blueway project and other efforts are under way to reconnect communities to the river and to each other. Plans include a proposed state park in the nearby community of Prichard—a sister city of Ouidah, Benin, since 1986.

The American Institute of Architects, the National Organization of Minority Architects, and Visit Mobile are sponsoring an international design competition for a new welcome center, a renovated school, and a museum and waterfront park where a replica of the *Clotilda* could be built. And officials at the Alabama Historical Commission and the Smithsonian Institution's National Museum of African American History and Culture have suggested that Africatown could become home to a national slave ship memorial.

"This is a major part of our history," says Lorna Gail Woods, a 70-year-old local historian and descendant of Africatown founder Charlie Lewis. "*Amistad*, *Titanic* got traveling exhibits, why not *Clotilda*? They built a whole building in Washington, D.C.," a reference to the African-American museum. "Why not something for *Clotilda*? We need these kids to have some closure. There's major history right here that needs to be told to the entire world!"

Anderson Flen agrees. "There's a lot of pain in this country right now. Until we address the substance of the race issue as opposed to the fluff of the matter, things will never heal. Until we address the pain."

OWNING THE PAST

BY CHELSEA BRASTED

ROBERT MEAHER has heard the stories of how his great-grandfather, Timothy Meaher, masterminded the last delivery of slaves to U.S. shores, and how the ship, the *Clotilda*, was scuttled near Mobile. But he questions whether the wreckage discovered in the murky waters of the Mobile River is the actual vessel, pointing to other claims of discovery made in past decades. He also underscores that his ancestor was never convicted of any crime, and he points to the involvement of other responsible parties, like the people in Benin who sold the slaves, and William Foster, who captained the ship.

"Slavery is wrong," Meaher says, but "if your brother killed somebody, it would not be your fault." Still, he says, "I'll apologize. Something like that, that was wrong."

Meaher, the only member of his family to respond to interview requests, says he has done his own investigating into the *Clotilda*, scraping together details about the ship and its cargo. He keeps a 1931 article from the *Mobile Register* about Cudjo Lewis, highlighting a quote in which Lewis said, "But after all I am glad that I am here, for when I was there I didn't know there was a God." For Meaher, a religious man, this is no small thing. His family's connection to the story, he says, has prompted them to donate church property in Africatown, land for a park, and money to a nonprofit that sends hospital ships around the world, including to Benin.

At 73, Meaher says he hasn't been part of his family's property management for about two decades, so he can't speak to plans for any of the land they own in and around Africatown. When asked whether he'd be interested in a meeting with descendants of those aboard the *Clotilda*, Meaher is clear: "I'm not open to it."

JOYCELYN DAVIS, a descendant of *Clotilda* captive Charlie Lewis, lives near the intersection of Timothy and Meaher Avenues. She says she's probably seen members of the Meaher family in the grocery store, or stood in line with them while waiting for coffee. They've never talked,

but she has thought about what she'd ask the Meahers if given the chance. "If they could just sit down and tell us the story of what was told to them, because it had to have been a story," she says. Davis has also considered reaching out to Foster's descendants, or to the people in Benin whose ancestors sold hers to the slave traders. "It's so much more than about getting back at someone," she says. "It's so much more than being about money."

That kind of connection, in which the descendants of the most fraught racial divides in America's history have found reconciliation, is possible. In 2009 the descendants of Homer Plessy and Judge John Howard Ferguson, the namesakes of the infamous case that led the U.S. Supreme Court to endorse racial segregation in 1896, formed a foundation to teach about the case's impact and modern-day relevance. The judge's great-great-granddaughter, Phoebe Ferguson, met Keith Plessy, whose great-grandfather was Homer Plessy's cousin, soon after she learned of her family's place in history.

"I was just speechless of the power of the symbolism of us being together without doing anything, really, except that we were friends," Ferguson says. "I knew it wasn't my fault, but it was my family's legacy. Being in the 21st century does not give us permission to not do anything about it."

It all has to start, Ferguson and Plessy say, with owning that history. "We are responsible for making things right in our time," Plessy says. African Americans have been "not welcome here, forced to labor, tortured, murdered, you name it. It was all done to us." Forgiveness, he says, begins with acknowledging and apologizing for those wrongs. □

Joel K. Bourne, Jr., broke the news of the *Clotilda*'s discovery in our May 2019 online story. Historian **Sylviane Diouf** is the author of *Dreams of Africa in Alabama*. **Chelsea Brasted** is a writer based in New Orleans. **Elias Williams** specializes in portraits of underrepresented people. Artist **Sedrick Huckaby** focuses on African-American family heritage.



Mardi Gras celebrations such as the Grand Marshal Ball remain largely segregated affairs in Mobile. Despite the city's troubled racial history, many hope the discovery of the last slave ship will bring Mobileans together to acknowledge their shared history and heal old wounds.

LAST WILD PLACES



By HANNAH NORDHAUS
Photographs by AMY TOENSING

PRairie



AN AMBITIOUS PLAN TO RETURN THE GRASSLANDS
OF CENTRAL MONTANA TO THE WILD SPLENDOR OF THE PAST
FACES IMPASSIONED RESISTANCE FROM THE PRESENT.

DIVIDE





PREVIOUS PHOTO

Justice Werk (on white horse) and Kassy Perez move cattle on the Werk ranch on the Fort Belknap Indian Reservation. The tribal land neighbors the American Prairie Reserve (APR), a conservation project aiming to create an immense protected area in central Montana.

LEFT

Aaniih dancers pose before joining in ceremonies at the Hays Community Powwow on the Fort Belknap reservation, home to both the Aaniih and Nakoda tribes. Most land their ancestors ranged is now divided among ranchers, conservationists, and public ownership.

A large bison is captured in mid-wallow, its body mostly obscured by a thick cloud of brown dust. The bison's dark, shaggy coat is visible at the edges of the dust cloud. In the upper right corner, a close-up view of the bison's head and neck is shown, highlighting its dark, textured fur and the long, dark hair on its mane.

A bison wallows in dust on the American Prairie Reserve. Bison reintroduction is a critical—and controversial—part of APR's plan to rewild a large swath of the northern plains, removing cattle, reestablishing native vegetation, and helping lost wildlife return and thrive.



LAST WILD PLACES

American Prairie Reserve is a conservation partner of the National Geographic Society's Last Wild Places initiative.

We bounce in the truck along a furrowed road, through a mud slick and up to a bluff that looks out to the curve of the Earth.

The plains glow emerald in this wet spring, rolling toward distant hills. Near an oxbow in the creek beneath us, a herd of buffalo graze. They are primeval creatures, bearded and huge, their winter fur peeling off in strips like old wallpaper.

In the days before horses and guns, Plains Indians chased buffalo off this steep embankment to their deaths. It's late in May, late in the afternoon, and the light has taken on a rich, nostalgic cast. Damien Austin, a former zookeeper with rectangular glasses and a rectangular fringe of hair, extends his hand across the humped expanse of prairie. "Just imagine grizzly bears running around out there," he says.

Austin oversees the herd of buffalo that graze below us, and the properties that contain them. He works for the American Prairie Reserve, a conservation organization seeking to create a massive protected area in central Montana and



Young members of their extended family take a break at Liz and Toby Werk's Blue Heaven Ranch. The Werks, who belong to the Aaniiih tribe, work with APR, but also share their neighbors' concerns about the reserve buying up ranches. Says Toby Werk: "We know firsthand what it's like to be taken off the land and destroyed."



repopulate it with the wildlife of bygone days. Imagine: the plains as they looked in 1805, when explorer Meriwether Lewis climbed to the top of a similar bluff just east of here. “The whole face of the country was covered with herds of Buffaloes, Elk & Antelopes,” Lewis wrote in his journal.

And then, in outrageously short order, the animals were gone. Historians estimate there were tens of millions of bison—the term is interchangeable with buffalo—when Lewis and fellow explorer William Clark traversed the northern plains; by the mid-1880s, fewer than a thousand remained. Other prairie creatures—grizzlies, elk, pronghorn, bighorn sheep, wolves, swift foxes, black-footed ferrets—saw similar declines as settlement spread west. The migrants slaughtered wildlife for cash and sport, built fences and roads that fractured the animals’ habitat, trailed livestock that competed for

forage and spread disease, and broke the prairie with their plows in order to farm it. Once broken, it takes decades, even centuries, to fix.

But here on the plains’ western edge, where the climate is unforgiving and the boom-and-bust farming economy is equally remorseless, swaths of prairie remain largely unbroken. In 2000 a group of conservationists identified this region as critical for preserving grassland biodiversity. In 2001 one member of that group, a spare, soft-spoken biologist named Curt Freese, teamed up with a Montana native named Sean Gerrity to form the American Prairie Reserve, or APR. Gerrity, a kinetic former Silicon Valley consultant with an unruly mop of white hair, says the idea was to “move fast and be nimble,” in the manner of a high-tech start-up. The group would use private money to patch together 3.2 million acres, or 5,000 square miles, of private

and public grassland along the Missouri River, acquiring ranches from “willing sellers” at market prices. It would remove the cattle that grazed the land, stock it with 10,000 or more bison, tear out interior fences, restore native vegetation, and create the conditions in which the region’s lost wildlife could return and thrive. Grassland biodiversity requires abundance, Freese says. “You’ve got to think big.”

In the 19 years since, the group has raised \$160 million in private donations, much of it from high-tech and business entrepreneurs. It has acquired 30 properties, totaling 104,000 acres, and more than 300,000 acres of grazing leases on adjacent federal and state land. The properties are all strategically located near two federally protected areas: the 1.1 million-acre Charles M. Russell National Wildlife Refuge and the 377,000-acre Upper Missouri River Breaks National Monument. Think of the refuge and monument as the trunk of a tree, Gerrity says. In buying nearby properties, “we’re trying to expand the girth of the tree,” adding branches to the trunk and enhancing the movement of wildlife between river systems and grasslands. Bison are an integral part of that restoration. APR now runs more than 800 on three of its properties.

Gerrity estimates the total cost to buy 500,000 acres of private land and endow it forever will be upwards of \$500 million—half the price of a professional football stadium, which has a rough shelf life of 20 to 30 years. From 2009 to 2017 alone, more than a million acres of native prairie were converted to cropland in the seven counties surrounding APR.

“Species are blinking out,” he says. “Habitat is going away. There’s a really short period, maybe 20 to 30 years, to do some really big stuff, and then the opportunity is going to be gone. We’re swinging for the fences here.”

It’s an audacious vision. It is also a very contentious one.

WHEN IT RAINS in central Montana, the dirt roads turn into what the locals call “gumbo,” a slick clay-mud that often is impassable. It is, mercifully, drying out as Leah LaTray steers her pickup down a track snaked with deep ruts, clods of mud winging out from the wheels. LaTray’s great-grandfather, Mose LaTreille, was a cowboy of French and Native American heritage who came with the cattle to

northern Montana in the 1870s. LaTray, 47, wears a long black braid over her shoulder, silver hoop earrings, vest and kerchief, and square-toed cowboy boots. Her parents lost their ranch when she was a girl; she left Montana in the 1990s to study microbiology in Seattle and then to train horses in Texas. “It took me 20 years to come back,” she says, “but I did,” buying 250 acres that remained in her family’s hands. LaTray makes her living running cattle on her partner’s property now. “If you sell your land, you sell your future,” she says.

We’re winding along a ridge on one of APR’s newest properties, the 46,000-acre Two Crow Ranch, which abuts the Charles M. Russell refuge on the south side of the Missouri River. I ride shotgun; Two Crow’s former manager Danny Maag sits in the back. There are no bison here yet, only cattle. They look up dimly as we pass; they seem small and tame when compared with APR’s bison across the river. Two Crow extends as far as the eye can see along the wrinkled, coulee-sashed hills of the Missouri Breaks that border the river. They look as if you took the plains and crumpled them, like a car in a pileup. It’s rough country.

“I can show you where a horse closed my eye,” Maag says. “I can show you where I almost got shot.” We pass a tumbledown homestead tucked into a ridge. Local lore holds that the owner used to hire ex-convicts to help at the ranch, but that some went back to jail because it was nicer.

All this to say, there have been generations of people who made a life on this land in the years since Lewis and Clark first traveled up the river. On fences all along the roads near APR, locals have strung up banners printed with the image of a father and son clad in cowboy garb, silhouetted against a sunset: “Save the Cowboy, Stop American Prairie Reserve.” LaTray has placed many of these signs herself. “I think the prairie reserve’s endgame is to depopulate this area,” she says. APR’s efforts to restore ecological resilience, she fears, threaten the cultural resilience of the people who live here. “There’s a lot at risk,” she says.

In 1862 Congress passed the Homestead Act, which gave settlers title to 160 acres of federal land if they were able to “prove up” on the property by building a house and planting crops. But 160 acres weren’t enough in the short-grass prairies, so Congress doubled it, then doubled it again to 640 acres for livestock. Today many ranchers feel they need to own thousands of acres and lease thousands more on nearby public land to make ends meet, and keeping

the “home place” in the family can require King Lear-like decisions about succession planning. Ranches are big, or they’re gone. In that context, land set aside for conservation is land unavailable for ranching families to expand. “It worries me more than water, wind, drought, prices,” says rancher Craig French, whose family is involved with the anti-APR movement in Phillips County, across the Missouri River from LaTray.

French is standing in a corral on a cloudy morning in a pasture just north of APR, where his parents, Bill and Corky French, have convened four generations of family and neighbors to brand their calves. Their forebears settled nearby more than a century ago; the couple run more than a thousand head of cattle on 60,000 public and private acres.

Brandings here are chaotic, cooperative affairs, with families traveling from ranch to ranch to help each other out. They mill around coolers

10,000 people in 1920. Other nearby counties—APR spans six now—have seen similar declines. More and more property is being bought up by wealthy, out-of-state owners. The average age of the principal operator of a farm or ranch these days is 58. It’s a demographic spiral that rural Americans fear: fewer kids in the schools, fewer tractors, balers, swathers, post pounders, cars, pickups, semis, trailers, tires bought at local dealers. APR buys those things too, of course: “We’ve brought more households in to work for APR than have left as a result of selling to us,” says APR senior land acquisition manager Betty Holder. “We believe we are helping to diversify the economy.”

But the antipathy is also cultural. The organization, with roughly 50 employees, is headquartered in Bozeman, a trendy college town of fly fishermen and mountaineers, artisanal coffee and avocado toast, four hours’ drive

‘THE CONSTRAINT ON WILDLIFE POPULATIONS

IS NOT WHAT THE HABITAT WILL SUPPORT,
BUT WHAT HUMANS WILL SUPPORT.’

DANIEL KINKA, RESTORATION ECOLOGIST

of sodas and Tupperwares of baked goods laid out in the bed of a pickup until the riders trail the cattle into the corral. Then they get to work: sorting, roping and dragging, wrestling and branding, vaccinating and castrating, calves squealing wild-eyed in rebuke (“Some are kind of theatrical,” Craig French says). We associate this part of the world with rugged individualism, but brandings are remarkably communitarian rituals, willing exchanges of time and labor.

“We don’t always agree with all our neighbors,” says Craig’s wife, Conni, “but we always help each other out.”

That neighborliness, however, does not extend to APR, which bought its first property in 2004 just south of here. Twice since then, the French family has pitched in to buy ranches that APR was interested in purchasing. “A neighbor wants to help you out, not buy you out,” Bill French says.

This resistance is based on real concerns about the future. Phillips County has lost more than half its population since its peak of nearly

southwest of APR’s nearest property. Most of APR’s large donors hail from even farther away—Silicon Valley, New York City, Germany. Some fly by helicopter to stay at APR’s luxury yurts equipped with leather furniture, chandeliers, and linen tablecloths. “Big fancy East Coast people coming in and telling us how to live,” LaTray says.

Scientists speak of a landscape’s “ecological carrying capacity”: habitat, forage, prey, and other factors that determine how much wildlife the land can support. But for ambitious conservation projects, “social carrying capacity”—the community’s tolerance for change—is also a limiting factor.

“The constraint on wildlife populations is not what the habitat will support, but what humans will support,” says Daniel Kinka, an APR restoration ecologist.

The group has always sought to engage its neighbors, keeping properties open to the public for hunting, camping, hiking, fishing. But in the face of implacable opposition, it also has

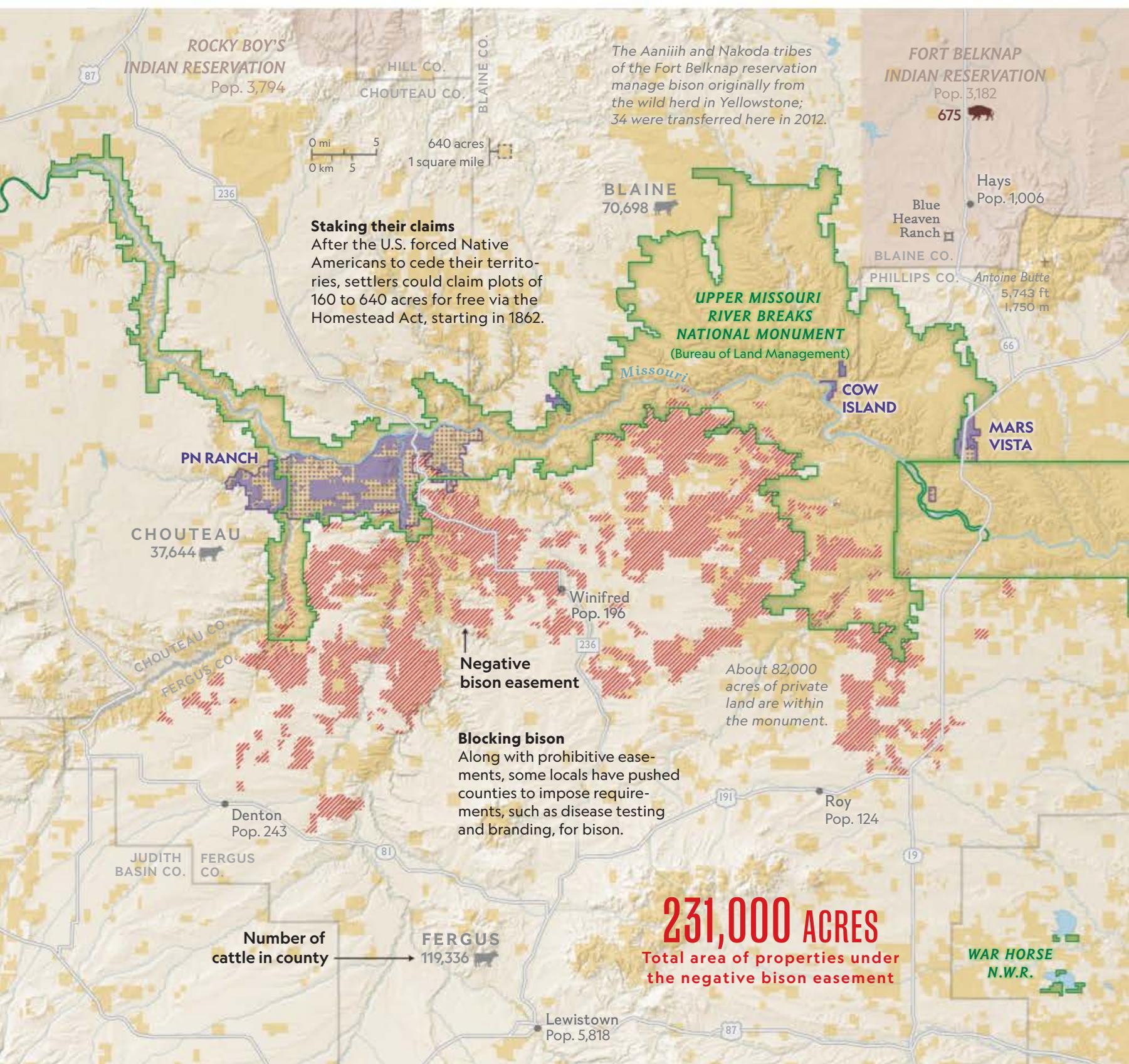


Thirteen-year-old Carter Ness hunts with his father for wood duck on APR land along the Judith River near Winifred, Montana. APR welcomes hunters and hikers on its properties, which opens new access points to public lands along local rivers.



TWO VISIONS COLLIDE

A cloud of conflict shadows a massive swath of grasslands in Montana. The nonprofit American Prairie Reserve (APR) is purchasing land and reintroducing native plants and herds of bison to echo the wild state that existed before homesteaders arrived in the 1800s. Many local ranchers, however, see the reserve as a threat to their future and 150 years of cowboy tradition.



Most private land in this area is used for cattle ranching. Many ranches include grazing leases on nearby public lands to stay in business.

In 2017, 63 landowners signed on to a "negative bison easement." It forbids bison on their properties for 20 years, even if the land is bought by APR.

The Bureau of Land Management regulates most public land in this region. It oversees permitting for grazing leases.

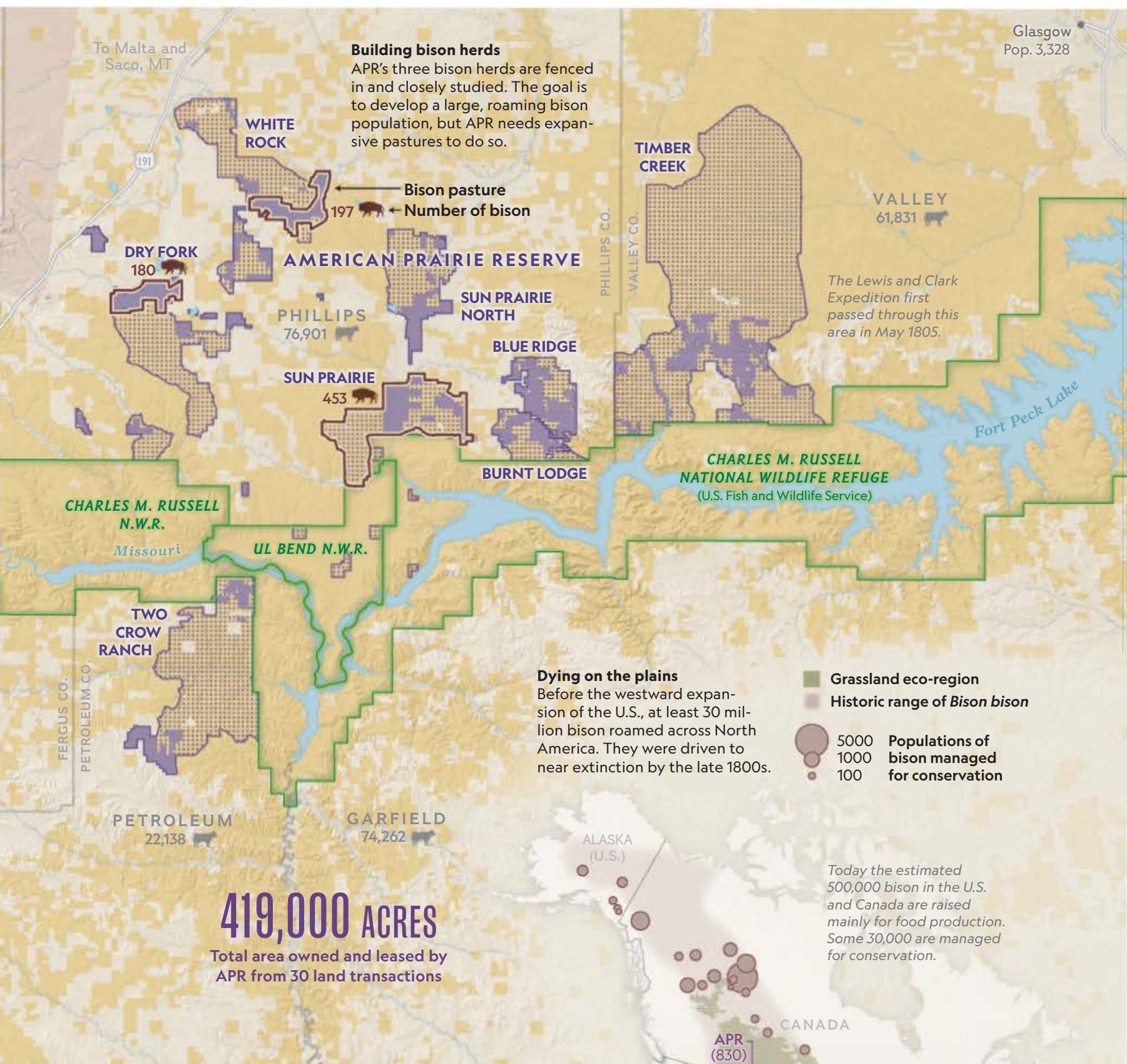
Federal designations, such as a presidential order to create a national monument, add an extra layer of protection to some lands.

RESTORING THE WILD

APR aims to protect 3.2 million acres—an area larger than Yellowstone National Park—and establish a herd of 10,000 bison. This would benefit other native species, such as prairie dogs, wolves, and even grizzly bears, and return the landscape to a wilder state. APR lands are public reserves, open to hunters, campers, and others wishing to connect with nature.

DEFENDING RANCHERS

"Save the cowboy" is a rallying cry for many locals who see APR as an unwelcome outsider. The ranchers don't want to raise cattle alongside bison, fearing disease exchange between species, as well as the return of apex predators. They say each acre taken from cattle grazing threatens ranching operations and hurts the local economy.²



APR deeded land

These are private lands that APR has already purchased. It is allowed to build structures and maintain bison herds on its properties.

APR leased land

APR also leases public land typically meant for cattle grazing. This land is counted as part of the reserve, but raising bison requires special permitting.



Locals like to gather at Pip's Diner in Saco, a town in Phillips County where APR bought its first property in 2004. The county has lost more than half its population since the height of the homestead boom a century ago. APR's neighbors fear that the reserve's practice of buying up working ranches will accelerate the region's demographic decline.



made some adjustments. “The end goal is still a 5,000-square-mile wildlife reserve,” says Alison Fox, who took over as APR’s CEO in 2018. “But how we’re going to get there, we’re really open to new and innovative ideas.”

One of those ideas is APR’s Wild Sky program, which pays ranchers to adopt habitat- and predator-friendly practices, such as installing wildlife-friendly fences and not removing prairie dog colonies, in order to create “soft boundaries” that allow wildlife to move safely back to their historic habitat. Since 2014, the Wild Sky program has paid more than \$230,000 in incentives to a handful of local ranchers, including Lance Johnson, whose cattle also graze on one of APR’s properties. A few neighbors have hassled him for working with the conservation group, but he appreciates the help. “I think they have an

idea and a real lofty goal for the future,” he says.

APR has also built new campgrounds and a hut system on its properties, donated beef and bison meat to local Native American communities and food banks, sponsored rodeo athletes, donated buffalo-hunting opportunities for local fund-raisers, and organized a “Living With Wildlife” conference (sponsored by the National Geographic Society) for ranching neighbors concerned about the arrival of more predators on the prairies. The group also has purchased a long-empty department store in nearby Lewistown as a new home for a planned National Discovery Center. There are, indeed, people in the town who welcome APR’s economic impact and support the reserve.

“We need to have a voice for the salamander, the plover, the buffalo,” says Lewistown City Commissioner Clint Loomis, an artist and retired teacher.



LAST WINTER Montana's Republican-dominated legislature passed a joint resolution asking the federal Bureau of Land Management to deny APR's petition to modify 18 BLM grazing allotments, covering 250,000 public acres, to replace cattle with bison. In September, responding to local opposition, the reserve scaled back the request to 48,000 acres.

Bison restoration is, without doubt, among the most controversial aspects of APR's vision. Bison are also central to it: Scientists regard them as "ecosystem engineers" that can fix much of what has gone wrong, ecologically speaking, on the plains. Bison graze selectively over long distances, moving quickly and creating a mosaic of heterogeneous habitat that supports hundreds of native plant, insect, bird, and

small mammal species. They wallow—rolling to shed biting insects and loose fur—creating moist depressions in the grass where certain species thrive. Their waste spreads nutrients across the landscape.

After bison are introduced to an APR property, the staff works with volunteers to pull up fences left over from cattle ranching, which uses fencing to separate and rotate stock from pasture to pasture. Bison don't require the same grazing rotations. If barbed wire tamed the West, removing those fences restores landscape connectivity, making it a little bit wilder again.

APR's first batch of bison arrived in 2005 from a herd in South Dakota. In 2011 a DNA test found that those bison carried genes from interbreeding with cattle many years before, and APR imported a new, genetically purer batch from Canada. This was important to the reserve's managers because bison handle extreme cold better than cattle, and because APR wanted to minimize management interventions and retain the creatures' wildness. "Our goal," Austin says, "is the largest, most genetically diverse bison herd in North America."

But it is this very wildness that alarms cattle ranchers. Bison are large and unpredictable, and can be difficult to contain. In 2011 APR's entire herd—240 animals, then—escaped when a snowdrift froze across a fence; they were herded back with a helicopter. Lone bulls get out more frequently, and the reserve has a three-person team to ride and maintain the fence perimeter, Austin says. For all their "wildness," APR's bison are, in fact, intensively managed.

Another concern ranchers have with bison is a disease called brucellosis, which causes miscarriages and infertility in livestock, and can be transmitted to humans. APR's bison are tested and vaccinated against the disease, which has been found in wild bison and elk farther west in Yellowstone National Park but not on APR land. Nonetheless, ranchers fear that bison from APR could transmit the disease to their herds.

These fears aren't necessarily based in data. But the fact is, we don't have much data. Part of APR's mission is to study the effect that bison restoration can have on an ecosystem. How far must buffalo roam to fulfill their ecological role? APR's pastures range in size from 6,000 to 27,000 acres. Is that enough? Is 3.2 million acres enough? How many bison do you need? How many are too many? How long will it take?



Wayne French (foreground) castrates a calf at a community branding near Malta, Montana, north of APR land. Brandings are cooperative affairs: Local families move from ranch to ranch, rounding up and branding neighbors' cattle. "If you're within 80 miles," says rancher Jesse Blunt, "you're a neighbor."





New York City scholars and their guide (standing, at right) pause on their journey tracing Lewis and Clark's 1805 expedition through the Upper Missouri River Breaks National Monument. Organized by APR and Montana Wilderness School, the trek teaches students about teamwork, prairie culture, and wildlife.



To help answer these questions, APR has partnered with the Smithsonian Institution and the National Geographic Society, both of which fund research at the reserve. To track bison movements and grazing patterns, scientists have attached tracking collars to the reserve's bison. To measure ecological benefit, they are surveying vegetation, mammals, and birds before and after bison introduction. "We don't know if it's incremental or if there's some tipping point," says Smithsonian conservation ecologist Andy Boyce. "It may be 30 to 40 years," he says, before we understand the long-term effect of large-scale bison restoration on the land.

In the meantime, the return of the bison to the Montana prairie has brought more poignant, if less quantifiable, impacts. George Horse Capture, Jr., stands in thick-soled shoes on a rise overlooking a sweeping stretch of prairie. He's a prominent member of the Aaniiih tribe from the nearby Fort Belknap Indian Reservation, tall and slender, with ruddy cheeks and intense eyes, his long black hair threaded with gray. He runs two fingers along a waist-high, truck-chassis-size rock in the grass. The stone is etched with ancient carvings and inscriptions. "There's things that just baffle us," he says, pointing at the symbols—lines and circles, human figures, horse and buffalo tracks. "This represents stories that we don't even know anymore."

The silence on the prairie is striking. Stop to listen and you'll realize how much there is to hear: the stringy call of a chorus frog, the flapping of a butterfly's wings, grass rattling against itself in the breeze. Bison edge along a slough nearby as Horse Capture speaks; cloudbursts circle. The Plains tribes depended on bison for food, clothing, tools, tepee skins. In 1888, soon after the last buffalo were driven from the plains, his tribe was removed to its current reservation. The Aaniiih once numbered more than 10,000 people. By 1904, only around 500 members remained. "We shared such a destiny, us and the buffalo together," Horse Capture says—headlong in the path of Manifest Destiny. The first time Horse Capture watched a herd of bison released onto APR's property, he found himself reduced to tears. Since the last days of conquest, the Plains Indians had prayed for the buffalo to come back. "And when that gate opened, I witnessed a prayer," he says. "Sometimes it takes a long time for prayers to come true."



THE MISSOURI is running fast and muddy, brimful with snowmelt and sediment, driftwood and old leaves. I'm camped with Wayne Fairchild, a Missoula-based guide and prodigious student of the river's history. Two hundred and fourteen years ago—to the day—Lewis and Clark passed this spot, fighting water and gravity as they hauled their loads upstream from eddy to eddy. Fairchild knows every landmark of their journey—those that remain, anyway. Many have been swept away in the river's frequent changes of course.

We've built a fire using driftwood that washed up earlier this spring after an ice jam broke upstream on the Judith River. Lewis wanted to call it Big Horn River, after the sheep on its shores, but Clark named it instead after his future wife. So many old names have washed away in the



Buffalo roam at sunset on APR's Sun Prairie unit. If the reserve is fully realized, thousands of these animals will once again range across the northern plains. "When we're done with it," says APR co-founder Sean Gerrity, "it's going to last hundreds of years."

Missouri's flood of change: The "river that scolds all others" became the Milk; Sacagawea changed to Crooked Creek, then changed back again. APR bought land at Antelope Creek and now calls it Mars Vista, after the Mars confectionery family, a major donor. Through naming, through owning, we impose our visions on the landscape.

Even five feet above its normal banks, the Missouri is soundless. We watch it slip past as the last light dies upriver. "Imagine going down this river and seeing buffalo on the shore," Fairchild says.

Imagine.

APR offers one vision of the future, its neighbors another. Both are born of a deep love of the landscape. Both also lean on a fleeting past. Which moment do we wish to recapture? The past of 1805: bison and grizzlies on the shore? Or 1905: cattle and fences and 160-acre homesteads?

It is a flickering target, our history—a racing river, driftwood and foam, past and present rushing eagerly into the future.

"I don't know if we can return to times that are gone," rancher Lance Johnson had told me earlier that afternoon on his deck overlooking the Judith Mountains. Most of his neighbors are out-of-town landowners now; he signed a grazing lease with APR after billionaires from Texas bought a nearby ranch and kicked Johnson's cattle off their land. So he knows that, even if APR disappears, he's going to have to try new things to survive.

"I understand," he says, "that this world is changing." □

Hannah Nordhaus is currently a National Geographic Society storytelling fellow. **Amy Toensing** teaches at Syracuse University. This is her 16th story for *National Geographic*.

The power
of social media
and the
economics
of fashion
are helping
to create a
big-tent culture
in which every
woman can be
celebrated as
beautiful.

ESSAY BY
**ROBIN
GIVHAN**

PHOTOGRAPHS BY
**HANNAH
REYES
MORALES**



Redefining Beauty



Halima Aden broke barriers when she wore a hijab on the cover of *British Vogue* and in *Sports Illustrated's* 2019 swimsuit issue. Here, her makeup is applied during Modest Fashion Week in Istanbul, Turkey, which celebrates a different side of fashion. Born a Somali refugee in Kenya, Aden moved to the United States and was the first contestant in the Miss Minnesota USA pageant to wear a hijab and burkini.

Contestants in the Miss Queen Korea pageant practice walking the runway at a modeling academy in Seoul, South Korea. These young ambassadors exemplify the K-beauty aesthetic, a \$13 billion industry viewed by many as the standard of beauty in Asia.





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REST



CAURANTE LANCHONETE PORÃO



A young woman has her hair styled at São Paulo salon and collective Coletivo Cabeças. Rather than trying to help people conform, the alternative salon works to create a sense of belonging and provide a platform for free expression in Brazil.

Women: A Century of Change

A YEARLONG SERIES



THE SUDANESE MODEL Alek Wek appeared on the November 1997 cover of the U.S. edition of *Elle* magazine, in a photograph by French creative director Gilles Bensimon. It was, as is so often the case in the beauty business, a global production.

Wek, with her velvety ebony skin and mere whisper of an Afro, was posed in front of a stark, white screen. Her simple, white Giorgio Armani blazer almost disappeared into the background. Wek, however, was intensely present.

She was standing at an angle but looking directly into the camera with a pleasant smile spread across her face, which wasn't so much defined by planes and angles as by sweet, broad, distinctly African curves. Wek represented everything that a traditional cover girl was not.

More than 20 years after she was featured on that *Elle* cover (see page 101), the definition of beauty has continued to expand, making room for women of color, obese women, women with vitiligo, bald women, women with gray hair and wrinkles. We are moving toward a culture of big-tent beauty. One in which everyone is welcome. Everyone is beautiful. Everyone's idealized version can be seen in the pages of magazines or on the runways of Paris.

We have become more accepting because people have demanded it, protested for it, and used the bully pulpit of social media to shame beauty's gatekeepers into opening the doors wider.

Wek was a new vision of beauty—that virtue forever attached to women. It has long been a measure of their social value; it is also a tool to



Billboards in New York City's Times Square bombard passersby with a broad range of beauty ads. Dove's #ShowUs and Rihanna's Fenty advertising campaigns reflect efforts to attract a more diverse audience to beauty products—and gain considerable market share.



be used and manipulated. A woman should not let her beauty go to waste; that was something people would say back when a woman's future depended on her marrying well. Her husband's ambition and potential should be as dazzling as her fine features.

Beauty is, of course, cultural. What one community admires may leave another group of people cold or even repulsed. What one individual finds irresistible elicits a shrug from another. Beauty is personal. But it's also universal. There are international beauties—those people who have come to represent the standard.

For generations, beauty required a slender build but with a generous bosom and a narrow waist. The jawline was to be defined, the

cheekbones high and sharp. The nose angular. The lips full but not distractingly so. The eyes, ideally blue or green, large and bright. Hair was to be long, thick, and flowing—and preferably golden. Symmetry was desired. Youthfulness, that went without saying.

This was the standard from the earliest days of women's magazines, when beauty was codified and commercialized. The so-called great beauties and swans—women such as actress Catherine Deneuve, socialite C.Z. Guest, or Princess Grace—came closest to this ideal. The further one diverged from this version of perfection, the more exotic a woman became. Diverge too much and a woman was simply considered less attractive—or desirable or valuable.



Eye of the Beholder

Technology has put the power to define beauty in the hands of the people. Mobile phones allow people greater control of their image, and include apps that come with filters used for fun, appearance, and entertainment.

CLOCKWISE FROM TOP RIGHT: Fashion bloggers covering Modest Fashion Week gather for a boat trip in Istanbul. A model takes a selfie at the Vendôme Luxury Trade Show during Paris Fashion Week,



the global leader in shaping fashion and beauty standards around the world. Members of the K-Pop group Girls' Alert take a selfie backstage before the media launch of their new single, "We Got the Power." At Copacabana Beach in Rio de Janeiro, Brazil, taking one's own picture is part of the landscape. Visitors play in a ball pit of emoji at the Museum of Selfies in Los Angeles, where they can take pictures with creative backgrounds and learn about self-portraiture in history.



And for some women—black and brown or fat or old ones—beauty seemed impossible in the broader culture.

In the early part of the 1990s, the definition of beauty as it applied to women began to loosen thanks to the arrival of Kate Moss, with her slight figure and vaguely ragamuffin aesthetic. Standing five feet seven inches, she was short for a runway walker. The British teenager was not particularly graceful, and she lacked the noble bearing that gave many other models their regal air. Moss's star turn in advertisements for Calvin Klein signified a major departure from the long-legged gazelles of years past.

Moss was disruptive to the beauty system, but she was still well within the industry's comfort zone of defining beauty as a white, European conceit. So too were the youthquake models of the 1960s such as Twiggy, who had the gangly, curveless physique of a 12-year-old boy. The 1970s brought Lauren Hutton, who stirred scandal simply because she had a gap between her teeth.

Even the early black models who broke barriers were relatively safe: women such as Beverly Johnson, the first African-American model to appear on the cover of *American Vogue*, the Somali-born Iman, Naomi Campbell, and Tyra Banks. They had keen features and flowing hair—or wigs or weaves to give the illusion that they did. Iman had a luxuriously long neck that made legendary fashion editor Diana Vreeland gasp. Campbell was—and is—all va-va-voom legs and hips, and Banks rose to fame as the girl next door in a polka dot bikini on the cover of *Sports Illustrated*.

WEK WAS A REVELATION. Her beauty was something entirely different.

Her tightly coiled hair was sheared close to her scalp. Her seemingly poreless skin was the color of dark chocolate. Her nose was broad; her lips were full. Her legs were impossibly long and incredibly thin. Indeed, her entire body had the stretched-out sinewiness of an African stick figure brought to life.

To eyes that had been trained to understand beauty through the lens of Western culture, Wek was jarring to everyone, and black folks were no exception. Many of them did not consider her beautiful. Even women who might have looked in the mirror and seen the same nearly coal black skin and tightly coiled hair reflected back had trouble reckoning with this *Elle* cover girl.

Wek was abruptly and urgently transformative. It was as though some great cultural mountain had been scaled by climbing straight up a steep slope, as if there were neither time nor patience for switchbacks. To see Wek celebrated was exhilarating and vertiginous. Everything about her was the opposite of what had come before.

We are in a better place than we were a generation ago, but we have not arrived at utopia. Many of the clubbiest realms of beauty still don't include larger women, disabled ones, or senior citizens.

But to be honest, I'm not sure exactly what utopia would look like. Is it a world in which everyone gets a tiara and the sash of a beauty queen just for showing up? Or is it one in which the definition of beauty gets stretched so far that it becomes meaningless? Perhaps the way to utopia is by rewriting the definition of the word itself to better reflect how we've come to understand it—as something more than an aesthetic pleasure.

We know that beauty has financial value. We want to be around beautiful people because they delight the eye but also because we think they are intrinsically better humans. We've been told that attractive people are paid higher salaries. In truth, it's a bit more complicated than that. It's really a combination of beauty, intelligence, charm, and collegiality that serves as a recipe for better pay. Still, beauty is an integral part of the equation.

But on a powerfully emotional level, being perceived as attractive means being welcomed into the cultural conversation. You are part of the audience for advertising and marketing. You are desired. You are seen and accepted. When questions arise about someone's looks, that's just another way of asking: How acceptable is she? How relevant is she? Does she matter?

Today suggesting that a person is not gorgeous is to risk social shunning or at least a social media lashing. What kind of monster declares another human being unattractive? To do so is to virtually dismiss that person as worthless. It's better to lie. Of course you're beautiful, sweetheart; of course you are.

We have come to equate beauty with humanity. If we don't see the beauty in another person, we are blind to that person's humanity. It's scary how important beauty has become. It goes to the very soulfulness of a person.

Beauty has become so important today that

denying that people possess it is akin to denying them oxygen.

THERE USED TO BE gradations when it came to describing the feminine ideal: homely, *jolie laide*, attractive, pretty, and ultimately, beautiful. The homely woman managed as best she could. She adjusted to the fact that her looks were not her most distinguishing feature. She was the woman with the terrific personality. Striking women had some characteristic that made them stand out: bountiful lips, an aristocratic nose, a glorious *poitrine*. A lot of women could be described as attractive. They were at the center of the bell curve. Pretty was another level. Hollywood is filled with pretty people.

Ah, but beautiful! Beautiful was a description that was reserved for special cases, for genetic

IN NEW YORK, London, Milan, and Paris—the traditional fashion capitals of the world—the beauty codes have changed more dramatically in the past 10 years than in the preceding hundred. Historically, shifts had been by degrees. Changes in aesthetics weren't linear, and despite fashion's reputation for rebelliousness, change was slow. Revolutions were measured in a few inches.

Through the years, an angular shape has been celebrated and then a more curvaceous one. The average clothing size of a runway model, representative of the designers' ideal, shrank from a six to a zero; the pale blondes of Eastern Europe ruled the runway until the sun-kissed blondes from Brazil deposed them. The couture body—lean, hipless, and practically flat-chested—can be seen in the classic portraits by Irving Penn, Richard Avedon, and Gordon Parks, as well



1997 *Elle*
Alek Wek



2016 *Sports Illustrated*
Ashley Graham



2018 *British Vogue*
Vittoria Ceretti, Halima
Aden, Adut Akech, Faretta
Radic, Paloma Elsesser

See and Be Seen

Fashion and beauty magazines present a paragon of aspiration, often setting beauty standards for women across cultures. The magazines also serve as giant advertisements for the industries dependent on selling these ideals to willing customers.

lottery winners. Beauty could even be a burden because it startled people. It intimidated them. Beauty was exceptional.

But improved plastic surgery, more personalized and effective nutrition, the flowering of the fitness industry, and the rise of selfie filters on smartphones, along with Botox, fillers, and the invention of Spanx, have all combined to help us look better—and get a little bit closer to looking exceptional. Therapists, bloggers, influencers, stylists, and well-meaning friends have raised their voices in a chorus of body-positivity mantras: You go, girl! You slay! Yasss, queen! They are not charged with speaking harsh truths and helping us see ourselves vividly and become better versions of ourselves. Their role is constant uplift, to tell us that we are perfect just as we are.

And the globalization of, well, everything means that somewhere out there is an audience that will appreciate you in all your magnificent...whatever.

We are all beautiful.

as on the runways of designers such as John Galliano and the late Alexander McQueen. But then Miuccia Prada, who had led the way in promoting a nearly homogeneous catwalk of pale, white, thin models, suddenly embraced an hourglass shape. And then plus-size model Ashley Graham appeared on the cover of the *Sports Illustrated* swimsuit issue in 2016, and in 2019 Halima Aden became the first model to wear a hijab in that same magazine, and suddenly everyone is talking about modesty and beauty and fuller figures...and the progress is dizzying.

In the past decade, beauty has moved resolutely forward into territory that was once deemed niche. Nonbinary and transgender are part of the mainstream beauty narrative. As the rights of LGBTQ individuals have been codified in the courts, so have the aesthetics particular to them been absorbed into the beauty dialogue. Transgender models walk the runways and appear in advertising campaigns. They are hailed on the red carpet for



Adisa Steele poses during a photo shoot in Los Angeles with Slay Model Management, which represents transgender models. In 2019 transgender models had 91 runway spots globally, an all-time high. Brands such as CoverGirl are increasingly choosing transgender models, elevating their visibility.





their glamour and good taste but also for their physical characteristics. Their bodies are celebrated as aspirational.

The catalyst for our changed understanding of beauty has been a perfect storm of technology, economics, and a generation of consumers with sharpened aesthetic literacy.

The technology is social media in general and Instagram specifically. The fundamental economic factor is the unrelenting competition for market share and the need for individual companies to grow their audience of potential customers for products ranging from designer dresses to lipstick. And the demographics lead, as they always do these days, to millennials, with an assist from baby boomers who plan to go into that good night with six-pack abs.

Social media has changed the way younger consumers relate to fashion. It's hard to believe,

but back in the 1990s, the notion of photographers posting runway imagery online was scandalous. Designers lived in professional terror of having their entire collection posted online, fearing that it would lead to business-killing knockoffs. And while knockoffs and copies continue to frustrate designers, the real revolution brought on by the internet was that consumers were able to see, in nearly real time, the full breadth of the fashion industry's aesthetic.

In the past, runway productions were insider affairs. They weren't meant for public consumption, and the people sitting in the audience all spoke the same fashion patois. They understood that runway ideas weren't meant to be taken literally; they were oblivious to issues of cultural appropriation, racial stereotypes, and all varieties of isms—or they were willing to overlook them. Fashion's power brokers were carrying on



Hyejin Yun undergoes eyelid surgery in the Hyundai Aesthetics clinic in Seoul. The procedure makes eyes look bigger. South Korea has one of the highest rates of plastic surgery in the world; one in three women ages 19 to 29 has had cosmetic surgery.

the traditions of the power brokers who'd come before, happily using black and brown people as props in photo shoots that starred white models who had parachuted in for the job.

But an increasingly diverse class of moneyed consumers, a more expansive retail network, and a new media landscape have forced the fashion industry into greater accountability on how it depicts beauty. Clothing and cosmetic brands now take care to reflect the growing numbers of luxury consumers in countries such as India and China by using more Asian models.

SOCIAL MEDIA HAS AMPLIFIED the voices of minority communities—from Harlem to South Central Los Angeles—so that their calls for representation can't be so easily ignored. And the growth of digital publications and blogs means that every market has become more fluent in

the language of aesthetics. A whole new category of power brokers has emerged: influencers. They are young and independent and obsessed with the glamour of fashion. And fashion influencers don't accept excuses, condescension, or patronizing pleas to be patient, because really, change is forthcoming.

The modern beauty standard in the West has always been rooted in thinness. And when the obesity rates were lower, thin models were only slight exaggerations in the eyes of the general population. But as obesity rates rose, the distance between the reality and the fantasy grew. People were impatient with a fantasy that no longer seemed even remotely accessible.

Fat bloggers warned critics to stop telling them to lose weight and stop suggesting ways for them to camouflage their body. They were perfectly content with their body, thank you very much. They just wanted better clothes. They wanted fashion that came in their size—not with the skirts made longer or the sheath dresses reworked with sleeves.

They weren't really demanding to be labeled beautiful. They were demanding access to style because they believed they deserved it. In this way, beauty and self-worth were inextricably bound.

Giving full-figured women greater access made economic sense. By adhering to traditional beauty standards, the fashion industry had been leaving money on the table. Designers such as Christian Siriano made a public point of catering to larger customers and, in doing so, were hailed as smart and as capitalist heroes. Now it's fairly common for even the most rarefied fashion brands to include large models in their runway shows.

But this new way of thinking isn't just about selling more dresses. If it were only about economics, designers would have long ago expanded their size offerings, because there have always been larger women able and willing to embrace fashion. Big simply wasn't considered beautiful. Indeed, even Oprah Winfrey went on a diet before she posed for the cover of *Vogue* in 1998. As recently as 2012, the designer Karl Lagerfeld, who died last year and who himself was 92 pounds overweight at one point, was called to task for saying that pop star Adele was "a little too fat."

Attitudes are shifting. But the fashion world remains uneasy with large women—no matter

Marked by Beauty



ANCIENT EGYPT
3100-30 B.C.

1. DRAMATIC COSMETICS

Heavy eye makeup, typically kohl, was worn by both sexes to darken and contour eyelids and for religious and medicinal purposes. The dark mineral was thought to prevent eye infections and ward off evil and could be complemented with green eyelid accents. Curled or braided wigs were also popular.



1.

ANCIENT ROME
LATE FIRST CENTURY A.D.

2. HEIGHTENED HAIRDOS

Rome's social elite embraced increasingly elaborate hairstyles during the early imperial period. Slaves helped women curl their hair with a *calamistrum* (a curling iron heated in hot coals). Complicated styles could take an *ornatrix* (hairdresser) hours to produce, with wigs or hairpieces added.



2.

CLASSIC MAYA
A.D. 250-900

3. MAYA MODIFICATION

Infant heads were reshaped by binding boards to the skull to produce an elongated look. It's believed the Maya did so to emulate their maize god, whose head was shaped like an ear of corn. They also modified their teeth by filing them and embedding stones, such as jade, as a way to mark the transition to adulthood.



3.

TANG DYNASTY, CHINA
618-907

4. IMITATION OF NATURE

Tang women painted red, black, and yellow beauty marks on the forehead and cheeks in the shape of flowers, insects, and other designs to hide blemishes or imperfections. Natural eyebrows were plucked and painted in a variety of dramatic contours; lips were artfully defined to resemble flower petals.



4.

SOURCES (ART): 2) "FONSECA BUST," CAPITOLINE MUSEUMS, ROME; 4) "FEMALE DANCER," XINJIANG UYGUR AUTONOMOUS REGION MUSEUM; 5) "PORTRAIT OF A LADY," ROGIER VAN DER WEYDEN, NATIONAL GALLERY OF ART, WASHINGTON, D.C.; 7) "LADIES AROUND A SAMOVAR," ISMA'IL JALAYIR, VICTORIA AND ALBERT MUSEUM, LONDON; 8) "PORTRAIT OF A WOMAN," METROPOLITAN MUSEUM OF ART, NEW YORK

We've been chasing beauty for millennia, primping and painting our way to a more desirable ideal. Cultures in every era have held different standards of feminine beauty and myriad means of achieving it, from the toxic lead cosmetics of the past to today's Botox injections. But the standards often serve the same aims: to attract and retain a mate; to signal social status, wealth, health, or fertility; and of course, to simply feel beautiful.





how famous or rich. No matter how pretty their face. Elevating them to iconic status is a complicated, psychological hurdle for the arbiters of beauty. They need sleek élan in their symbols of beauty. They need long lines and sharp edges. They need women who can fit into sample sizes.

But instead of operating in a vacuum, they now are operating in a new media environment. Average folks have taken note of whether designers have a diverse cast of models, and if they do not, critics can voice their ire on social media and an angry army of like-minded souls can rise up and demand change. Digital media has made it easier for stories about emaciated and anorexic models to reach the general public, and the public now has a way to shame and pressure the fashion industry to stop hiring these deathly thin women. The Fashion Spot website became a diversity watchdog, regularly issuing reports

on the demographic breakdown on the runways. How many models of color? How many plus-size women? How many of them were transgender? How many older models?

One might think that as female designers themselves aged, they would begin to highlight older women in their work. But women in fashion are part of the same cult of youth that they created. They Botox and diet. They swear by raw food and SoulCycle. How often do you see a chubby designer? A gray-haired one? Designers still use the phrase “old lady” to describe clothes that are unattractive. A “matronly” dress is one that is unflattering or out-of-date. The language makes the bias plain. But today women don’t take it as a matter of course. They revolt. Making “old” synonymous with unattractive is simply not going to stand.

The spread of luxury brands into China, Latin



Ami McClure braids her daughters' hair in their home in New Jersey while the twins, Alexis (in pink) and Ava (in purple), fix their dolls' hair. The McClure twins' beauty-industry career began with a focus on natural hair after they'd become popular on YouTube. They have nearly two million Instagram followers.

America, and Africa has forced designers to consider how best to market to those consumers while avoiding cultural minefields. They have had to navigate skin lightening in parts of Africa, the Lolita-cute culture of Japan, the obsession with double-eyelid surgery in East Asian countries, and prejudices of colorism, well, virtually everywhere. Idealized beauty needs a new definition. Who will sort it out? And what will the definition be?

IN THE WEST, the legacy media are now sharing influence with digital media, social media, and a new generation of writers and editors who came of age in a far more multicultural world—a world that has a more fluid view of gender. The millennial generation, those born between 1981 and 1996, is not inclined to assimilate into the dominant culture but to stand proudly apart from

it. The new definition of beauty is being written by a selfie generation: people who are the cover stars of their own narrative.

The new beauty isn't defined by hairstyles or body shape, by age or skin color. Beauty is becoming less a matter of aesthetics and more about self-awareness, personal swagger, and individuality. It's about chiseled arms and false eyelashes and a lineless forehead. But it's also defined by rounded bellies, shimmering silver hair, and mundane imperfections. Beauty is a millennial strutting around town in leggings, a crop top, and her belly protruding over her waistband. It is a young man swishing down a runway in over-the-knee boots and thigh-grazing shorts.

Beauty is political correctness, cultural enlightenment, and social justice.

IN NEW YORK, there's a fashion collective called Vaquera that mounts runway shows in dilapidated settings with harsh lighting and no glamour. The cast could have piled off the F train after a sleepless night. Their hair is mussed. Their skin looks like it has a thin sheen of overnight grime. They stomp down the runway. The walk could be interpreted as angry, bumbling, or just a little bit hungover.

Masculine-looking models wear princess dresses that hang from the shoulders with all the allure of a shower curtain. Feminine-looking models aggressively speed-walk with a hunched posture and a grim expression. Instead of elongating legs and creating an hourglass silhouette, the clothes make legs look stumpy and the torso thick. Vaquera is among the many companies that call on street casting, which is basically pulling oddball characters from the street and putting them on the runway—essentially declaring them beautiful.

In Paris, the designer John Galliano, like countless other designers, has been blurring gender. He has done so in a way that's exaggerated and aggressive, which is to say that instead of aiming to craft a dress or a skirt that caters to the lines of a masculine physique, he has simply draped that physique with a dress. The result is not a garment that ostensibly aims to make individuals look their best. It's a statement about our stubborn assumptions about gender, clothing, and physical beauty.

Not so long ago, the clothing line Universal Standard published an advertising campaign featuring a woman who wears a U.S. size 24. She





Girls from families in the favelas of Rio de Janeiro take a lesson at Na Ponta dos Pés, a ballet initiative run by Tuany Nascimento. A ballerina from the favelas herself, Nascimento sees ballet as a way for girls to embrace their bodies and build confidence. She believes beauty and strength are intertwined.





Flávia Carvalho and Júlia Maria Vecchi attend a party in São Paulo dedicated to diversity in all its forms. The body-positivity movement in Brazil, driven by social networks, encourages people to "live in their bodies freely," according to Carvalho.

posed in her skivvies and a pair of white socks. The lighting was flat, her hair slightly frizzed, and her thighs dimpled with cellulite. There was nothing magical or inaccessible about the image. It was exaggerated realism—the opposite of the Victoria's Secret angel.

Every accepted idea about beauty is being subverted. This is the new normal, and it is shocking. Some might argue that it's even rather ugly.

As much as people say that they want inclusiveness and regular-looking people—so-called real people—many consumers remain dismayed that this, this is what passes for beauty. They look at a 200-pound woman and, after giving a cursory nod to her confidence, fret about her health—even though they've never seen her medical records. That's a more polite conversation than one that argues against declaring her beautiful. But the mere fact that this Universal Standard model is in the spotlight in her underwear—just as the Victoria's Secret angels have been and the Maidenform woman was a generation before that—is an act of political protest. It's not about wanting to be a pinup but about wanting the right for one's body to exist without negative judgment. As a society, we haven't acknowledged her right to simply be. But at least the beauty world is giving her a platform on which to make her case.

This isn't just a demand being made by full-figured women. Older women are insisting on their place in the culture. Black women are demanding that they be allowed to stand in the spotlight with their natural hair.

There's no neutral ground. The body, the face, the hair have all become political. Beauty is about respect and value and the right to exist without having to alter who you fundamentally are. For a black woman, having her natural hair perceived as beautiful means that her kinky curls are not an indication of her being unprofessional. For a plus-size woman, having her belly rolls included in the conversation about beauty means that she will not be castigated by strangers for consuming dessert in public; she will not have to prove to her employer that she isn't lazy or without willpower or otherwise lacking in self-control.

When an older woman's wrinkles are seen as beautiful, it means that she is actually being seen. She isn't being overlooked as a full human being: sexual, funny, smart, and, more than likely, deeply engaged in the world around her.

To see the beauty in a woman's rippling

JoAni Johnson, who began her modeling career in her 60s, poses for a portrait in New York City. She has appeared on runways and in print ads for brands including Fenty, Eileen Fisher, and Tommy Hilfiger. Advertising campaigns characteristically have been the domain of youthful models.



muscles is to embrace her strength but also to shun the notion that female beauty is equated with fragility and weakness. Pure physical power is stunning.

"Own who you are," read a T-shirt on the spring 2020 runway of Balmain in Paris. The brand's creative director, Olivier Rousteing, is known for his focus on inclusiveness in beauty. He, along with Kim Kardashian, has helped popularize the notion of "slim thick," the 21st-century description of an hourglass figure with adjustments made for athleticism. "Slim thick" describes a woman with a prominent derriere, breasts, and thighs, but with a slim, toned midsection. It's a body type that has sold countless waist trainers and has been applied to women such as singer and fashion entrepreneur Rihanna who do not have the lean physique of a marathoner.



Slim thick may be just another body type over which women obsess. But it also gives women license to coin a term to describe their own body, turn it into a hashtag, and start counting the likes. Own who you are.

WHEN I LOOK at photographs of groups of women on vacation, or a mother with her child, I see friendship and loyalty, joy and love. I see people who seem exuberant and confident. Perhaps if I had the opportunity to speak with them, I'd find them intelligent and witty or incredibly charismatic. If I got to know them and like them, I'm sure I'd also describe them as beautiful.

If I were to look at a portrait of my mother, I would see one of the most beautiful people in the world—not because of her cheekbones or her neat figure, but because I know her heart.

As a culture, we give lip service to the notion that what matters is inner beauty when in fact it's the outer version that carries the real social currency. The new outlook on beauty dares us to declare someone we haven't met beautiful. It forces us to presume the best about people. It asks us to connect with people in a way that is almost childlike in its openness and ease.

Modern beauty doesn't ask us to come to the table without judgment. It simply asks us to come presuming that everyone in attendance has a right to be there. □

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A BIRD CRASHES INTO A HOTEL WINDOW.

UNABLE TO RETURN TO THE WILD, HE BECOMES
A BELOVED SYMBOL OF CONSERVATION.

THIS IS HIS STORY.

— Flamingo



A photograph of a pink flamingo standing in shallow, blue-tinted water. The flamingo is facing right, its long neck curved elegantly. To the right of the flamingo, a person's bare foot is partially submerged in the water, pointing upwards. The background shows a bright sky with scattered white clouds.

Bob

BY CHRISTINE DELL'AMORE PHOTOGRAPHS BY JASPER DOEST



After a swim, Flamingo Bob stretches his wings. In 2016 he smacked into a hotel window in Curaçao, getting a concussion and hurting his left wing. These and other injuries have prevented his return to the wild. He now lives with his rescuer, veterinarian Odette Doest.

PREVIOUS PHOTO

Photographer Jasper Doest, Odette's cousin, swims with Bob in the Caribbean Sea.





Christmas decorations in 2016 at the CBA Television studios in Willemstad, Curaçao's capital, provide a backdrop as Bob prances by before a guest spot on a morning show. His public appearances promote the importance of protecting nature.



B

OB ENJOYS BREAKFASTS OF CAVIAR, dips in his own saltwater pool, and biweekly foot massages on the beach. A charmed life, perhaps, but you could say he deserves it: Bob spends a lot of his time interacting with schoolchildren on his native island of Curaçao, serving as an emissary for conservation.

Bob, you see, is a flamingo.

Veterinarian Odette Doest rescued Bob in 2016, after the bird slammed into a hotel window and got a concussion. While rehabilitating the bird at her nonprofit wildlife sanctuary, Fundashon Dier en Onderwijs

Cariben (Foundation for Animals and Education in the Caribbean), Doest discovered that Bob previously had been domesticated: He was very relaxed around people, and he suffered from bumblefoot, a chronic foot disease common in captive birds, which would have impaired his ability to catch food in the wild.

For those reasons, Doest decided to keep him as an educational animal at her sanctuary, alongside some 90 other animals. He lives on her property with, among others, a caracara, a species of tropical falcon; a donkey; a bevy of cats and dogs; and, until their deaths, two naughty pelicans that were always trying to escape. “I’ve stopped counting,” Doest admits.

When Doest began taking the then nameless bird on her foundation’s weekly visits to schools and other community gathering spots on the Dutch Caribbean isle, the flamingo became an instant celebrity. Media appearances followed, and when asked the bird’s name during a radio interview, Doest blurted out “Bob.” The name stuck.

“Bob’s like the hot item—everyone wants Bob,” Doest says.

Bob’s natural pink harmonizes with colorful stairs in a historic quarter of Willemstad. The easygoing flamingo accompanies Odette Doest around town, even sitting in her lap as she drives. Recently someone stopped her to ask, “Is he real?”







Rihantely Niles, then eight, listens to Bob's heartbeat at a school in Willemstad. The island's American flamingos often are harmed by plastic pollution and discarded fishing gear, a topic that Doest, holding Bob, addresses in her educational talks.



Bob visits the A.E. Goilo School in the Julianadorp neighborhood. Not every flamingo is as intrepid as Bob—his friend George, for example, another of Doest's rescued birds, is a "stay-at-home flamingo," she says, because he gets nervous around people.



Bob takes a nighttime swim in the saltwater pool behind Doest's house. He's among the 90-some animals at the sanctuary on her property, about half of which are permanent residents. Flamingos regularly end up there, injured by fishing lines or stray dogs.





Doest naps in the pool near some of the animals she has saved. Besides running the rescue center and her veterinary practice, she's a mother, the board chair of a local conservation group called Carmabi, and a Ph.D. candidate in zoonoses, or diseases that can be transferred from animals to humans. An optimist, she reminds kids that a small thing, such as skipping balloons at their birthday parties, can help eliminate waste that harms animals.



That's because most people have never seen such an elegant, colorful bird up close, much less one that's so friendly. "When Bob starts flapping his wings," she says, "children start to flap their arms, and so do grown-ups. They are so mesmerized by his beauty."

Just don't try to take a #Bobsselfie. "That's not what Bob's about," Doest says firmly. "I have Bob for people to think about nature and the environment, and how a slight change in their habits can have a big impact on nature around us."

That could mean opting for reusable cups instead of plastic bottles or skipping the balloons at a birthday party or picking up trash on the beach—all things Doest says children take to heart because they're so dazzled by Bob.

"She's using him to tell a bigger story," says Jasper Doest, a Netherlands-based photographer and Odette's cousin who has chronicled the bird's adventures for three years. "He by himself would just be a flamingo, and without Bob, she would not have that emblematic animal that gives her the attention to do her educational work."

JASPER DOEST FIRST GOT THE IDEA to photograph Bob when the bird sauntered into his bedroom at Odette's house early one morning. "He walks around like he's king," Jasper says. "We see a lot of gloom-and-doom stories. This was a great chance to show a positive side."

At home, Bob plays another educational



role: He regularly takes other rehab flamingos under his wing, showing them how to eat from a bucket, for example. Odette says his presence helps newly arrived flamingos stay calm. Bob lives in a room in Odette's house called the "bird room," sharing the space with two other permanent flamingo rescues, George and Thomas. They each had to have a wing amputated after serious injuries—George from a dog bite and Thomas possibly from a feral animal or fishing gear—making it impossible for them to return to the wild.

Many of Odette's rescued birds were entangled in fishing lines, an environmental threat that she highlights in her talks, along with plastic pollution, coral reef degradation, and loss of

mangrove forests to tourism development. As a local who speaks Curaçao's language, Papiamento, Odette can connect with children on a level others might not.

It can be difficult to determine the impact of any education program, but Odette says students remember her lessons. When a female flamingo died recently after getting tangled in fishing line, Odette brought the line to a school and showed the kids. She told them: "She was just as beautiful as Bob, just as big and powerful and healthy, but because someone left a fishing line out, she's dead." Weeks later, teachers told her the children were still talking about it.

Odette encourages kids to be proud of their native wildlife—including a transient population of American flamingos, which number 400 to 600 in Curaçao and often are seen foraging among the island's salt flats, where they use their webbed feet to stir up the crustaceans and algae that give them their characteristic pink color.

American flamingos were hunted nearly to oblivion for food and feathers during the late 1800s, when the species dipped to a low of about 10,000 animals restricted to a single Bahamian island. American flamingos have since rebounded throughout the Caribbean, Venezuela, and the southern United States. One location now has more than 50,000 nesting pairs, according to Jerry Lorenz, a flamingo expert and director of research at Audubon Florida.

Lorenz says that American flamingos generally are sociable with people, making rescued birds that can't be returned to the wild "wonderful" ambassadors for wildlife conservation. Busch Gardens Tampa Bay, in Florida, had an amiable Chilean flamingo, Pinky, that would greet guests at the park—and particularly liked kids, he says.

Odette estimates that Bob is 15 years old. Flamingos have been recorded living up to 50 years in the wild—and they likely can live longer in captivity, Lorenz says—so Jasper believes that he has many years left to document this Caribbean odd couple.

"I have pictures in my mind of Odette being an old lady in a rocking chair," he says, laughing, "with flamingos all around her." □

Senior Animals Editor **Christine Dell'Amore** last wrote about the illegal trade in parrots. **Jasper Doest** started photographing Bob in November 2016.



TRAVEL | VIETNAM

A Journey With Spice

TREKKING THROUGH AN OLD-GROWTH FOREST IN
SOUTHEAST ASIA, IN SEARCH OF PRECIOUS CARDAMOM

BY MIKE IVES PHOTOGRAPHS BY IAN TEH



An increasing number of intrepid adventurers are heading to Hoang Lien National Park, close to Vietnam's border with China. The park is home to forests of black cardamom, *thao qua*, an essential spice in pho and other Vietnamese dishes.



Giang A Thao, a farmer who lives near Sa Pa, gateway town to the national park, rests on a bag of freshly picked cardamom pods. During harvest season, he helps out his relatives, who own a cardamom plot in the Hoang Lien Mountains.



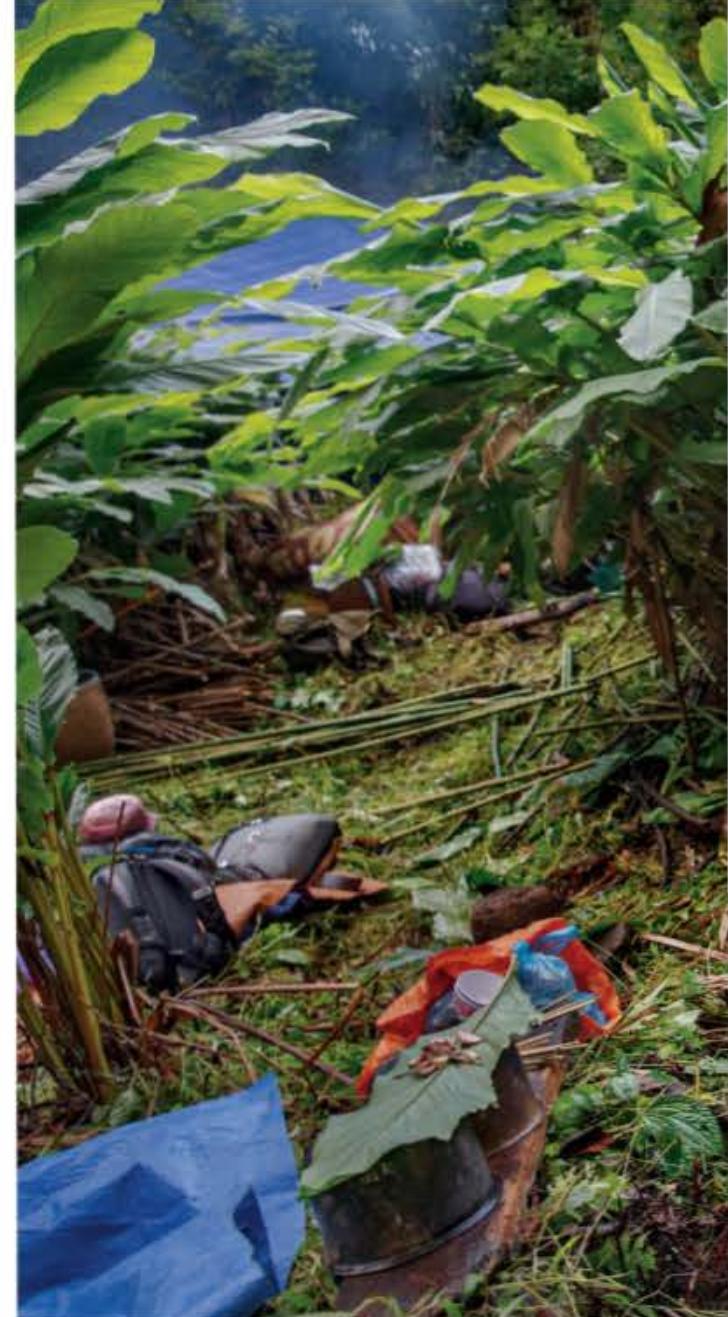
A stranger with an air rifle appeared out of nowhere in the mountain valley where Lang and I were standing. This should be interesting, I thought.

"Hi. We're lost," said Lang, who wore a hand-woven traditional blouse over her spandex trousers and rubber boots. "Have you seen my relatives? Seven men and two women?"

To get here, we'd spent a day riding motorbikes over a bumpy mountain pass, fording knee-high rivers, winding our way up switchbacks, and even sidestepping a poisonous snake. Now we were close to our destination—a black cardamom forest on a nearby peak—but couldn't find the approach trail among the shrubs and wildflowers. Lang's husband, Duong, had just wandered off to look for it.

As it turned out, Lang and the hunter were from the same village, not far from Hoang Lien National Park. He had been farming cardamom in the park for years, he said, and knew exactly where her family was camped.

We had entered the park, a collection of rugged mountains and valleys near Vietnam's border with China, to see cardamom being harvested in the wild. Giang Thi Lang and Nguyen Danh Duong are trekking guides in the nearby town of Sa Pa; I had befriended them years earlier while living in Hanoi, the Vietnamese capital. Lang's family has cultivated cardamom in the Hoang Lien Mountains since the 1990s, and now her younger brother, Cho, who leads the family's



annual harvesting expedition, had agreed to let me tag along.

Even in a country with exceptional biodiversity and natural beauty, Sa Pa stands out. The mountain town sits beside Vietnam's highest peak, Fansipan (10,312 feet), and on the doorstep of a national park that's more than twice the size of San Francisco. It's a great place to hike and to experience the customs of the ethnic-minority groups who have lived in Sa Pa and an adjacent river valley for generations.

The trip was both a grand adventure and a lesson in Vietnam's recent environmental history. Black cardamom was first planted in the Hoang Lien Mountains in the 1990s as a replacement for opium, a banned crop that once helped prop up Indochina's colonial economy. The national park, meanwhile, is a symbol of postwar Vietnam's efforts to protect plant biodiversity. Hence this conundrum: How could a forest be a haven for conservation and cash-crop agriculture at the same time?



LEFT

Farmers wash greens at a campsite near a stand of black cardamom plants in Hoang Lien National Park. They were part of a group that spent several days harvesting the spice and drying it on an open campfire before hauling it back to their villages around Sa Pa.

BELow

Freshly harvested pods are red until roasted, then they turn dark brown or black. The spice is primarily sold to Chinese brokers and used in traditional medicines.







Two villagers from the Red Dao ethnic group cross a footbridge on their way back from harvesting cardamom. People in their village, Nam Cang, earn much of their income from selling the spice to traders.

I STARTED MY JOURNEY in Hanoi, more than 200 miles southeast. At a market near my old apartment, I bought six black cardamom pods for 9,000 Vietnamese dong, or 39 cents. They were about twice as large as their thumbnail-size green cousins, which are used widely in Indian cuisine, and they smelled intensely smoky and fruity—an aromatic cross between a cigar box and a jug of mulled wine.

Black cardamom, known as *thao qua*, grows along streambeds in high-elevation forests, under the canopy of tall trees. As a dried spice, it is used in pho, Vietnam's ubiquitous noodle soup, and a few other popular dishes. Trinh Thi Quyen, the vendor who sold me the pods, explained that *thao qua*'s smoky flavor complements cinnamon and star anise, the other usual members of pho's spice trifecta.

Thao qua has less of a market in the West than green cardamom: It is primarily sold to Chinese brokers and used in traditional medicine to treat constipation and other ailments. Through the years, rising Chinese demand has made Sa Pa an important hub for black cardamom trading.

That night I rode a northwest-bound train from Hanoi toward the Chinese border. When I arrived in the Vietnamese border city of Lao Cai the next morning, I took an hour-long taxi ride west to Sa Pa, where Lang met me for coffee. She then took me around the corner to a cardamom warehouse, where workers were sorting freshly harvested pods under a bare light bulb.

Business at the warehouse appeared to be booming. Every few minutes a farmer would pull up on a motorbike carrying fertilizer bags stuffed with *thao qua*. Then the warehouse's owner, Nguyen Thi Hue, would pay him on the spot from an ostentatiously fat bundle of cash. I saw many thousands of pods waiting to be sorted. A flotilla of small trucks had parked outside, waiting to whisk them to Lao Cai and north across the border.

Hue told us that her *thao qua* buying price was currently five dollars a kilogram, but that it changed constantly, based on supply and demand. A generation ago, Sa Pa's spice traders did not have such regular contact with Chinese brokers, she added, glancing at her silver iPhone. "Now it's much easier: We just call them."

Sa Pa, once a summer retreat for French colonial officials, sits among terraced rice fields

and cloud-draped forests. In Vietnam, such highlands often are farmed not by Vietnamese but by people from some of the country's 53 officially recognized ethnic minorities. Some of these groups cultivated opium as a cash crop under French rule, and continued even after Vietnam declared its independence in 1945 and fought successive wars—against France, the United States and its allies, and later China, which briefly invaded northern Vietnam in 1979.

Lang's family is from the Hmong ethnic group and lives in Ta Van, a village outside Sa Pa that has profited in recent years from Sa Pa's boom in trekking tourism.

But cardamom is still an important source of village income. Lang's father, Giang, told me that he began cultivating it deep in what is now Hoang Lien National Park in 1994, just after the government ordered him to stop growing the opium he had planted there when the American War ended in 1975. "I used to love going there," he told me in his living room. "Now I always push my kids to look after it."

HOANG LIEN NATIONAL PARK, established in 2002, is one of many protected areas in Vietnam where ethnic-minority groups earn a living from land that belongs to the state. Enforcing conservation rules with precision in Vietnam's protected areas is often impossible because so many people with modest incomes live nearby, said Pamela McElwee, author of *Forests Are Gold: Trees, People, and Environmental Rule in Vietnam* and an associate professor of human ecology at Rutgers University. "It's just not going to happen, so you have to have some sort of alternate model," she told me.

McElwee said the "cardamom model"—in which villagers harvest *thao qua* inside the national park, and park rangers mostly ignore them—has so far worked reasonably well for both sides. Yes, it's illegal to harvest cardamom within the park's boundaries, and to collect firewood for campfires that are used to dry it. But cutting down entire forests would be worse, she said, and the Vietnamese authorities often accept such trade-offs, at least for now.

Cardamom farmers still face risks, however. The crop's rising value has prompted some villagers to steal their neighbors' harvests, for

example, and an uptick in extreme weather in recent years has disrupted the crop's year-to-year supply. Sarah Turner, a geographer at Canada's McGill University who studies Vietnam's black cardamom industry, told me there was a high probability that the recent extreme weather was linked to climate change.

"Now farmers are faced with either trying to find a new cash alternative or basically waiting to see if things might get better," she said.

Lang's family is a case in point. Lang and husband Duong, who is from the Muong ethnic group, don't need cardamom for security, because they run a trekking agency. But Lang's brother Cho, who never had much interest in being a tour guide, still sees it as a key to his prosperity, despite the financial risks.

THE PATH TO CHO'S CARDAMOM wove upward through waist-high brambles that scratched at my bare legs. We were nearing 7,000 feet, having started the day at about half that elevation. Lang,

the mountainside. Inside I saw a campfire and a bed of dried thao qua fronds. This is where the harvesting crew would eat, sleep, and roast black cardamom pods for the next two days.

The site was humming with activity because Cho had recruited nearly a dozen friends, neighbors, and relatives to help shoulder the workload. "We're cousins," said one of them, Giang A Thao, when I asked why he'd agreed to do Cho such a big favor. "We help each other."

THE CARDAMOM HARVEST BEGAN early the next morning after a breakfast of rice, instant coffee, and greasy slabs of salted pork that had been cooked on the campfire. The cardamom plot—2,100 plants in all, according to Lang's father—was split between two gently sloping mountain valleys. Cho divided the group into two teams, and they began scrambling up parallel streambeds. Each farmer carried a machete. The basic idea was to extract raw, red pods from a plant's base while also clearing nearby

I paused to take in the scene: hundreds of cardamom plants the height of basketball hoops, each with thick, electric green fronds.

who treks for a living, was visibly winded. But Duong looked nonchalant. "Even if I walked farther, I could still smoke," he joked, a cigarette hanging rakishly from his mouth.

We arrived at the campsite around sunset and greeted Cho, who had arrived earlier to set it up. I paused to take in the scene. Hundreds of cardamom plants the height of basketball hoops, each with thick, electric green fronds roughly the size and shape of banana leaves, lined a nearby streambed. The fronds seemed to move through the forest in waves, following the stream's contours, as if they were swirly brushstrokes on a van Gogh canvas.

High above the cardamom stood old trees whose mossy trunks and craggy branches soared hundreds of feet in the air. Some had a shaggy, Seussian look. I wondered how these exquisite specimens had managed to survive here for so long, even as large swaths of northern Vietnam's forests were logged for timber.

The streamside campsite was basic: a giant blue tarp hoisted on bamboo supports over an earthen bunker that Lang's father had once hacked out of

vegetation. That way, barring extreme weather events, the plant would have room to grow lots of new pods before next year's harvest.

For long hours the farmers silently navigated the streambeds, stopping only to drink water and wipe their brows. The air was colder here than in the valley below, and the sun had ducked behind some gathering rain clouds.

By late afternoon they had trudged back to camp and built a fire big enough to roast and smoke a few refrigerator-size mounds of raw cardamom. I watched as a few pods turned from candy-cane red to coffee brown, giving off a heady medicinal smell in the process. Roasting them was essential because it would significantly reduce their weight, making it easier to carry the harvest down the mountain.

The farmers opened a bottle of *ruou*, the Vietnamese equivalent of moonshine, to celebrate what looked like an impressive haul. There were rounds of shots and more rations of salted pork. We eventually nodded off beside the fire, huddling for warmth as the wind whistled through the cardamom fronds.



I MUST HAVE FALLEN into a deep sleep—so deep that I didn't notice when a heavy rainstorm broke in the wee hours and dumped a bulge of water onto the blue tarp above our heads. By the time I bolted awake around 4 a.m., the campsite was in a panicked frenzy.

Cho's 350-kilogram cardamom harvest was on track to be worth nearly \$2,000 at then current prices, almost as much as Vietnam's annual median wage. But the bulge, with enough water to fill a Jacuzzi, was sagging directly above the campfire. We worried that the tarp would rip under pressure, flooding the pods beyond repair.

Shouting ensued. Pots and pans clanked. Flashlight beams canvassed the darkness. Cho

scrambled up and leaped over the fire, flames licking at his heels, and tried to retie a ripped tarp flap to the tent poles. But the rain kept coming.

By the time the storm tapered off, nearly an hour later, it was almost daylight. The tarp had been further battered and ripped, and many of the people underneath, including me, had been half-soaked in the process. Miraculously, though, the *thao qua* was dry.

As the sun rose, Duong donned his camouflage jacket and poured out two mugs of coffee. My muscles ached from the hiking and scrambling, and my head was throbbing with a *ruou* hangover. On our way up this mountain, Duong had been full of energy and bravado. Now he looked chastened.



Ly May Vy boils plants atop a wood fire to prepare a traditional medicinal bath. Cardamom stems are among the many ingredients used at Tam La Thuoc Dao Do Herbal Bath Spa in Ta Van village, near Sa Pa.

Once back in Sa Pa, we'd have time for a bowl of steaming pho and a soak in a cardamom-infused herbal bath at a village guesthouse. But before we could relax, we still had a long journey ahead of us, back across the streams and mountain passes we'd traversed on the ascent, this time with the harvesters carrying their precious load.

"Tired?" I asked him, as the sky turned pink. He nodded.

"Even if they gave me this whole forest, I wouldn't take it," he said with a laugh. "This is too hard." □

Mike Ives is a Hong Kong-based journalist writing primarily for the *New York Times*. **Ian Teh** lives in Kuala Lumpur, Malaysia, and is a Pulitzer Center grantee exploring life along China's Yellow River.



Travel Wise: Sa Pa, Vietnam

WHY GO NOW

Restaurants and hotels have been opening at a brisk pace in Sa Pa, in part because a new highway connecting the nearby city of Lao Cai to Hanoi opened in 2014. But much of the national park that is visible from Sa Pa remains as wild and beautiful as ever.

WHAT TO KNOW

Vietnam does not grant visas on arrival to Americans. Apply online or in person at the nearest Vietnamese embassy or consulate.

GETTING THERE

Sa Pa is easily accessible by bus or train from Hanoi. Sleeper bus service takes at least six hours each way, and round-trip tickets cost about \$40. Round-trip fares on an overnight sleeper train, eight hours each way, begin at about \$50; a private cabin in the train's luxury sleeper car costs \$200 to \$400 for two.

NOT TO MISS

Mount Fansipan

Many Sa Pa-based travel agencies offer multi-day trekking tours to Fansipan, Vietnam's highest mountain and the primary attraction

in Hoang Lien National Park. There's also a cable car from Sa Pa to Fansipan's peak; a round-trip ticket costs \$30.

Village treks

Sa Pa is ringed by ethnic-minority villages, and some are connected to each other by walking or hiking trails. Several trekking companies based in the city offer trip and homestay packages of varying lengths, prices, and difficulty.

Weekend markets

The villages of Can Cau and Bac Ha, both a few hours' drive from Sa Pa, host weekend markets selling livestock, produce, and more.

Local dishes

In open-air restaurants around Sa Pa Lake, one popular dish is hot pot served with fresh salmon raised in local mountain streams. Another is a plate of crispy, fried river fish called ca suoi.

GO WITH NAT GEO

Topas Ecolodge

This National Geographic Unique Lodge offers 33 bungalows perched on a hill outside Sa Pa, with dramatic views of peaks and rice terraces.



INSTAGRAM

TREVOR FROST

FROM OUR PHOTOGRAPHERS

WHO

Photographer and filmmaker Frost focuses on humans' relationships with the wild.

WHERE

At the Hoja Nueva research station in the Peruvian Amazon, where Frost worked with wildlife reintroduction specialist Harry Turner

WHAT

A Canon 5D Mark IV with a 100mm f/2.8 macro lens

Yes, cat pictures are a perennial hit online—and this one has become the most liked image on the @natgeo Instagram accounts. About three months old here, the male ocelot was bound for the illegal wildlife trade before Hoja Nueva staffers rescued him and named him Keanu. Conservationists aim to thwart sales of ocelots and return them to the wild: “It’s heart-wrenching work,” Frost says. Keanu is now 18 months old. With some monitoring from staffers, he lives in the forest, hunting rodents and reptiles for food and learning to be wild.

This page showcases images from National Geographic's Instagram accounts. We're the most popular brand on Instagram, with more than 126 million followers; join them at instagram.com/natgeo.



Decken's Sifaka

(*Propithecus deckenii*)

Size:

Head and body length, 42 - 48 cm (16.5 - 18.9 inches); tail, 50 - 60 cm (19.7 - 23.6 inches)

Weight:

3 - 4.5 kg (6.6 - 9.9 lbs)

Habitat:

Dry, deciduous forest patches

Surviving number:

Unknown

Photographed by Houdin and Palanque



WILDLIFE AS CANON SEES IT

Leaping lemur. As it moves through its forest home in search of fruits, seeds, flowers and its favored leaves, Decken's sifaka can leap nearly 40 feet. These prodigious bounds are powered by its strong, long legs. From its elongated hands to its limb-grasping feet, this lemur is adapted to the unusual means of locomotion called "vertical clinging and leaping."

Although it is taboo to hunt Decken's sifaka, its future remains very much up in the air due to the loss and fragmentation of its habitat.

As Canon sees it, images have the power to raise awareness of the threats facing endangered species and the natural environment, helping us make the world a better place.



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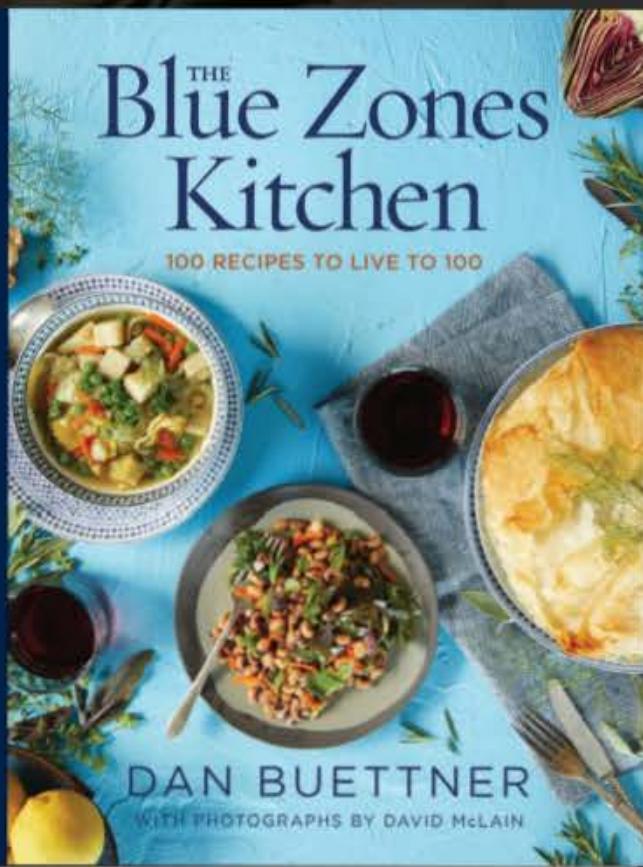


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I LIVE LONGER, BETTER!



Built on decades of research, the authentic regional dishes featured in the latest book from best-selling author Dan Buettner use ingredients and cooking methods proven to increase longevity and improve wellness and mental health. Complemented by mouth-watering photography and an insider's look at each Blue Zone, these recipes can improve your health, extend your life, and fill your kitchen with happiness.

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