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**TREES
OF LIFE**

BY DANIEL GROSSMAN / CONTRIBUTOR

How pruning forest vines could curb global warming as much as solar or wind energy.



Story map

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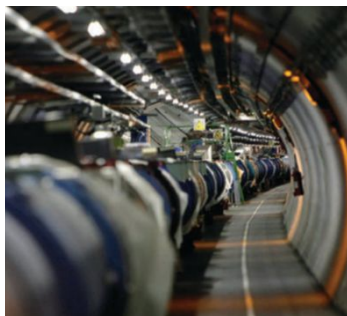
Abu Dhabi, United Arab Emirates; Berlin; Freeman Reserve and Monrovia, Liberia; Geneva; Kilombero Valley, Tanzania; Mexico City; Nairobi, Kenya; Paris; Santiago, Chile; Wolong, China; and the US

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COVER STORY Forest gumption

Scientists are tapping everything from drones to pruning shears to save rainforests and stem global warming. **BY DANIEL GROSSMAN**

COVER PHOTO: GORDON WILTSE/NATIONAL GEOGRAPHIC/GETTY IMAGES



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“Quark fusion” may sound like “Star Trek” technobabble, but a recently confirmed particle could be the result of this process – an explosive reshuffling of some of nature’s smallest constituents. **BY CHARLIE WOOD**

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LIBERIA: A PIONEERING WOMAN’S LEADERSHIP

Ellen Johnson Sirleaf is Africa’s first female president. Citizens say she’s leaving a mixed legacy, particularly for women.

BY RYAN LENORA BROWN



"The object of the Monitor is to injure no man, but to bless all mankind."

— MARY BAKER EDDY



FILM Gary Oldman takes on the role of Winston Churchill for the biopic "Darkest Hour."

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ANDY MARSHALL'S CHIEF ASSISTANT, RUBEN MWAKISOMA, LEADS THE WAY THROUGH TANZANIA'S MAGOMBERA FOREST.

DANIEL GROSSMAN

A crazy way to help save a planet

AT FIRST, ANDY MARSHALL'S IDEA SEEMS A BIT NUTTY. His great idea to mitigate the rise of greenhouse gases globally is essentially the world's biggest gardening project. He wants to go into tropical forests damaged by logging and deforestation and cut out all the invasive vines that flourish there.

As world-altering ideas go, it would seem to fall somewhat short of Elon Musk's solar tiles and missions to Mars. Thinking about how to save the planet often conjures up an image rather more epic than someone slathered in bug spray and toting a machete. But it shouldn't.

The cover story this week by contributor Daniel Grossman takes us to Tanzania, where Mr. Marshall has used a small swath of African jungle as a laboratory.

In damaged parts of the forest, he found, cutting away aggressive liana vines allows trees to recover more quickly and robustly. And larger, healthier trees suck up more carbon dioxide. That fact might seem trivial until you realize that forests consume one-quarter of the carbon dioxide we produce – and that tropical jungles are the best sponges.

To be honest, Marshall's plan is not going to save the planet – at least not singlehandedly. But that, in a sense, is its beauty.

In thinking about what constitutes effective action, there's a tendency today to think on a "Lord of the Rings" scale. If we're not going to conquer Mordor, vanquish Sauron, and destroy Mount Doom, then what's the point of even leaving the shire?

Put another way, it's easy to be mesmerized by the epic

and grand. You can see it even in politics. A Harvard Business Review report argued that the greatest threat to effective democracy was a take-no-prisoners, "all-out war" philosophy – and that was back in 2012. The tendency to demand sweeping and absolutist solutions instead of incremental steps has only grown since then.

But look at one of the items from our Points of Progress this week (see page 14): Iceland has made astounding progress against teen substance abuse. From 1998 to 2016, the percentage of 15- and

16-year-olds who had been drunk in the previous month fell from 42 percent to 5 percent, the BBC reports. Cigarette smoking fell from 23 percent to 3 percent.

What led to the change? Dozens of steps. Raising the age for buying tobacco helped. So did a new nationwide curfew. Every school had to create an organization to engage with parents. And perhaps most important, kids were given new opportunities to participate in sports, music, and art.

Marshall's Tarzan take on climate change is quirky and hardly a cure-all. But it's a step backed by mounting evidence. And in that way, it's part of a bigger picture.

The portrait of progress is a picture of thought in motion. Not every idea will work. Most won't change the world all by themselves. But all point to a mental diligence that refuses to sit still and accept the problems of the present as unsolvable. And that inevitably does change the world – occasionally, in grand swoops, but more often, vine by vine.

■ You can reach me at editor@csmonitor.com.

BY MARK SAPPENFIELD
EDITOR

'Should have happened a long time ago.
Should have happened years ago.'

– **President Trump**, describing the United States designating North Korea as a 'state sponsor of terrorism' Nov. 20. Reinstating Kim Jong-un's regime on the blacklist – President George W. Bush had removed it in 2008 in hopes of spurring talks – was largely symbolic, given that the Trump administration already had the authority to enact nearly any sanction it wanted on the rogue regime. Mr. Trump indicated sanctions would ramp up steeply in the coming weeks as part of a 'maximum pressure' campaign designed to cut off funds for North Korea's nuclear and missile programs. Analysts say the move is unlikely to encourage the nation to participate in negotiations.



AP



REUTERS

ZIMBABWEANS CELEBRATE THE RESIGNATION OF PRESIDENT ROBERT MUGABE IN HARARE, ZIMBABWE.

'Thirty-seven years is not a joke....
I feel like we've been liberated
a second time.'

– **Bryan Moyo**, a Zimbabwean who works in internet security, telling The New York Times how he was feeling after news that Robert Mugabe, who had ruled Zimbabwe with an iron fist since 1980, had resigned. Mr. Mugabe initially refused to step aside after the military placed him under house arrest Nov. 15. But on Nov. 21, as impeachment proceedings began, Mugabe declared, via a letter to Parliament, that he was stepping down for 'the welfare of the people of Zimbabwe and the need for a peaceful transfer of power.' His likely successor, former Vice President Emmerson Mnangagwa, is nicknamed 'the Crocodile.'

'I don't have a minority government in my plans.'

– **German Chancellor Angela Merkel** in a television interview, explaining her preference for fresh elections rather than forming a minority government, something untried since the end of World War II. Negotiations to form a new coalition government following federal elections in September collapsed Nov. 19 when the Free Democratic Party shockingly withdrew, citing 'no common basis of trust' (See story, page 8.)

'It was a decision taken under duress.
We do not condemn the court; we sympathize with it.'

– **Kenyan opposition leader Raila Odinga**, stating his attitude toward his nation's Supreme Court after its Nov. 20 decision to uphold the legitimacy of incumbent President Uhuru Kenyatta's reelection in the Oct. 26 rerun election. Mr. Odinga had boycotted that vote. The court had annulled the results of the previous national election, held Aug. 8, citing irregularities, a move that was – at the time – widely considered a groundbreaking victory for Kenya's justice system. Odinga said the court had been coerced into its latest decision.

'There's a tendency in American culture to leave
the imagination to kids – they'll grow out of it and
grow up to be good businessmen or politicians.'

– **US science fiction author Ursula K. Le Guin**, talking with the Los Angeles Review of Books about the importance of imagination, and where there should be more and less of it. Ms. Le Guin, who recently received a rare honor from the American Library Association, called much of the fantasy in today's culture a 'derivative' mishmash of orcs and unicorns. She sees too much imagination where there should be fact: in memoirs and in the pursuit of 'truth' instead of facts. 'I'm just a scientist's daughter. I really like facts. I have a huge respect for them. But there's an indifference toward factuality that is encouraged in a lot of nonfiction,' she said.



AP/FILE



VIEW
FINDER

WOLONG,
CHINA



ARE YOU SURE WE NEED TO DRESS LIKE THIS?

Workers in panda costumes use a wireless device Nov. 20 to locate Yingxue (YING shoo-eh), a formerly captive panda that was given survival training before being reintroduced to the wild in Wolong in China's Sichuan province. REUTERS

One week

SEXUAL HARASSMENT

Spotlight shifts to Congress

Lawmakers find abuse in their ranks, and poor ways to handle it



YURI GRIPAS/REUTERS

AGREED: Rep. Bradley Byrne (R) of Alabama and Rep. Jackie Speier (D) of California shake hands just before a House hearing Nov. 14 on how to prevent sexual harassment on Capitol Hill.

WASHINGTON – First it was the military, then college campuses, then the media and Hollywood. Now, it’s the US Capitol, where a wave of complaints about sexual abuse and harassment has flooded the stately halls and engulfed a sitting senator, Democrat Al Franken of Minnesota.

Women lawmakers and aides say inappropriate sexual behavior has long been

‘I WAS OF A GENERATION OF SURVIVORS [OF SEXUAL HARASSMENT ON CAPITOL HILL] THAT NEVER SAID A WORD.’

– Rep. Ann McLane Kuster (D) of New Hampshire

“pervasive” on the Hill, largely kept in the shadows amid an insular, old-boys-club culture that persists to this day. But there’s a growing sense that that is changing.

“I was of a generation of survivors that never said a word,” Rep. Ann McLane Kuster (D) of New Hampshire told reporters after she and a bipartisan group of lawmakers

introduced a bill to make it easier to file sexual harassment complaints in Congress.

By not talking about their own experiences, Ms. Kuster said, she felt that she and others were “complicit” in today’s environment of “rampant sexual assault and harassment.”

Now, they are speaking up.

Since Rep. Jackie Speier (D) of California went public in October about being forcibly kissed by a chief of staff when she was a congressional aide in the 1970s, dozens of staffers – former and current – have contacted her office with similar stories.

It was Ms. Speier’s account, as well as the scandal over Hollywood titan Harvey Weinstein, that compelled Los Angeles radio host Leeann Tweeden to publicly accuse Senator Franken of forcibly kissing her on a USO tour in 2006 and groping her on the plane home while she was asleep.

Ms. Tweeden’s account landed like a grenade in the Senate with Franken apolo-

gizing and inviting an ethics investigation.

How will Congress proceed on this issue? There are complicated matters of gradations of wrongdoing, as well as the relevance of behavior before people entered Congress.

In Franken’s case, he was not a senator when those events took place. He has admitted guilt and apologized, and Tweeden has accepted his apology. Eight former women staffers in Franken’s office issued a statement in his defense. Subsequently, however, another woman has accused Franken of grabbing her behind during a photo in 2010, when he was a senator.

And now Rep. John Conyers (D) of Michigan has become the subject of a House Ethics Committee inquiry for alleged sexual misconduct.

It remains to be seen whether – if the problem is as pervasive as appearances suggest – Congress is about to face a flood tide of official complaints. In terms of public attention, the issue has clearly reached a “tipping point,” as Speier put it. In testimony on the Hill, Rep. Barbara Comstock (R) of Virginia told of a female aide who delivered documents to her boss’s residence and was greeted by the lawmaker wearing only a towel. He then exposed himself. The lawmaker is still in office, and the aide has quit.

CNN reported conversations with more than 50 lawmakers, staffers, and other political types – past and present – nearly all of whom personally experienced sexual harassment on the Hill or know someone who has. They spoke of an unofficial “creep list” of lawmakers to avoid.

– Francine Kiefer / Staff writer

GERMANY

Merkel’s woes unsettle Europe

Collapse of coalition talks weakens longtime chancellor

PARIS AND BERLIN – Earlier this spring, when President Trump, on his first trip to Europe, threatened to drop out of a major climate accord and berated fellow NATO members, German Chancellor Angela Merkel rallied the continent.

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“The times in which we can fully count on others are somewhat over,” she told a crowd in Munich, Germany. “We Europeans really must take our fate into our own hands.”

Implicit in that message was the reassurance that it was Ms. Merkel who would shepherd Europe in the reshuffled order.

But what if there is no Merkel?

Monthlong negotiations in Berlin to form

THE CRISIS IN EUROPE'S ECONOMIC POWERHOUSE HAS STRUCK AT A DELICATE MOMENT.



MARKUS SCHREIBER/AP

STOPPING BY: German Chancellor Angela Merkel (l.) arrives at the Reichstag building in Berlin for a Nov. 20 meeting of her political bloc.

a coalition government after September's federal election collapsed Nov. 19. Germany is in uncharted waters, in its worst political crisis since World War II. Many have begun to see Merkel as a weakened caretaker chancellor.

German President Frank-Walter Steinmeier has called on the political parties to resume coalition talks. If they fail, he is likely to call fresh elections.

The crisis undercut Merkel's stature; after 12 years in office, she is a pillar of the European Union. Some observers say it's a wake-up call. Just as the EU adjusted to a disinterested United States under Barack Obama and to a defiant one under Mr. Trump, it may have to get used to life without Europe's de facto leader, they say.

“People are slowly getting used to the idea that there will be life after Merkel, and Europe has to get used to this idea also,” says Roland Freudenstein, policy director of the Wilfried Martens Center for European Studies, a think tank in Brussels.

The crisis in Europe's economic powerhouse has struck at a delicate moment. The EU is in the middle of complex and rancorous negotiations with London over Britain's exit from the Union; extreme right-wing, anti-EU political parties remain a force in many countries; the eurozone needs reform to strengthen its common currency; and the

flow of migrants, though slower, continues.

On all these fronts, Germany has come to be seen as the indispensable nation, whose decisions shape European debate.

Paul Nolte, a professor of contemporary history at Free University Berlin, says the instability in Germany is certainly not good for Europe. Yet he also sees it as a reality check. “It works against the myth of Germany the strongman, and Merkel the strong woman of Germany,” which he says has been oft-repeated during his recent academic year as a visiting professor at Oxford University.

“I've often been irritated about how much trust and expectation is being projected onto Germany and Merkel. I think it's good to see Germany in a way being shrunk to its real size and not blown up to some mythical dimension,” he says.

It's time for other member states to step up, he says, notably France.

New French President Emmanuel Macron is keen to take on new responsibilities. After winning office on a strongly pro-EU platform, he has voiced grand visions for Europe including a European finance ministry, continent-wide taxes, and a common military force.

But none of those ideas will come to anything without German support. That support – uncertain even with Merkel in office – is now firmly on hold.

– Sara Miller Llana / Staff writer and Rachel Stern / Correspondent

TAXES

Is GOP tax plan what voters want?

Both parties see need for some kind of corporate tax reform

BOSTON AND WASHINGTON – Ask Americans what bothers them the most about taxes, and they typically don't talk about their own tax bill. Their top complaint is that corporations are not paying their fair share. Polls this year suggest that two-thirds of Americans believe corporate taxes should go up.

So why are Republicans in the House and Senate moving full speed ahead to do just the opposite?

As the Senate Finance Committee voted Nov. 16 to move its tax bill to the floor, the measure was stirring controversy on several fronts – not least because it makes its tax cuts for average Americans temporary, and it uses that phaseout to help finance a

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PRIME NUMBERS

85.4 BILLION

Value (in dollars) of AT&T's long-slated merger with Time Warner that the US Justice Department has blocked. The government says the merger would harm competition.

59,000

Haitians whose “temporary protected status” was revoked by the Trump administration, giving them 18 months to leave the United States.

30,000

Number of “disappeared” Mexicans resulting from that nation's ongoing drug war, according to the Mexican government. Many observers say the number could actually be much higher.

396

Illegal pill presses confiscated by authorities at the Port of Los Angeles in 2017; only two were seized in 2011. Presses are used to make lethal fake opioids as drug cartels seek to capitalize on the supply shortage caused by tighter government opioid regulations.

70

Years that England's Queen Elizabeth II and her husband, Prince Philip, have been married as of Nov. 20, making it the longest union in the history of the British monarchy.

33

Percentage increase of US troops and Defense Department personnel in the Middle East over the past four months, from 40,517 to 54,180.

400

Rough price (in dollars) for each of two African men sold at a slave auction in Libya. Analysts say the video of the sale depicts a common experience for young African men attempting to use Libya as a gateway to Europe.

800

Length (in meters, about half a mile) of Oum-uamua, a cigar-shaped asteroid spotted by scientists Oct. 19. It is the first confirmed charting of an object from outside our solar system.

Sources: CNN, Vox, The New York Times, The Washington Post, The New York Times, Defense One, Reuters, The Atlantic

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permanent tax cut for corporations.

The political optics aren't good, and the proposal could face changes when it's taken up on the Senate floor. Yet the reality, many economists say, is that the corporate tax code needs an overhaul, and some of the Republican ideas come right out of a years-old Republican playbook.

The basic challenge: Other advanced nations tend to have lower tax rates, while some features of the US code incentivize

TRUMP OFFICIALS SAY INCREASED REVENUE WILL OFFSET DEFICITS. MOST ECONOMISTS DISAGREE.

firms to send capital and jobs abroad. While the Republican proposals raise questions of fairness between the wealthy and average Americans, leaders of both parties have long agreed on the need for tax reforms to keep more investment and jobs at home.

"It's a global race ... to attract global corporations," says Richard Kaplan, a tax expert at the University of Illinois College of Law. "The nominal rate [for US corporate taxes] is 35 percent. There are very few countries at that level."

If Republicans succeed in cutting that rate to 20 percent, it would put the US rate roughly on par with top marginal rates in Europe, according to research cited by the Tax Foundation in Washington.

In 2015, President Barack Obama called for lower corporate taxes, with his budget team saying that "the tax code needs to ensure that the United States is the most attractive place for entrepreneurship and business growth."

It's not that US corporations pay hugely more in taxes, Professor Kaplan and others note. Due to a maze of deductions and credits, US firms pay an effective rate somewhere in the 20s.

Still, economists generally support the idea of lowering the rate as part of broader tax reforms that could make US corporations more competitive, help grow the domestic economy, and create more jobs.

"Cutting the corporate rate this substantially is going to draw some additional investment," says Alan Viard, resident scholar at the American Enterprise Institute and former senior economist at the Federal Reserve Bank of Dallas.

US corporations will have less incentive to park their earnings offshore and foreign companies will have more reason to locate facilities here in the US.

But many economists would prefer to have corporate reforms be revenue-neutral



Political milestones in Africa

SUPPORTERS OF THE JUBILEE PARTY cheer in Nairobi, Kenya, Nov. 20 after the Supreme Court upheld the reelection of longtime President Uhuru Kenyatta after a new vote. In Zimbabwe, meanwhile, Robert Mugabe's 37-year tenure ended Nov. 21 with his forced resignation.

and not add to the deficit. Instead, the House and Senate tax plans would add \$1.5 trillion to the deficit over 10 years.

While some Trump officials, notably Treasury Secretary Steve Mnuchin, say the additional revenue would create enough new economic activity to offset the federal deficit, most economists disagree.

Joel Slemrod, director of the Office of Tax Policy Research at the University of Michigan, Ann Arbor, says that's unlikely. "The empirical evidence is pretty clear."

— **Laurent Belsie and Mark Trumbull**
Staff writers

FOREIGN POLICY

US skittish of unleashed Saudis

Trump's full-throated support could lead to Iran showdown

WASHINGTON — From the outset of his presidency, Donald Trump has signaled his intention to refashion Middle East policy in a big way — and to return Saudi Arabia, which had been sidelined in President Barack Obama's regional vision, to a preeminent spot in US policy.

When Saudi Arabia's young king-in-waiting, Crown Prince Mohammed bin Sal-

man, recently launched a lightning anti-corruption and power-consolidation operation — detaining so many princes and high officials that he had to add a Marriott Courtyard to the Riyadh Ritz-Carlton he'd commandeered as a detention facility — President Trump quickly tweeted that King Salman and the prince "know exactly what they are doing."

Trump had already assigned his son-in-law, Jared Kushner, to work closely with the equally young and untried crown prince to come up with what the dealmaker in chief has promised will be the "ultimate deal." Resolving the Israeli-Palestinian conflict is to be just one part of a grand Middle East peace plan featuring a path to full relations between Israel and its Arab neighbors, Saudi Arabia chief among them.

Yet now as the Saudi kingdom risks getting bogged down by its domestic upheaval, and especially as Saudi actions toward Lebanon threaten to add another foreign-policy misfortune to a list topped by a disastrous war in Yemen and a botched row with neighboring Gulf kingdom Qatar, some US officials and longtime regional experts are questioning the wisdom of Trump's policy.

Among the chief worries is this: that the president's full and unquestioning embrace of the Saudis and their king-in-waiting could lead to the United States being dragged into a conflict with Iran. Moreover, some warn that a Saudi perception of *carte blanche* — and the absence of any restraint or cau-

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tionary advice from the US – could harm a longtime US ally by paving its path to even deeper blunders.

“Trump’s unquestioning support and evident encouragement have unleashed the Saudis to do things we’ve long hoped for, namely to assert themselves in the region and to take on more of their own security,” says Aaron David Miller, vice president for new initiatives and Middle East Program director at the Wilson Center in Washington.

“But now that the president has emboldened the prince to launch into these actions, what you’re hearing increasingly is remorse about what we’ve wished for,” he adds. “No one knows where all this is heading, but

‘[W]HAT YOU’RE HEARING ... IS REMORSE ABOUT WHAT [THE U.S. HAS] WISHED FOR.’

– Aaron David Miller, Wilson Center

it’s pretty clear that not all the potential outcomes are in our interest.”

Clearly, Trump is delighted with the Saudis’ new assertiveness, particularly their efforts to counter Iran. But that unvarnished enthusiasm does not extend to either the US State Department or the Pentagon, where support for Saudi actions is tinged with concerns about where what some see as adventurism could lead – and what any resulting instability could cost the US.

– Howard LaFranchi / Staff writer

In S. America, no more ‘presidentas’

Era of women leaders ends, for now. What did it accomplish?

MEXICO CITY; AND SANTIAGO, CHILE – When Michelle Bachelet won Chile’s presidential election in 2006, she not only became the first woman to hold her country’s highest office, she ushered in a wave of female presidential victories that shattered glass ceilings across Latin America.

By 2014, more than 40 percent of the region’s citizens lived under female rule. But as President Bachelet prepared to step down last month, an era was ending: For the first time in more than a decade there will be no women presidents in the region.

It’s an important shift. In a part of the world known for its rampant machismo, the recent “*presidenta*” period was a hopeful turning point for Latin America. And while there has been progress in gender equality in many Latin nations, some women are disappointed that Bachelet and her fellow women leaders did not do more.

And will the gains since 2006 outlast the women who fought for them?

“At one point Latin America had four women presidents at the same time,” in Argentina, Chile, Brazil, and Costa Rica, says Farida Jalalzai at Oklahoma State University in Stillwater. “It’s spectacular,” she adds, “but it doesn’t mean something will be built on that.”

Other observers are more optimistic: “The symbolic weight of having a woman president can’t be underestimated,” says Gwynn Thomas at the State University of New York at Buffalo. *Presidentas* “changed the perception of women’s leadership.”

Latin America had known female presidents before, but half of them had taken over from their dead husbands and another, Violeta Barrios de Chamorro, was the widow of a martyred Nicaraguan journalist.

Bachelet and other female leaders benefited from the greater role in politics that women carved out in the pro-democracy movements that emerged from dictatorships that collapsed in the 1980s and ’90s. They also profited from voters’ hopes they would be less corrupt than their male counterparts.

Every country in Latin America except Guatemala now has a law on its books that sets quotas for female members of local and national assemblies.

– Whitney Eulich / Correspondent

■ Piotr Kozak contributed to this article from Santiago, Chile.

DC DECODER

How close should Democrats hold Hillary Clinton?

In some ways, the Democrats are on a roll. First, they beat expectations by easily winning the Virginia governorship last month and nearly taking over the state legislature’s lower house. Now they have a shot at claiming a much more improbable prize: a US Senate seat in a special election Dec. 12 in deep-red Alabama, following allegations of sexual misconduct by Republican candidate Roy Moore.

But Democrats are hardly resting easy. The Clintons have roared back into the headlines, with some in the party now reevaluating former President Bill Clinton’s sexual escapades and Hillary Clinton’s controversial defense of her husband. Mrs. Clinton also caused a recent stir by questioning the legitimacy of President Trump’s election, behaving just as she said Mr. Trump would if he had lost.

Clinton’s shadow still hovers over the Democratic Party – a party with many leaders and therefore no leader. And as the Democrats regroup, they will need to answer an important question: Can they find a way to incorporate Clinton’s perceived positives – including as a role model for women in politics – while avoiding her negatives?

The Democrats won’t have a true leader until they have a presidential nominee, and that’s 2-1/2 years away. Ask Democrats who their leaders are, and the list is long: from Hillary Clinton, former President Barack Obama, and former Vice President Joe Biden; to Sen. Bernie Sanders of Vermont (who is actually an independent); to Democratic National Committee chairman Tom Perez and vice chair Keith Ellison; to Sen. Charles Schumer of New York and Rep. Nancy Pelosi of California, the minority leaders

on Capitol Hill.

“On the one hand, such a long list is great because it shows the kind of diversity and breadth of our Democratic Party,” says Jane Kleeb, chairwoman of the Nebraska Democratic Party. “But on the other hand, it’s not great because everybody knows that everybody’s fighting.”

Republicans can be expected to keep demonizing Clinton as they seek to avoid a wipeout in the 2018 midterm elections. Most recently, they’ve been calling for a special prosecutor to look into the so-called Uranium One deal and charges of influence peddling at the Clinton Foundation.

“One way to keep a very fractured Republican Party together is just to bring up the name Hillary Clinton,” says Seth Masket, a political scientist at the University of Denver.

– Linda Feldmann / Staff writer



RYAN LENORA BROWN/THE CHRISTIAN SCIENCE MONITOR

NEW DRILL: A student at Cecelia Dunbar Elementary School helps lead a phonics lesson. The school is part of an attempted reform that will see many of Liberia's public schools converted into charter schools.

AN EDUCATIONAL EXPERIMENT

Liberia's schools take radical steps

Can privately run companies fix a broken school system?

FREEMAN RESERVE, LIBERIA – At first glance, Cecelia Dunbar Elementary School hardly looks like the site of a radical educational experiment. Set in a village about an hour from Liberia's capital, its low-slung classrooms are unlit and streaked with dirt. Children – as many as 50 to a class – squeeze into desks of which there are never quite enough.

This corner of West Africa is undeniably one of the worst places in the world to get an education. Nearly two-thirds of children never go to school at all, and even for those who make it to the end of high school, half fail the West African graduation exam.

'WHEN YOU'RE IN A SITUATION LIKE OURS, YOU NEED TO DO SOMETHING RADICAL.'

– George Werner, Liberian education minister

Many students had their education interrupted first by the country's more-than-a-decade-long civil war, which ended in 2003, and more recently by the Ebola virus outbreak that swept Liberia three years ago and shuttered schools for nearly a year. When the Ministry of Education surveyed adult

women who had attended school through the fifth grade, it found only 20 percent could correctly read a single sentence.

So in early 2016, the Liberian government announced it was going to try something new. It would take about a hundred public schools – among them Cecelia Dunbar – and hand them over to nongovernmental organizations and for-profit companies.

As part of the Partnership Schools for Liberia (PSL) program, the government would keep training and paying teachers at these schools, and kick in \$50 per student each year. The organizations running the schools, meanwhile, would have control over almost everything else.

If it worked, the education minister pledged, the charter school experiment would expand across the public school system – a global first, and a highly controversial one. From San Francisco to Sweden, private-public partnerships in education have become touchstones for debate. Defenders hold them up as models of desperately needed innovation, while critics say they erode public resources and equality.

"Liberia had fallen so badly behind that we didn't think incremental steps were enough anymore," says George Werner, the minister of education.

So starting in September 2016, eight companies and nonprofits, ranging from a Bangladeshi education NGO to a small Liberian charity that provides education to street children, took over a few dozen Liberian schools. The project was a pilot to test whether the entire school system could eventually be privately run with public funding.

At Cecelia Dunbar, teachers were given spiral-bound booklets with a new curriculum designed by a team of international education experts. New teachers arrived, fresh from the country's teaching colleges, and the principal was replaced.

"School is better now," says one third-grade student, who has attended the school since preschool. "Now our teachers come to school every day." Before, she says, they showed up once or maybe twice a week.

But so far, there's not much evidence that the high performance of the new charter schools is helping Liberian schools in general. Some PSL schools have capped class sizes to make teaching easier. But shrinking class size can have unintended consequences, says Tarrance Johnson, a Cecelia Dunbar teacher.

"There have become major issues with access," he says. "In communities where there is only one school, what you're effectively doing is ensuring those kids don't go to school at all."

For now, however, the program is still growing, despite a call by the program's evaluators and technical advisers to halt any expansion until the results of the PSLs first year had been fully analyzed. This school year, the number of PSL schools has doubled, from 93 to about 200. The ministry hopes to add more schools next year.

"When you're in a situation like ours, you need to do something radical," Mr. Werner says.

– Ryan Lenora Brown / Staff writer

■ Tecee Boley and Adrian Pabai contributed reporting.

FARMERS VS. CRANES

Conservation creates farm woes

Should the sandhill crane be hunted to cull population?

DETROIT – Lisa Johnson has spent her life coaxing corn, soybeans, and potatoes out of the ground in Michigan's rural Montcalm County. In the past couple of years her crops have faced a new threat: sandhill cranes.

The sandhill crane, a tall, migratory species known for its striking crimson forehead and rattling cry, was nearly wiped out in Michigan. In the late 19th century, the local population teetered on the brink of extinction as a result of habitat destruction and

▶ NEXT PAGE

rampant hunting. Thanks to conservation efforts, however, the Eastern Population has begun to rebound, particularly in Michigan, where many of the cranes nest. From 2004 to 2015, fall survey counts in the state increased an average of 9.4 percent annually, according to a February state Department of Natural Resources report. In 2015, there were 23,082 cranes in Michigan.

But from Ms. Johnson's perspective, the lanky birds are pests. "They pluck the planted corn right out of the ground," she says.

It's the kind of clash between conservation and economic interests that's become

IT'S A CLASH BETWEEN CONSERVATION AND ECONOMIC INTERESTS THAT HAS BECOME FAMILIAR ACROSS THE U.S.

familiar across the United States (think wolves in the Northern Rockies, rattlesnakes in New England, and panthers in Florida).

Michigan's solution: In October – in a move swiftly opposed by environmental groups – the state's House of Representatives proposed allowing hunters to cull the flock, a controversial response.

"I think it's a win for sport hunters," says James Lower, the state representative who sponsored the resolution. "It's a win for farmers, and it's a win for the cranes, too," he added, referring to evidence suggesting that regulated hunting can keep overpopu-



NEWSCOM

ON THE REBOUND: Sandhill cranes tend their nest in Kensington Metropark, in Milford, Mich.

lation in check.

At this point, it's unclear what a Michigan sandhill crane hunt would actually look like. (The resolution passed by the House is nonbinding.)

But for conservationists, "It's just kind of a slippery slope," says Rachelle Roake, conservation science coordinator for Michigan Audubon. "We're not an anti-hunting group. But we really support scientifically sound management practices, and this isn't what a sandhill crane hunt in Michigan would be."

– **Trevor Bach** / Contributor



SATISH KUMAR/REUTERS

HAUTE CULTURE: Visitors stroll through a 'rain of light' at the Louvre Abu Dhabi in the United Arab Emirates after the new museum was opened to the public on Nov. 11.

PARIS IN THE MIDEAST

Louvre Abu Dhabi bridges cultures

The Arab world's first 'universal museum' is distinctly French

PARIS – The latticed dome, nearly 600 feet in diameter and comprising 8,000 metal stars, plays with Gulf sunlight to form a "rain of light" in what is being touted as the most ambitious museum project of the 21st century.

The Louvre Abu Dhabi, perched on Saadiyat Island overlooking the sea, opened to the public last month, bringing the most recognized museum name in the world to the United Arab Emirates

Of all of the Western investments in the UAE, from museums to universities, the Louvre's vision is the most spectacular, says Martin Kemp, a professor emeritus of art history at the University of Oxford. "It's a particularly French vision," he says on the phone from Abu Dhabi. "France as an operator on a world scale, obviously it is less [so] financially and politically than it used to be, but in a way it can still [be one] culturally."

Ten years in the making, the Louvre Abu Dhabi is no replica of the 18th-century in-

stitution born during the French Revolution. The play of light and shadow under the dome gives the visitor the feel of being in a souk, of being in a grove of palm trees found in the oases of the UAE, says Jean Nouvel, the famed French architect who designed the building.

It is the first "universal museum" in the Arab world and bears testament to the capital's "golden age," says Mr. Nouvel. It's been billed as a bridge between East and West.

The more-than-\$1.2 billion deal was signed in 2007 under then-French President Jacques Chirac. It designated \$525 million for the use of the "Louvre" name over the next 30 years and \$750 million for French experts to oversee 300 loaned works of art from 13 leading museums.

The deal kicked up a storm of criticism in France. Some objected to the Louvre and other institutions arguably selling their souls for petrodollars.

But none of this was apparent as the museum was splendidly inaugurated last month in the presence of kings and other rulers. French President Emmanuel Macron called it a showcase, as a "bridge between civilizations," of "beauty of the whole world."

Nouvel has said that he sees the museum as a "testimony of this golden age, as was done in every city of the world in the past." It was built not for decades but for centuries to come: "It is like a cathedral in this epoch; it's exactly the same thing."

– **Sara Miller Llana** / Staff writer

POINTS OF PROGRESS

Cosmetic shift for women of color?

As the demographic's spending soars, makeup companies are beginning to seize an opportunity

When Wanja Ochwada dropped by cosmetic store Sephora recently she encountered a scene she describes as “coming into a sisterhood”: women excitedly trying out a new brand of makeup and offering up their opinions to their friends.

“[There were] maybe 14 or 15 other black women ... [saying,] ‘Do you think this works with my shade? Could I get away with this concealer...?’” recalls Ms. Ochwada, who was looking for a foundation in the new Fenty Beauty line to match her dark skin tone.

WOMEN OF COLOR USE TO HAVE TO BLEND PRODUCTS, BUT THAT IS CHANGING.

Mega pop star Rihanna is the celebrity behind Fenty Beauty. The line, launched in September and marketed as “Beauty for all,” features a foundation that comes in 40 different shades ranging from very light to very dark. It sold out almost immediately.

Echoing Ochwada, many women of color tell stories of having to blend multiple products to get the right match for their skin tone – or just going without makeup at all. But recent trends, such as the sellout success of Fenty Beauty products, suggest that homemade remedies may soon become a thing of the past.

Traditionally, cosmetics producers have focused on creating products for white women who, until recently, made up a majority of their market.

“Because we live in a society where white and/or light-skin is still considered the norm (or at least is associated with power, privilege, and positions of authority), the mainstream beauty industry has focused primarily on products for women who fit this category,” writes Shauna MacDonald, director of programming for the gender and women’s studies program at Villanova University in Villanova, Pa., in an email.

But those norms are poised to change. Racial

▶ SEE PAGE 16

ICELAND

Iceland has gone from having the highest to the lowest level of teen substance abuse in Europe. In the 1980s and '90s teen drinking, smoking, and drug use were at critical levels in Iceland. The Scandinavian nation responded with a curfew for teens, programs encouraging greater parental involvement, and youth sports and other activities. Some Icelanders attribute their country's newfound prowess in music and sports to the anti-substance abuse measures.

BBC, MOSAIC



WORLD CUP GROUP I QUALIFYING SOCCER MATCH BETWEEN ICELAND AND KOSOVO IN REYKJAVIK, ICELAND

AP

NIUE AND CHILE

The two nations recently created protected zones for a combined 290,000 square miles of ocean. Niue, a tiny South Pacific island nation of 1,600 people, announced in October that it was turning 40 percent of its exclusive economic zone into a marine park (49,000 square miles). Chile added two new marine parks that prohibit fishing and other extractive activities.

RADIO NZ, NATIONAL GEOGRAPHIC

A WEEKLY GLOBAL ROUNDUP

THE NETHERLANDS

A Dutch professor has discovered a way to grow 10,000 kilograms (22,046 pounds) of beef from a single piece of muscle. Mark Post of Maastricht University says embracing the new technology could reduce the number of cows in the world from 1.5 billion to 10,000. Livestock contribute 14.5 percent of all global greenhouse gas emissions – more than all transportation combined.

AL JAZEERA, WORLD ECONOMIC FORUM



DUTCH SCIENTIST MARK POST

REUTERS/FILE

GAMBIA

The West African nation has sworn in its first female vice president. The country's president, Adama Barrow, named Fatoumata Jallow-Tambajang as his vice president after his election in January. (The appointment was delayed for some months because Ms. Jallow-Tambajang exceeded the legal age limit for the office.)

President Barrow described Jallow-Tambajang as "a woman with wealth of experience highly required for rebuilding the New Gambia."

FACE2FACE AFRICA, THE HERALD



VICE PRESIDENT
FATOUMATA JALLOW-TAMBAJANG

REUTERS

CAMBODIA

Twenty-five critically endangered turtles have been released into the wild in the nation's southwest. The 25 royal turtles, also called southern river terrapins, were fitted with acoustic transmitters that will allow researchers to monitor their survival and seasonal movements. There are an estimated 500 to 700 royal turtles left in the world in Indonesia, Malaysia, and Cambodia. Since 2000, about 187 have been released into the wild.

XINHUA NET, KHMER TIMES

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and ethnic minority groups in the United States are outpacing whites, with babies of color now outnumbering non-Hispanic white babies, according to the 2016 US Census. Further, black women make up a majority of black spending power in the US. Black Americans spend approximately

'I DON'T HAVE TO [MIX MAKEUP COLORS] ANY MORE....'

– Lupita Nyong'o, actress

\$1.3 trillion today, and that number is expected to reach \$1.5 trillion by 2021, according to a 2017 Nielsen report.

In short: Black women are increasingly able to influence the cosmetics market through their purchases. And it's sending a deeper cultural message than just creating a fresh face.

"I think we also have a tendency to – when we are talking about things like makeup – to really trivialize it," says Ms. MacDonald, an associate professor of communication, in a phone interview. "[B]ut it really says a whole lot about who we value, what we value, what we consider to be beautiful, and then that's linked to whose

lives do we value...."

The trend toward more inclusive beauty products isn't exactly new – celebrities facing the challenge of finding makeup for their skin tone have helped to expand or create lines in order to fill in the color gaps within the cosmetics industry over the past several decades.

Recognizing a growing market as ethnic demographics expand, established brands have increasingly worked to partner with celebrities of color. Lupita Nyong'o, who won an Academy Award in 2013 for her role in "12 Years a Slave," was named a Lancôme ambassador in 2014, the first black woman to be the face of the company.

In a recent interview with The Times of London Ms. Nyong'o said she sees expanding product lines as a sign of progress.

"Even during my time with Lancôme, they have expanded their range of skin tones," Nyong'o said. "I remember a time in my teens when it was impossible to find my color of foundation. When I began going on red carpets, we used to have to mix different colours to get the right one for my tone. I don't have to do that any more...."

Some consumers think Rihanna's cosmetics launch comes at a timely moment



VIANNEY LE CAER/INVISION/AP

SKIN TONE: Pop star Rihanna launched her Fenty Beauty line in September as 'Beauty for all.'

in the current dialogue on race in the US; others feel the growing inclusivity in the beauty aisle comes down to profit.

"It's not really about inclusion," says Kimberly Norwood, a professor of law and African and African-American studies at Washington University in St. Louis. "It seems to me that the driver here is, 'Oh, wow, there's a lot of money to be made here. Let's hop on it.'"

– Bailey Bischoff / Staff

Bethel, Alaska

Marie is one of our Bethel members and is now the Executive Director of the Co-Operative. We asked her to share what living in Bethel was like when she was younger.

"After living in Anchorage and moving to Bethel in the early '60s life was very different. Bethel was small; one main road, two stores and a single school for 1st-6th grade and they had just built a high school. Homes didn't have indoor plumbing; your water was delivered by truck and you used oil for heat.

Summers, we went to fish camp. We were taught to process fish, but the adults did it much faster, so we could play along the river. My cousins and I would draw in the mud and tell stories.

Culturally it was a change too. I hadn't had a lot of 'Native Food' before moving to Bethel. While living there my grandma made me a parka and some mukluks. I had to learn how to walk with a skin sole, rather than store bought boots. Village life is centered around people coming together; meeting up to share traditional arts & crafts, helping with subsistence hunting and fishing. You learn that your time is tied to the seasons and you must work hard to get food for the year because you can't always rely on the planes or barges for supplies."

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A new kind of fusion

Researchers calculate the energy from 'quark fusion'

"Quark fusion" may sound like "Star Trek" technobabble, but a recently confirmed particle could be the result of this process – an explosive reshuffling of some of nature's smallest constituents.

Q: What are quarks again?

You're looking at quarks right now. Magazines, screens, and air are made of atoms, and atoms are largely made of protons and neutrons – which are the most familiar examples of the three-quark bundles that physicists call baryons.

Quarks come in six varieties: up, down, strange, charm, top, and bottom. Up and down quarks form protons and neutrons, while the unstable and much heavier strange, charm, top, and bottom quarks tend to transform into lighter particles fractions of a second after being created.

Q: What is quark fusion?

Fusion describes a general process in which particles recombine to form new particles, because the new particles need less energy to exist than the old ones did.

According to a paper published online in *Nature* on Nov. 1, researchers have calculated the energy savings that would result if two charmed baryons (three-quark bundles including a charm quark) collided and shuffled their bits around to spit out a neutron (up-down-down) and a doubly charmed baryon (up-charm-charm). That energy output was unremarkable, but then the researchers considered what would happen if a similar fusion reaction took place between quark bundles featuring the much heavier bottom quark. "It was a shocker," says lead author Marek Karliner, a physicist at Tel Aviv University. The event would release about eight times as much energy as a nuclear fusion reaction.

Q: Does quark fusion really happen?

Dr. Karliner's calculation rests on an observation made in July by the Large Hadron Collider beauty experiment (LHCb) at the LHC, a powerful particle accelerator outside Geneva. The experiment confirmed the doubly charmed baryon's existence and measured its mass. The mass matched previous predictions, giving Karliner the confidence to extend his calculation to heavier particles.

Admittedly, quark fusion is not the only way to make the doubly charmed baryon seen in July, and whether this process really plays out in the LHC is an open question. "I would presume the quarks form [the doubly charmed baryon] straight away and do not use the convoluted way described by Karliner and [coauthor Jonathan L.] Rosner," Patrick Koppenburg, a physicist involved with LHCb, writes in an email.

Karliner points out that other baryons often undergo similar quark-swapping and that there's no reason to suspect that the charm or bottom versions are any different. Dr. Koppenburg agrees that the reaction is "not forbidden," echoing a common quantum physics refrain: All that is not forbidden is mandatory. In other words, quark fusion probably happens on occasion, even if the LHC can't bear witness.

Q: Why does this calculation matter?

Talk of powerful fusion reactions may conjure up fears of new weaponry or hopes of a novel energy reactor, but physicists insist neither will happen. Thermonuclear bombs and nuclear fusion reactors need stores of hydrogen fuel, but bottom quarks tend to evaporate



MARTIAL TREZZINI/KEYSTONE/AP/FILE

LARGE HADRON COLLIDER: The particle accelerator outside Geneva was the site of an experiment this summer that confirmed the doubly charmed baryon's existence.

after a millionth of a millionth of a second. "Nature has been very kind and does not allow us to make such a terrible reaction," Karliner says.

Rather, the weighing of the doubly charmed baryon and the calculation of the bottom quark's theoretical fusion energy represent steps forward in physicists' understanding of the force that binds quarks into bundles and those bundles into atoms.

"Every little bit of information we get about the nuclear strong force is important for understanding this force and figuring out ways to do some kind of engineering with it," says Gene Van Buren, an experimental physicist at the particle accelerator at Brookhaven National Laboratory, located on Long Island in New York. However, weaving the strong force into technology in any form will take many decades, he says.

Q: What does this have to do with nuclear fusion?

Only the name. The reaction that lights up the sun relies on gravity squeezing together protons and proton-neutron pairs tightly enough that the strong force clumps them into triplets and quadruplets. The process of packing the particles more tightly releases energy (but no quark-swapping occurs).

It's this phenomenon that many hope to someday harness for bountiful, carbon- and radioactivity-free energy. Instead of gravity, scientists have been trying to use magnetism to pack protons tightly enough that the clumping gives off more energy than the magnets consume. That dream has proved elusive: A 1997 record of producing 16 megawatts of energy for the price of 24 megawatts still stands.

As research into controlling the violent fusion process advances at small reactors around the world, construction of what aims to be the world's first energy-profitable reactor has begun in France. If successful, the colossal International Thermonuclear Experimental Reactor (ITER) will produce 10 times as much energy as it takes to run it when it becomes fully operational in the 2030s.

– Charlie Wood / Correspondent

Ellen Johnson Sirleaf is Africa's first female president. Constituents say she's leaving a mixed legacy, particularly for women. **BY RYAN LENORA BROWN / STAFF WRITER**

A pioneering woman's leadership record

B MONROVIA, LIBERIA
 eside a busy strip of road near the downtown of Monrovia, Liberia's capital city, a tall mural tells the story of the country's recent history – or at least, someone's version of it.

“MA ELLEN,” it says in the familiar language that Liberians often use to describe their president, Ellen Johnson Sirleaf, “THANKS FOR THE DEVELOPMENT AND THE PEACE.”

Below the words are a portrait of Ms. Sirleaf, her face creased by smile lines, and a series of idyllic scenes – a lush university campus, a tidy hospital, a bridge flanked by palm trees.

To many who have watched Sirleaf's career from afar, this is a neat summary of her legacy. Since 2005, when she became the first woman elected president of an African country, Sirleaf's accomplishments have been, in many ways, soaring.

She presided over a dozen years of peace – no small feat given the dozen-plus years of war that preceded them. Her administration built roads and schools and clinics, and persuaded the international community to write off nearly \$5 billion of Liberia's wartime debt. There is a Nobel Peace Prize on her mantel. Bono has called her a hero.

But for Liberians, who will soon elect her successor, Ma Ellen's legacy is far less settled. Here, in the informal debating halls of the country's taxis, markets, and bars, the glittering accomplishments that have earned Sirleaf international acclaim are tallied alongside an equally long list of perceived failures: Her administration pledged to fight corruption, then turned out to be as nepotistic as its predecessors. She presided over a dramatic economic downturn. She didn't do enough to stop the worst Ebola virus outbreak in recorded history.



PRESIDENT: For 12 years in Liberia, Ellen Johnson Sirleaf has presided over peace – and controversy.

AFOLABI SOTUNDE/REUTERS

▶ WHY IT MATTERS

The elections of female leaders often seem like signs of progress. But a tougher test is whether their administrations deliver real gains for the rest of the women in those countries.

And for Liberian women, there's one more.

“When she first ran [in 2005] she spoke a lot to us, and about us,” says Quita Paye, who sells dented water bottles full of neon red palm oil in Monrovia's Nancy Doe market. “So I was really surprised to see there was no change for women when she became

president.”

Many Liberian women, indeed, speak of Sirleaf's tenure in ways at once proud and wounded. She rewrote the script for what was possible for Liberian women, they say, but most women still don't have a part in that story.

“She was able to shatter the myth that women cannot be leaders,” says Korto Williams, country director for ActionAid Liberia and a leading feminist activist. And just having a woman in the Executive Mansion, she says, gave a gravity to the concerns of women's rights activists that they had never had before. “Symbolically, her presence was very important. But in terms of concrete actions to dismantle the oppression of women, there's been much less of that.”

Women waging peace

Indeed, in many ways, it wasn't a female president who radically changed Liberian women's world as much as the gruesome civil war that came before.

For more than a decade in the 1990s and early 2000s, much of Liberia all but emptied of men and boys, an entire generation abducted or recruited to fight the country's brutal guerrilla conflict.

In Liberia's lush green villages and run-down cities, in the walled estates of the wealthy and the poorest rural hamlets, that left only one option for who would run society: women.

Women took over not only households, but also family pocketbooks. At the time, the country had almost no functioning formal economy, but hundreds of thousands of women made their way as small-time traders, so-called market women, hustling bright-pink kola nuts and crumbling hunks of soap to whoever could still afford to buy them.

Women took over not only households, but also family pocketbooks. At the time, the country had almost no functioning formal economy, but hundreds of thousands of women made their way as small-time traders, so-called market women, hustling bright-pink kola nuts and crumbling hunks of soap to whoever could still afford to buy them.

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When the war grew too interminable to bear, it was these same market women who brought it to an end. In 2003, the activist group Women of Liberia Mass Action for Peace met with the country's then-president, Charles Taylor, and cajoled him to attend peace talks with rebel leaders in Ghana.

Where the men went, the women followed. For eight weeks, the women gathered daily outside the negotiations in Accra, Ghana's capital, singing and praying. When Mr. Taylor finally resigned, in part because of their unrelenting protests, suddenly the idea that a woman could lead Liberia didn't seem so radical.

"By the end of the war, women had realized they could be political beings, and some men had, too," says Robtel Neajai Pailey, a Liberian political analyst who also worked for Sirleaf. "It's no coincidence that Sirleaf was able to ride this wave of renewed autonomy."

'I'll fix this'

But Sirleaf was in some ways an unlikely figurehead for that awakening. Harvard-educated, she had grown up among the country's Americo-Liberian, or "Congo," elite – descendants of the US slaves who had settled in Liberia in the 1820s and built a new plantation society, this time with themselves at the top. Though she herself wasn't Congo, and spoke often of a grandmother who was a market woman, Sirleaf's résumé was white-collar all the way down, with high-level stints at the World Bank, the United Nations, and Citibank.

Still, she endeared herself to Liberia's women, many of whom were fed up with the way men had run their country into the ground.

Mary Flomo remembers the first time she saw Sirleaf during the presidential campaign in 2005, hiking up her dress and wading through the flooded market where Ms. Flomo worked as a trader. During the war, big chunks of the market's tin ceiling had been stolen.

"And she just walked right through the water and gathered us around and said, 'I'll fix this,'" Flomo recalls. "We were so proud of her."

In November 2005, women

'Symbolically, [President Ellen Johnson Sirleaf's] presence was very important. But in terms of concrete actions to dismantle the oppression of women, there's been much less of that.'

– Korto Williams,
country director for ActionAid Liberia

like Flomo went to the polls for her in the hundreds of thousands. When the results came back, they'd done something that had eluded even many of the world's most "developed" countries – they had elected a woman to their top office.

"Liberian women endured the injustices during the years of our civil war," Sirleaf told the crowd of international notables gathered at her inauguration in January 2006. "My administration shall endeavor to give Liberian women prominence in all the affairs of the country."

At first, that goal was evident. In Sirleaf's early days in office, she appointed women to head crucial ministries such as finance and justice. She put a woman at the helm of the national police force and another atop the commission on refugees.

She also pledged her support for the country's new anti-rape law, which activists had passed through the country's transitional parliament the year before her election.

During the war, rape had been a devastating and common weapon. For many Liberian women, simply laying down a punishment was a way of writing their struggles back into history.

Then, in 2008, Sirleaf announced the creation of a special court, dubbed Criminal Court E, to deal exclusively with sexual violence, so those cases could be fast-tracked through the backlogged criminal justice system.

Post-vote disappointments

But many activists grew restless. For all her campaign talk about women's empowerment, they thought, it hardly seemed the focus of her administration. And many gestures stung of tokenism.

Meanwhile, she appointed two of her sons and a stepson to high-level govern-

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MARCH: Activists near the downtown area of Monrovia, Liberia, demonstrate against proposed changes to the country's anti-rape law. The changes, the timing of which felt calculated to some, would allow the accused to be released on bail before their trials. RYAN LENORA BROWN/THE CHRISTIAN SCIENCE MONITOR



VOTE POSTPONED: People in Monrovia, Liberia, read a board with information about Liberia's runoff election, whose original Nov. 7 date was delayed. JAMES GIAHUYE/REUTERS

► FROM PREVIOUS PAGE

ment posts and filled her cabinet largely with men – many of them unusually young and well connected, notes Ms. Pailey.

“What it comes down to is this: President Sirleaf is a politician, not a feminist,” says Leymah Gbowee, a peace activist and former ally who in 2011 shared the Nobel Peace Prize with Sirleaf and Yemeni activist Tawakkol Karman. “She needed votes to get elected, she needed international lime-light for her political program, and it was women’s agenda that could give it to her.”

A few years in, market women like Ms. Paye and Flomo were beginning to lose hope. Sure, their markets were cleaner now; they had electricity. Some even provided child care – all Sirleaf initiatives. But the economy wasn’t improving as quickly as they had hoped. People were still too poor to buy most goods, and for market women, customers were everything.

Some activists, meanwhile, noted with regret that although Sirleaf regularly made time for meetings with up-and-coming African female politicians, she was a stranger to most Liberian women.

“Most women in this country didn’t get to know her story,” says MacDella Cooper, the only female candidate for president in this year’s election. (She was eliminated in the first round.) Sure, Sirleaf had grown up privileged, but she had experienced the stinging sexism of Liberian society all the same. She left her husband in the early 1960s, for instance, because he regularly

beat her. “But not many people know her struggle,” Ms. Cooper says. “She didn’t appeal to women in that way.”

Still, to many of her critics, she would always be remembered not merely as a president who failed, but as a woman who failed.

“After this, any woman who says she wants to be president, I will not vote for her,” says Flomo, the market trader. “We have seen now that women are too soft to lead.”

Voters turn the page

As Liberia’s election season cranked up earlier this year, many of the candidates played on that backlash. “Our pa marry! Our pa marry!” chanted supporters of former soccer star George Weah at a rally for his

‘Most women in this country didn’t get to know [President Ellen Johnson Sirleaf’s] story’

– **MacDella Cooper**, the only female candidate for president in this year’s election

campaign in early October, using Liberian English.

Translation: Our candidate is married, a family-values man. Sirleaf, on the other hand, divorced in 1961 and hasn’t remarried.

And from the ruling Unity Party, Sirleaf’s own: “Our ma spoil it, our pa will fix it.” Sirleaf, in other words, had messed

up the country. But her vice president, Joseph Boakai, could be counted on to set things right. (Mr. Boakai joined a last-minute challenge to the election results, which contends, among other things, that Sirleaf interfered in voting by meeting privately with electoral officials shortly before election day. On Nov. 6, the Supreme Court halted preparations for the runoff vote, originally planned for Nov. 7, until the National Elections Commission investigates those allegations.)

Another concern: Less than a week before the first round of the election in October, Liberia’s Senate quietly voted in favor of an amendment to the country’s anti-rape law, which would allow the accused to be released on bail before their trials.

The timing felt calculated. By the time the law traveled through the House of Representatives and to the desk of the president, it was very likely that the president wouldn’t be Sirleaf anymore. None of her would-be successors had shown much interest in protecting the law whose implementation was a signature accomplishment of her presidency. (In an interview with the Monitor and other foreign journalists, Boakai said he “couldn’t say” whether he would oppose the amendment. “We should not be hasty,” he explained.)

So on a bright blue morning the day before the election, a few hundred activists gathered in Monrovia and began marching down the city’s main drag, Tubman Boulevard, toward the Legislature. As they streamed past the mural of Sirleaf, they waved their own version of the country’s history in front of their president’s.

“Liberian women deserve better,” read one of their hand-painted signs.

“Over ten years later and we still have to fight about rape,” read a second.

But as the women – and a few men – streamed past, men who were gathered on the sidewalks eyed them suspiciously.

“If someone says they were raped, there’s no investigation. They just throw him in jail,” muttered Abemego Bomwin.

Farther down the road, another man cupped his hands and shouted, “You wear short pants, you ask for this.”

The activists didn’t reply.

“As much as Sirleaf had her issues, there was something symbolic about having a woman president to keep us and our issues going,” says Naomi Tulay-Solanke, executive director of community health for ActionAid, who helped organize the march. “The small things we got; they were a foundation. But now we could lose it all.”

■ *Tecee Boley contributed reporting.*

As the holiday season approaches, what's an environmentally conscious reveler to do for a tree? **BY JOSEPH DUSSAULT / STAFF WRITER**

A Christmas quandary



ROBERT F. BUKATY/AP

GROWING CHEER: There are currently about 15,000 Christmas tree farms in the United States, like this one in Fryeburg, Maine. There are roughly 350 million trees growing on US farms.

Every year, Americans raze 25 million trees in the pursuit of holiday cheer. But could that actually be good for the environment?

It's no Christmas miracle, but plant scientists say the endless cycle of chopping and growing can contribute positively to soil health, atmospheric carbon levels, and local ecosystems.

For one thing, Christmas trees can be valuable vehicles for carbon sequestration. Seedlings, which take eight to 10 years to mature, absorb more carbon dioxide from the atmosphere than mature trees do.

"The carbon taken out of the atmosphere is put into the branches and stem, but also into the roots," says Bert Cregg, a forestry professor at Michigan State University who studies Christmas tree systems. "So even when the tree is harvested, a lot of that carbon will stay in the soil. When Christmas trees contribute to carbon sequestration, they also contribute to soil health by providing carbon resources for microbes."

That's not to say the industry is completely environmentally sound. Much of Professor Cregg's research focuses on how to minimize the environmental impact of fertilizers, which many growers use to maintain ideal tree color and scent. And as in most

other types of farming, gas and diesel are used in planting, harvesting, and shipping. But there are things conscious consumers can do to minimize the environmental impact of their holiday décor.

Christmas trees are biodegradable and can be chipped, shredded, and used for gardening mulch – in some areas, public works departments will pick up your tree and do it for you. Some communities place used Christmas trees along lake and river shorelines as soil erosion barriers. Consumers can even purchase live, potted Christmas trees and plant them in their yard after the holidays.

Artificial trees, on the other hand, are made from petroleum-based plastics and not biodegradable. If you prefer the cleanliness of an artificial tree, Cregg recommends reusing it as many times as possible.

"There's obviously carbon that goes into the manufacture and shipping of an artificial tree," says Cregg. "So the longer you can keep it, the more you can minimize the input."

A 2009 comparison life cycle assessment conducted by Canadian researchers found that an artificial tree needs to be reused for 20 years to outpace the sustainability of choosing a real tree.

CITIZEN SCIENCE

WANTED: TREE SPOTTERS

Trees cleanse the air, shade our streets, and provide habitat for creatures big and small. Caring for the world's estimated 3 trillion trees takes an army of forest managers, ecologists, and citizen scientists.

Backyard ecology: Every year, trees progress through a fixed biological cycle. But shifts in weather and climate can lead to subtle changes in the timing of spring blooms and autumn leaf falls. In this way, each tree offers a data point for climate scientists studying the shifts in seasonal patterns. But there are far more trees than there are scientists to study them.

That's where citizen scientists come in. Whether you have a single tree or a whole forest in your backyard, you can contribute valuable data to support this research by recording simple observations. Check out Nature's Notebook for more information.

Urban forestry: Many communities rely on local volunteers to monitor the health of area trees. In Washington, D.C., citizen scientists can help identify, measure, and catalog the city's trees during community tree inventory events hosted by Casey Trees. The data help inform pest- and disease-management programs and future planting practices.

In Britain, scientists have enlisted local citizens in helping to create a map of every tree in the nation through project Treezilla. Similar programs exist in cities and towns all over the world. To find a project near you, try searching online for your town or state and the key words "tree map" or "tree inventory."

Far away up close: At Harvard University's Arnold Arboretum in Boston, visitors can stroll through a living collection of 150,000 trees, shrubs, vines, and other plants. But the Arboretum's mission to disseminate knowledge of the plant kingdom doesn't stop at the park's gates.

Arboretum staff members have compiled thousands of photos from trees in full canopy to detailed close-ups of bark and buds. Through the TreeVersity project hosted by the citizen-science platform Zooniverse, amateur botanists can help catalog these images for use in classrooms around the country.

NATURE MATTERS

■ Questions? Comments? Email the science team at sci@csmonitor.com.

– NOELLE SWAN / STAFF WRITER



STORY AND PHOTOS BY MELANIE STETSON FREEMAN
STAFF PHOTOGRAPHER

Birds rise where Audubon once lived

NEW YORK – A four-story black-headed grosbeak peers down on a parking lot on W. 149th Street as artist Louise “Ouizi” Jones, atop an 80-foot lift, alternates between using a paintbrush and cans of spray paint to finish creating its head. Sadly, the grosbeak is one of 314 birds on the Audubon Society’s list of North American birds threatened by Earth’s warming climate. The good news is that the Audubon Mural Project, a collaboration between Gitler & ____ Gallery (yes, that’s its name) and the National Audubon Society, is commissioning artists to create paintings to remind us what might be lost. The artists chosen to participate in the project receive a stipend and art supplies to help them with their creations. So far, the likenesses of more than 80 birds on the list are adorning metal roll-up doors and the sides of buildings in the Harlem neighborhood that John James Audubon, the celebrated painter of American birds and their habitats, once called home. The privately funded project will continue until murals featuring each of the birds on the endangered list have been finished. ■





1 & 2 LOFTY ART As part of the Audubon Mural Project, Louise 'Ouzi' Jones works on a wall-sized mural on W. 149th Street between Amsterdam Avenue and Convent Avenue.

3 WINGED GLORY Artist James 'BlusterOne' Alicea poses next to his mural of an American redstart on a metal roll-up door at the corner of W. 149th Street and Broadway.

4 IN FLIGHT A detail shot shows part of a mural of a Wilson's warbler painted on a metal roll-up door by artist Cara Lynch at 1805 Amsterdam Avenue.

5 UNEXPECTED BEAUTY A detail of a mural of a black-chinned hummingbird by artist Ashli Sisk is seen on the back of a staircase at 601 W. 149th Street.

6 BIRD OF PREY A peregrine falcon painted by artist Damien Mitchell rises up on a storefront at 752 St. Nicholas Avenue. The owner of the building requested a 'ferce' bird.

ANDY MARSHALL, a biologist, yanks on the steering wheel of a battered Nissan station wagon and swings it off a track in the Kilombero Valley of southern Tanzania. Rain from the night before has left hubcap-deep puddles across the road. Mr. Marshall downshifts, swerves onto a recently harvested field of sugar cane, and parks on the furrows. The Nissan shudders for an instant before going quiet.

The biologist – a researcher on the staffs of the University of the Sunshine Coast in Queensland, Australia and the University of York in England – and three Tanzanian villagers slog a short distance through dirt clods and stubble toward a tall leafy wall of deep green: the Magombera Forest. Cradled at the base of the Udzungwa Mountains, the Magombera is one of the most biologically diverse habitats in Africa. Many large mammals, birds, and reptiles inhabit the emerald woods, including elephants, waterbucks, buffaloes, bush pigs, wart hogs, armadillos, porcupines, and three monkey species. Marshall himself has discovered a new species of chameleon here: the *Kinyongia magomberae*. An unusual mixture of East African trees normally not found together shade the forest floor. The canopy towers 100 feet above the ground.

Until recently, the Magombera carpeted about six square miles of mostly flat land in the valley. But in the past three decades, half of the forest plain has been cleared, primarily for farming. The jungle that remains has been seriously degraded – selectively logged for construction timber – leaving gaping holes in the high, green canopy.

Marshall wants to patch Magombera's wounds. The unnatural holes in the forest's fabric lessen the trees' capacity to soak up and store carbon dioxide, the gas that's warming the planet and turning the weather chaotic. Forest gaps also reduce the jungle's suitability for some of its rare wildlife. If only he can cure this small woodland's ills, Marshall says, his method might then revive millions more acres of unhealthy forest around the world – and perhaps make a significant contribution to slowing global warming. There's "huge

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Parts of the Western Amazon rainforest in Brazil have suffered heavy deforestation in the past year as an economic crisis has contributed to illegal logging.

CARL DE SOUZA/AFP/GETTY IMAGES

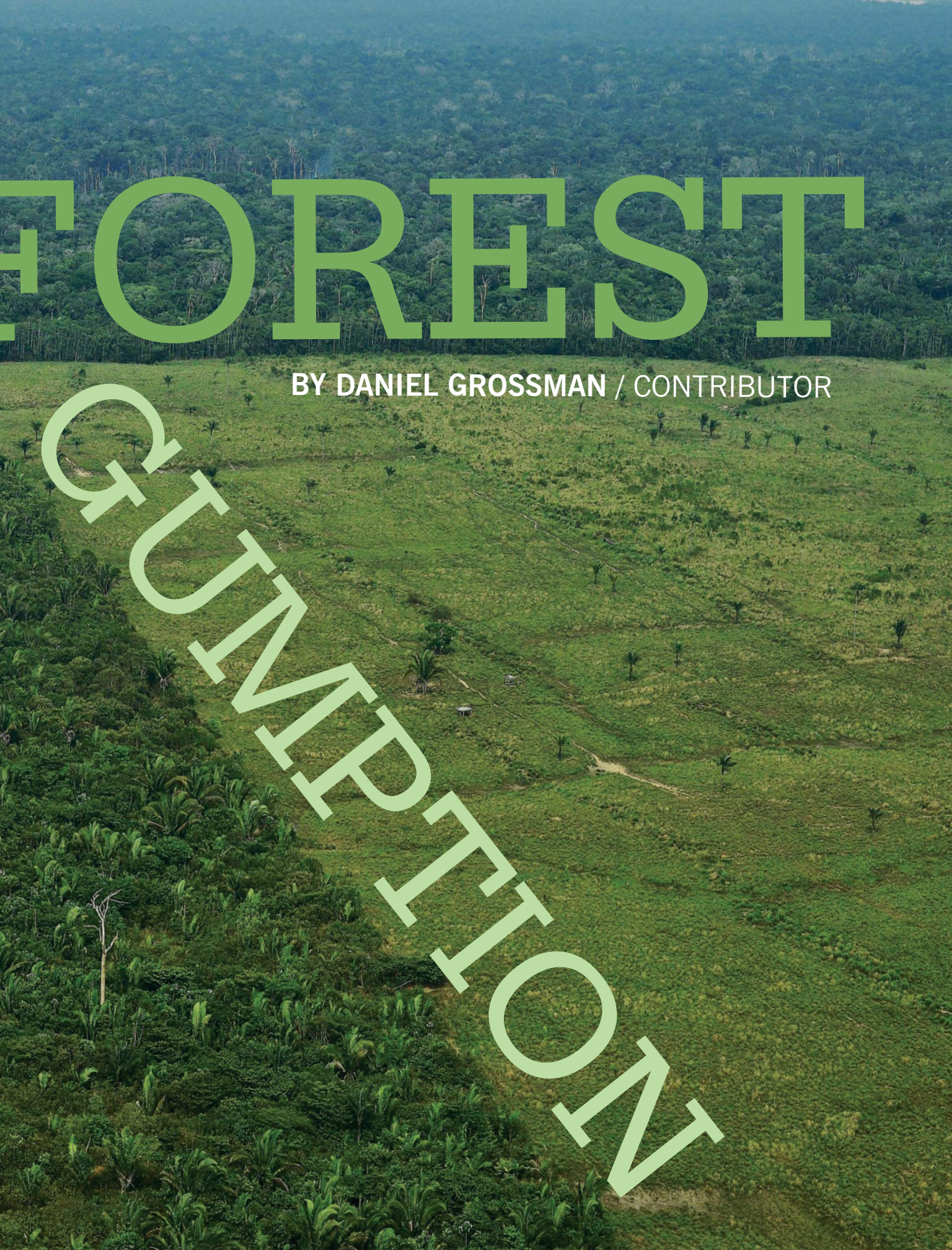


SCIENTISTS TAP
EVERYTHING
FROM DRONES
TO PRUNING
SHEARS TO SAVE
RAINFORESTS
AND STEM GLOBAL
WARMING.

FOREST

BY DANIEL GROSSMAN / CONTRIBUTOR

QUANTITATIVE



potential,” he says. He needs only one simple tool: a sharp machete.



Marshall’s method of stemming greenhouse gases – by pruning excessive undergrowth that prevents forests from flourishing – is one of a slew of quixotic ideas being worked on by scientists and researchers around the world to help solve what could be the dominant issue of the next 100 years.

While most of the attention in curbing global warming focuses on lowering emissions, many people are trying to solve the problem from the other side – by preserving the “lungs of the Earth” that absorb and sequester harmful gases. Though some of the initiatives may be more notional than forest-ready, experts believe it will ultimately take a host of different approaches to avert worsening superstorms and to keep rising seas from coursing through coastal cities from Miami to Ho Chi Minh City, Vietnam.

Every year humans disgorge 36 billion metric tons of carbon dioxide – almost enough to fill up all of the Great Lakes – out of tailpipes and smokestacks. Fortunately, only about half of this planet-insulating gas stays in the atmosphere. Otherwise, Earth would be warming at an even faster rate. Ocean water and vegetation on land absorb the other half, in equal parts. Forests alone soak up one-quarter of the torrent of CO₂ that people pump into the air. “We are talking about a free 25 percent emissions reduction,” says Scott Denning, a climate scientist at Colorado State University in Fort Collins. “It’s awesome.”

Preserving the health of forests is one of the best ways to slow global warming, says Professor Denning, especially in the band of productive tropical jungle that encircles the globe from the Amazon to Central Africa, through Southeast Asia and Indonesia. But humans are doing the opposite. They’re clearing these forests at a furious clip. In the thousands of years since humans discovered fire and invented agriculture and axes, people have chopped down, burned off, and cleared away a third of the woods that once carpeted the earth. The world has lost a forested area twice the size of the United States. After accelerating for centuries, the rate of forest loss has slowed slightly

‘WE ARE TALKING ABOUT A FREE 25 PERCENT EMISSIONS REDUCTION. IT’S AWESOME.’

– **Scott Denning**, climate scientist at Colorado State University, on how much carbon trees absorb



in recent decades. Still, every year loggers and farmers cut down a West Virginia-size area, almost all in tropical South America, Africa, and Asia.



In 2014, diplomats from 36 countries, including the US, many European nations, and Japan, signed the New York Declaration on Forests, an agreement intended to halt deforestation by 2030. They pledged to restore and reforest 865 million acres – an area larger than India – as well. That is a monumental logistical challenge. “2030 is only 12 years away,” says Stephen Elliott, a biologist at Thailand’s Chiang Mai University. Mr. Elliott, director of his

university’s Forest Restoration Research Unit, is among the hundreds of scientists and policymakers around the world looking for ways to renew the vitality of land degraded by wholesale and selective logging, and protect the endangered woods that remain.

The world hears about advances in driverless car technology every day, and Elliott says the same autonomous navigation techniques might someday help to achieve the ambitious objectives of the New York Declaration. “I don’t think we can do an area the size of India by 2030 manually,” he says.

By “manually,” Elliott means how people restore forests today. He says that in Thailand, and in most other tropical countries, forest crews work with tools and apply techniques that would be familiar to their ancestors, “using Iron Age hoes and Stone Age baskets.” Sturdy farmworkers haul heavy hampers of nursery-raised saplings into clearings. They insert root balls into shallow holes cut through unyielding soil mats.

Such backbreaking work is expensive,

DANIEL GROSSMAN



even where labor is cheap. It's slow, too. Farmers and ranchers already occupy the most accessible, easily worked parcels – flat areas near roads. Politically and economically, these plots are not open for reforestation. Roads don't go where most of the available land is. Steep slopes, untamed rivers, and other obstacles also hinder access, multiplying the difficulty and expense.

Reforestation is “the only agricultural and horticultural activity that hasn't been automated,” Elliott says. In 2015, he set out to change that, with help from autonomous drones. He invited an interdisciplinary group of 80 scientists and engineers from around the world to meet up in northern Thailand where he studies reforestation methods.

They bantered and brainstormed for four days about how drone squadrons might reconnoiter over restoration plots, pluck seed-laden fruit from treetops, shoot those seeds into the soil, and care for the seedlings that later emerged. Freewheeling discussions on how aerial robots could cut down fruit with mini chain saws, ferry this harvest in nets, and ward off rodents with urine-soaked cat litter, lived up to a conference slogan: “The craziest ideas are best.” “It was the best fun I've ever had,” says Elliott.

Many researchers are withholding judgment about the potential for drone restoration of forests, though. Robin Chazdon, a biologist at the University of Connecticut in

Storrs, says Elliott's idea for robotic weeding “raised my eyebrows a bit.” Professor Chazdon edited a 2016 paper in the journal *Biotropica* where Elliott laid out his ideas. “There are a lot of issues that remain to be worked out,” she says. Not the least of these is how to induce air-dropped seeds to germinate and how to repel seed-hungry herbivores.



Other ways to preserve the carbon sequestering ability of forests focus on preventing the trees from being cut down to begin with. This isn't easy, either. Any attempt to silence chain saws and the thwack of axes must answer to a litany of powerful interests craving new land and fresh wood. Farmers want more acreage for crops. Ranchers want new pastures. Developers want lots to build on. And both timber companies and small-

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JULIE FALLON/STAFF



DANIEL GROSSMAN

Andy Marshall, a British biologist based in Australia (top), identifies a plant in the Magombera Forest in southern Tanzania, where he is trying to save trees to help curb global warming.

The Udzungwa Mountains (left) and the Magombera Forest at their base are among the most biologically diverse habitats in Africa.

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scale loggers want lumber.

Farmers in the Hoima and northern Kibaale districts in western Uganda are clearing trees – mostly for subsistence farming and to sell wood for timber and fuel – faster than almost anywhere else on Earth. In 2011, Seema Jayachandran, an economics professor at Northwestern University in Evanston, Ill., began an unusual investigation: how to entice small landowners in Uganda into protecting land, not clearing it.

With collaborators in the US, Belgium, and the Netherlands, Professor Jayachandran recruited 1,099 Ugandan families for a study of whether modest cash rewards could sway them. Her results, published last July in the journal *Science*, has attracted worldwide attention from forest restoration experts.

In the past two decades, farmers in many countries have been offered such payments to refrain from clearing jungle. The idea has been tried in countries as far-flung as Vietnam and Costa Rica.

Scientists disagree about how well these efforts work. One problem has been that even if land clearing slows down after payments, how can researchers be sure that the reimbursements, and not other factors, caused the change? Moreover, skeptics suggest that payment programs might simply shift cutting to other locations, with no net benefit.

Jayachandran's experiment was novel. Unlike previous reimbursement programs for forest protection that had been studied, landowners were selected at random either to receive payments or not, creating two groups for comparison. Half of the landown-

ers received about \$12 per year for each acre they left alone. Through a local conservation group, the scientists spot-checked parcels. The research team also monitored forest cover with high-resolution satellite photos.

Jayachandran started the experiment doubting that payments could substantially reduce tree cutting. So she was surprised when a research assistant emailed her a table with preliminary findings. "Wow, this program is having a big impact," she thought. Later verification proved that the small payments had slowed cutting substantially. People who received no money cleared 9 percent of their land in two years of observation. People paid to leave their land untouched cleared only 4 percent. The program had reduced deforestation by more than 50 percent.

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EVERY YEAR, LOGGERS AND FARMERS AROUND THE WORLD CUT DOWN A WEST VIRGINIA-SIZE AREA OF FOREST.

Moreover, the team showed that the program was an economical way to fight global warming. Trees owned by families who received the program's cash rewards stored 250 tons per year more CO₂ than woodlands owned by neighbors who had not chosen to receive the payments, at a cost of \$105. The climate benefit could be ephemeral, unless payments continue. Still, Jayachandran has calculated that paying Ugandans to protect their land in perpetuity costs much less than putting up a solar panel or a windmill in the US with an equivalent CO₂ reduction.

Alex Pfaff, an economics professor at Duke University in Durham, N.C., praises the Uganda study for proving that "there is potential" for reducing deforestation by paying landowners not to cut trees. But he doesn't think that means the idea will succeed everywhere. He says payments

work best where a lot of forest is being cut, but not at great profit (such as in hilly terrain), and where somebody carefully monitors compliance. Otherwise, he says, people who have no plans for clearing forest might get paid for doing nothing. Or, conversely, they might get paid and then chop down forest anyway.

Professor Pfaff studied one of the world's longest-running attempts to protect tropical forests with cash rewards, Costa Rica's Payment for Environmental Services program. Like several other experts who've examined Costa Rica, he found that two decades of payments – totaling tens of millions of dollars – have saved very little forest. The payments "didn't do much." Deforestation declined, he says, but for other reasons.



In the Tanzanian wild, Marshall wants forests to heal themselves, with only a little help from humans. He's cutting skeins of lianas, a variety of vine with a woody stalk – the "kind that Tarzan swings on," says Marshall.

They are native to the Magombera woods and other degraded forests that Marshall hopes to help. They often proliferate after a logger makes a clearing – stymieing regrowth of some of the world's most lush forests and preventing trees from playing their role as Earth's burial ground for carbon.

Marshall notes that between one- and two-thirds of all tropical forest land on the planet has suffered some form of abuse. Careful tending of ailing patches could substantially boost tree productivity. He is determined to prove his case in the Magombera.

He steps from the sugar cane plantation where he parked, baking under a sulfurous sun, into the forest. In only a few paces, the air cools noticeably and the light dims. The scientist and three helpers form a single file as they tramp deeper into the woods. Marshall wears a pair of scuffed black boots. Dirt from weeks of fieldwork clings to his pants.

Felipe Spina Avino, a conservationist with the World Wildlife Fund, uses a drone to map an area of rainforest in the Western Amazon region of Brazil.

REFORESTATION 'IS THE ONLY AGRICULTURAL AND HORTICULTURAL ACTIVITY THAT HASN'T BEEN AUTOMATED.'

– Stephen Elliott, a biologist at Chiang Mai University in Thailand

"Ants!" one of the villagers yells in Swahili. A column of driver ants marches across the path. The size of a rice grain, a driver ant can bite with powerful jaws. The team starts jogging, stomping the ground with each step to prevent the insects from clinging to their shoes.

Over the years, Marshall has learned to identify most of the 500 plants in Magombera by their fruit, leaves, and flowers. "Sniff this," he says, scraping bark from a sapling. "It smells like raw carrots."

The four arrive at a red plastic triangle standing atop a stake in the soil. It marks a corner of one of Marshall's 40 research plots. In a tennis-court-size clearing, a twisted sapling attracts his attention. It had grown straight like a tree then doubled over vinelike back toward the ground. What is it?

Sometimes lianas look like trees. He snaps a pencil-thick branch in two. It's a tree, *Xylopiia holtzii*, he announces. Liana branches are stringy and don't break cleanly.

The distinction between liana and tree is central to Marshall's research on how to revive degraded jungle areas such as this opening in the woods. Locals probably cleared the trees decades ago. A thick mass of leaves growing on coiled liana stalks carpets the glade now. The green, living lid shades everything below, Marshall says, stalling forest regrowth. "You can imagine what a tree has to go through to break through that."



Research elsewhere grounds Marshall's project. Scientists have long known that vines slow forest growth. More recently, biologists have put numbers on how much more carbon vine-free forests contain.

Stefan Schnitzer, a biology professor at Marquette University in Milwaukee, says that lianas ascend into forest heights, free-loading on the scaffolding of carbon-storing tree trunks. The size of their crowns often far exceeds that of the trees themselves. A group of gluttonous guests who refuse to leave once they've arrived, lianas suffocate the trees that host them. But liana trunks, far less hefty than those of trees, store pitifully little CO₂, making forests webbed with the

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CARL DE SOUZA/AFP/GETTY IMAGES



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vines less efficient in hoarding the planet-warming gas.

Several years ago, Professor Schnitzer and five workers severed the trunks of every liana in 12 acres of a forest in Panama. Freed of shading and strangling vines, the trees bulked up. “It was stunning,” says Schnitzer. Three years into the experiment, the liana-free jungle was accumulating carbon in its trunks and leaves nearly twice as fast as nearby unpruned woods.

Marshall proposes putting such findings to practical – and, eventually, extensive – use. He recently published the results of his own pilot study in the Magombera Forest. He’d clipped lianas in an area of degraded jungle the size of a suburban front yard. The trees burgeoned. After five years the same land had stored eight times as much carbon as nearby control areas. Marshall says his initial results suggest that cutting lianas in a degraded forest is as effective for sequestering carbon as reforestation. And killing lianas costs 1/50th as much, he says.

Widespread liana

removal awaits larger-scale and longer-term trials. Schnitzer, whose research inspired Marshall, agrees that liana removal could help degraded forests store more carbon. But he fears unintended side effects of industrial-scale liana trimming. “You’re killing part of the community and you don’t know what the ramifications are,” he says.

On a walk through his research plots in Panama earlier this year, Schnitzer described an example. His colleague Steve Yanoviak, a biology professor at the University of Louisville in Kentucky, noticed that the population of one ant species increased after crews had cleared lianas.

Professor Yanoviak speculates that anteaters, predators of this arboreal ant, can’t climb into canopies to raid the insects’ nests without lianas. Even bigger impacts on denizens of the woods might remain to be discovered. This is

to say nothing of the logistics of dispatching machete-swinging forest workers into every square inch of the world’s jungles. As a result, Schnitzer argues that efforts at slowing deforestation make more sense

Andy Marshall, a biologist based in Australia, discovered this new species of chameleon in the Magombera Forest in Tanzania.

than trimming woodlands like an arboreal hedge.

Relaxing after a tiring day crawling through thickets, Marshall talks expansively about his hopes for someday thinning liana tangles far beyond the Magombera Forest. He is still smarting from an ant bite and a nasty thorn snag. Researchers often dodge degraded forests, he says, because they’re hotter and choked with undergrowth. “It’s an inhospitable place for us big humans.”

Marshall, like Schnitzer, is uneasy about the idea of widespread liana cutting. Yet he notes that no solution will be simple or without trade-offs. Replanting costs a lot. Entrenched interests resist controls on deforestation.

Last June Marshall received a \$900,000 grant from the Australian government to fund his large-scale trials. He’s now poised to turn his largest patch yet of viney jungle into a healthy forest again. “The potential carbon gain,” he says, “is colossal.”

■ Reporting for this story was supported by the Frank B. Mazer Foundation and the Pulitzer Center on Crisis Reporting.

‘THE POTENTIAL CARBON GAIN IS COLOSSAL.’

– Andy Marshall, a biologist at the University of the Sunshine Coast in Queensland, Australia

THE JAPAN TIMES / TOKYO

Mugabe's descent into autocracy was not inevitable

"Few tears may be shed for Zimbabwe President Robert Mugabe, who was effectively deposed by the military....," states an editorial. "[O]ne thing seems certain: It is an ignominious end to the career of one of Africa's greatest leaders – and one that is long overdue.... Economic mismanagement and chronic starvation did not spur the military to take action against Mugabe.... [It] was the power grab by his wife, Grace.... Mugabe's descent into autocracy, capriciousness, corruption and tyranny was not ordained, but it is all too common in Africa.... Rather than demanding that Mugabe adhere to the rule of law, other parts of the power structure joined him in exploiting institutions of the state.... And neighbors and regional powers that could have made Mugabe pay for his rapaciousness, indulged him instead...."

DAILY MONITOR / KAMPALA, UGANDA

After Mugabe, Zimbabwe looks set for more of the same

"The people of Zimbabwe have rebelled against the defiant Robert Gabriel Mugabe and for all intents and purposes, the army has overthrown him," writes Nicholas Sengoba. "Like it happens in countries where leaders with an iron grip subjugate people for decades, the citizens get so fed up that their yearning for change finds any kind of change acceptable.... [Mugabe's] substitute is likely to be his immediate former vice president and long standing comrade ... Emmerson Dambudzo Mnangagwa.... All the major players against Mugabe do not come to the table with clean hands.... If the history of the main characters in the ouster of Mugabe is anything to go by, things in Zimbabwe are likely to change, but still remain the same."

THE HINDU / CHENNAI, INDIA

Why Germany's political center needed to hold

"The crisis over government formation in Berlin has raised the possibility of fresh elections in Germany and the ripple effect of instability in the European Union," states an editorial. "The breakdown in talks between Chancellor Angela Merkel's Christian Democratic Union and potential partners ... has dealt a blow to a time-tested post-War model of political compromise and consensus-building.... The proof of the efficacy of the German consensus model lay in solidifying the political centre-ground.... The need for a strong middle ground could not be greater than it is at this point. Once the Netherlands and France averted political instability ... the outcome in Germany had appeared to be a foregone conclusion. Perhaps not."

THE JORDAN TIMES / AMMAN, JORDAN

As Lebanon looks to be next Middle East hot spot, the US should be cautious

"The resignation of Lebanese Prime Minister Saad Hariri ... is an indicator of a potential local escalation with Hizbollah and regional escalation with Iran," writes Amer Al Sabaileh. "The expectation of an imminent escalation with Hizbollah has been there for months, as the end of the crisis in Syria was likely to turn regional focus to the Iranian-backed group.... The US and its allies launched a strategy to isolate Iran, but they must ensure its long-term viability with a clear and substantial roadmap in order to prevent clever and influential Iran from turning the outcome to its advantage...."

THE GLOBE AND MAIL / TORONTO

Australia welcomes same-sex marriage, but much of the world still resists

"Holland was first off the mark in December of 2000, and in the intervening years 25 other countries have approved same-sex marriage," states an editorial. "Actually, make that 26. If all goes as expected, Australia will legalize same-sex marriage by Christmas.... The reality is there are regions of the world where it is still difficult, and even dangerous, to be gay.... Homosexuality is considered a crime in much [of the world] and is punishable by death in some places. It's an intolerable situation that cannot and will not last.... The latest evidence is the vote in Australia, a country where the political middle is generally situated to the right, but which still embraced tolerance and equality."

Founded in 1908 by Mary Baker Eddy

EDITOR: Mark Sappenfield

CHIEF EDITORIAL WRITER: Clayton Jones

MANAGING PUBLISHER: Abe McLaughlin



*"First the blade, then the ear,
then the full grain in the ear."*

Protecting the innocent from cyber warriors

In new warnings about cyberattacks by foreign entities, Britain and the United States have lately left the impression that innocent civilians, and not just governments, might become victims on a digital battlefield. On Nov. 15, for example, the US said North Korea is targeting banks, airlines, and telecom firms. And Britain claimed Russian hackers have targeted energy networks and the media. Prime Minister Theresa May accused the Kremlin of a campaign of cyber "disruption."

The warnings are credible given evidence of Russian meddling in the 2016 US elections and North Korea's 2014 hacking of Sony Pictures. Last spring, the so-called WannaCry virus shut down hospitals in Britain, rail ticket operations in Germany, and some FedEx operations in the US. Terrorism experts also warn of Islamic State or Al Qaeda shutting down critical infrastructure, such as electric grids.

"Algorithms can be as powerful as tanks, bots as dangerous as bombs," says top United Nations official Michael Moeller.

Amid these rising fears, however, cybersecurity experts are calling for new international norms and agreements that recognize the need to wall off civilians from cyberharm. The idea is to replicate the kind of pacts that have largely curbed instruments of war, such as chemical weapons.

Under the Geneva Conventions that serve to protect the innocent during a conflict, cyberwarfare is already restricted to military targets. Just as warplanes cannot drop bombs on civilian hospitals, government hackers cannot hit civilian facilities, such as a factory. Yet these humanitarian rules apply only during war. Many cyberattacks today are stealthy events by an adversary whose identity cannot be easily detected. Governments are responding by beefing up cybercapabilities to respond in kind. This risks the possibility of widespread and mutual destruction of digital networks.

'Digital Geneva Convention'

Just as the Geneva Conventions and other agreements have set legal bumpers for the use of physical weapons, the world needs a pact that restrains digital attacks. Microsoft's president and chief legal officer, Brad Smith, has even called for a "digital Geneva Convention" out of his perception that "nothing seems off limits" in

cyberattacks these days.

"Now is the time for us to call on government to protect civilians on the internet in times of peace," he said. "We need a convention that will call on the world's governments to pledge that they will not engage in cyberattacks on the private sector, that they will not target civilian infrastructure whether it's of the electrical or the economic or the political variety."

Another idea is for tech companies to prevent their products from being weaponized. Last month, Peter Maurer, president of the International Committee of the Red Cross, which is guardian of the Geneva accords, visited companies including Face-

book and Microsoft to ask that they alter their technologies to prevent them from being used as instruments of war.

Such ideas are grounded in a powerful concept well developed since the mid-19th century that even enemies must recognize the innocence of noncombatants. With each new type of weapon, the world must again find the means to protect the dignity of innocent lives. ■

A mental liberation in Zimbabwe

In Africa, a popular Twitter hashtag in recent weeks has been #Zimbabwe. And for good reason. It is rare for Africans to witness an authoritarian figure like Robert Mugabe being forced out, especially after 37 years in power. He was a fixture for a generation, a symbol of how rulers can cling to power. Yet it is not only the political transition in Harare that is the focus of interest. Just as compelling for Africans is the sudden lifting of mental chains among millions of Zimbabweans.

Many in the Southern African nation have taken to cyberspace to express a liberation of thought and a shedding of fear. They are scratching their heads over why they once believed what had seemed to be a fact – that a corrupt ruling elite must be Zimbabwe's future. The phenomenon is similar to the 2011 Arab Spring, or the surprise awakening to a new narrative and a rejection of servitude as the norm.

Typical of the new introspection is this internet posting by branding consultant Thembe Khumalo on the media site NewsDay:

"We saw the end of an error, or rather a collection of errors; errors we had been making and failing to correct for decades,

and we also saw the end of an era. We saw the beginning of another... We should have required more of ourselves and one another."

Or this comment by writer Learnmore Zuze in Zimbabwe Daily: "The system was so impermeable that everyone felt powerless over the possibility of untangling it. But fast forward to November 2017, could this be the beginning of a rebirth of Zimbabwe arising from the current chaos?"



PASTOR EVAN MAWARIRE LEADS A PRAYER.

REUTERS

The ground for a national introspection was laid last year by a Baptist pastor, Evan Mawarire. He released a homemade video asking Zimbabweans to refuse to participate in a corrupt regime and stay at home for a day. The mass "soft insurgency" caught

on, as did his calls for daily prayers and for peaceful grass-roots action.

"Let not fear grip your hearts," he said in a posting recently as the country dealt with how to end the Mugabe era.

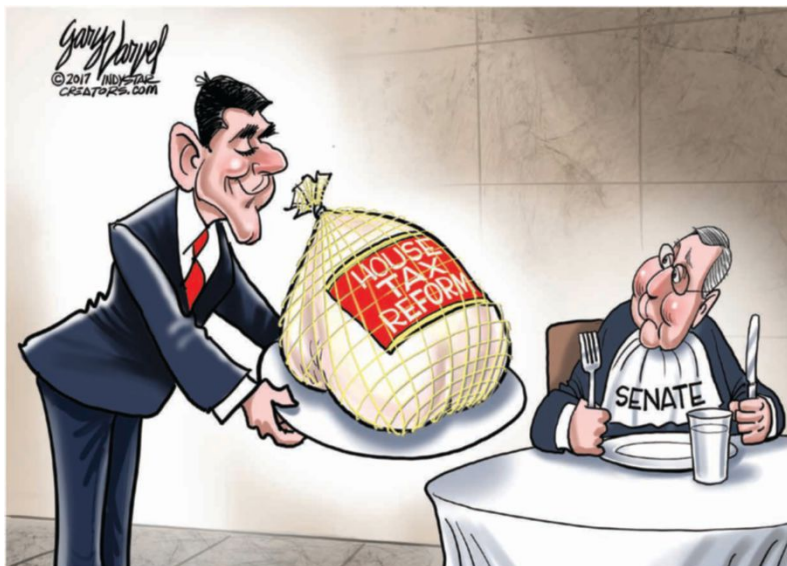
A nation's liberation is often portrayed as a matter of raw power over others, of guns and intimidation. But as Morgan Tsvangirai, a major opposition figure in Zimbabwe, said in a speech last April: "None but ourselves can free ourselves." ■



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ROBERT ARIAL © 2017 SHJ/UNIVERSAL UCLICK



GARY VARVEL/THE INDIANAPOLIS STAR © 2017 CREATORS.COM

Chronicle of Ukraine

Regarding the Oct. 19 book review “ ‘Red Famine’ chronicles the ruin wrought upon Ukraine by Joseph Stalin” (CSMonitor.com): I recently heard “Red Famine” author Anne Applebaum speak at the Ukrainian Museum in New York. My grandparents were immigrants from Ukraine in the 1920s. I believe that Ms. Applebaum deserves another award for this book.

JOAN CARMODY
New York

Opportunities from technology

The Oct. 4 Monitor Daily article “Digital humanitarianism harnesses the power of crowds” was fascinating and encouraging.

I help mentor two high school students who seem a bit lost in trying to figure out what to do after graduating from high school. I like to share and discuss articles with them that may spark an idea. I will be sharing this article with them. I love learning of the new opportunities that technology opens for us. Thanks.

JANICE DELACY
Black Diamond, Wash.

Best government

Thank you so much for the very interesting and thought-provoking Nov. 6 cover story about Russia, “1917 today.” It is so tempting to think that the Western government model is right for every country, but obviously that is not the case. Your article brings out so clearly that each nation must have a unique approach to the right governmental fit.

I especially appreciated how the article – via interviews with three generations of a Russian family – illustrated so clearly that Russia is not like the West and we should not expect our government model to work there.

The best government grows out of a nation’s historical experiences. Personally, I look forward to seeing how the Russian government model evolves.

LUANN CONDON
Traverse City, Mich.

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GARY OLDMAN STARS IN 'DARKEST HOUR.'

JACK ENGLISH/FOCUS FEATURES



ON FILM

Gary Oldman takes on Churchill for biopic 'Darkest Hour'

FILM FOLLOWS THE PRIME MINISTER AFTER 1940 ELECTION.

By Peter Rainer / Film critic

In the past two years alone, we've had John Lithgow in a television series and Michael Gambon in a TV movie about Winston Churchill. Earlier this year, we had Brian Cox on the big screen. All these are highly estimable enactments, each definitive in its own way. So why another? Perhaps the simplest answer, prompted by Gary Oldman's newest incarnation in "Darkest Hour," is that Churchill, with his valiance and massive cigars, his dark dyspepsia and mumbly eloquence, is an actor's dream role.

Directed by Joe Wright and written by Anthony McCarten, "Darkest Hour" follows Churchill during his first few weeks in May 1940 as the newly elected prime minister, succeeding Neville Chamberlain (Ronald Pickup), at a time when France is close to surrender and the Nazis have trapped virtually the entire British Expeditionary Force on the beaches of Dunkirk, France. (For more of the same, see "Dunkirk," which carries its own Churchill bona fides.)

Churchill is first introduced to us in his darkly lit bedroom, swathed in blankets, as his tremulous new secretary (Lily James) tentatively enters and risks his wrath. It's the kind of slow reveal one might expect to

see in a monster movie, except Churchill, of course, turns out to be something of a sweetheart. His real wrath is directed at Hitler, which, at least in pragmatic terms, puts him at odds with his chief political adversaries, Chamberlain, Viscount Halifax (Stephen Dillane), and, for a time, King George VI (Ben Mendelsohn), who believe "peace" negotiations with Hitler are the only way to rescue the militarily outmatched England from annihilation.

Since we know how this all plays out, it is incumbent upon the filmmakers to provide us with more than historical waxworks. With the exception of Oldman's performance, this is, alas, not the case. There is altogether too much screen time expended in the underground war room as we watch stuffy politicians hotly debating tactics. Above ground, things aren't much better, what with all the parliamentarians jeering and cheering in the corridors of power as Churchill weightily ponders the best course of action and the screen flashes date-stamped title cards cluing us in as to what day it is.

Amid all the stiff-upper-lip theatrics, it's amusing to see our Winnie rising to greet the day with his customary whiskey and

cigars, or insisting on his daily 4 p.m. nap. But we are left in no doubt that Churchill is a man of steadfast principle, even when he himself wavers in his resolve to fight Hitler at all costs. In one especially dubious scene, Churchill elects to ride the underground with the common folk and seeks out their opinion about appeasement. Led by a little girl, they respond with a resounding "Never!" Armed with fresh resolve, he strides into Parliament.

Just in case we still don't fully appreciate Churchill's humanity, which comes through most fully in conflict, we have his wife of 31 years, Clementine (Kristin Scott Thomas), to set us straight. Speaking through the persistent haze of cigar smoke that imbues this movie, she tells him, "You are strong because you are imperfect."

This is pretty standard-issue Great Man of History psychobabble, and it's insufficient, though somewhat satisfyingly so. The clichés go down easy. Oldman doesn't attempt to convey Churchill's dark nights of the soul, nor is he encouraged to step outside the homburg-and-bow-tie caricature of the prime minister that is by now de rigueur. What he does do is fully fill out the caricature. It's not a performance of great depth — how could it be within Wright's limited conceptual framework? — but it's highly entertaining. The film itself may skirt stodginess, but Oldman, who has played everyone from Sid Vicious to Ludwig van Beethoven to Lee Harvey Oswald, never does. (The extraordinary makeup job is courtesy of Kazuhiro Tsuji.) And like many first-rate British actors, he knows how to ringingly deliver a speech. This is especially important in this movie because Churchill epitomized a statesman for whom words, however grandiloquent, were not just words — they were incitements to action.

An added note: I wouldn't take too seriously the tendency among some of this film's liberal champions to inflate its importance by drawing parallels between the unfolding events in "Darkest Hour" and the era of Donald Trump. Are we supposed to recognize here, by implication, the lack of such a great leader in our own perilous times? But "Darkest Hour" could just as easily be co-opted by those who feel it depicts a lion who battles his own party and, while making his own rules, stands up to murderous bullies. This is one of those "Patton"-like movies that can be embraced for its own ends by virtually any political faction. Which is another way of saying its usefulness as principled propaganda is moot.

■ *Rated PG-13 for some thematic material.*

ART

O'Keeffe's clothing provides insight into the artist

THE AESTHETIC SENSIBILITY of an iconic American artist who remains a muse for designers to this day is explored in "Georgia O'Keeffe: Art, Image, Style," which was recently on view in the New York borough of Brooklyn and in North Carolina and is now at the Peabody Essex Museum in Salem, Mass., from Dec. 16 through April 1, 2018.

"It's the first time you're going to see Georgia O'Keeffe's paintings in the context of her wardrobe, which has never been seen before, and photographs of her," says Austen Barron Bailly, the George Putnam Curator of American Art at the Peabody. "So this is really the first exhibition to look at O'Keeffe's entire creative practice as a painter, as a woman, as a person, and as a subject for dozens and dozens of great American photographers."



ALFRED STIEGLITZ, COURTESY OF THE GEORGIA O'KEEFFE MUSEUM

The exhibition contains garments that O'Keeffe designed and handmade such as an ivory silk ensemble, a black wool dress with pleats, denim and chambray shirts, and bandannas. The clothing and colors reveal the artistic choices O'Keeffe made, adapting a black-and-white wardrobe from her time in New York to the rugged landscape of her new home in the Southwest and always striving for simplicity and practicality in what she wore.

Works on display include oil and watercolor paintings, garments, accessories, jewelry, photo-paintings, and sculpture.

O'Keeffe's signature style is still felt today. Her path to celebrity and her lingering influence are major themes running throughout the exhibition.

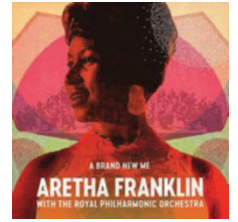
"She really became a household name," Ms. Bailly says. "These photographs of her were widely published until people became very familiar with her persona, sometimes more than her art. What's great about this show is that it gives you a chance to put all the pieces back together and really understand her [with] a more 360-degree view of this truly exceptional creative person."

— **Robert Lerose** / Contributor

robe, which has never been seen before, and photographs of her," says Austen Barron Bailly, the George Putnam Curator of American Art at the Peabody. "So this is really the first exhibition to look at O'Keeffe's entire creative practice as a

1 REBORN SOUL

Talk about a radical remix! Remember all those stellar soul hits by the queen of soul, Aretha Franklin? Think "Respect" and "(You Make Me Feel Like) A Natural Woman" – they're back, wrapped in a warm blanket of strings by the Royal Philharmonic Orchestra. With rich new orchestrations recorded at London's famed Abbey Road Studios, **Aretha Franklin: A Brand New Me** is a sonic treat, with all the soul of Franklin at her peak intact, yet sounding positively reborn.



2 EXPLORE SPACE

Space comes to life with **Solar Walk 2**. The app features 3-D models of the moon, sun, various planets, satellites, and spacecraft; a space encyclopedia; and an astronomy calendar to keep you on top of what's happening. The app is \$2.99 for iOS and free for Android.

3 TRUE BLUE

Photographers know about "blue hour" – the time just before sunrise or just after sunset when objects take on a blue appearance. Artist **Journey Gong** took photos of sights including Grand Central Terminal during "blue hour," and the resulting images are beautiful and sometimes eerie. You can find the work at <http://bit.ly/bluehourphotos>.



COURTESY OF JOURNEY GONG

4 TRACK YOUR SKIS

Heading out on the slopes? The **Ski Tracks app** could become your favorite skiing buddy. It allows you to set down the details of what you did that day, recording the number of runs, altitude, and more (no data is needed to do so). You can also see how your skiing experiences compare with those of your friends. Ski Tracks is \$0.99 for iOS and Android.

5



COURTESY OF ETIENNE GEORGE/PATHÉ PRODUCTION

REWARDING 'JOURNEY'

Director Bertrand Tavernier's documentary **My Journey Through French Cinema** celebrates people with film jobs as varied as screenwriter Jacques Prévert, composer Joseph Kosma, and director Jacques Becker. The film "is a feast for everybody who loves classic Gallic movies..." Monitor film critic Peter Rainer writes. "It's also a movie for people who just plain love movies – from anywhere. Plus, it's a great introduction to French cinema for all those who have yet to make its acquaintance." "My Journey Through French Cinema" is available on DVD and Blu-ray.

THE ONES TO READ

2017

“Whenever you read a good book,” fantasy author Vera Nazarian once wrote, “somewhere in the world a door opens to allow in more light.” The 2017 books we have listed below were the top choices of the Monitor’s book critics – the 30 books that moved, informed, or delighted them most. We wish the same for you, and hope that at least a few of these titles will lighten your days in the year to come. – Marjorie Kehe, Monitor books editor

FICTION

DARK AT THE CROSSING

by Elliot Ackerman

Knopf, 256 pp.

Set against the war in Syria, this National Book Award-nominated novel by former US Marine Elliot Ackerman focuses on the actions of characters caught up in the chaos of fighting. (CSMonitor.com, 2/2/17)

LINCOLN IN THE BARDO

by George Saunders

Random House, 368 pp.

This 2017 Man Booker Prize winner by acclaimed short story writer George Saunders juxtaposes a family tragedy – the death of President Abraham Lincoln’s son – with the national tragedy of the Civil War. (CSMonitor.com, 2/27/17)

THE HATE U GIVE

by Angie Thomas

Balzer + Bray, 464 pp.

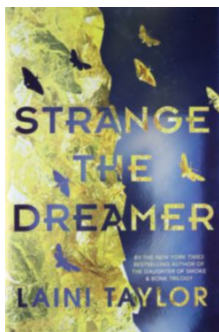
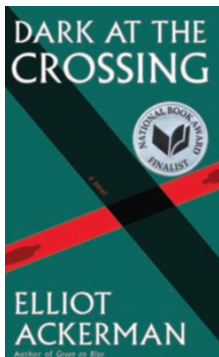
This dark but excellent young adult novel provides a window into conversations about race. (CSMonitor.com, 3/1/17)

STRANGE THE DREAMER

by Laini Taylor

Little, Brown, 544 pp.

This evocative and lyrical young adult fantasy novel by National Book Award finalist Laini Taylor blends a love story with a search for a lost city and a battle between humans and gods. (CSMonitor.com, 3/31/17)



THE GOLDEN LEGEND

by Nadeem Aslam

Knopf, 336 pp.

Set in contemporary Pakistan, acclaimed author Nadeem Aslam’s fifth novel tells the story of a widow who must decide whether to pardon her husband’s killers. Aslam handles themes of religious conflict, violence, and family dissent with dignity and grace. (CSMonitor.com, 4/18/17)

THE LEAVERS

by Lisa Ko

Algonquin, 352 pp.

Lisa Ko’s powerful debut novel examines transracial adoption, bravely and beautifully sorting through issues of love, loyalty, and identity. (CSMonitor.com, 5/2/17)

SALT HOUSES

by Hala Alyan

Houghton Mifflin Harcourt, 320 pp.

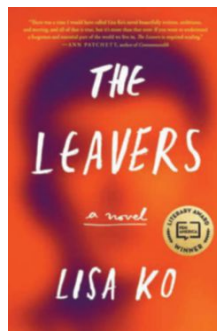
Drawing on her formidable skills as a storyteller and lyrically gifted writer, Palestinian-American writer and poet Hala Alyan uses her debut novel to tell the story of the diaspora of a Palestinian family. (CSMonitor.com, 5/9/17)

THE PURPLE SWAMP HEN AND OTHER STORIES

by Penelope Lively

Penguin, 208 pp.

British author Penelope Lively mixes perspicacity and grace in this short story collection. (CSMonitor.com, 5/30/17)



ANYTHING IS POSSIBLE

by Elizabeth Strout

Random House, 272 pp.

Pulitzer Prize winner Elizabeth Strout’s perceptive and unflinching short stories set in small-town rural America showcase the drama in everyday life. (CSMonitor.com, 5/30/17)

THE ESSEX SERPENT

by Sarah Perry

Custom House, 432 pp.

A Loch Ness-like monster and a woman scientist face off in this engaging novel set in England in the Victorian era. (CSMonitor.com, 6/19/17)

THE MINISTRY OF UTMOST HAPPINESS

by Arundhati Roy

Knopf Doubleday, 464 pp.

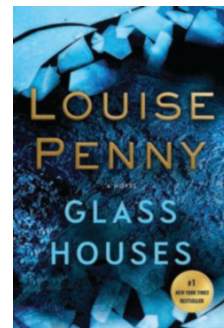
Arundhati Roy’s first novel in two decades returns to the religious divisions polarizing India. (CSMonitor.com, 7/18/17)

GLASS HOUSES

by Louise Penny

Minotaur Books, 400 pp.

Louise Penny transcends the limits of genre fiction with yet another excellent “Chief Inspector Armand Gamache” murder mystery set in a rural village in Quebec. (CSMonitor.com, 9/7/17)



SING, UNBURIED, SING

by Jesmyn Ward

Scribner, 304 pp.

Jesmyn Ward’s National Book Award-winning novel about a racially mixed family with one parent in prison has been called a “Beloved” for the incarcerated generation, with echoes of William Faulkner and Eudora Welty. (CSMonitor.com, 10/11/17)

NONFICTION

THE NEW ODYSSEY

by Patrick Kingsley

Liveright, 368 pp.

Based on firsthand observations and interviews, journalist Patrick Kingsley paints a vivid picture of what migrants from Africa and the Middle East experience during their journeys to Europe. (CSMonitor.com, 1/10/17)

THE SOULS OF CHINA

by Ian Johnson

Knopf Doubleday, 480 pp.

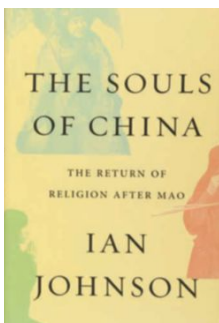
Pulitzer Prize-winning journalist Ian Johnson traces the remarkable rebirth of religion in China. (CSMonitor.com, 5/12/17)

THUNDER IN THE MOUNTAINS

by Daniel J. Sharfstein

W.W. Norton & Co., 640 pp.

Historian Daniel Sharfstein recounts the tragedy of the Nez Perce War. (CSMonitor.com, 4/27/17)



I WAS TOLD TO COME ALONE

by Souad Mekhennet

Henry Holt, 368 pp.

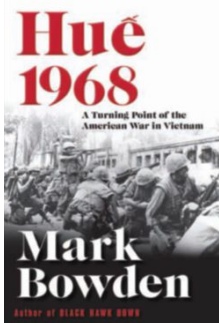
A journalist with a specialty in terrorism and security, Souad Mekhennet offers a chilling but intelligent up-close look at the war on terror. (CSMonitor.com, 6/14/17)

HUE 1968

by Mark Bowden

Grove Atlantic, 608 pp.

“Black Hawk Down” author Mark Bowden wades into deep historical waters with this skillful, gripping account of the turning point of the Vietnam War. (CSMonitor.com, 6/15/17)



SEA POWER

by Adm. James Stavridis

Penguin, 384 pp.

Adm. James Stavridis has crafted a

fascinating and bracing examination of the ways that the world’s major bodies of water and politics intersect. (CSMonitor.com, 6/27/17)

BE FREE OR DIE

by Cate Lineberry

St. Martin's Press, 288 pp.

Journalist Cate Lineberry tells the remarkable story of former slave and US Congressman Robert Smalls. (CSMonitor.com, 6/20/17)

READING WITH PATRICK

by Michelle Kuo

Random House, 320 pp.

This is the touching true story of a one-time teacher who put her prestigious career on hold (she was fresh out of Harvard Law School) when she heard that a former student in Arkansas had landed in jail and needed her help. (CSMonitor.com, 7/10/17)

HENRY DAVID THOREAU

by Laura Dassow Walls

University of Chicago Press, 640 pp.

Laura Dassow Walls offers a well-crafted biography of Walden’s most famous resident. (CSMonitor.com, 7/14/17)

AN ODYSSEY

by Daniel Mendelsohn

Knopf, 320 pp.

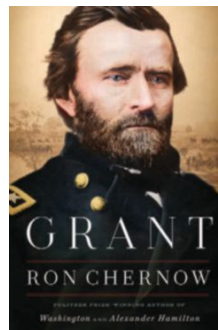
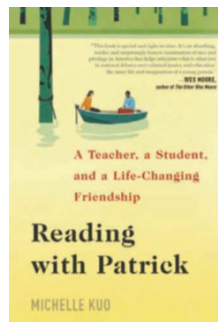
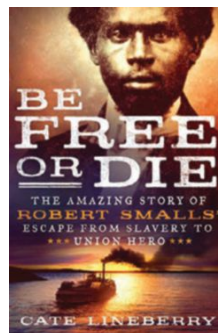
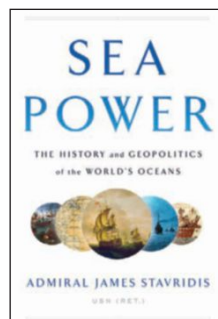
A classics professor learns much when his father becomes his student, studying the “Odyssey” with him and even traveling to the sites that inspired it. (CSMonitor.com, 9/20/17)

THE FUTURE IS HISTORY

by Masha Gessen

Penguin, 528 pp.

Russian-American journalist and activist Masha Gessen offers a dark examination of what went wrong in contemporary Russia. (CSMonitor.com, 10/3/17)



CODE GIRLS

by Liza Mundy

Hachette Books, 432 pp.

Journalist Liza Mundy tells the captivating story of America’s female code-breakers in World War II. (CSMonitor.com, 10/12/17)

THE GOURMANDS' WAY

by Justin Spring

Farrar, Straus and Giroux, 448 pp.

This engaging culinary history features profiles of six talented American writers who were strongly impacted by Paris and the French – a fascination they passed along to their American readers. (CSMonitor.com, 10/13/17)

STANTON

by Walter Stahr

Simon & Schuster, 768 pp.

This excellent biography brings President Abraham Lincoln’s secretary of War out of the historical shadows. (CSMonitor.com, 9/15/17)

GRANT

by Ron Chernow

Penguin, 1,104 pp.

“Hamilton” biographer Ron Chernow returns with his latest take on a historical figure, vigorously portraying Ulysses S. Grant as a great military leader, champion of rights, and honest man. (CSMonitor.com, 10/10/17)

LENIN

by Victor Sebestyen

Knopf Doubleday, 592 pp.

Hungarian-born author and historian Victor Sebestyen illuminates one of history’s most destructive leaders.

(CSMonitor.com, 11/13/17)

CALDER

by Jed Perl

Knopf Doubleday, 704 pp.

Art critic Jed Perl has written a comprehensive biography that clearly establishes American sculptor Alexander Calder as one of the artistic giants of the 20th century. (CSMonitor.com, 11/30/17)

To curb homelessness in Detroit, the Rev. Faith Fowler believes in a tiny homes project – the first to allow homeownership.



TREVOR BACH

TINY HOMES: The Rev. Faith Fowler heads the Detroit nonprofit that's behind this neighborhood for formerly homeless and other low-income people.

By Trevor Bach / Correspondent

In 2013, when Keith McElvee got out of prison after a 12-year stint for a drug conviction, he returned to a neighborhood in northwest Detroit that he didn't recognize. "This is like Beirut," he thought. "Like a war zone."

He struggled, but then found work doing homeless outreach at Cass Community Social Services (CCSS), a nonprofit. Four years later, he's a full-time employee tasked with helping clients secure housing and jobs, and he speaks proudly of success stories. "My passion is people," he says. "I like to help people."

But Mr. McElvee's background and low salary meant his own housing was precarious: His apartment in the same neighborhood cost \$450, nearly half his monthly income. In August, however, he moved into a new place, a "tiny house" that costs him substantially less per month – and that he's on track to actually call his own.

"That's the key," McElvee says of his projected homeownership. "That's a beau-

tiful thing."

Tiny Homes Detroit, run by the organization that McElvee works for, represents an innovative approach to low-income housing: Instead of living in high-density apartment buildings, residents pay low rent on well-constructed tiny houses that range from 250 to 400 square feet and have kitchens, washer-dryer units, and

'That's a beautiful thing.'

– Keith McElvee, a resident in one of Detroit's new tiny homes, speaking about his projected homeownership

heating and cooling.

Tiny homes are a popular housing trend, made more visible by shows like HGTV's "Tiny House Hunters," and they've been used as a novel approach to curbing homelessness. But the CCSS project marks the first where residents, after paying rent for seven years, will actually be given the deeds to their homes.

"We thought, 'With an asset they would

fare better in the longer term,' " says the Rev. Faith Fowler, CCSS's executive director. "And tiny homes really became the vehicle for that."

A reputation for innovation

Ms. Fowler, a native Detroit and long-time pastor at the Cass Community United Methodist Church, has through decades of service earned a reputation as one of Detroit's most devoted and innovative citizens. Among the various CCSS programs she oversees are projects that employ local homeless people to transform thousands of illegally dumped tires into sandals, doormats, and hanging planters.

Since 2002, CCSS has run homeless residency programs. It was in 2013, Fowler says, that she first considered tiny homes. Her mother had recently died, and she was thinking a lot about inheritance – and how the poor often miss out on what can be an important economic safeguard.

Villages of tiny homes for the poor already existed or would soon exist in cities including Portland, Ore.; Madison, Wis.;

▶ NEXT PAGE

and East Austin, Texas. Fowler dreamed of building a community on Cass's large campus that would provide both housing and assets for Detroiters who needed them most.

"So do you think anybody will want to live in these?" Fowler remembers a board member asking.

There was no shortage of need. Detroit, despite a recent economic revitalization, still has the highest poverty rate among the 20 biggest cities in the United States, at about 36 percent. A January count found more than 2,000 homeless people in Detroit, and the rapid gentrification taking place in some areas has led to new fears of housing shortages. "The city is at a critical crossroads in its history," Detroit councilwoman Mary Sheffield recently told the Detroit Free Press. "How we address the housing inequities that will inevitably arise will determine ... if all Detroiters are included in the revitalization."

A year ago, CCSS received 122 completed applications for the initial batch of seven houses. Plans call for a neighborhood of an eventual 25 tiny homes, all with unique designs and their own lots. In the six months after the initial window closed, more than 900 people requested applications.

"I think it says probably two things," Fowler says of the demand. "One is that folks are needing good, clean, safe affordable housing. And two is, everyone has the aspiration to own their home."

Eric Hufnagel, executive director of the Michigan Coalition Against Homelessness, sees "huge potential" in Tiny Homes Detroit. "This is giving an opportunity of ownership that perhaps a certain segment of the population would otherwise not have," he says.

Mr. Hufnagel notes that communities need people who have a clear vision of how to move forward while bringing others along. Fowler "has been able to do that," he says. "That is one of the most important pieces."

No government funding is involved in the project. Construction costs come out to about \$50,000 per house and have been subsidized with donations, including a \$400,000 gift from the Ford Motor Co. Architects provided plans pro bono, and the

houses are built by both teams of volunteers and paid contractors. Low-income tenants – a planned mix of formerly homeless people, senior citizens, and young adults who have aged out of foster care – agree to pay CCSS rent equal to \$1 per square foot, plus electric bills. Residents agree to take classes on maintenance and financial literacy and to attend regular meetings of their new neighborhood's homeowners association.

"This is going to be a little community," McElvee says.

Early skeptics

Even before the first batch of homes was built, the project received an avalanche of attention. Much of it was positive, but Facebook posters railed about "future tiny crack houses" and "another step toward communism." Others doubted that such a project could work here – "Detroit isn't like Austin and Portland. Get a clue." – or questioned the decision to build new structures in a city that already has tens of thousands of abandoned houses.

Fowler isn't opposed to rehabbing – she points out that her organization has revitalized more than a dozen homes – but this particular space happened to be vacant. The construction costs are significant, she says, but still amount to far less than building new full-size houses or even doing extensive rehab work. "We're building quality homes that will last decades," she says.

Fowler, who as a sixth- or seventh-grader felt a calling to join the ministry, sees herself

as "a workhorse for people who sometimes get overlooked – for neighborhoods that have been neglected."

Her pastor role shines through in her view of what needs to be done: "Scripture's pretty clear about the least, the last, the lost, the underdog. We should protect those people, or even give opportunity to those people, to make sure nobody's taking advantage of those people."

And Fowler, who early on wanted to be in a city ministry, believes strongly in the tiny homes approach. "Soup kitchens and hygiene kits and showers and even shelters are good and necessary," she says. "But they don't do long term what I'd like to see done



How to take action

UniversalGiving (www.universalgiving.org) helps people give to and volunteer for top-performing charitable organizations around the world. All the projects are vetted by UniversalGiving; 100 percent of each donation goes directly to the listed cause. Below are links to three groups trying to provide a homelike environment for young people who need one:

■ **Nepal Orphans Home** (<http://bit.ly/NOrphans>) attends to the welfare of children in Nepal who are orphaned, abandoned, or not supported by their parents. Take action: Help give the essentials to a child at Papa's House for a year (<http://bit.ly/PapasHouse1>).

■ **Global Volunteers** (<http://bit.ly/GloVol>) aims to advance peace, racial reconciliation, and mutual understanding between peoples. Take action: Work with orphans in India (<http://bit.ly/IndiaChild>).

■ **Achungo Children's Centre** (<http://bit.ly/AchungoChildren>) gives food, clothing, education, and medical aid to more than 200 orphans and other children in rural Kenya. Take action: Help provide food for the center's youths (<http://bit.ly/AchungoFood>).

– and that is help people become whole and happy and have opportunities."

In August, after donating many of his possessions so he could downsize, McElvee moved into his new 310-square-foot beige one-story, part of an initial community that ranges in age from 24 to 74 and has an average annual income just shy of \$12,000.

His first night in the new house, he says, he anxiously paced for 20 minutes. "I kept walking around. I said, 'This is so small; am I going to like it?'"

But he quickly settled in, also finding his place as a good neighbor. McElvee patrols the area at night and helps out his older neighbor, watering her grass and taking up her garbage bin. And when the residents' washing machines had a glitch, another resident went around to each house offering to fix it.

"That was the whole point," says McElvee, "so that everybody knows each other and looks out for each other."

The lower rent and future ownership mean that, decades after he grew up as a ward of the state in a rough foster home for boys in the same neighborhood, McElvee finally has in middle age the promise of economic security.

"Now I can breathe," he says. ■

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ESSAY

Tale of an overachieving toaster

ITS ZEAL WAS SUDDEN AND SHORT-LIVED.
BUT IT CHANGED ME.

I pay about as much attention to small appliances as I do the spiderweb that has been dangling in the corner of the bedroom for the past six months. The only time such devices receive serious notice from me is when they fail to perform. The toaster, however, has changed me.

As toasters go, ours is pretty average. So it was a surprise when one morning, unprovoked, it began performing its toasting tasks with unprecedented vigor. Per usual, I had popped two halves of an English muffin into its long, lone slot, jammed down the lever, and turned my back on it to make tea.

This day, however, the sound of the lever releasing its hold on the freshly toasted muffin was followed by an audible encore: the gentle thud of half the muffin landing on the counter and the soft crash of the other half hitting the floor. I figured it was a fluke and that next time, the toaster would settle back into its normal pattern of gently delivering perfectly toasted products.

I was wrong. It continued to overachieve.

The small appliance had come into my life as an Easter gift from my husband. At the time, I had puzzled over the significance of a toaster for the holiday, but I believe the motivation was simply that we needed one. And as the last four letters of the words *toaster* and *Easter* provide a pleasant note of conso-

As a gesture of appreciation for this daily game of catch, I positioned a plate where I thought the tossed toast would land.

nance, I tried to abandon my search for further meaning.

While I don't typically keep track of the acquisition dates of small appliances, certain major events, in this case hurricane Katrina, which devastated our home city of New Orleans in 2005, provide a further reference point. I received the toaster a couple of years before the storm, which makes the toaster about 14 years of age. Of course, given its mechanical nature and our daily demands for its service, I wonder just how toaster years compare. I suspect they might lean toward the 7-to-1 ratio we reference as dog years, but that's only a guess. If that were the case, the toaster would be closer to 98.

But even at 14, I would expect a small, mechanical toasting device to be waning by now. Whatever had triggered our toaster's sudden zeal for its duties, the event felt worthy of some gesture of appreciation – at the very least, by indulging in a daily game of catch. I attempted this with a plate positioned where I predicted the tossed toast would land, but I discovered that each delivery varied slightly. I became increasingly intrigued by this feisty little machine and decided to memorialize its distinction among our family of appliances by capturing its latest feat in a photo. After several failed attempts, I finally caught the action with a live shot.

The toaster's trick made me wonder about the hidden strengths of the other appliances sitting around the kitchen. I began to consider which gadget might next be inspired to erupt from its routine into hyperactivity or go rogue entirely. I eyed



NO, THIS IS NOT THE AUTHOR'S TOASTER.

PHOTO ILLUSTRATION BY ANN HERMES/STAFF

suspiciously the old drip coffeemaker, nearly as old as the toaster. Would it one day transform its trickle of coffee into a torrent? Might the hand mixer, next time I used it, rev up and take off like a helicopter?

Recently, as suddenly and as inexplicably as it began its spirited behavior, the toaster returned to normal, faithfully delivering its contents in a controlled and predictable manner.

But the toaster had changed me. It caused me to take notice and appreciate these small, pedestrian mechanical servants that serve me so reliably, all the while expecting little more in return than an occasional wipe with a damp dishcloth.

I'm committed to keeping this daily gratitude stoked and to extend it around me to less-tangible forms of abundance. Should my appreciation wane, I suspect there's a small appliance primed and ready to teach me another exuberant lesson.

– Susan Sarver

Words in the news

Bolded clues are linked to current events.
Where was an apology issued for an early train?

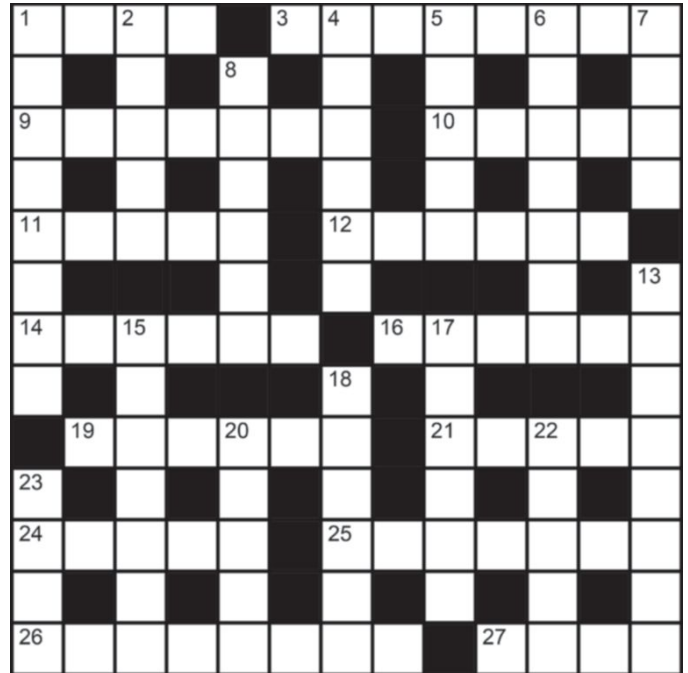
By Owen Thomas

Across

- 1. Part of N.Y.C.
- 3. Victories
- 9. "The Little _____" TV show
- 10. Most esoteric of five basic tastes
- 11. **Its soccer team failed to qualify for the World Cup for the first time since 1958**
- 12. Arctic native peoples
- 14. **World Anti-Doping Agency says this nation is still "non-compliant"; its athletes could be banned from the Winter Games in February**
- 16. **US House of Representatives recently passed one. What will Senate do?**
- 19. Worker with an apron
- 21. **Company in this nation apologized to riders when one of its trains left 20 seconds early**
- 24. **Leonardo da Vinci portrait that sold for \$450 million: "Salvator _____"**
- 25. Performing
- 26. **Hawaiian name for an asteroid recently identified as having come from another star system**
- 27. **Abu Dhabi aims to set up a police station here in 2057**

Down

- 1. Three of these from the United States were maneuvering



- 2. **Just introduced an electric truck and a speedy sports car**
- 4. **Used its Security Council veto to block chemical weapons probe in Syria**
- 5. **Australia has banned climbers from this sacred Aboriginal site starting in October 2019**
- 6. **Stomachs of crustaceans that live six miles deep in the ocean were found to contain this**
- 7. **Strain of Islam followed by the majority of Muslims in Iraq and Iran**
- 8. Egyptian papers
- 13. Some passengers on crowded mass transit
- 15. Dutch colony in South America that added an "e" to its name after gaining independence
- 17. Fiddle with
- 18. Gold-colored alloy of copper, zinc, and sometimes tin, often used in 18th-century furniture and ornaments
- 20. **Seeing US in retreat in Asia, Japan has moved to mend fences with this neighbor**
- 22. Fountain locale
- 23. BB's, e.g.

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meanwhile ...

ON CHRISTMAS ISLAND, millions of red crabs are making their annual migration from the island's forests to the Pacific Ocean where they will lay their eggs. The astounding number of creatures on the move – **as many as 45 million, each approximately five inches long, all traveling at the same time** – means that for a short time each year the Australian territory is literally swarming with crabs.

To help keep the crabs safe, Christmas Island officials shut down some roads. They also use “crab fences” to guide the crabs to a special bridge (about five yards high) or to numerous underpasses that allow the crustaceans to safely traverse busy highways.

The migration to and from the ocean takes place from late October to early December, depending on

STEPHEN BELCHER/ MINDEN PICTURES/NEWSCOM



CHRISTMAS ISLAND RED CRAB

weather and the phases of the moon. Three to four weeks after the adult migration, the baby crabs will leave the ocean to rejoin their parents in the forest.

IN VERACRUZ, MEXICO, they are rocking the danzón. The *danzón* is a uniquely Cuban dance form, popularized on the island during the 19th century. It's a slow-moving, elegant dance, done to syncopated beats, and built around pauses during which the dancing pairs stop to listen and appreciate the orchestra.

The *danzón* nearly disappeared from Cuba sometime after Fidel Castro's 1959 takeover, but fortunately a love for the dance had already moved across the Gulf of Mexico to Veracruz, where it is still popular today, especially among senior citizens. Several times a week, according to Rappler.com, couples decked out in formal evening wear can be seen dancing the *danzón* in the city's main plaza.

IN SUÐUR-ÞINGEYJARSÝSLA, ICELAND, farmer Ólafur Ólafsson uses **a drone to herd his sheep.** The drone – which has a range of more than four miles and can operate for about 30 minutes between charges – flies low and slightly behind the sheep, guiding them toward the farm and into the barn for the night.

Mr. Ólafsson told the Iceland Review that all the drone is missing is the bark of a dog, but he can compensate for that by increasing the speed – and thus the mechanical hum – of the drone.

– Staff

CORRECTION: An item in the Nov. 6, 2017, “Meanwhile” column misstated Guinea-Bissau's rank in world cashew production. Guinea-Bissau is the third largest cashew producer in Africa.

A truer view of nature

My little dog and I regularly go to a nature area near our house. When we walk there, I take in the majestic Rocky Mountain peaks. The mountains, along with the nesting birds, gentle breezes, and budding trees, stir my heart. I'm reminded of the words of naturalist and Colorado homesteader Enos Mills: “A climb up the Rockies will develop a love for nature, strengthen one's appreciation of the beautiful world outdoors, and put one in tune with the Infinite.” I've especially found this to be true when I think of what the magnificence of the earth points to – the grandeur of spiritual reality, the universe created by God.

This psalm in the Bible also comes to mind: “The earth is the Lord's, and the fulness thereof” (Psalms 24:1). It makes sense to me that the true nature and substance of all creation is like God, divine Spirit – meaning, it's spiritual and good. In “Science and Health with Key to the Scriptures,” Monitor founder Mary Baker Eddy gives this definition of *Earth*: “A sphere; a type of eternity and immortality, which are likewise without beginning or end. To material sense, earth is matter; to spiritual sense, it is a compound idea” (p. 585).

Loving nature and protecting the planet is important. But I've found that a helpful approach is to look beyond the physical to understand more of the glories that God has created.

When Earth and its environment are viewed through the material senses, limitations such as fragility, extinction, and pollution can become the focus. But seeing our planet through a spiritual sense of things brings into focus the awe-inspiring solidity of the spiritual qualities that nature hints at. Beauty, grace, and strength are a sampling of the eternal, spiritual elements nature symbolizes. And praying to better understand the true, spiritual nature of God's creation naturally impels us to care for the environment around us and inspires solutions to problems.

Christ Jesus proved that seeing this way, with the spiritual sense inherent in each of us, brings healing. He didn't let the material senses define God's creation for him. He insisted on the fact of spiritual perfection right where imperfection seemed to be, freeing many from illness and injury.

I once read an account in one of the Monitor's sister publications, the Christian Science Sentinel, that mentioned that some peach trees had become blighted (see “For many years I have been ...,” May 31, 1958). Through prayer, the author recognized that the qualities of “individuality, beauty, usefulness, and so on” that the trees represented were from God, divine Life, and so were spiritual and permanent. This revelation ended the blight, and the trees yielded good fruit.

Mrs. Eddy wrote, “All nature teaches God's love to man ...” (Science and Health, p. 326). In the stillness of prayer, we can feel the infinite presence of the Divine, and affirm the reality of the intact, indestructible, and healthy nature of God's spiritual creation. This is the highest form of appreciation we can show for the environment. Such prayer has also led me to take practical steps to better care for the planet.

– Annette Dutenhoffer

A CHRISTIAN SCIENCE
PERSPECTIVE

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