

OCT. 27, 2025

TIME



THE END OF STRANGER THINGS

INSIDE THE
UPSIDE-DOWN
WORLD OF NETFLIX'S
BIGGEST SHOW EVER

BY ELIANA
DOCKTERMAN



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Miners at work in Ghana's Ashanti Region on July 12

Photograph by Natalija Gormalova for TIME

On the covers

The 300 Best Inventions of the year

For 25 years, TIME Best Inventions has recognized the breakthrough products and ideas shaping our world. Given the rapidly accelerating rate of innovation today, this year's list recognizes 300 inventions—more than ever before. This issue highlights 50 of those genius ideas, including a customizable Barbie doll, a high-top sneaker that aids workout recovery, a screen-free digital camera that re-creates the 1990s memory-making experience, and a space-saving ball for babies that works as both a teether and a bath toy. Find the full list now at time.com/best-inventions and in a special issue that will hit newsstands in December.



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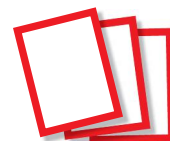
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Back in TIME

In 2021, the primatologist Jane Goodall, having published a memoir, sat down with TIME for a profile that became a cover story celebrating her legacy of optimism. Goodall, who died on Oct. 1 at 91, talked about changing hearts and minds through storytelling and encouraging young people to never give up hope. "I'm about to leave the world, and leave it behind me with all the mess," she said. "Young people have to grow up into it. They need every bit of help they can." Read the full story at time.com/vault



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SETTING THE RECORD STRAIGHT

In the TIME100 Next (Oct. 13), we misstated the name of the party Zack Polanski now leads; it is the Green Party of England and Wales.

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THAILAND - The Next Chapter



Thailand's economic transition is increasingly attracting the attention of the international financial community. Following the infrastructural and logistics development of the Eastern Economic Corridor (EEC), Thailand is now undergoing a significant digital transformation. This next chapter in the nation's economic evolution is less about cement and steel, and more about an economy based around high-value manufacturing, creative industries, and deep-tech innovation.

This transition to a value-based economy is at the heart of the government's long-term National Strategic Plan (2018—2037). The ambitious roadmap aims to lift the country by leveraging technological advancements and sustainability principles, encapsulated in the Bio-Circular-Green (BCG) Economy Model.

The momentum is evident in sectors outside of traditional manufacturing. Thailand's Board of Investment (BOI) is promoting investments that fall into the new S-Curve industries, particularly robotics and automation, digital services, and establishing the country as a medical hub. This targeted approach is designed to attract foreign direct investment (FDI) that delivers technology transfer and upskill the local workforce, which will directly boost Thailand's economic growth potential.

A key challenge to sustained growth remains weak domestic demand, which is exacerbated by historically high household debt. However, with near-universal mobile internet coverage and advanced digital public infrastructure like the PromptPay system, Thailand now has a thriving digital economy that already accounts for approximately 6% of GDP, the second largest in ASEAN. E-commerce, for instance, has grown at an average of 10% annually since the COVID-19 pandemic.

Beyond the digital sphere, the focus on healthcare and the creative industries underscores the country's strategic diversification. The government aims to position Thailand as a regional medical and wellness hub and is drawing considerable private investment into advanced therapy medicinal products (ATMPs) and genomics. This sector capitalizes on Thailand's reputation for skilled medical professionals and its high ranking as a medical tourism destination.

It's a move backed by business leaders in the field. Dr. Veerapol Khemarangsarn, CEO of MEDEZE Group, highlights the long-term vision. "We believe Thailand has the potential to become the region's center for medical and health services. With a low cost of living combined with high-quality medical services Thailand is set to become an increasingly attractive destination," he said. MEDEZE Group is focused on research and development, aiming to reach 1 billion baht in revenue by advancing

into the biopharmaceutical sector—a clear sign of private capital chasing the high-value potential in the health economy.

The creative and entertainment economy is also emerging as a high-potential export. Global demand for Thai content, from television dramas to films and music, is surging, providing a new engine for service-sector growth that is less susceptible to global trade friction.

Takonkiet Viravan, group CEO of The One Enterprise, a leading integrated media and entertainment organization, emphasized this shift. "The global consumption of Thai soft power—our unique stories, music, and dramatic productions—has created an exportable, high-margin product. We're not just distributing content; we are exporting a cultural value proposition that generates significant foreign exchange and establishes Thailand as a creative powerhouse. A crucial component for our future service economy," he said.

Even in seemingly traditional sectors, companies are turning toward higher-value ventures. The jewelry and gold industry, a longstanding segment, is leveraging its traditional base to expand into new luxury markets and investment products. This highlights a broader effort by domestic firms to evolve their business models in line with the national value-addition goals.

Aniwat Srirungthum, CEO of Aurora Design, a major Thai retailer of gold jewelry and accessories, explained the necessity of this business evolution. "The future is not about transactions, but rather creating and securing long-term wealth for consumers. Our expansion into gold saving services and investment-grade products shows that local businesses are changing along with a new consumer mindset—one that demands both quality of life and financial stability. The push for higher-value services across all industries is the quiet revolution driving Thailand's domestic growth," he said.

While the World Bank projects a cautious GDP growth of 1.8% in 2025 and 1.7% in 2026, the potential for a rebound to 2.2% in 2025 hinges on improved investment sentiment. The data confirms this sentiment is improving, driven by Chinese investment in advanced technology sectors like electric vehicles (EVs) and the broader BCG economy. The Board of Investment has already approved 21 projects for battery EV production, totaling \$4.27 billion (137.7 billion baht) in investment, demonstrating a clear commitment to the green mobility transition.

Thailand is going through a profound transition, from a largely traditional manufacturing base to a tech-driven and service-oriented economy. As a result, an ecosystem where digital, health, and creative industries are all set to become the primary drivers of Thailand's future prosperity, making the country an attractive proposition for forward-thinking global capital.

THE ONE ENTERPRISE: Putting Thailand Center Stage



Thailand, the Land of Smiles, is undergoing a soft-power transformation, with its entertainment industry emerging as a formidable global force. Spearheading this cultural wave is The One Enterprise Public Company Limited (ONEE), a content-creation powerhouse that is redefining Thai storytelling for a global audience. Under the leadership of CEO Takonkiet Viravan, the company has also become a key ambassador for Thai culture and a magnet for international partnerships.

For more than three decades, Takonkiet Viravan has been a force in Thai entertainment. From his early days at the pioneering Exact Company Limited, Viravan's journey has been one of relentless innovation. He has adapted to a constantly shifting media landscape, from the era of a handful of television channels to today's fragmented digital universe. "The audience is changing, so the nature of our content has to change with them," he said.

Viravan and his team recognized early on that while traditional television was in decline, the demand for high-quality, authentic storytelling was not. They doubled down on content creation, focusing on producing dramas and series that resonated with local audiences but also held a universal appeal. This strategic pivot has allowed ONEE to thrive in a market saturated with competitors, including global streaming giants.

The core of ONEE's success lies in what Viravan calls "Thainess." It's a sensibility rooted in the kindness, warmth and resilience of the Thai people. While many companies attempt to mimic international formulas, ONEE believes its greatest strength is its unique cultural identity. "Thainess is our greatest selling point. We position ourselves as a content creator, and it is our role to communicate to the world about what Thailand really is, the lifestyle of the people, the Thai sensibilities," he said.

This approach has already yielded significant

international breakthroughs. The company's hit series *Girl from Nowhere* became a global phenomenon on Netflix, reaching number one in multiple countries and proving that a distinctively Thai narrative could captivate a worldwide audience. This success is a testament to ONEE's ability to balance and combine the international and the Thai elements.

Beyond dramas, ONEE has pioneered the monetization of its content through idol marketing and merchandise, particularly with its popular BL (Boys' Love) series. These shows have cultivated massive fan bases around the globe, turning actors into international celebrities and generating substantial revenue through fan meets, concerts, and brand partnerships. This successful model demonstrates a comprehensive approach to content monetization, proving that a well-crafted series can be the starting point for a vast and profitable ecosystem.

Viravan's vision for ONEE is aggressive expansion built on collaboration. The company sees strategic partnerships and co-productions as the key to unlocking its next phase of growth. "Partnership is really, really important in this day and age," he said. "This isn't just about distributing content; it's about building an entire ecosystem that attracts global investment and cements Thailand's position as an entertainment hub."

One tangible example of this forward-thinking strategy is a recent co-production with a Singaporean partner. The project, which features both Thai and Singaporean actors, represents a new model for regional collaboration. ONEE is also actively seeking investment for the expansion of its studio facilities, particularly its sound stages, to meet the growing demand from international filmmakers. "When international productions like *The White Lotus* come to rent our Acts Studios' sound stages, it shows the opportunity," Viravan explained. "If we can have strategic



Mr. Takonkiet Viravan
CEO of The One Enterprise Public Company Limited

partners in investing on that, that would be another partnership that we're looking at."

This focus on co-production and infrastructure development is a direct response to a global trend. As international production houses search for new locations and talent, Thailand, with its rich culture and competitive incentives, is perfectly positioned to become a go-to destination. ONEE is not just a beneficiary of this trend, but actively shaping it by offering itself as a proven and reliable partner.

ONEE's ambition extends to its own streaming platform, ONED, which aims to become the central home for premium Thai content. The platform, which recently began its international rollout, is a direct channel to global audiences, a place where the best of Thai storytelling can be showcased and celebrated.

The company's journey is a microcosm of Thailand's broader soft-power strategy. By leveraging its authentic cultural identity and building a foundation of strategic partnerships, ONEE is not only growing its business but also serving as a vital link between Thailand and the rest of the world. Viravan's legacy is a story of continuous creation, one where the final scene is still being written, with each new project carrying the heart of Thailand to a global stage.



MEDEZE GROUP: Turning Stem Cells into Cures — Pioneering Thailand's Next Era of Biopharmaceutical.

The vibrant city of Bangkok, known for its bustling markets and serene temples, now beats to the rhythm of a different drum—one powered by scientific innovation and the ambitious vision of MEDEZE Group. In a world grappling with evolving governments and a K-shaped economy, where some businesses falter while others boom, MEDEZE is redefining the future of healthcare. Dr. Veerapol Khemarangsarn, the co-founder and CEO, is a medical doctor turned visionary entrepreneur whose insights offer a glimpse into a bold new era for Thailand, one where it sheds its traditional image to emerge as a global leader in regenerative medicine.

"In 2025, we see failures everywhere," Dr. Veerapol observed in a candid assessment of the global landscape. "Thailand's health and wellness industry is losing momentum, people are stressed. It's a K-shaped economy." Yet, within this volatility, MEDEZE Group has charted an upward trajectory. Their success is rooted in an understanding of what the "old economies" need: adaptation, differentiation and continuous improvement. While many sectors struggle, particularly healthcare, which traditionally faces a 15-year gauntlet of clinical trials and doctor education before widespread adoption, MEDEZE is accelerating the pace. "We are the weakest, we are down compared to other sectors," Dr. Veerapol admitted, "because we want to prove effectiveness, but before that effectiveness, we need to do clinical trials." This inherent time challenge, however, has become MEDEZE's motivator.

October 2024 marked a pivotal moment for the company, as the Thai public gained a deeper understanding of "biological payments"—a term that encapsulates the future of cellular therapies.



MEDEZE's ambition is expansive, aiming to "free up sales" and potentially "buy banks for you for 60 years," a testament to their long-term vision and confidence in the enduring value of their work.

The future, for MEDEZE, is linked with robotics and advanced manufacturing. By June 2025, MEDEZE plans to deploy an automated surgical machine, a robot designed to handle cells with unparalleled precision. "The robot will put cells in the incubator, take cells out of the incubator, and send them to the monitoring table and take pictures for us to use and extract information from them" Dr. Veerapol explained. This automated system, capable of expanding 500,000 cells to 50 million cells in just seven days, will revolutionize cell culture and dramatically scale up production. This initiative is a collaborative effort with Shibuya, a world-class Japanese medical equipment manufacturer known for its extensive range and respected expertise. The commercial use of these machines is slated for January of the following year, placing MEDEZE at the forefront of automated biomanufacturing. "We will be the first to use robots worldwide," Dr. Veerapol said.

Beyond broad-spectrum cell therapies, MEDEZE is also venturing into highly specialized applications. A new venture, HairFolico, harnesses biological technology to promote hair regrowth, moving beyond mere thickening. "People go to Turkey," Dr. Veerapol noted, referring to the global trend of hair tourism. "We keep 50 of your hairs, and then we can see which are in the cyclical process comprising of growth (anagen). Then, we take those hair follicles and add them into your hair and let it grow." This personalized approach, leveraging an individual's own hair cells, promises a more effective and natural solution for hair loss.

MEDEZE's strategic expansion is not confined to Thailand's borders. They are actively establishing a biobank platform and aiming to replicate their model across Southeast Asia, starting with the Philippines. "The Philippines has one of the highest GDP incomes in Southeast Asia," Dr. Veerapol said, making it an ideal proving ground. The philosophy is simple yet profound. "I believe every country needs to protect themselves, and they need to protect their own DNA," he said. This means ensuring that Filipino cell samples are banked and utilized within the Philippines, fostering local self-sufficiency in biotechnology. If successful, this template can be applied globally, leading to a new era of localized regenerative medicine.

As Dr. Veerapol emphasized, "You have stem cells everywhere in your body." The challenge arises after the age of 25, when cell regeneration slows, leading to "failures" and, eventually, degenerative diseases. MEDEZE's therapies aim to reduce the disease process with younger tissues, applying the power of regenerative medicine to combat the effects of aging.

The commercial potential of MEDEZE's work is immense. "If you want to make a profit, you just need to have customer opportunities," Dr. Veerapol said. The company's focus is on delivering highly effective therapies with a 100% success rate in cell culturing. The biobank, a crucial component, ensures a ready supply of cells for clinical applications. MEDEZE targets a wide range of conditions, including osteoarthritis, a common ailment affecting 200,000 to 500,000 new patients annually in Thailand.

Beyond this, their therapies address anti-aging, skin rejuvenation, and even immune cell enhancement for cancer patients. "Just this one disease is more than enough," Dr. Veerapol said, reflecting on the vast market. "Our profit will increase 100 times."

If these therapies gain national approval and trust, Thailand stands to become a global hub for medical tourism, attracting patients from across the region and beyond, boosting the country's healthcare economy.

Dr. Veerapol's journey into this pioneering field is deeply personal. "I felt that I wanted to do business, and this business needs to be identifiable," he reflected. Unlike traditional medical specializations, where doctors focus on specific organs or diseases, his role as an obstetrician-gynecologist exposed him to the fundamental power of tissue regeneration in babies. This perspective, combined with his entrepreneurial spirit, led him to envision a broader impact. "If I can do stem cells and I can culture stem cells and do biobanking for them," he said, "then I can serve 3,000 to 10,000 people a day through my company." He sees himself as a "turquoise sea"—a metaphor for an unexplored opportunity, requiring specialized skills, innovative researchers and the right financial partners.

MEDEZE's expansion strategy includes an investment firm in Singapore, recognizing its role as a financial hub. Their goal is to "copy paste our template to everywhere," through a franchising

model, generating additional revenue through patent fees. For potential investors, Dr. Veerapol cites MEDEZE's impressive financial performance, boasting a net profit margin of approximately 37% last year. The investment required for expansion, such as in the Philippines, is estimated to yield a return on capital within three years.

When asked about the role of artificial intelligence, Dr. Veerapol acknowledged its potential, particularly in data analysis and image recognition. "AI is good. It concludes good things for us," he said. However, he emphasized the indispensable role of human expertise in clinical trials and research. "We need this approach to learn. It is not possible that AI will do research, from other people's research," he said. Yet, he

foresees a future where AI integrates seamlessly with their robotic systems. "In five years, our robots will be AI. Because I need to give them data. In five years, I think AI will take care of everything," he said.

Thailand, long celebrated for its tourism, is now poised to become a beacon for medical innovation and MEDEZE is playing its role. "I was not born a disruptor. I was not born a stem cell scientist," Dr. Veerapol said. "But I have achieved success. I believe that with large manufacturing and with more people trusting the industry, as well as many clinical trials

that our processes are undergoing, then I think we can become a successful medical wellness hub for the country."

Dr. Veerapol's vision is clear: to elevate Thailand's global image from a manufacturing hub to a sophisticated leader in biopharmaceuticals. With the deployment of the world's first automated biomanufacturing robots and a commitment to rigorous clinical trials, MEDEZE is making this vision a tangible reality, promising not only significant financial returns but also a profound impact on global health within the next five to 10 years. The smile of Thailand, it seems, is now backed by the formidable power of cutting-edge science.

Perhaps one of MEDEZE's most impactful contributions to Thailand lies in its collaboration with the government, particularly within the framework of the Advanced Therapy Medicinal Products Sandbox (ATMPs Sandbox) initiative. Recognizing the lack of funding and operational capacity within universities and the Thai FDA, MEDEZE has stepped forward to bridge the gap. "The government offered us space in two places, one in Phuket, the other in Bangkok," Dr. Veerapol said. These designated "sandbox" areas allow for the accelerated development and regulation of cell therapies, effectively classifying them as medicine. This progressive approach acknowledges the ubiquity of stem cells within the human body, from skin cells that regenerate every 30 days to blood cells every 120 days.





AURORA DESIGN: “Asia’s Hidden Gem in Gold Retailing & Financing”

The glitter of gold has long been a pillar of Thai culture, from its role in ancient ceremonies to its modern function as both a cherished heirloom and a primary form of savings. Amid this tradition, one company has systematically redefined the landscape of precious metals in Thailand, moving beyond the confines of Chinatown gold shops and into the future of a fully integrated, data-driven enterprise. This is the story of Aurora Design, but more accurately, it is the story of the Aurora Group, a sprawling network of businesses under the strategic stewardship of its parent company, Thum Enterprise Co. Ltd.

Aurora Design PCL, the flagship retail arm, is the most recognizable face of this empire. It is the gold and diamond jewelry business that has become a household name, distinguished by its modern retail approach and network of over 500 branches across the country. For over 40 years, the company has built its reputation on trust, innovation and focus on the customer. Aurora has consistently been a pioneer in the industry. It was among the first Thai gold retailers to digitize its inventory and operations, transforming it into a data-driven company. This enabled transparency in pricing and competitive offerings, including a high buy-back price and loan-to-value for gold.

Aurora CEO Aniwat Srirungthum noted that a key strength is the use of data to inform every decision, from store location identification, inventory management to product placement. Aniwat likened this to the operational rigor of a tech giant, which allows the company to predict demand for each SKU across different branch locations. It has dramatically increased efficiency, reducing the number of personnel required for tasks like quality control and distribution from as many as 40 people to just 10, all while handling a network that has grown from 200 to over 500 branches.

While Aurora Design PCL is the consumer-facing jewel of the company, the strength of the group lies in the breadth of its integrated value chain, all managed under the umbrella of Thum Enterprise Co. Ltd. This holding company oversees two other critical businesses that cement the group’s position as a dominant force in the precious metals sector.

The first is Aurora Trading Co. Ltd. (ARR), a major player in Thailand’s bullion wholesale market. ARR is a vital supplier of gold bars to domestic institutions and wholesale partners, helping the group maintain its position at the heart of the Thai market. The second is Aurora Precious Metal International Pte. Ltd. (AUPM), based in Singapore, it manages the group’s international precious metals trading, linking Aurora to global bullion banks and trading partners. “While many of the top Thai gold companies have expanded to Singapore due to complex domestic regulations, Aurora’s move was initially for internal hedging position,” Aniwat explained. “Today, this international presence reinforces the group’s resilience and trusted global standing.” Looking ahead, AUPM is firmly committed to growth in international markets

with an ambitious vision: to become a leading force in the bullion sector, covering gold, silver, and PGMs.

The Aurora Group has also made significant inroads into innovative financial solutions for Thai consumers. A primary example is the Thong Ma Ngern Pai (Gold for Cash) gold financing business, which has become a growth engine for the company. “The market opportunity remains substantial, with an estimated industry size exceeding 220 billion baht (\$6.8 billion), and with Aurora’s current AR portfolio at just 6.6 billion baht (\$204 million), we believe there is significant room for growth,” he said.

The group’s approach to managing the inherent volatility of gold prices is a testament to its strategic foresight. They have developed a responsive inventory and pricing system that adjusts in near real-time to market fluctuations. That allows them to protect profit margins whether gold prices are rising or falling. When prices soar, retail sales volume may soften, but the company’s buy-back service becomes stronger, as customers sell gold back to Aurora at a discount.

Aurora also stands out for its commitment to transparency, which was a driving force behind its decision to become the first publicly listed gold company in Thailand. This public listing has enabled them to raise funds and grow much faster, with their bottom-line average year-on-year growth rate of more than 25% since their November 2022 IPO.

By showcasing the collective strength of Aurora Design PCL, ARR, and AUPM, all under the guiding hand of Thum Enterprise Co. Ltd., the company demonstrates a modern business model that is a clear reflection of Thailand’s future economic ambitions.



The Brief



NEW OPIOID ON THE BLOCK

BY CONNOR GREENE

Amid crackdowns
on fentanyl, a potent
and less detectable
alternative emerges

INSIDE

WHAT THE DATA SHOW
ABOUT ICE DETENTIONS

HOW CLIMATE IS IMPACTING
THE CHANGING COLORS

THE CLUES YOUR FEET
HOLD ABOUT YOUR HEALTH

PHOTOGRAPH BY JOE LAMBERTI

AS EFFORTS TO FIGHT THE FENTANYL TRADE ramp up, new synthetic opioids that are less detectable and sometimes stronger than the notorious drug are cropping up with greater frequency in the American market.

Multiple analogues, or variations, of opioids known as nitazenes have now been detected across more than a dozen states. Some are on par in potency with fentanyl. Others, which are less prevalent but have been detected in the U.S., are exponentially more potent.

Their emergence is being seen by scientists who track the spread of opioids around the U.S. as a harbinger of an altered landscape of drugs about which little is known.

“We’re at this really unique inflection point where a lot of the fentanyl supply is contracting,” says Nabarun Dasgupta, a scientist at the University of North Carolina’s Gillings School of Global Public Health who has been tracking nitazenes and other novel drugs in the U.S.

In the coming months, Dasgupta suggests, other drugs such as nitazene analogues or other sedatives his lab has detected in the drug supply chain might become more prominent in the market and fill supply gaps left by fentanyl.

The sheer volume of fentanyl circulating into and within the country means a major shift in the opioid supply is not immediately imminent, according to experts. But it’s possible the apparent increase in nitazenes across the country at the same time that fentanyl’s presence is waning marks the beginning of such a trend—though it may take years to establish, if it ever does.

Dasgupta’s lab analyzes drug samples from over 40 states provided by roughly 200 public-health agencies, clinics, hospitals, and health departments to provide up-to-date metrics on what drugs are circulating in American markets. It has detected nitazenes in 15 states so far, mostly on the East Coast. But data show the greatest concentration of the drugs in the U.S. in Tennessee, which he describes as a known “bellwether for synthetic opioids.” Alex Krotulski, program manager for new psychoactive substance discovery at the Center for Forensic Science Research and Education’s drug early-warning system, says he has seen an increasing number of deaths from nitazenes in recent years.

Although nitazene-related deaths in Europe have garnered more attention, Krotulski says his research has yielded data indicating a far greater concentration of such deaths in North America.

“In general, the United States and Canada really bear the majority of nitazene consumption around the world,”

he says. Krotulski notes that the U.S. lacks a “uniform way of tracking drugs,” and that the absence of this infrastructure suggests the country’s numbers are underreported.

DASGUPTA ATTRIBUTES THE EMERGENCE of the new drugs being detected in the market, in part, to enforcement pressure from the U.S. government.

Efforts to combat one drug ultimately leading another to emerge would not be without precedent. Dasgupta cited the “Iron Law of Prohibition,” which holds that drug markets begin to favor new products that are easier to trade, and potentially more potent, when law enforcement on a more common product intensifies. This dynamic was seen roughly 10 years ago when heroin was largely replaced by fentanyl, which now dominates its predecessor in the U.S. market, Dasgupta explains.

That transition process happens gradually, however, and the U.S.’s detection infrastructure—as well as the ways nitazenes are moving within the country’s drug market—makes it difficult to document.

“There is no one consistent supply chain across all 50 states,” says Sheila Vakharia, who has written on drug use and harm reduction in the U.S. She says regional and urban supply chains interact within their own bubbles across the country, evolving at different rates and slowly introducing new substances into the market.

Krotulski notes that while the mixing of nitazenes with other drugs has been documented in low numbers, the fentanyl and nitazene supplies are by no means directly linked.

Fentanyl mostly comes to the U.S. through Mexico, while nitazenes are primarily produced in China. They “merge and overlap at times,” he says, but the two don’t directly influence each other because their supply chains for the most part operate on their own.

“It is possible that if fentanyl decreases, nitazenes could increase, but that doesn’t have to necessarily be the case,” he tells TIME.

By all accounts, the increasing—and likely underrepresented—presence of nitazenes in the U.S. does not come close to rivaling the fentanyl trade at this point.

But their emergence is indicative of a market that is undergoing a period of unpredictable shifts and diversification and that is, once again, being changed into something new and unknown.

“Fundamentally, an unregulated drug supply is going to always be changing,” Dasgupta says. “And we’re just at kind of a period of hyperchange that we’ve never seen before.” □

‘We’re at this really unique inflection point where ... fentanyl supply is contracting.’

—NABARUN DASGUPTA,
UNIVERSITY OF NORTH CAROLINA



Law-enforcement officers use smoke grenades to disperse demonstrators in front of ICE headquarters in Portland, Ore., on Oct. 4

THE BULLETIN

Nearly half of those held by ICE faced no criminal charges

WHEN PRESIDENT DONALD Trump launched his re-election campaign, he vowed to deport “the worst of the worst” while blaming migrants for bringing “crime, drugs, misery and death” to the U.S. And since he took office for his second term, a wave of public and sometimes violent arrests by Immigration and Customs Enforcement (ICE) officers have taken place across the country. The Trump Administration has insisted that its hard-line immigration agenda is focused on rooting out dangerous criminals to carry out mass deportations as a means of protecting law-abiding

Americans. But recent federal data show that more than 70% of detainees held by ICE had no criminal convictions.

BY THE NUMBERS Nearly half of the 59,762 people in ICE custody—27,746—had neither a conviction nor pending criminal charges against them, according to the federal data as of Sept. 25. While 17,007 detainees had been convicted of a crime, the remaining 15,009 faced pending criminal charges. Separately, the libertarian Cato Institute reported in June, citing nonpublic data from the agency, that only 6.9%

of detainees had been convicted of violent crimes.

A FALSE NARRATIVE The data runs counter to the Trump Administration’s narrative that it has prioritized the “worst” criminals as it has deported tens of thousands of people and detained many others. By the end of August, the number of deportations it had carried out was nearing 200,000. The Department of Homeland Security announced last week that “2 million illegal aliens have been removed or have self-deported” since Trump’s inauguration on Jan. 20, saying the Administration was on pace to deport nearly 600,000 by year’s end.

TARGETING CITIES In recent months, Trump has blended the immigration campaign

with crime more broadly, notably in Democratic-led cities that have seen protests against ICE. To date, the President has deployed troops to cities including Los Angeles; Washington, D.C.; and Portland, Ore. The Administration has also ramped up immigration enforcement operations in Massachusetts and Chicago, and sought to fight sanctuary-city policies that limit local law enforcement’s cooperation with federal immigration authorities. In response to a social media post by Trump saying he should be jailed for “failing to protect” ICE officers, Illinois Governor J.B. Pritzker said he wouldn’t back down. “What else is left on the path to full-blown authoritarianism?”

—CONNOR GREENE

GOOD QUESTION

How is climate change impacting fall foliage?

BY SIMMONE SHAH

IT'S OFFICIALLY FALL IN THE NORTHERN HEMISPHERE, but depending on where you are, it might not look like it.

From Maine and Vermont to New York, tourists often flock to the U.S. East Coast to see the maple and oak leaves transform into vibrant oranges and reds. Leaves can change color from as early as mid-September all the way through early November.

But pay closer attention and you might notice that the color shift isn't always following that predictable pattern from year to year. Research shows that climate change is already affecting when leaves fall, along with the vibrancy of their colors—a tree that was previously barren by the end of October might still have leaves come November, while a drought-stricken region might see dull, brown leaves that simply crumble off the tree.

The reason comes down to the biology of foliage. When temperatures drop and the days grow shorter, trees get less sunlight, causing the energy-absorbing chemical chlorophyll, which gives them their green hues, to break down and reveal the other color pigments. “They’re present the whole time,” says Stephanie Spera, a professor at the University of Richmond who is currently studying shifts in the fall foliage season. “They’re just masked by all the chlorophyll.”

Of course, the result looks different depending on the type of tree. Maples and oaks spend their energy creating a sort of “sunscreen” that helps leaves stay on the branches—where they can absorb nutrients—a little longer in the fall, and is related to their turning red. Aspens, the most widespread tree in North America, turn a less energy-intensive yellow. “Aspen trees, and also some other trees, get extra nitrogen from fungi in their roots, so they don’t need to make such a big effort to recuperate the last nitrogen from their leaf,” says Susanne Renner, honorary professor of biology at Washington University in St. Louis. (Related logic is what allows evergreens to skip the whole process: keeping their leaves isn’t a drain on their systems. “Their needles are really thin and covered in wax,” which protects them from the cold, says Spera.)

The facts of this chemical reaction won’t change, no matter how the climate does.

Autumn color at
White Mountain
National
Forest in New
Hampshire



**‘Fall colors
[can be]
pretty dull
because
the nights
weren’t cold
enough.’**

—SUSANNE
RENNER,
BIOLOGIST

“The maple trees will continue to be red no matter the temperature,” Renner says, “because of the underlying chemical ability of the plant to produce this or that color.”

BUT TREES NEED cold temperatures to bring out the vibrant hues we’re used to seeing. If the leaves in your area are a disappointing brown, it could be that the temperatures didn’t drop low enough to produce bright colors. “Fall colors in some regions and some years are pretty dull because the nights weren’t cold enough,” says Renner.

Higher temperatures in the summer and autumn can also affect when the leaves begin to fall. Without a stronger decline in temperature, “the

trees don’t have that cue to start shutting down chlorophyll production and shutting down photosynthesis,” says Spera. In the region of Maine that Spera has been studying, fall foliage has been delayed by almost a day each decade, mostly because of warmer summer temperatures.

Rain and drought can also impact the leaves, with too much rain leading to fungus and too little leading to “drought scorch.”

“The leaves literally crisp off the trees,” says Spera.

Just as each tree has its own chemistry, there’s no one-size-fits-all answer to how climate change is affecting this process. Impacts vary depending on the type of tree and the region it lives in. “It is not possible to predict across the board how climate warming will impact leaf coloration,” says Renner.

But the fact that things are changing is already visible in some parts of the U.S. After a summer of drought and erratic rainfall, experts say that New England’s famous fall foliage, which brings an estimated \$8 billion to local economies, will be “bright, brief and early” this year.



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DIED

Jane Goodall

Ambassador of hope

BY JEFFREY KLUGER

THERE ARE FEW PEOPLE IN HUMAN history whose last names alone are sufficient to conjure up a sense of kindness, goodness, wisdom, grace—Mandela, Gandhi, King, Lincoln. Add to that list Goodall. The other four left us years ago. Jane Goodall—primatologist, zoologist, conservationist, winner of the U.S. Presidential Medal of Freedom, and Dame Commander of the Order of the British Empire (DBE)—joined them on Oct. 1, dying at age 91.

“Dr. Jane Goodall DBE, U.N. Messenger for Peace and founder of the Jane Goodall Institute, has passed away, due to natural causes,” the Jane Goodall Institute posted. “Dr. Goodall’s discoveries as an ethologist revolutionized science, and she was a tireless advocate for the protection and restoration of our natural world.”

The spare prose of the announcement was a fitting reflection of the quiet, deliberate way Goodall lived her remarkable life—qualities that were essential for work that required hours, months, and years crouched in the jungles and clearings of Africa, most notably in the Gombe National Park in Tanzania, observing chimpanzees from a sort of intimate distance and discovering their sometimes loving, sometimes violent, sometimes ingenious lives.

Goodall had the gift of years—and the gift of patience—and over the decades her discoveries spilled forth. In 1960, the year she first arrived in Gombe, she witnessed a group of chimpanzees eating a bushpig, disproving the previous belief that chimps were vegetarians. That same year she made the startling observation that chimps strip the bark from twigs and use the denuded stick to fish for termites in rotting logs—overturning the jealously held belief that humans are the only animal to use tools.

Chimps, she discovered, mirror humans in other, decidedly less benign ways. From 1974 to 1978 she observed what she dubbed “the four-year war,”



an extended, bloody conflict between two groups of rival chimpanzees in Gombe. That same year she observed cannibalism among chimpanzees, when a mother-and-daughter pair stole, killed, and ate babies in their own community—likely to eliminate a line of rival females.

But Goodall discovered a gentle side to chimpanzees too. They play, they tickle, they kiss, they grieve. And, in powerful moments of cross-species care, they sometimes accepted her—the quiet, comparatively hairless, human

observer—as part of their band. In 2009, Goodall spoke to TIME about her years in the field, and shared some of her most treasured exchanges with the chimps.

In one such moment she was following a young male through the jungle scrub, thrashing along and catching thorns in her hair as the chimp hurried ahead. Finally she reached a clearing—a space across which the chimp could have easily hurried if he were trying to leave his pursuer behind. Instead, she found him sitting quietly, apparently waiting for her. Touched by the gesture, she found a palm nut on the ground—something chimps love—picked it up and held it out to him. But the chimp wasn’t hungry.

“He turned his face away,” she recalled. “So I put my hand closer. And he turned, he looked directly in my eyes, he reached out, he took the nut ... he dropped it, but he very gently squeezed

**“Together, let’s
create a sustainable
planet for
generations to come.”**

—JANE GOODALL

<
Goodall at
Sydney's Taronga
Zoo in 2014

my hand, which is how chimpanzees reassure each other. That was a communication that, for us, predates words."

On another occasion, she was observing a young mother she named Flo and her 5-month-old baby, who was just learning to walk. "[Flo] trusts me so much that when he totters towards me, and reaches out, she doesn't snatch him away like she used to, but she just keeps her hand protectively around him and she lets him reach out to touch my nose. And this was just so magic."

Flo wasn't alone in trusting Goodall. The billions of members of Goodall's own species did too. We trusted her to be something of an ambassador between the human nation and the great ape nation. We trusted her to be an advocate for nature. And it was a trust that was rewarded.

In her final article for *TIME*, in 2021, Goodall took up the cause not of fauna, but flora, writing about the consequences the planet could suffer as millions of acres of trees are cut and burned every year. Forests, and all plant life, she wrote, "have a crucial role in balancing and maintaining the cycles of life on our planet."

From space, Goodall wrote, our planet is a palette of white and blue and brown and green—and the green is in retreat. But "if everyone pitches in," she wrote of the need to support reforestation, "we have a fighting chance to make a difference. Together, let's create a sustainable planet for generations to come. Let's give our planet a new reason for hope."

In her near-century of life, Goodall was all about the hope. In her final conversation with *TIME*, also in 2021, she said, "I'm about to leave the world with all the mess, whereas young people have to grow up into it. If they succumb to the doom and gloom, that's the end. If you don't hope you sink into apathy, hope is a crucial way to get through this."

Goodall's long, heartening campaign has ended. Let's now see if we're all worthy of her work. □



SELECTED

Sanae Takaichi

A first for Japan

SANAE TAKAICHI BROKE JAPAN'S HIGHEST GLASS ceiling on Oct. 4 when she was chosen as the new leader of Japan's long-ruling Liberal Democratic Party (LDP)—which holds just shy of a majority of legislative seats. The vote put her in line to become the first female Prime Minister of the country.

Takaichi takes over from Shigeru Ishiba, who resigned in September after the LDP suffered historic election losses during his short tenure, fueled in part by a series of political scandals in recent years that have marred the party's reputation and given rise to an insurgent far right in Japan.

Takaichi is a hardline conservative likened to the U.K.'s Margaret Thatcher. Her victory marks a departure from Japan's male-dominated politics. The country ranked the lowest among G-7 members in the World Economic Forum's 2025 Global Gender Gap Report, languishing in the political-empowerment metric.

Yet Takaichi's win does not necessarily portend a brighter future for Japanese women. Mikiko Eto, professor emerita on gender and politics at Hosei University, previously told *TIME* that Takaichi "behaves like men." Critics say that although she has promised more women in leadership roles, Takaichi has a record of backing conservative domestic policies and is expected to follow her mentor, the late conservative Shinzo Abe, in promoting traditional female roles in Japanese society.

"We tend to appreciate the symbolic effect," Hiroko Takeda, a Nagoya University professor, says. "There is some superficial impact by having a female leader. But the essence there is an Abe-type LDP politics, which is very conservative, particularly in terms of culture and tradition."

—CHAD DE GUZMAN

KILLED

Two people in an attack at a **synagogue in Manchester, U.K.**, on Oct. 2, Yom Kippur. The suspect—and possibly one of the victims—was killed by police, who termed the attack a terrorist incident.

SENTENCED

Sean "Diddy" Combs, on Oct. 3, to more than four years in prison after he was convicted of transportation to engage in prostitution.

INSTALLED

Bari Weiss, the Free Press CEO who has made a name opposing what she frames as progressive groupthink, as editor in chief of CBS News, on Oct. 6.

REAPPOINTED

Sébastien Lecornu, as **France's Prime Minister**, on Oct. 10, just four days following his resignation—and just 30 days after his original appointment.

WON

The **Nobel Peace Prize**, by Venezuelan opposition leader María Corina Machado, on Oct. 10.

NAMED

Sarah Mullally, as the **Archbishop of Canterbury designate** on Oct. 3, making her the first woman chosen to lead the Church of England, beginning in January.



Two years of war

A woman and child walk by the Sheikh Hamad bin Khalifa Al-Thani mosque at the Hamad City residential complex in northwestern Khan Yunis, in the southern Gaza Strip, on Oct. 6, nearly two years after the Israel-Hamas war began. Representatives from Israel and Hamas, meeting in Egypt on Oct. 8, agreed to the release of all remaining Israeli hostages in return for Palestinian prisoners, and Israeli forces' pulling back to an agreed line inside the Strip. U.S. President Donald Trump called it "the First Phase of our Peace Plan."

Photograph by Omar Al-Qattaa—AFP/Getty Images

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5 symptoms foot doctors say you should never ignore

BY ANGELA HAUPT

If you want to take a step toward better health, see a foot doctor. You might learn something about a totally different (and seemingly unrelated) part of your body. Sometimes, “your feet are the first place where you can see warning signs of things like diabetes or vascular disease or even skin cancer,” says Hira Mirza, a podiatrist at CLS Health in Houston. “If you look closely enough, it really is a window to the rest of your health.” We asked experts about the foot-related symptoms you should never ignore—and what some of these issues can reveal about your health.

1. Hair that stops growing on your toes

When Anne Sharkey examines patients’ feet, she always checks the hair on their toes—prompting a quizzical reaction. “They’re like, ‘Why are you looking at my hair?’ And I tell them, ‘Because if it stops growing, we have a problem,’” says Sharkey, a podiatrist in Cedar Park, Texas. It could indicate vascular insufficiency, which means the body’s veins aren’t working properly, leading to poor blood flow back to the heart. “I tell my patients that skin is like grass,” she says. “Skin needs blood to grow, grass needs water to grow, and if we aren’t getting enough blood down here, we’re not going to grow hair.”

2. Sudden pain in your big toe

If you wake up at night with severe toe pain, it could be a sign of gout—which Sharkey is seeing more and more in her office. The telltale symptom: a red, hot, swollen big toe that’s extremely tender and painful. “You don’t even want a bedsheet to touch it,” she says. “Patients call the office frantic in the morning, like, ‘I didn’t do anything and I woke up in the middle of the night, and I have this excruciating pain in my foot.’” They often show up to their appointment barefoot, she adds, unable to withstand



the sensation of anything touching their foot. Gout is diagnosed through a physical exam and lab tests, and patients need steroids or oral anti-inflammatories to get their pain under control, in addition to ongoing medication management and dietary changes.

3. Numbness or tingling in the feet

Sharkey’s patients sometimes show up with symptoms that indicate metabolic problems—like numbness, tingling, or burning in their feet that gets worse at night. “During the day, our body is processing so much external feedback,” she says. “At night, when things are

quiet, all of a sudden your body is so much more aware.” What your body might be saying: “‘My toes are tingling, or they feel like they’re on fire,’” Sharkey says. While people in this situation could be experiencing any type of neuropathy, the most common is related to diabetes, Sharkey adds—which is often a surprise to the patient.

4. A dark streak under your toenail

Mirza, the podiatrist in Houston, recently diagnosed a patient with subungual melanoma, a rare type of skin cancer that develops under the nail bed. The telltale sign is a dark vertical line that

can also lead to other color changes in or around the nail. Get in the habit of doing regular self-checks, she urges; if you typically wear nail polish, which would conceal any discoloration, check your toes before applying a new coat.

Subungual melanoma is curable when it’s detected in an early stage. While treatment depends on the stage of the cancer, it might include removing the nail or amputating the toe in some cases. “The goal is to not have to remove the entire toe, but it depends how soon you catch it,” Mirza says.

5. An inability to bear weight on an injured foot

If you twist your ankle playing pickleball or wearing high heels, you might assume that you can walk the injury off and that you’ll be back to normal soon. That might be true. But podiatrist Damian Roussel’s patients often ask him what counts as a concerning amount of pain and swelling, and how to know if they should make a doctor appointment. “I generally tell them that if you’re still not able to put weight on the foot three to four days after the injury, it needs to be seen,” he says. “That indicates a more significant injury than they probably anticipated,” such as a fracture or dislocation.

The View

WORLD

HISTORY UNENDED

BY RICHARD STENGEL

In 1989, the Berlin Wall fell. The Cold War had ended, and it looked like liberal democracy had triumphed. That year, Francis Fukuyama published his famous essay “The End of History,” which posited that with the fall of communism, an international consensus had been reached. No more communism, or fascism; no more theocracy, or monarchies. No more totalitarianism. Democracy had won. ▶

INSIDE

TOUGH TIMES FOR ARGENTINA'S
'ANARCHO-CAPITALIST'

A PROMISING TREATMENT FOR
A DEVASTATING DISEASE

WHY AUTHORITARIANS GO AFTER
COMEDIANS FIRST

The phrase *the end of history* comes from Hegel, who prophesied that “history” would end when there was no longer ideological competition in world affairs. This was not the end of “events” happening, but the end of history as a struggle for the best way for human beings to govern themselves. After the fall of the wall, dozens of nations in Eastern Europe, Africa, Latin America, and Asia embraced constitutional democracy. There was, in Bernard Bailyn’s wonderful phrase, a contagion of liberty.

But something started to change around 2005. According to the Freedom House survey, 2005 was the last year when global movement toward democracy outnumbered declines. Every year since then, the number of countries moving away from democracy has outnumbered those becoming more democratic. Political scientist Larry Diamond calls this the “democratic recession.” We are still in it.

The signs: Weakening of the rule of law. The undermining of an independent judiciary. The diminishment of free speech. Corrupt elections, or no elections at all. And political parties that do not accept election results.

Democracies do not die from the outside, but from within. They do not die at the end of a gun, but at the ballot box. They democratically elect leaders who then dismantle democracy. It’s often unwitting. The people choose officials who seem strong, or who don’t like immigrants, or who stoke their grievances, who say, *It’s not your fault*.

My old boss, Barack Obama, loved to quote the Martin Luther King Jr. line that the arc of the moral universe is long, but it bends toward justice. It’s a beautiful sentence. The idea also arises from the notion that history is linear, directional, even providential. Of course you have to bend it yourself.

But autocrats do not think that history bends toward justice. I’m not sure Xi Jinping and Vladimir Putin even think there is a moral universe. They believe, like the ancient Greeks, that history is cyclical, and that humankind is not advancing. That life, as Hobbes said, is nasty, brutish, and short. They seek to bend it in the opposite direction.

What we’re seeing now is a rise in



The wall that divided Berlin between communist East Germany and democratic West Germany coming down on Nov. 11, 1989

soft fascism—a combination of ultra-nationalism, xenophobia, authoritarianism, and toxic nostalgia. The reason is clear: the immigration of brown people from the Global South to the Global North. The universal slogan “Make country X great again,” is very often “Make country X white again.”

INSTEAD OF MOVING FORWARD, the wheel of history has turned back to the 19th century world of strongmen and power politics, spheres of interest and economic nationalism.

Conservatives in the U.S. mythologize the past and believe the benefits of immigration ended after World War I and the advantages of free trade ended after World War II. They have a 19th century mercantilist view of trade that the U.S. must have surpluses with its trading partners and high walls to secure American sovereignty.

Twenty years ago, I was the head of the National Constitution Center in Philadelphia. I recruited Sandra Day O’Connor, the first female Supreme Court Justice, for the board. Take it from me, she was a force. (She is a member of the National Cowgirl Hall of Fame. You can look it up.) One day

she said to me, “Mr. Stengel, we’re going to pay a terrible price for having stopped teaching civics in this country.” We have.

In one of the exhibition halls at the Constitution Center, carved into the marble wall were lines from one of the most beautiful speeches ever given about democracy: “The Spirit of Liberty,” delivered by Judge Learned Hand in Central Park in 1944, as World War II was raging.

“I often wonder,” he said, “whether we do not rest our hopes too much upon constitutions, upon laws, and upon courts. These are false hopes; believe me, these are false hopes. Liberty lies in the hearts of men and women; when it dies there, no constitution, no law, no court can do much to help.”

But that doesn’t mean the situation is hopeless. Civics teaches us that voting and protest are democratic superpowers. Let’s get out there. Let’s use them and continue to enlarge the circle of liberty.

Stengel, a former editor-in-chief of TIME, served as Under Secretary of State for Public Diplomacy under President Obama



The Risk Report

By Ian Bremmer

CONTRIBUTING EDITOR

ARGENTINA'S PRESIDENT JAVIER Milei, a man who's enjoyed extraordinary success with a "move-fast-and-break-things" approach to politics and economic policy, is starting to look a lot more vulnerable. And at an inconvenient moment, with the approach of the country's Oct. 26 midterm elections, which could mark the beginning of the end for Milei and his reform efforts.

In early October, lawmakers resoundingly overturned two vetoes that were part of his economic reform process: Argentina's Senate voted 59-7 to overturn Milei's block on new funding for universities and 58-7 against his attempt to veto new money for pediatric health care. The Chamber of Deputies, Argentina's lower house, had already rejected Milei's vetoes.

Milei had argued that both bills would force government to spend money it doesn't have, but opponents in the Senate argued the plans were essential on moral, not fiscal, grounds.

These defeats come at a time of scandal. Allegations linking Jose Luis Espert, head of the ruling Liberty Advances ticket in Buenos Aires province, to a corruption scandal look likely to damage Milei's party's standing. Espert faces accusations of close ties with Federico Machado, a man indicted in the U.S. for drug trafficking and money laundering. Documents surfaced that appear to show Espert received a \$200,000 transfer from Machado after the former had denied its existence. Though Espert denies any wrongdoing and quit the race on Oct. 6, the damage is done, in part because his name and photo will remain on the ballot.

The story is particularly damaging at a moment when public anger over violence is rising in Buenos Aires province in the wake of a recent high-profile crime involving drug-trafficking gangs.

This is not the first time that Milei, who rose to power in part with attacks on the venality of Argentina's elite, has been tarred with corruption accusations. In 2023, leaked audio messages suggested a senior official had discussed kickbacks with



President Milei addresses the U.N. on Sept. 24, the image blurred by the camera's movement

a drug company. Worse still, the leak appeared to implicate Karina Milei, his sister and chief of staff. (She denies the allegations.)

MILEI FACES THESE CHALLENGES at a time when **the country's financial conditions continue to deteriorate and help from the Trump Administration is uncertain.** Last month, U.S. Treasury Secretary Scott Bessent's promises of aid triggered optimism within the ruling party. But Washington's plan didn't offer many specifics, and Bessent later clarified that any U.S. help

would come only as a currency swap, would not include a plan to buy Argentinian debt, and would come only after the midterms.

Milei's economic team will soon travel to Washington, and he is set to sit down with Trump on Oct. 14, but a major breakthrough before the upcoming midterms is unlikely.

For all these reasons, Milei's party is set to underperform in the midterms, where half the seats in the Chamber and a third in the Senate are up for grabs. The party will likely draw less than 40% of the vote, an outcome that would bolster the view that Milei is politically wounded, and leave him with fewer willing negotiating partners for the next round of unpopular reforms.

Milei's party will also, of course, face greater opposition in Congress, further damaging the prospects of his agenda.

For instance, after the midterms, Milei will likely have to take the hugely controversial step of devaluing the Argentine peso, and for that he'll need the full support of his base. A tepid election showing will make it more difficult. His party already holds just seven out of 72 seats in the Senate and 38 out of 257 seats in the Chamber in Argentina's fragmented politics.

Other political players, including governors and members of former President Mauricio Macri's allied Republican Proposal party, will demand more concessions on reform and a much greater say in Milei's future policy choices—concessions he will be reluctant to concede.

In November 2023, Milei won a commanding presidential election. He is weakened, and yet his opponents underestimate his continuing appeal with voters exhausted by decades of political dysfunction. The big question is if Milei, off-balance now, can bounce back. □



In the Loop

By Andrew R. Chow
TECHNOLOGY CORRESPONDENT

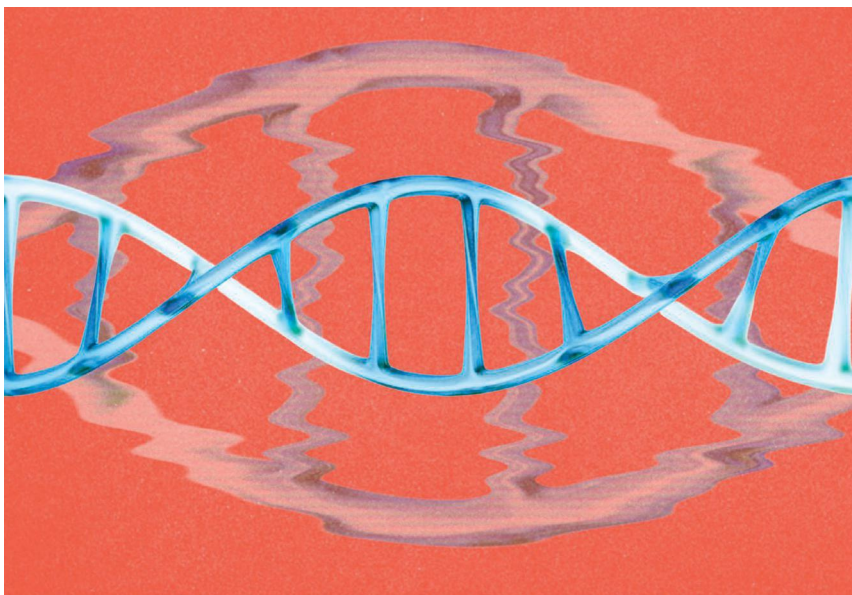
In late September, OpenAI released its latest AI video-generation model, Sora 2, advertising it as a “big leap forward” for the space. As Sora hits the public, it will have to compete for market share in a crowded field, including with a major competitor that is rapidly gaining steam: the Chinese company ByteDance, which owns TikTok. In the past few months, ByteDance released See-dance, an AI video generator that users have called the best in the world, and a new version of See-dream, an elite image model.

ByteDance’s advancements are a prime example of how Chinese AI companies are quickly catching up to American ones, despite chip-export controls. Because their models are high quality and also cheaper, they are winning over consumers around the world, including in the U.S. But while they enthrall many users, these models also come with a host of concerns that plague many of the cutting-edge options: **they allow anyone to create affordable deepfakes that are indistinguishable from reality—and also to freely reproduce copyrighted material.**

As these hyperrealistic AI tools spread, threats of misinformation loom large. Katharine Trendacosta, a director at the Electronic Frontier Foundation, argues that education is key to mitigating deepfake risks. “We’ve reached this weird point where simultaneously anything can be generated, but no one believes anything anymore,” she says. “But we never solve the underlying problem. We just keep targeting the new technology, and not media literacy or teaching analytical skills or how to evaluate sources.”



For a twice-weekly deep dive into the AI revolution, sign up at time.com/intheloop



Health Matters

By Alice Park
SENIOR CORRESPONDENT

GENE THERAPY IS BECOMING a powerful way to treat challenging diseases that don’t respond to traditional treatments, and researchers now report the first success in modifying genes to slow Huntington’s disease. **In a study reported by Uniqure, which developed the experimental gene therapy, scientists found that it slowed progression of Huntington’s disease by 75% over three years.** The study has not yet been published in a scientific journal.

“I went into the trial cautiously optimistic but very anxious, as one does when starting a gene-therapy trial,” says Dr. Sarah Tabrizi, director of the University College London Huntington’s Disease Center. “I was blown away when I saw all of the data and it was very, very clear that the gene therapy worked.”

The study involved 29 patients with Huntington’s disease who were given one of two doses of gene therapy that targeted the huntingtin gene, which is mutated in the disease. The aberrant gene makes a form of the huntingtin protein that clumps into toxic aggregates, which prevent nerves from functioning normally. Eventually, nerve cells—particularly those in the part of the brain that regulates movement and

cognitive skills like motivation, habit formation, and decisionmaking—degrade, leading to physical and cognitive symptoms.

In a 12- to 15-hour brain operation, surgeons injected the gene therapy, which included DNA delivered by an inactivated virus vector, coding for instructions to turn off production of the huntingtin protein. Everyone in the trial was monitored for a number of biological and behavioral measures, including for degraded nerve proteins in spinal fluid and their ability to perform a variety of activities.

The 17 people who received the high dose showed a 75% slowing in the progression of their symptoms overall, compared with a group of about 2,000 untreated Huntington’s patients matched to the study patients by factors like age and disease stage. All who received the gene therapy were monitored for several years.

Uniqure plans to submit a request for the U.S. Food and Drug Administration to grant accelerated approval of the gene therapy to treat Huntington’s in the first part of next year.



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Aramco is an energy and chemicals company with oil and gas production as its primary business. The fuel mentioned here is not yet commercially available.

NATION

We need uncontrolled laughter

BY LIZZ WINSTEAD

AUTHORITARIANS HISTORICALLY COME FOR THE COMICS first. In Vladimir Putin's Russia, satirist Idrak Mirzalizade was jailed and expelled for mocking Russian housing. In Egypt, Bassem Youssef—dubbed the “Jon Stewart of the Arab world”—was forced off the air and into exile after satirizing the country's leadership. Authoritarians are attacking these folks first because laughter is power.

The reason you see so many comedians banding together right now is that we understand that none of us are safe, even those who have an act that isn't “political.” When Stephen Colbert was targeted earlier this year, I warned that this wasn't a one-off. Then they came for Jimmy Kimmel. There is no predicting what joke might set off this particular malignant narcissist in chief, so really, who's to say who is next? The answer is all of us. Any of us.

A week after ABC pulled *Jimmy Kimmel Live!* off the air for its host saying the “MAGA gang” was “desperately trying to characterize this kid who murdered Charlie Kirk as anything other than one of them” and trying to “score political points from it,” the network brought the show back following significant blowback from fans. A win, sure—but also a cautionary tale.

Kimmel's suspension wasn't a response to an audience backlash to the comments. Advertisers weren't threatening to bolt. And I highly doubt ABC was caught off guard. I know firsthand how network lawyers comb through every word of a script several times before it airs. If they objected, it never would have made it to your TV.

This happened because President Donald Trump is attempting to silence his critics, especially influential critics with big platforms—even if wielding the power to do so violates the Constitution, according to legal scholars. Kimmel's reinstatement doesn't change the fact that the government interference was real, and the network caved, albeit temporarily, when it was threatened.

THE CRACKDOWN IS PART of a broader scheme. Over the past several decades, corporate media companies have gobbled up smaller media companies so they can control the information landscape and thus all the profits. The Federal Communications Commission (FCC) has to approve many of those mergers—and Trump stacked the FCC with his supporters. Cue Trump's FCC chair, Brendan Carr, who publicly threatened Disney with consequences if it didn't “take action” against Kimmel. “We can do this the easy way or the hard way,” said Carr of Disney. “These companies can find ways to change conduct, to take action, frankly, on Kimmel or, you know, there is going to be additional work for the FCC ahead.”

That is not cancel culture. It's state censorship.



Stephen Colbert
and Jimmy
Kimmel show a
united front on
Sept. 30

As the story unfolded, comic after comic offered support for Jimmy. But there was an eerie silence from the self-proclaimed free-speech warriors like Dave Chappelle and Andrew Schultz. It took Joe Rogan nearly a week to address it. These guys will talk for hours about how “woke mobs” are destroying comedy by policing speech, but when the actual President of the United States and the FCC strong-arm a network over a late-night monologue, suddenly it's crickets. Free speech, it seems, matters only when you're punching down.

I've known Jimmy a long time—I was a producer on the pilot of *The Man Show* in 1999. Yes, me, the loud-ass feminist. I've never been shocked when I didn't get booked at a club or was canceled from gigs because of what I dared mention on stage: abortion, homophobia, sexism, racism, fascism, really any of the



**This is
not cancel
culture.
It's state
censorship**

isms or the phobias. As frustrating and sometimes maddening as it is, I know the difference between clubs not booking me or audiences deciding they don't like my material and the government blocking my right to tell those jokes.

A parent company like Disney's investment in free speech has one driving economic principle: "Does it make us money?" When I perform as a comedian, I speak full-throatedly about abortion, and audiences can boo, boycott, or bail—that's the free market of ideas. I cultivate my own audience, and I book theaters that align with my values. If, after all that, I still can't fill a room or get heckled—I live with the results. But here's the crucial line: when the government threatens media outlets with regulatory punishment unless they silence dissent—that's not "the marketplace."

That's authoritarianism.

And Carr's hypocrisy makes it even more galling. In 2018, during an FCC oversight hearing, Carr told Senator Maggie Hassan, a Democrat from New Hampshire, "The whole purpose of the First Amendment is to encourage strong, robust—perhaps rough, in some situations—discourse. My job is to act consistent with the First Amendment in every single thing I do." Fast-forward to today, and he's using his position to muzzle a comedian. So which is it, Brendan?

Jimmy's quick return is not proof of corporate backbone. What it does reiterate is the vulnerability of our freedoms. Disney blinked once and could just as easily blink again. Late-night stars are getting the attention and the headlines, but it doesn't stop there. Vice President J.D. Vance has literally urged Americans to report neighbors and colleagues who criticized Kirk—even if those criticisms were just Kirk's own words repeated back. "Call them out, and hell, call their employer," said Vance, conflating criticizing Kirk with celebrating his death.

That's making McCarthyism great again.

YOU WOULDN'T KNOW IT by the way this Administration behaves, but the courts have been clear on the First Amendment for decades. In *Rankin v. McPherson* (1987), the U.S. Supreme Court said a government employee who joked she hoped Reagan's would-be assassin succeeded couldn't be fired. In *Hustler v. Falwell* (1988), the court unanimously ruled that parody of public figures, no matter how outrageous, is protected. Free speech covers the jokes, the satire, the parodies—even the dumb, crass, or offensive ones. Our constitutional protections exist for this exact moment—for when the government tries to muzzle the people who challenge it.

No one has a right to a Netflix special or a network desk. If you can't build a reliable fan base and they cancel you—that's not censorship. But being suspended because the President's regulator leaned on your bosses? That's the very definition.

CBS announced the cancellation of *The Late Show With Stephen Colbert* while the network's owners were awaiting federal approval of its sale. (The sale went through.) Even with Jimmy back, the lesson is clear: corporate media will never be our defenders of free speech. That burden falls on us—comics and audiences alike.

This is not the time to keep your head down and wait it out. It's time to speak up for your freedom of speech. If you've got truth to tell, find a way to tell it. People look to comedians as truth tellers, and it's our responsibility to show people how to defend not just your voice but their own. But it only works if we refuse to be silent.

The good news? Laughter is what gets us through dark times, and audiences won't let the government steal it.

If the First Amendment is going to survive, it'll be because we built and defended our own stages, our own platforms, and our own audiences. It'll be because the American people won't let our freedoms be taken away.

Winstead is a comedian, co-creator of The Daily Show, and the founder of Abortion Access Front

CHINA WATCH

PRESENTED BY CHINA DAILY 中国日报

A land of imagination

Ethnic groups celebrate their cultures in a gem that many have yet to discover

BY YANG YANG
and HE CHUN

Hundreds of millions of years ago this land was a vast sea. In its littoral areas, rivers carried vast amounts of quartz-rich sediment from the land, which steadily settled and built up over time. On the seabed huge amounts of carbonate material were deposited, mixed with mud and sand.

Over eons of tectonic shifts, what were once oceans have transformed into land, creating a world of peerless and spectacular natural beauty in the west of Hunan province. Two big rivers, the Yuanjiang and the Lishui, run across the land, bordered by the Wuling Mountains to the northwest and the Xuefeng Mountains to the southeast.

This area is now called Xiangxi, which, from north to south, mainly includes Zhangjiajie, Xiangxi Tujia and Miao autonomous prefecture and Huaihua.

In this land, rivers flow like the sweetest poetry, and rugged rock formations add to the beauty of a region rich in the cultures of many ethnic groups.

More than 2,000 years ago the poet Qu Yuan was exiled by the king of the Chu state to the Yuanjiang River basin. Journeying upstream, he arrived in Huaihua, passing through Xupu, where the Xushui River joined the Yuanjiang River.

When he entered Xupu, seeing towering mountains and the rushing waters of the Xushui River, he exclaimed: "Entering Xupu, I wander hesitantly; lost, I know not where to go."

In Huaihua, Qu wrote masterpieces such as *Lisao*, *Tianwen*, *Shejiang* and *Shan-gui*. Here, too, he pioneered the tradition of Chinese romantic poetry, thus creating Huaihua's reputation as the "source of poetry".

For thousands of years Xiangxi has been an inclusive region where ethnic groups have thrived.

Now, people of various ethnic groups account for more than 64% of the population of about 8.2 million. Zhangjiajie is the cultural center of the Tujia ethnic group; Jishou, the capital of the autonomous prefecture, is the cultural center of the Miao ethnic group;



A village nestled in the depth of mountains in western Hunan. PROVIDED TO CHINA DAILY



If you go

Getting there

You can fly to Zhangjiajie or take a high-speed train from most big cities in China. From the airport or train station to the city center a taxi costs about 30 yuan (\$4).

Transportation

Zhangjiajie city center is close to Tianmen Mountain, about a 10-minute taxi ride. It takes about 50 minutes to travel from the city center to Wulingyuan scenic area, with options including buses and ride-hailing services.

Accommodation

If you plan to visit Tianmen Mountain you can stay near the lower station of the Tianmen Mountain Cableway. You may also consider staying near the bus station for a cost-effective option.

Wulingyuan is another accommodation option. Xibu Street has many attractive inns near which you can experience the bustling night market and taste local delicacies.

Activities

- Natural attractions: Enjoy Zhangjiajie's stunning peaks and waters. Experience the world's longest mountain cableway at Tianmen Mountain, challenge yourself on the glass walkway, and climb the 999 steps to Tianmen Mountain.

- Performances: In Wulingyuan, the show *Eternal Love of Zhangjiajie* presents local culture through large-scale song and dance. *The Charming Xiangxi* performance offers a glimpse into the rich folk customs of western Hunan.

- Nightlife: Take a night tour of Xibu Street, where you can buy handmade crafts such as Miao embroidery.





From top:
The 3,000
sandstone
pillars in
Zhangjiajie,
Hunan
province,
are often
shrouded in
cloud, giving
the illusion
that they are
floating in the
air. LIU YING /
FOR CHINA
DAILY

Dong people
celebrate
festivals with
lusheng (a
reed-pipe wind
instrument)
shows in
Tongdao Dong
autonomous
county in
Huaihua,
Hunan
province.
PROVIDED TO
CHINA DAILY
The Tuojiang
River flows
through
the heart of
Fenghuang
ancient town
in Hunan,
flanked by
traditional
stilted
houses and
residences.
PROVIDED TO
CHINA DAILY

and Huaihua the cultural center of the Dong ethnic group.

In Yongshun county, the ruins of Laosicheng are what remain of the pinnacle of power of the Tujia ethnic group in the Xiangxi region. Laosicheng, the political, economic, cultural and military center of the Tusi chieftain system since the 13th century, is now a UNESCO World Cultural Heritage site, a place where visitors can experience Tujia ethnic culture.

Despite their differences, people from various ethnic groups live harmoniously together, celebrating their cultures on special occasions and in their daily lives, and respecting the cultures of their peers.

At regular fairs that fall on fixed days in different towns, women wear beautiful ethnic clothes and delicate decorations while bargaining for goods with vendors, speaking dialect that can strike the uninitiated ear as highly melodious.

Apart from being inclusive, diverse and poetic, Xiangxi is also a place of mystery.

Tao Yuanming, a poet and essayist in the Eastern Jin Dynasty (317-420), wrote in an essay about a person in Wulingyuan who accidentally found a utopia — a land of peach blossoms outside the world.

Wulingyuan later often appeared as a symbol of utopia in works by poets such as Li Bai, Du Fu and Wang Wei in the Tang Dynasty (618-907).

The land's mystique is reinforced by the traditional practices of ethnic groups in their rituals of worshipping deities and of funerals.

In 1988 the core scenic area of Zhangjiajie was named Wulingyuan, where people see peak forests shoot skyward from nowhere and on cloudy days, giant rocks covered by lush plants float in the air, an inspiration for the floating Hallelujah Mountains in James Cameron's 2009 blockbuster *Avatar*.



Online
Watch the video
by scanning
the code.



Participants in the 2025 Discover China Program learn about *guqin*, or ancient Chinese zithers, at an exhibition. ZOU HONG / CHINA DAILY

Tour of discovery reveals real deal

BY XU NUO

Cultural exchange programs for young people from across the world to visit China are enabling them to experience the country's culture firsthand.

The Discover China Program, organized this year by Beijing Foreign Studies University for the second year running, was split into two parts, one attended by 13 university students from the United States, and the other by 37 students from European countries.

This year's program included lectures on China's economic and technological development, and diplomatic policies, as well as visits to historical and cultural landmarks and companies in Beijing, Xi'an, Shaanxi province, and Hangzhou, Zhejiang province.

"I've always been interested in China," said one of the participants, Ashley Blake, a sophomore student in social sciences at Harvard University.

Blake said she has studied Chinese for two years and decided to anchor her academic focus on East Asia, especially China, and to "do some global cooperation" to tell Chinese stories that people can engage and connect with. The program offered her the opportunity to see and experience real Chinese culture and forge partnerships with Chinese people, she said.

Another tour participant, William Rose, of the University of Wyoming, said future generations will need to understand one another. "I think countries should work together in whatever ways they can, because each country has its own set of unique properties that is beneficial for everybody."

Joshua Calandrella, a PhD

student at Indiana University of Pennsylvania, made special note of the historic buildings he had seen. "I've been very much impressed with the art and the architecture, such as the Forbidden City. Learning the symbolism behind it and knowing how they're preserved and respected is really inspiring. It puts the past and the present together in a really unique way."

Apart from getting a taste of the long history of Chinese civilization, the students also experienced how technological innovation is transforming people's lives and leading to industrial advances. At a showroom in Beijing of the Chinese electric auto maker Nio, the students checked out various electric vehicle models and saw how artificial intelligence technologies have been integrated into voice assistants and autonomous driving systems.

William Crow, a Norwegian studying at the University of Oslo, said he was impressed with China's fast-developing EV industry. "Just the idea that a car can have an operating system like a phone is very impressive. You can download an app to watch a movie in your car. We got to sit in the car, and they put on some movie with a roller coaster theme, and the car started to tilt to the left and right alongside the movie, which is just amazing."

Rose of Wyoming said: "The cities are for sure different, but in some way they have the same rhythm. When you look at the people of China and the people of the U.S., there are not a whole lot of differences. The core principles and the morals of each person, being outgoing, friendly, having integrity, as far as I can tell, look pretty much the same."



*Eli Sharabi in
Tel Aviv on
Sept. 10, 2025*



WORLD

The story I lived to tell

FOR ISRAEL'S HOSTAGES, AS FOR THE WORLD,
OCT. 7 WAS ONLY THE BEGINNING **BY ELI SHARABI**

Eli Sharabi's Hostage, the first memoir of captivity in Gaza in the aftermath of Oct. 7, appeared in Israel in May, just four months after his release; the English translation was published in the U.S. on the second anniversary of the Hamas attack. A taut, immersive chronicle of endurance, the book also serves as a window into the Israeli view of the war.

The author was pulled away from his wife and two daughters in the first hours of the attack. For the next 491 days, with rare exceptions, the only people Sharabi saw were other hostages and Hamas militants—the same parties that have remained front and center in the viewfinder of Jewish Israelis for two solid years, even as most of the world shifted its focus to the Palestinian civilians also confined in Gaza, and dying in the tens of thousands under Israeli fire.

During captivity Sharabi ached for his life in Be'eri—which as a kibbutz, or commune, is the original

expression of the interdependence on which Israel functions. Another is the army, which he looked for frantically, and in vain, as he was thrown into a car along with a Thai farmworker.

In the first of the excerpts below, they have just arrived in the Strip. In the next, 51 days have passed. He has been hidden in a family's home, sometimes bound with rope in excruciating pain. Sharabi, who is terrified of being held in a tunnel, is being moved to one. He travels with a fellow Israeli hostage, one of several who will be his intermittent companions. In January, he's been moved again, this time to a space where he will remain for eight months. Deliberately underfed, he loses a great deal of weight, but finds a different sustenance in traditions that bind even secular Israeli Jews.

Sharabi also passes hours working to shore up the spirits of fellow prisoners, and to glean something of what's happening outside from the mood of his jailers ...

OCTOBER 2023

THE VEHICLE STOPS. The terrorists pull me and the Thai worker out. The sun is beating down on me. I'm sweating: it was hot in the car, I had a heavy blanket over me, and another person chucked on top of that the whole way. I'm also sweating from fear. The terrorists lead me out of the vehicle, still wrapped in the blanket. There's a huge commotion around us. I hear a noisy crowd, ecstatic, and suddenly hands start pulling me. Many hands. I'm being dragged into a sea of people who start thumping my head, screaming, trying to rip me limb from limb. They're fighting over me. Cursing and whistling all around. My heart is pounding, my mouth is dry, I can barely breathe. I'm a goner. The Hamas terrorists try to push the mob back, and after a struggle, they pull me back into their own hands, drag me, and quickly smuggle me into a building.

This is our first stop in the Gaza Strip. It's a mosque. I realize it because I can see the floor through my blindfold—which isn't too tight, at this point—and I recognize the colorful prayer rugs. Having just managed to save us from getting lynched, the terrorists slam the doors behind us.

Inside the mosque, it's quiet for a moment. I can hear my own breathing and the Thai worker sobbing next to me. The terrorists take us into a side room, where they remove our blindfolds and order us to strip. I blink, look around, and see that we're in what looks like a grand boardroom, with a long table and luxurious chairs, like I've just stumbled into a board meeting at an American corporate office, not a mosque. In Gaza. With trembling hands, I remove my shirt and pants and strip down to my boxers in front of the terrorists' prying eyes. They start interrogating me.

NOVEMBER 2023

WE CLIMB DOWN a long ladder, into the shaft. I'm scared. Every nightmare, every fear, every fevered thought climbs down with me, step by step, down the ladder. I brace myself for total darkness, for the Hamas tunnels I've seen on TV, the ones we've all heard about. And now it's me—me!—going down into them. Any moment now, the trapdoor will shut above me, and I'll be buried there.

The anxiety is all-consuming. After two tense minutes of carefully climbing down, we reach the bottom, about one hundred feet underground. It's pitch black. The terrorists have only headlamps to light the way. We walk a few steps, then descend a flight of stairs. A few more steps—another staircase. After the stairs, we keep moving forward, and I feel

the ground sloping downward. We're going even deeper underground.

We spend several stressful, silent minutes walking through a dark corridor with arched concrete walls. Then, at last, a faint white glow appears ahead. It's a fluorescent light, growing brighter as we approach. The corridor begins to widen, and we enter a space that's clearly been adapted for living. There's lighting. A real floor. Ceramic tiles on the walls. A sink. A kitchen. A bathroom.

They order us to sit on a mattress in the middle of this large room.

It's hot. Very hot. I assume it's from the stress and fear. I take off my shirt, but I'm still hot. I take off my pants too and sit in my boxers. Almog sits beside me. We wait. I look around. The room we're in is long and narrow. At one end there's a large TV mounted on the wall; at the other end, where we came from, is a wide opening that leads to the corridor. The corridor has other doors, to the kitchen and a bathroom. There is another narrow corridor extending from the room, seemingly leading to another space. The terrorist we call "the Triangle" and the one who greeted us at the ladder, who we later call "Smiley," bring us water to drink and some wafers to eat. I don't feel like eating. I just keep drinking. I'm still boiling. I can't believe I'm going to stay here. That I'm going to spend tonight here, and who knows how many more after that.

I can barely breathe.

We hear more people approaching. In the tunnels, we quickly learn, every sound carries, clear and sharp, from one end to the other. The sealed acoustics amplify everything. Almog hears it before me, because my hearing has been a bit weak for years, and I guess the explosions have made it weaker still. Almog





< Sharabi's extended family watch a live feed of his release on Feb. 8, 2025

hears the creak of the trapdoor opening, hushed whispers, approaching footsteps. I hear them too. Two young men are brought into the room and placed on the mattress across from us. We study them in silence. One is missing an arm. They glance around, disoriented. I wonder: Are they hostages too? Are they Israeli?

After the captors leave again, one of them turns to us. "You're Israelis, right?" he asks. We nod.

"I'm Ori, and this is Hersh," he says, pointing at the young man who is missing an arm. "Who are you?"

"I'm Almog."

"I'm Eli," I say. "Where are you from?"

"We were at the Nova Festival," says Ori. "So was I," says Almog.

They look at me. "I'm from Kibbutz Be'eri," I say.

JANUARY–SEPTEMBER 2024

DIFFICULT DAYS LIE AHEAD.

This tunnel lacks basic supplies and equipment. It doesn't even have a landline for our captors, and they spend several days trying to set one up. Our only food is what they brought with them from the previous tunnel. In the kitchenette across from our cell, there's no gas. No way to cook the dry food. Like before, our captors sleep in the space next to ours. There's

no corridor connecting the rooms, just a narrow opening at the edge of the wall.

For the first three days in this tunnel, we eat nothing but biscuits. Two or three in the morning. Two or three at night. Biscuits and water. That's it. After three days, they bring us some raw *ful* beans. I start feeling weak. My body needs real food. I think it takes them nearly two weeks to get pitas into the tunnel. They're stale, probably foraged from the street. I don't care. I savor the single pita bread I'm given and devour it slowly. Besides the pitas, they give us a can of cream cheese. I break my pita into pieces, dip each one into the cheese, and chew slowly. I save the last morsel for the end of the day, just to fall asleep with something in my stomach.

After two weeks of surviving on biscuits, one daily can of cheese between four men, and a handful of stale pitas, a gas burner finally arrives. We hope things will start to improve. They clearly have supply issues. That's clear soon

enough. Unlike in the previous tunnel, there are no regular deliveries. All they have is what they manage to scavenge outside. And outside, there's hardly anything. Hunger sets in. Not from deliberate starvation, but from scarcity. For them too. Sure, they eat more than us, and better. But even they don't have much. The shortages make them more irritable. Less patient with us. We're careful not to cross them, not to speak out of line, not to make any requests.

We're impatient too. The hunger turns each man inward. Empathy dries up. These are hard moments. When everything you are, everything I am, is reduced to one thing: hunger. Nothing else matters.

Slowly, our captors manage to sneak in more supplies. Because our room faces the kitchenette, we see them cooking and eating. They don't like that. We're too exposed to the contrast between their food and ours. They cook flatbread over the burner. Sometimes, when they have sugar and oil, they make sweets—for themselves. Right in front of us. The Mask and Smiley remain nice to us, even in these conditions. Sometimes they sneak us treats: halva, a scoop of sesame seeds, a small pita. But food is scarce. The stale pitas that arrive every few days give us a glimpse of the world above: The bakeries aren't operating. There's no food coming in. Sometimes they manage to bring rice or pasta; they cook some and give us a little.

We have no mattresses. At night, we spread our blankets on the ground and sleep on them, in pain. Our toothpaste from the previous tunnel runs out after three weeks. We brush our teeth with plain brushes. After a few months, we get a new tube, but it only lasts a month, even after we agree to ration it and use toothpaste once every other day. There's no toilet paper. We clean up in the bathroom with a water bottle. There are jerricans in the tunnel: some for drinking, hauled down by our captors, and others, not safe to drink, for washing and toilet use. We reuse the same water to wash our hands, clean ourselves off after using the toilet, and refill the water tank, since there is no running water.

Our rations keep shrinking, and with them, the frequency of our bathroom visits. We do not share toilets with our captors. We have ours; they have theirs. They clean theirs, not ours. Soap is a rare commodity. When they have some, they give us a little. At first more often. Then much less. Eventually, not at all.

Our hygiene deteriorates. Our bodies are filthy. We go for weeks without showering. Our clothes are never washed. Our space is never cleaned. And there's no way to clean it.



Everything becomes gross. In the last tunnel, we got to shower twice in forty days. Here, not even that. We shower once every six or eight weeks. With a bucket. And a bit of soap. Every time we shower, we're shocked by how dirty our bodies are. The layers of grime. I scrub and I scrub with the little soap I have. I never knew the human body could collect so much filth.

We constantly pray we won't get sick. We realize how easily it could happen. Diseases we'd never worry about at home, infections that shouldn't occur, could absolutely happen here. I'm spared most of them, thankfully. But not the others. Or, Alon, and Elia suffer from constant diarrhea. Frequent vomiting. Fungal infections. Nails falling off. My problem is mostly dizziness. I think it's because I'm so weak.

Another week passes. And then another. The days crawl by and pile atop of each other. The cesspit under the toilet stops draining. Everything spills over.



< *The heavily rehearsed handover from Hamas to the Red Cross on Feb. 8*

The raw sewage rises to the surface, adding to the unbearable stink, which spreads and worsens with every passing day. I don't know how to describe it. How do you convey what it feels like to be swallowed in such a suffocating odor? It's a stench you never get used to.

NOVEMBER 2023 UNTIL RELEASE

IN ALL THE HARD MOMENTS—the fights, hunger, humiliating searches, and conflicts between us—we try to create moments of strength. Moments of togetherness.

Many of our shared moments revolve around tradition and faith. I'm not religious, but I'm no stranger to Jewish tradition. I come from a traditional family. I spent many hours in my childhood in a synagogue on Shabbat and Jewish holidays. I make Kiddush with Lianne and the girls every Friday night. And even though I lead a very secular life, and I'm perfectly happy with that life, these traditional spaces give me strength. They give me fulfillment.

Even in the early days of captivity, I find myself murmuring Shema Yisrael again and again, almost unconsciously. Like a mantra to keep me grounded. Every morning, Elia recites the traditional Jewish morning prayers out loud. He grew up religious and knows them by heart. He recites the prayers, and we

stand and answer, "Amen." That's how we start every day.

And every Friday night, we do Kiddush. No matter what we've been through during the week, what fights we did or didn't have, whatever our frustration or sorrow or pains, we gather in silence. The four of us. We listen to Elia, holding a cup of water in both hands, reading in a trembling, quiet voice:

Yom hashishi vayeichulu hashamayim vahaaretz vekhol tzeva'am ...

The sixth day, and the heavens and the earth and all that filled them were complete ...

Before Kiddush, I sing "Eshet Chayil," a traditional hymn from Proverbs. "She is good to him, never bad, all the days of her life. She looks for wool and flax, and sets her hand to them with a will ..." I sing with my eyes closed, thinking about the women in my life: my mom, my sisters, Lianne, Noiya and Yahel. Elia doesn't know the song. I teach him the words every Friday, till he starts joining me and we sing together.

Then we break the bread, or rather, a slice of pita we've saved especially for the Hamotzi blessing. Like on Jewish holidays, when we share memories with each other, every Shabbat we tell stories. We each share what Shabbat was like at home—the foods we cooked or ate, the customs we observed.

On Saturday nights, when the Jewish Sabbath ends, Elia chants the zemirot, the traditional table hymns. Sometimes we join him. Songs I remember my father singing. And that memory comes as a pinch of sweetness.

I don't know if I feel God in those moments. But I feel power. I feel a connection. To my people. To our tradition. To my identity. It connects me to my family. To my childhood. To my



< Tents in Gaza City
on Aug. 10

roots. It reminds me why I must survive. Who I'm surviving for. What I'm surviving for. It brings back glowing memories of childhood. Of my father. Of my mother. Of a white tallit during Shabbat prayers. Wine in a goblet. Candles on the windowsill. Opening the ark. Torah scrolls. A cantor singing. A white tablecloth spread over a table overflowing with good food. Everything that feels so far from here.

And it brings to life the whole cast of characters waiting for me. Mom. My siblings. Lianne. The girls. I imagine returning to all of them. I imagine their hugs. I imagine the souls I love most enveloping me in light, whispering:

Shabbat shalom, Eli. Shabbat shalom.

It's so good to have you home.

FEBRUARY 2025

SATURDAY MORNING ARRIVES. Our captors wake us up in the dark tunnel at 05:00 to start getting ready. We take our plastic bags, and together with our captors begin the long ascent to the top. There are sections of this tunnel with very low ceilings, so low that you practically have to crawl. We get covered in mud. We keep walking and crawling through furrows of bare, cold, filthy

earth, inching up toward ground level. It's a long ascent: the tunnel is extremely deep.

When we finally reach the exit, we get given new, clean clothes for the release itself. Ugly brown suits, the perfect complement to our anyway-disheveled look.

We make our way through garbage dumps and junkyards until we reach a vehicle. The car windows are blacked out. Our eyes are blindfolded, our heads pinned down. The terrorists are not only afraid of the IDF, but also of the frenzied mob that would attack the car if it realized who's inside.

The car stops. The terrorists remove us from the vehicle and remove our blindfolds. After a few minutes of standing around, the dress rehearsal begins. Hamas operatives give us stage directions for every moment of the ceremony: how to get out of the car, walk up to the stage, and go up the stairs, what to say, what they'll say, how to wave as instructed, when to smile. Everything. It's a meticulously stage-managed spectacle.

The team handling our release includes one Hamas member who speaks Hebrew. He's in charge of our media messaging and interviews. He sits down with us to coach us for the questions he'll ask onstage. The questions are similar to those we were asked on Thursday night, for the "movie shoot." "Say this like that," he corrects us. "And that like this. Emphasize this here. Add that there." He drills us again and again until he's satisfied with our answers and happy that they meet the needs of the production.

We each have to answer four or five questions. I have only one goal: to do whatever it takes, and give them whatever they want, to ensure a smooth release. To survive. To get home.

Adapted from Hostage, available now from HarperCollins

Lords Mark Industries Takes Indian Innovation to the World Stage

In just over two decades, Lords Mark Industries Ltd. (LMIL) has grown from a modest venture into one of India's most ambitious diversified business groups, a company that today sits at the intersection of science, technology, and social impact. A global presence across MedTech, diagnostics and, biotechnology, LMIL is reshaping not only the Indian business landscape but also how the world views Indian innovation.

Healthcare lies at the heart of this transformation. LMIL's portfolio includes Renalix, the world's No.1 AI-based indigenous smart tech-enabled kidney care ecosystem, which makes early detection and dialysis accessible to rural communities, and One DNA, a genomic testing platform that puts preventive healthcare into the hands of ordinary people. The collaboration between IIT-B and Lords Mark Industries aims to revolutionize sickle cell testing in India, providing improved disease diagnosis and management for patients across the country at the point of primary care, thereby reducing costs and enabling convenience for the affected population.

Together, they reflect the company's philosophy: healthcare should be affordable, accurate, and accessible, whether in a metropolitan hospital or a small village clinic.

That focus is now driving LMIL's boldest ambitions yet. By 2027, the group plans to establish Asia's largest biochemistry plant, followed a year later by the continent's largest medical device manufacturing facility. These mega-projects will power advanced research, mass production, and exports on a scale that could place India at the center of the global MedTech map. To fund this expansion, LMIL is preparing to raise capital from global sources and is exploring a dual listing on NASDAQ and the Bombay Stock Exchange (BSE), signalling its determination to attract international partners and investors.

The company's rise is also drawing global attention. Last month, LMIL was honored at the Indo-European Business Forum (IEBF) at the House of Lords, Westminster in London for its pioneering contributions to MedTech, diagnostics, and biochemistry innovation. Political leaders, businesspeople and industry stalwarts hailed LMIL as "a shining example of how Indian enterprises can merge innovation, scale, and social impact." The summit saw participation from an illustrious gathering, including Lord David Evans, Minister Kanishka Narayan, Minister Seema Malhotra, Virender Sharma ji, His Excellency Samuel Mahama from Ghana, Dr Rohitga Sri Lanka's former Foreign Minister and High Commissioner, Dr. Neerja Birla, Niharika Handa ji, Tejesh Kumar Kodali, Subodh Kumar Gupta, Sandip Sali ji, and distinguished guests from the USA, Dubai, Hong Kong, Africa, and Europe.

"This recognition is both a validation and a responsibility," said Subodh Gupta, CEO of Lord's Mark Microbiotech, a subsidiary of LMIL. "Through Renalix and One DNA, backed by Asia's largest upcoming facilities, we are shaping the future of healthcare while delivering on India's vision of 'Make in India' and *Atmanirbhar Bharat* (self-reliant India)."



Dr. Sachidanad Upadhyay
MD and CEO,
Lords Mark Industries Ltd.



Looking ahead, the road is ambitious, and LMIL's trajectory under its young and dynamic Managing Director and CEO Sachidanand Upadhyay has demonstrated that the company is comfortable with reinvention. From its early experiments in solar and LED to its current healthcare mega projects, it has proven that Indian enterprises can not only dream big but execute with impact. As it prepares to take its innovations global, Lords Mark Industries is making a larger point: the future of healthcare will not just be built in labs and factories, but in the ability to blend scale with empathy, and ambition with responsibility.

WORLD

Driven by a changing
global order, the
new clamor for gold
brings ready cash,
and deadly costs

By Charlie Campbell/
Kumasi, Ghana

THE

NEW

▲
A MINER
SEARCHES FOR
GOLD WITH A
METAL DETECTOR
OUTSIDE KUMASI

A full-page photograph of a miner in a rural, hilly area. The miner, wearing a brown t-shirt and a yellow headwrap, is standing in a muddy pit. They are holding a large, green, textured sluice carpet over a large, brown, cylindrical tub. A thick, yellowish-brown slurry is overflowing from the tub. The background shows a dirt-covered hillside with some green plants and a few houses in the distance under a cloudy sky.

GOLD

RUSH

▲
A MINER WASHES
A SLUICE CARPET
TO RECOVER
GOLD PARTICLES
TRAPPED INSIDE

DRIVE AN HOUR SOUTH OF KUMASI, GHANA'S BUSTLING second city, and before long the dense jungle gives way to denuded hills peppered with rickety timber frames. On every slope, gumbooted workers shovel the tawny earth down to muddy pools in the furrows, from whence the sludge is pumped to the frame's zenith to gush down a shallow ramp lined with webbed plastic matting. At the base, more workers sweep the outflow with metal detectors.

Several times a day, the incessant din of diesel engines pauses while the mats are delicately removed and placed in outsize tubs for washing. It's only then that the glistening purpose of this toil materializes through the murky soup: gold—tiny flecks, yet with global prices breaching a record high of \$4,000 an ounce, valuable enough to render any other labor foolish by comparison.

"I've worked *galamsey* for 15 years," says dad of five Steven, using the local term for wildcat gold mining, as he rests wearily on his shovel. His work here earns 1,000 Ghanaian cedis (\$81) each week, he says, or eight times the national minimum wage, "I also work as a driver and grow plantain, cassava, and coconut on my family farm. But the money here is so much better."

Profitable, but illegal—which is why Steven requested TIME use only one name. Yet *galamsey* is no secret in Ghana, whose colonial name "Gold Coast" offers some measure of how this precious metal has long been interwoven with people's lives. Early Arab traders exulted in the extravagance of the Asante court in Kumasi, including royal guard dogs adorned in gold collars and officials whose wrists were hung with nuggets so large they had to be supported by boy attendants.

Today, Ghana remains Africa's top gold exporter and sixth largest globally. In recent years, however, what should be a boon has become spiked with burden. Independent of commercial mining operations, thousands of *galamsey* sites dot the emerald countryside of this West African nation of 34 million. But to isolate gold, *galamsey* workers typically use poisonous mercury, which pollutes drinking water and farmland and has been linked to serious illness and birth defects.

When Ghanaian President John Mahama returned to power in January, he made fighting *galamsey* a signature policy. He banned foreigners from trading gold inside Ghana to crack down on smuggling networks and established a state regulator, GoldBod, to streamline revenue and supply chains. New police patrols raid illegal mines and seize equipment.

Still, "it's a complicated fight," Mahama tells TIME in his



Accra office, highlighting that more than 1.5 million Ghanaians work in *galamsey*. "So there's also an issue of livelihoods. If you just stop them, what alternatives are you giving?"

Ghana's struggles are mirrored across the developing world, where sky-high commodity prices are warping livelihood choices by incentivizing illicit mineral extraction with little heed to environmental or social concerns. In Brazil, wildcat gold mining degrades the Amazon rainforest and imperils Indigenous groups. In Indonesia, Chinese-backed illegal gold mines are polluting arable land with cyanide. And in Sudan, access to gold reserves is one of the major drivers of a civil war that the U.N. has dubbed the world's worst humanitarian crisis, having so far killed 150,000 people and forced 12 million more from their homes.

Geopolitics is fueling this new gold rush. Much of global demand comes from China, which is stockpiling gold to reduce reliance on the U.S. dollar, develop the means to influence the international monetary system, and shield itself from potential U.S. punitive measures. Last year, the People's Bank of China covertly bought 630 tons of gold, and it has now accumulated more than twice the 2,530 tons that it officially declares, according to Money Metals analyst Jan Nieuwenhuijs. China's voracious appetite for gold has contributed to a spike in illicit gold mining across the Global South, prompting the U.N. Office on Drugs and Crime (UNODC) to warn in May that organized crime in gold supply chains posed a "serious global threat." (Some 50,000 illegal Chinese gold prospectors are believed to work in Ghana alone.)

But China's superpower rival is also playing a part. The Trump Administration's tariff war sent markets reeling and investors around the globe buying gold as a hedge. In addition, recent cuts to U.S. foreign aid—the \$12.7 billion slashed from sub-Saharan Africa includes \$156 million to Ghana—means governments are scurrying to plug the funding gap.

Mineral wealth such as gold offers one solution—though diverting labor and resources from more sustainable industries could prove catastrophic if prices suddenly drop. The



▲
**MINERS SEARCH
FOR GOLD AT A MINE
OUTSIDE KUMASI**

hope for gold-producing nations like Ghana is to responsibly leverage this bountiful natural resource without falling prey to environmental degradation and civil strife. “When gold prices are that attractive, it creates an El Dorado effect,” says Mahama. “So it’s a blessing and a curse.”

THE CONQUISTADORS MAY have obsessed over El Dorado, but Ghana’s historic kingdom of Asante makes the mythical land feel a little drab by comparison. West Africans have been extracting gold since the 10th century, and when British colonizers arrived they found young officers bedecked in leopard skins and brandishing gold-handled swords often adorned by a life-size ram’s head of solid gold. The most sacred symbol in Asante culture remains the Golden Stool, which according to lore was conjured down from the heavens and symbolizes not only royal authority but also the people’s collective soul.

Gold remained a lifeblood of the nation into modern times. But following independence in 1957, Ghana’s gold sector underwent a process of nationalization whereby underinvestment, mismanagement, and stagnant prices pushed it into steady decline. Production plunged from more than 28.5 tons in 1964 to just 6.8 by 1983 as Ghana fell out of the top 10 global producers for the first time.

By the mid-1980s Ghana was liberalizing its gold industry, and today foreign ownership is above 90%, with the biggest players Australian, Canadian, Chinese, and American firms—specifically Colorado-based Newmont, the world’s biggest gold producer and among Ghana’s top taxpayers. But in addition to liberalizing large-scale gold production, Ghana also legalized small-scale mining, which rose from just 5% of total



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**GOLD PARTICLES
BOUND TOGETHER
AFTER BEING
WASHED AT A
SMALL-SCALE MINE**

output in 1991 to nearly 40% today. However, lax regulation meant the distinction between legal artisanal mining and illegal, destructive *galamsey* became increasingly blurred. But along with ready cash, the laissez-faire approach brought the banes of corruption, criminal infiltration, and rampant pollution.

A half-hour drive from Steven’s *galamsey* mine, Sicilia Frimpong, 45, lives in a mud-brick house with a rusting iron roof next to her family’s 30 acres of cocoa trees. But the adjacent plot straddling the riverbed has been taken over by *galamsey* workers after her brother leased his land to an Asian businessman. “I’m very angry with my brother,” she tells TIME, sitting on her stoop. “I’m worried about my kids, but what can we do? Pollution from *galamsey* is like mosquitoes,” she shrugs. “It’s just something you have to live with.”

Last year, hundreds of demonstrators took to the streets of Ghana’s sprawling capital Accra to demand the government take action, with hashtags #stopgalamseynow and #freethecitizens proliferating on social media. Some protesters brandished bottles of contaminated water from drinking wells. Dozens were arrested by police on charges of holding an illegal gathering but released after public

outrage to their detention grew.

In an interview with local radio, George Manful, a former senior official in Ghana’s Environmental Protection Agency, highlighted that mercury can stay in waterways for 1,000 years and affects the entire food chain by accumulating in crops, livestock, and fish. “The water in these rivers is so turbid that it is undrinkable,” he said. “We are slowly poisoning ourselves.”

Mahama calls this unacceptable. He came to power aiming to tweak the regulatory dial back to harness more of Ghana’s gold wealth without casting a pall over the industry.

‘WE ARE SLOWLY POISONING OURSELVES.’

—GEORGE MANFUL,
FORMER GHANAIA EPA OFFICIAL

The most radical change has been the launch of GoldBod, which sets gold prices, issues licenses to domestic traders, provides equipment and training to artisanal miners, and is the only entity allowed to sell gold for export. However, being both regulator and commercial arm entails “structural conflicts,” says Bright Simons, head of research at the IMANI Centre for Policy and Education, an Accra-based think tank. He points to how GoldBod’s remit to prevent illicit gold from entering the market “is in tension” with its role sourcing as much gold as possible to maximize state revenues. “It’s a really unwieldy beast in that regard.”

Mahama plays down any conflict, pointing to recent arrests of foreign gold smugglers while official gold exports almost doubled year-over-year to \$5.1 billion during the first six months of 2025. Meanwhile, the gold reserves of Ghana’s central bank reached a record high of 39.7 tons in August 2025—a fourfold increase in just two years—helping the Ghanaian cedi strengthen 30% since he took power to assuage a cost-of-living crisis.

Law enforcement is bolder too. Previously, foreign nationals caught illegally trading in gold were simply deported. However, 10 Chinese nationals were arrested in July for illegal gold trading, and if convicted “they’ll be imprisoned in Ghana,” says GoldBod spokesman Prince Kwame Minkah resolutely. “We are moving heaven and earth so that they dance to the music of Ghanaian law.”

MAHAMA ALSO WANTS his country to reap more of the downstream benefits of gold. In August 2024, Ghana opened its first commercial gold refinery and hopes to become only the second nation on the continent after South Africa to have a refinery certified by the benchmark London Bullion Market Association (LBMA) Good Delivery List—a credential necessary to access the world’s largest gold market in the U.K. capital, which trades some \$165 billion worth of the yellow metal every day. “There’s no fast track when it comes to meeting these standards,” LBMA CEO Ruth Crowell tells TIME in her London office. “They need to do the work ... but it is promising.”

The cuts to U.S. aid add pressure as well. Rolf Olson, acting chargé d’affaires at the U.S. Embassy in Ghana, insists that reorienting “away from aid and toward investment and commercial partnerships ... is in the best interests of both the U.S. and African nations, including Ghana.”

Still, the trade-over-aid pitch might be more persuasive



▲ GHANAIAN PRESIDENT JOHN MAHAMA IN HIS OFFICE AT JUBILEE HOUSE

had the U.S. not just slapped a 15% tariff on Ghana’s exports. For Mahama, Washington’s mercantilist tilt “takes away U.S. soft power. Everybody is looking for opportunities in Africa, so it just makes Africa pivot to other countries that are willing to cooperate with us.”

And not just China. In July, Narendra Modi arrived in Ghana for the first visit by an Indian Prime Minister in 30 years, and just days later London Mayor Sadiq Khan came to Accra as part of the first-ever African trade mission by a holder of his office. Speaking to TIME, Khan explicitly cited the Trump Administration’s nativist turn as an opportunity for the U.K. “It’s really important to recognize that by providing a helping hand to those in the Global South, in the future there’s a better chance of doing trade with these countries.”

Yet the reality is that the U.S. isn’t shunning the Global South wholesale but becoming more selective and transactional—with minerals often a decisive factor. President Donald Trump’s desire to broker an end to the three-decade conflict between the Democratic Republic of Congo (DRC) and Rwanda seemed like an odd priority until he revealed that the U.S. would receive “a lot of mineral rights” from the DRC as part of June’s peace deal, with the implicit understanding that these would be granted at Beijing’s expense.

In November, Chinese defense and industrial giant Norinco was blocked from buying DRC copper and cobalt mine Chemaf despite the sale having been agreed on for months. In August, the U.S. sanctioned two Hong Kong-based firms for illegal mining in the country. Some 60 tons of gold worth

**‘EVERYBODY IS
LOOKING FOR
OPPORTUNITIES
IN AFRICA.’**

—PRESIDENT JOHN MAHAMA



▲
**A PROTEST IN
ACCRA DEMANDING
GOVERNMENT ACTION
ON ILLEGAL MINING**

Hong Kong and Riyadh that facilitate gold-backed transactions without the physical movement of bullion.

China itself is the world's biggest gold producer, refining 418 tons last year, and is also the top purchaser, importing 1,350 tons over the same period. Meanwhile, Beijing forbids any export of gold without a special license, spurring analysts to conclude that the official figure of 2,530 tons held by the People's Bank of China is farcically low. "There's no way that's real," says Quentin Mai, CEO of West Point Gold, a Vancouver-based mining company. "There's something going on there that no one's been able to figure out."

One theory is that Beijing is secretly stockpiling gold in case relations with the U.S. spiral. By suddenly disclosing its true holdings, China could drive up gold prices while signaling stronger backing for the renminbi, thus weakening the dollar's global clout.

Whatever the reason, the U.S. is concerned and making its own moves to secure gold reserves. In March, Trump issued an Executive Order to declare gold a critical mineral—a category deemed essential for national

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**GOLD JEWELRY
AND CLOTHES
ADORN SHOP
WINDOWS IN THE
DUBAI GOLD SOUK**

security and economic prosperity—which should help fast-track permitting of new domestic gold mines. (The U.S. ranks fifth in global gold production.)

Ensuring responsible sourcing is a major headache given how easily illicit gold can be disguised as recycled bullion or jewelry. Beyond setting the global gold price, the LBMA is charged with overseeing the transparency and sustainability of supply chains via its Good Delivery List, which has 66 certified gold refineries around the world. Yet several refiners have been delisted in recent years, and in April last year the NGO Swissaid wrote an open letter saying that "many" LBMA refiners continue to be linked to money laundering, land and water pollution, or human-rights abuses.

Crowell insists that the LBMA's systems of reporting and audits are "not a guarantee" but "a strong measure and a strong stick."

"There's still an enormous amount of gold that funds conflict," she says. "We put the controls in place, but it doesn't mean that the gold doesn't get sold somewhere as long as other centers are happy to turn a blind eye."

NESTLED IN DUBAI'S DEIRA DISTRICT, the city's Gold Souk is reputed to be the largest and cheapest gold market in the world. Back in the early 1900s, before the United Arab Emirates was even a country, merchants from India and Iran began hawking gems and precious metals by the twisting waterway known as Dubai Creek. Today, more than 500 stores line the

\$7 billion is smuggled annually out of the DRC, whose government hopes U.S. investment and security can help wrest back control of enormous deposits from rebel groups, including those aligned with the Islamic State. "The U.S. and DRC are building stronger ties all the time," says Charlie Chase-Gardener, co-CEO of Horizon Corp., a London-based mining-investment firm with projects in both countries.

IT'S ANOTHER EXAMPLE of how gold production is increasingly a battleground. Gold has been a prized asset for over 5,000 years and today is seen as a hedge against inflation, currency devaluation, and geopolitical shocks. Global demand rose to a record 5,483 tons in 2024, driven by increased mine output and recycling. As legendary financier J.P. Morgan put it: "Gold is money; everything else is debt."

Central banks have been on a gold-buying spree, snapping up over 1,000 tons of the metal for the third straight year in 2024. "Central banks are holding gold because it's a diversification away from the U.S. dollar, partly as the U.S. role in the global economy and geopolitics has fundamentally changed with the latest Administration," says Crowell.

Over the past few years, Beijing has been shedding U.S. Treasury bills and buying gold, whose untraceable and fungible characteristics offer many of the benefits of modern cryptocurrencies. While the LBMA sets the globally recognized benchmark gold price, so much of the action has shifted to China these days that insiders whisper that the true global standard is set 5,700 miles east of London in Shanghai.

Gold's utility also has soared with recent U.S. sanctions on Russia and Iran, providing a way for pariahs to trade outside the dollar-denominated financial system. China uses gold to buy oil from Saudi Arabia, building enormous gold vaults in



Gold Souk's narrow alleys, crammed with pearls, platinum rings, silver earrings, and diamond-encrusted necklaces—as well as its namesake yellow metal, which can be bought as jewelry, coins, or biscuits.

Traders at Dubai Gold Souk insist their wares are responsibly sourced. But the numbers tell a different story. According to a Swissaid report last year, some 40% of all African gold exports are undeclared, of which 93% goes to the UAE.

The UAE's alleged role in laundering gold is nothing new. In 2016, the UAE declared gold imports worth \$7.4 billion from 25 African countries that had not declared any exports to the UAE, according to analysis by Reuters. The UAE also declared an additional \$3.9 billion more in gold from the 21 other source countries than was declared in their exports.

It's a no-questions-asked approach that has cast the UAE as a key player in the civil war in Sudan. The conflict erupted in April 2023 when a vicious power struggle boiled over between leaders of Sudan's armed forces and its powerful Rapid Support Forces (RSF) paramilitary group. But the war is also a proxy conflict between Middle East rivals, with Qatar and Iran major backers of the Sudanese government, and the UAE, despite its denials, accused by U.N. sanctions monitors of bankrolling the RSF.

Sudan has a storied tradition of gold mining. The territory's northern civilization of Nubia supplied much of the gold for ancient Babylon and Egypt, including for Tutankhamen's tomb. Gold is still the top commodity of Sudan, accounting

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**COCOA FARMER
SICILIA FRIMPONG,
CENTER, WITH
NEIGHBORS IN
HER VILLAGE**

for 70% of exports, with a record 70 tons worth \$1.57 billion shipped in 2024. But a comparable amount is also smuggled out via Chad, the Central African Republic, Ethiopia, and

Egypt—nearly all destined for the UAE.

In addition, Russia's Wagner militia is also heavily involved in the trade, helping funnel some \$2.5 billion of African gold to Vladimir Putin's war of choice in Ukraine, according to the 2023 Blood Gold Report. Both sides have been fighting mercilessly over Sudanese gold mines.

"Minerals and gold in particular are exacerbating the war," says Muhammad Hassan, a Sudanese former aid worker in the Darfur region who has fled to Ethiopia. "These things are very visible."

The quest for nations that produce gold is to ensure it serves as a stabilizing rather than disruptive influence—and for ordinary people to harness the benefits.

Working alongside Steven in Ghana, 21-year-old Sarah had been doing *galamsey* for only a week when TIME visited and says she intends to use her earnings to put herself through tailoring college. "The money is good, but I don't want to do this forever," she says. "Hopefully I can make a good living from dressmaking."

As Sarah speaks, the tiny splatters of yellow mud on her face catch the afternoon sun, making it seem for a moment as if she herself has been lightly gilded. Perhaps one more symptom of a gold fever sweeping the earth. □

'AN ENORMOUS AMOUNT OF GOLD FUNDS CONFLICT.'

—RUTH CROWELL,
LONDON BULLION MARKET ASSOCIATION

CIARA

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Inventions Built for a New Age

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Superior Welds

Dengensha Toa Co., Ltd.

“One major theme in the welding industry is verifying whether a weld is of high quality—it can be very difficult to determine this just by looking from the outside. By collecting visual and tactile data of successful welds and feeding it to AI, we can identify the best conditions and allow a machine to quickly determine successes and failures.”

– President Kenji Yamashita.

Silicone Solutions

Nissin Kagaku Kenkyusho Co., Ltd.

“We are committed to fostering environmental expertise within the company. We receive a number of inquiries related to sustainable products, particularly those that contribute to recycling and upcycling. Silicone, while versatile and durable, often adheres stubbornly to materials, leaving behind stains that are difficult to eliminate. Our silicone dissolver effectively dissolves silicone polymers in liquid and acid, making their removal possible.” – Chairman and President, respectively, Haruo and Yuichiro Kato.

Smart Ramen Machines

NEC Magnus Communications, Ltd.

“I think the role of AI for a manufacturer like us comes in several forms. One is serving and providing convenience for people, for example, by embedding AI in ticket vending machines to improve service. Consider a vending machine with a camera in a ramen shop. AI can detect the gender, size and age of the customer, and then provide recommendations based on accumulated data.”

– President Yasushi Tanaka.

Ultimate Flood Control

Ishigaki Company

“Due to climate change, heavy rain has become a significant issue, and we are providing water exhaust systems to help prevent flooding. Our equipment plays a crucial role in removing water from city water canals, which is vital for disaster prevention. While we initially saw this as a domestic business, the demand for flood prevention equipment has risen in Southeast Asia, where the region is prone to flooding.” – President Makoto Ishigaki.

T&K TOKA Co., Ltd.

MANI Inc.

Takenaka Seisakusho Co., Ltd.

Building Niche Strengths

Takenaka Seisakusho Co., Ltd.

“We built our own system to avoid risks and red flags, and target areas with fewer competitors. In the electronics division, we have strong expertise in the advanced and complex field of power electronics. Few SMEs have the capability to handle design, development and quality control, meaning there is much potential here for our company.” – President Saeko Takenaka.

Recycling Revolution

Mitsubishi Materials Hardmetal

“The Mitsubishi Materials Group, to which we belong, is one of the world’s leading suppliers of cemented carbide, and we have been actively engaged in its recycling for more than 20 years. We thought it would be difficult to achieve additive manufacturing because the melting point of cemented carbide, the main raw material in our products, is extremely high at 1,500°C or more. As a result of our active development, we may soon achieve additive manufacturing of cemented carbide. When this is successful, we believe that we can accelerate the reduction of its consumption.” – President Katsu Yamamoto.

Advanced Medical Maneuvers

MANI Inc.

“As the global standard for medical devices continues to advance and the world’s population grows, demand for our products is steadily increasing. Within the dental field, one of our specialties is root canal treatments, also known as endodontics.

Patients in these cases typically have advanced symptoms, so high-level, technical treatment is required. At the moment, we provide devices for the first two steps of root canal treatment, and eventually, our business will provide devices for other steps as well.” – President Masaya Watanabe.

Powered by Carbon

Sunarrow Limited

“We’re working on products using carbon nanotubes, which we blend into rubber and resin. One of the key applications is in battery-related components, particularly for the automotive industry. The potential goes beyond just cars, with drones and smartphones also key markets as battery technology evolves.” – President Yuji Tokimune.

Innovative Inks

T&K TOKA

“In our products, UV-curing inks are being pushed to be more and more efficient, which contributes to lower energy consumption in curing. Japanese consumers generally have a strong feel for good aesthetics, and this can also be said for consumer food packaging, especially in convenience stores.

For example, as food items may be put in microwaves at high temperatures after storage in a refrigerator, we have to ensure that they can remain stable in these kinds of conditions.”

– President and CEO Nobumasa Ishiai.

The Common Sense Approach to Flood Defense

Japan's Ishigaki Company is committed to providing no-compromise solutions for wastewater and flood defense, providing safety where it matters most.



As climate change fuels increasingly severe weather events, communities around the world face mounting pressure to reduce the impact of environmental disasters such as floods and typhoons. In Japan, a country long accustomed to nature's extremes, public policy is shifting decisively toward prevention and resilience. A prime example is Tokyo's vast *Metropolitan Outer Area Underground Discharge Channel*, one of the largest flood control systems in the world. This engineering feat has already prevented an estimated \$1 billion (150 billion yen) in economic damage, while helping to protect the lives of many in the world's biggest metropolis. The private sector is also experiencing a surge in innovation, as city planners seek out the most effective, no-compromise solutions. Founded in 1958 on the island of Shikoku, Ishigaki Company has built a reputation as a trusted developer of industrial water machinery and engineering life-saving solutions for flood control. Its technologies also support the critical mission of delivering clean drinking water to millions. Ishigaki's aptly named Flood Buster pump plays a crucial role in protecting towns and cities across Japan, especially in areas with many historically significant buildings. "Our equipment plays a crucial role in removing water from city water canals, vital for disaster prevention. Over the past six years, we have sold several hundred of these machines for public civil engineering projects," said Makoto Ishigaki, president of the company. The pump's distinctive form factor allows it to operate at all water levels, reducing the frequency of start-stop cycles, which are a

"Our goal is to ensure that we can deliver top-quality products to the Asian market"

Makoto Ishigaki



The Flood Buster's distinctive design offers clear advantages over conventional water pump systems.

common cause of breakdown for conventional pumps. Looking ahead, the company hopes it can contribute to safer societies not only in Japan, but around the world. Currently, about 25% of Ishigaki's sales come from overseas, with plans to grow that share further in the future. "With Southeast Asia's growing economy and a more attractive yen, the market now has growing potential," Ishigaki said. "Clients from the Philippines have reached out to us, placing orders for flood-prevention equipment. This is a huge opportunity, especially considering the impact of global warming, which is causing more unpredictable heavy rain and extreme weather in regions that have never experienced such conditions before," he added. Beyond flood control, Ishigaki is also active in several other sectors. Sewage sludge treatment has long been a core focus, with the company's latest screw press systems offering a more sustainable alternative. "In the past, centrifugal dehydrators were the main equipment used, but our screw press offers significant benefits," noted Ishigaki. "It helps reduce CO2 emissions substantially, operating with low electricity consumption." In more specialized areas, Ishigaki highlights growing demand from the semiconductor industry. "Our flagship product, the filter press, is especially valuable in managing wastewater from semiconductor production. The manufacturing process generates many small parts and significant waste, which needs to be separated from wastewater. We have seen growing potential in this sector, particularly as semiconductor production expands in Japan and the wider region," Ishigaki said.



A Catalyst of Change for the Chemical Industry

Japanese firm Nissin Kagaku Kenkyusho has bold plans to establish itself as a “true biochemical assistant,” backed by extensive research in the field of enzymes.



Haruo Kato (Right)
Chairman

Yuichiro Kato (Left)
President
Nissin Kagaku Kenkyusho Co., Ltd.

Within the world of chemistry, enzymes are increasingly seen as the key to solving many industrial and environmental challenges. The human use of biological catalysts goes back centuries, often unknowingly, helping to brew beverages, create fertilizers and develop early pharmaceutical products. As sustainability now plays a major role in business decisions, companies in the chemicals sector are now going back to their roots—making use of naturally derived enzymes in favor of harsh artificial chemicals.

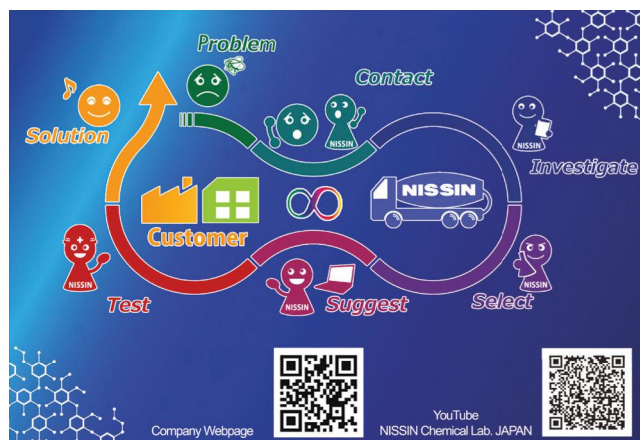
One such firm is Japan’s Nissin Kagaku Kenkyusho. Founded almost one hundred years ago in rural Ehime Prefecture, Nissin’s history began with producing agents for the burgeoning pulp and paper industries and now extends into new areas, including cosmetics and other consumer products. Headed by a father-son duo, Haruo and Yuichiro Kato, serving as chairman and president of the company, respectively, the firm is positioning

itself as a “biochemical assistant,” providing solutions based on its extensive expertise. “We are dedicated to solving the challenges manufacturers face through chemical approaches,” said Chairman Kato.

Enzymes are essential in recycling waste paper through biological means, and in recent years, Nissin has seen remarkable growth around this use case. “We receive a large number of inquiries related to sustainable products, particularly those that contribute to recycling. Many clients ask us to develop solutions that can bring waste materials back to their virgin state, allowing them to be reused,” Kato said. Nissin’s unique silicone-dissolving technology allows for quick and efficient cleaning of machinery in the molding industry, saving both time and labor. Similarly, its pitch control agents, developed from decades of experience in the paper industry, improve product quality. “It is essential first to remove stains from the waste paper. These stains generate sticky substances, known as pitch, which not only impacts product quality, but also cause significant challenges during manufacturing. Our pitch control method addresses this problem effectively,” Kato said.

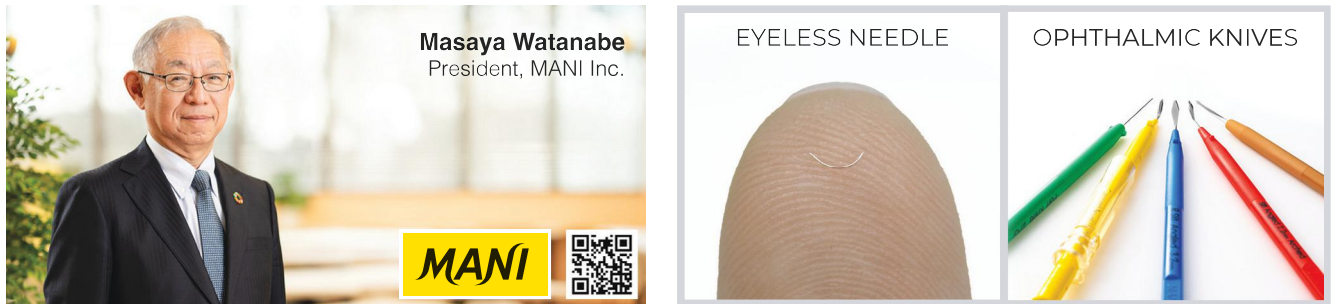
Looking ahead, Nissin has set its eyes on the global market for expansion, with a new dedicated division handling overseas trade. “We are establishing strategic partnerships with companies in Asia and Europe,” said President Kato. “Although still in early stages, we expect our collaborations to support important export activities, enabling us to bring overseas products to Japan and to market our products internationally. Our long-term vision is to become a truly international chemical solutions partner.”

Nissin’s diverse team is ready to take on new challenges in the chemicals industry.



Setting New Standards Across the World

As global standards in the medical field continue to rise, medical device provider MANI is ready to cater to demand with products that meet the highest standards of quality.



Rising disposable incomes are reshaping the healthcare industry in developing regions, as patients seek quality treatment. For MANI, a medical device manufacturer in Tochigi Prefecture, global demand for high-quality tools is having a major impact. Over 85% of the company's sales come from overseas, aligning with President Masaya Watanabe's goal to "become a truly global enterprise." Founded as a supplier of surgical needles in the 1960s, MANI has evolved into a trusted provider for the dental, oph-

thalmic and surgical markets, refining its products for modern needs. "People recognize our device quality and trust their safety," said Watanabe.

The company has developed eyeless needles for robotic surgery, an area expected to grow due to advancements in minimally invasive treatment. "We need to consider our mission in society as both a company and a representative of Japan," added Watanabe. MANI's reach spans over 120 countries and regions, while maintaining its

commitment to a personal approach. "Our mission is to deliver the highest quality to the world, providing localized products for medical industries in each country," said Watanabe. "We aim to build relationships with doctors and other medical professionals that create trust." To achieve this, MANI hopes to establish local headquarters in key markets, from Japan, China and other Asian regions to Europe and the Americas, giving local talent the opportunity to expand their capabilities.

Building Solutions That Last

As a leader in materials innovation, Takenaka Seisakusho is making significant contributions to critical infrastructure projects in Japan and internationally.



Saeko Takenaka
President, Takenaka Seisakusho Co., Ltd.

Japanese manufacturers are responding to demand for high value-added components. For Osaka's Takenaka Seisakusho, years of R&D and collaborations with institutions such as Kyoto University have led to the development of TAKECOAT®-1000, the world's first fluoropolymer specifically for bolts. In environments where seawater corrosion is common, such as oil platforms and pipelines, this innovation is a game-changer. Its importance in these regions can't be overstated. "We have been focusing on overseas markets for over 30 years, responding to global business trends. TAKECOAT® meets the national oil specifications in the UAE and Saudi Arabia, and we are working hard to meet customer needs, including expansion into local markets," President Saeko Takenaka explained. Takenaka is also mindful of how her company can contribute to society. "We have an ongoing project to introduce more environmentally friendly products. I truly hope, as a member of modern society, that we can contribute more and more to a greener, healthier future, and we aim to do this by improving not only our products but also our production methods. Environmentally friendly *monozukuri* will remain a big priority for us as much as continuing to innovate," she said.



Unique Products for High-end Customers

Mitsubishi Materials Hardmetal is ready to exceed expectations, offering custom-tailored tooling solutions designed to meet the unique needs of each customer.

Katsu Yamamoto

President & CEO
Mitsubishi Materials
Hardmetal Corporation



For many years, Mitsubishi Materials Corporation has been a trusted partner to customers who demand the most reliable products. Within its many constituents, Mitsubishi Materials Hardmetal (MMH), formerly known as MMC Ryotec, has long provided customers with the highest quality cemented carbide tools, the go-to material for many of the world's most demanding industries. Company President and CEO Katsu Yamamoto believes that “our mission is to become the main supplier of tools for key industries that underpin society.”

The company is divided into three key pillars, each tailored for different customers. First, MMH's rock tools draw on experience cultivated in mining, quarrying and tunneling projects to meet customer needs for efficient excavation.

Second, the company's wear-resistant tools leverage advanced precision processing to contribute to the technology sector. In particular, slot dies are indispensable for the production of LCD panels, films, lithium-ion batteries, as well as newly developed perovskite solar cells—all of which require precision at the micrometer scale or less.

Finally, MMH's carbide blanks contribute to various industries, utilizing world-class development capabilities and manufacturing know-how in cemented carbide materials.

Moving forward, the company is entering a bold new chapter. “A restructured organization now seamlessly integrates manufacturing and sales, supporting a portfolio where 60% of our business comes from global markets. To advance globalization further, it is essential

to expand production capacity and strengthen our technical services and proposal capabilities for customers,” explained Yamamoto.

Specifically for rock tools, Japan is positioned as MMH's command center for manufacturing, development and technology, serving as a hub for technical services and solution proposals. Meanwhile, their OTEC subsidiary in Thailand functions as a specialized manufacturing site for the company. While the manufacturing of rock tools in Thailand began in the 1990s, beginning in October 2025, OTEC's new plant will boost production capacity and increase direct shipments from Thailand to customers worldwide.

In terms of sustainability, MMH is also setting the stage for strong gains in the future. Regarding tungsten, an essential raw material for cemented carbide tool production, its scarcity has made a stable supply an industry-wide challenge. To address this, the Mitsubishi Materials Group has set a target of raising its tungsten recycling rate from the current 58% to 80% by 2030. “We are actively working to collect and reuse tungsten used by our customers, strongly supporting the realization of a circular economy in the tool industry, and contributing to Mitsubishi Materials' corporate philosophy of ‘For People, Society and the Earth,’” said Yamamoto.

 **MITSUBISHI MATERIALS HARDMETAL**



Voices of Leadership

While much attention is given to Japan's shrinking workforce, its reputation for producing world-class products through diligence remains unmatched. We spoke with several Japanese business leaders to hear their perspectives on the evolving nature of their workforce.

Kotaro Ishizaka, president of JIT, draws on his experience in Singapore to harness his team's strengths. "Many Japanese workers find deep value in their work beyond just pay. I make it a priority to listen to both employees and clients, especially those closest to the front lines," he said.

Hiromi Ishizuka, CEO of Tomei Diamond, sees potential for international investment going forward. "The cost performance of the Japanese labor force is much better than our regional counterparts. I believe there's a real opportunity for FDI in Japan by tapping into our exceptional human resources. That kind of business model could thrive in the future," she noted.

Katsunori Hamasaki, president of Sigma Corporation, instills a clear philosophy. "Our approach centers on five principles: streamlining operations, developing robotics, improving inspection, refining maintenance and eliminating unnecessary processes. These values are embedded across our workforce," he explained.

Joined-up Thinking



"We are ready to offer our customers solutions for many kinds of joining technologies."

Kenji Yamashita
President
Dengensha Toa Co., Ltd.

As a key player in the welding and joining technology sector, Dengensha Toa plays a crucial role in holding Japanese manufacturing together. The company operates across a range of industries from automobiles and rolling stock to steelworks and construction. To keep pace with industry demands, Dengensha Toa is actively developing technologies such as FSSW (friction stir spot welding), solid-phase bonding and laser welding. President Kenji Yamashita, newly appointed as of June, is proud of the value his firm's products can provide. "Japanese carmakers are known for their quality, and much of this stems from the welded parts that make up their automobiles. This year, Dengensha Toa celebrated its 90th anniversary. Looking toward our 100th, we will keep assisting many industries with our joining technologies," said Yamashita.



Recycling Together

Japanese recycling pioneer JIT aims to replicate its leading collection system in new markets.

Kotaro Ishizaka
President
JIT Corporation



The push to improve recycling is expanding into many areas, and one Japanese company believes it may have found the key to making it work. One of the biggest hurdles to ensuring a high recycling rate is having the right infrastructure in place—from collection and transportation to sorting and processing. Take, for example, the humble printer ink cartridge, used in homes and offices worldwide. Japanese firm JIT, based in rural Yamanashi Prefecture, has set a strong example by collecting over 25 million units per year from more than 26,000 collection locations. Taking its name from the famed "just-in-time" inventory management system, JIT is addressing the 40% of ink cartridges that currently don't make it to recycling. The company is also adapting its successful Japanese business model for the Indian market. "Our India business has now successfully installed collection boxes in a range of schools. However, we have still not achieved a satisfactory recycling rate," said President Kotaro Ishizaka. Recycling and corporate responsibility go hand in hand for Ishizaka, who is committed to supporting workers with disabilities through his organization, *Taiyo* (meaning "sun"). "Taiyo operates various employment support programs for people with disabilities, providing opportunities for meaningful work. In Yamanashi alone, we have over 45,000 people with disabilities that we wish to support. We hope to create a warm and welcoming environment—like the sun, hence the name—where everyone can live vibrantly with a smile," Ishizaka said. In its future pipeline, JIT plans to increase revenue by \$33 million (5 billion yen) by the end of the decade, with expansion into the B2B market as a key driver. "We also hope to soon open a further global base in Singapore, strengthening our overseas operations," Ishizaka said.



Ink With an Edge

Japan's T&K Toka is reshaping the printing industry with a combination of innovative ideas, advanced technologies and a strong commitment to sustainability.



Nobumasa Ishiai
President and CEO, T&K TOKA Co., Ltd.

Packaging does more than protect—it informs customers, defines brand identity and drives sales. In Japan, where competition means packaging design can make or break a product, advanced inks provider T&K Toka has built a strong reputation. Founded nearly eight decades ago, the company continues to uphold its mission of “technology and kindness” with a lineup of environmentally conscious inks. Its flagship UV Zero ink is free of traditional photoinitiators—chemicals used in curing via light exposure. With low-impact materials that meet strict safety standards, UV Zero is redefining printing for food, medical and cosmetics packaging. Alongside producing inks that use 50% less energy to cure, and saving costs for customers and the planet, T&K Toka has also developed EB Ink, a VOC-free formula cured by electron beams, reducing odor and heat. President and CEO Nobumasa Ishiai emphasizes a people-first approach. “My focus is on building a tightly knit, efficient team that can engage with the global market. Ultimately, it’s about turning weaknesses into strengths. We see strong potential in Southeast Asia, where Vietnam, Indonesia and Thailand have a growing middle class with rising demand for convenient packaged food,” Ishiai said.



Solving Tomorrow's Challenges, Today

Taking the world's toughest engineering challenges in stride, Sunarrow is bringing flexibility to the future with its advanced silicone rubber and resin molding solutions.



Yuji Tokimune
President, Sunarrow Limited

From medical devices and automobiles to mobile phones and watches, flexible rubber parts play a crucial role in ensuring reliability and durability. Founded in the 1950s, Japan's Sunarrow has grown to become a key player, becoming the first manufacturer in the world to successfully establish a molding process for conductive silicone rubber products. For Sunarrow President Yuji Tokimune, maintaining variety is essential to staying innovative as the company explores new markets, including the medical and robotics fields. “Our market-driven thinking is what sets us apart,” Tokimune said. “Clients

come to us when they can't find solutions elsewhere.” Sunarrow has developed its own proprietary compound, SAR-PLUS—a lightweight, high-performance resin alternative to metal for engineering applications. For high-pressure, high-temperature environments, the company's SGOINT fluorine rubber (FKM) incorporates carbon nanotubes for enhanced performance. “Every successful product we've introduced has come from our commitment to solving real-world challenges,” Tokimune said. “That philosophy will continue to guide us as we move forward.”

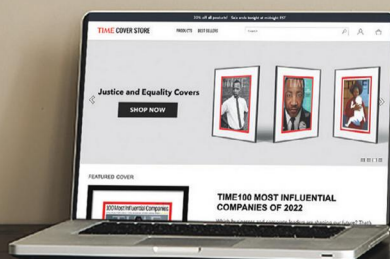


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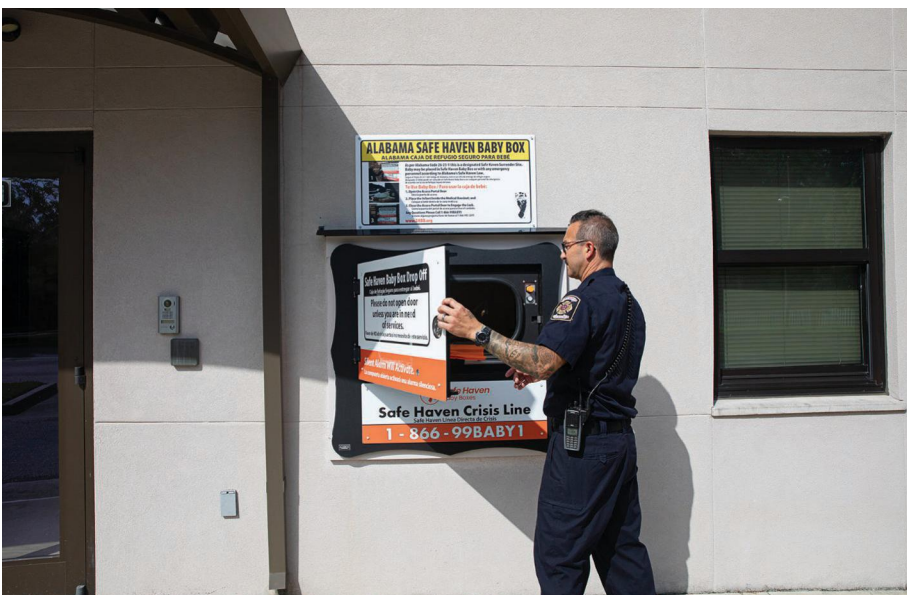
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WHY BABY

Devices to help parents anonymously surrender an infant are spreading across the U.S.—stirring emotions, and debate





THE DOZENS OF PEOPLE GATHERED AT THE FIRE STATION ONE JUNE afternoon quieted when the battalion chief dressed in a heavy blue uniform approached the podium. He was there to bless the fire station's new baby box, a temperature-controlled bassinet installed in the side of the building where parents could safely and anonymously surrender infants that they felt they could not care for. He led the crowd, sweltering in the 90°F heat, in praying over the box: the 18th in Alabama and 344th in the nation.

"Heavenly Father, we come before you to dedicate this safe haven," he began. "We know that each and every child placed not only in this cradle, but similar cradles across the country, are children you formed in the womb, and we know that you have a special plan for all of them."

Afterward, people gathered to take pictures in front of the box, where signs note that a silent alert will activate if a baby is placed in it. A few people discussed the baby boxes that would soon open in the

BOXES ARE SUDDENLY EVERYWHERE

By Alana
Semuels/
Daphne, Ala.

nearby towns of Spanish Fort and Foley, which, like this one, were funded by private donations.

In the wake of the 2022 *Dobbs v. Jackson Women's Health Organization* Supreme Court decision that gave states the ability to essentially outlaw abortion, communities and nonprofits are installing these baby boxes, which cost more than \$16,000 each, in hopes of reducing dangerous infant-abandonment rates and giving more options to women who must carry pregnancies to term. They say the alternative is that mothers will break the law and abandon their infants somewhere unsafe. So far, 22 infants have been abandoned in 2025, according to the National Safe Haven Alliance; 11 were found alive, and 11 were deceased.

In the past two decades, nearly two dozen mostly red states have amended their safe-haven laws, which allow people to anonymously give up their infants for adoption through face-to-face surrenders at hospitals and fire stations, to also permit people to surrender babies in these boxes. The trend has picked up in the past few years.

Mississippi, for instance, passed a law in 2023 that changed its safe-haven law to allow infants to be dropped off in a "baby safety device," and Alabama followed shortly after, allowing the installation of baby boxes at hospitals and fire stations. Now, baby boxes have been approved in more than 18 states, largely ones with near total bans on abortion, including Oklahoma, Kentucky, Tennessee, Virginia, Arkansas, Iowa, Kansas, Montana, Texas, West Virginia, Wisconsin, Idaho, Louisiana, New Hampshire, Florida, South Dakota, and North Dakota. They're supported by antiabortion groups, which say they provide another safe way for mothers in crisis to surrender their babies.

For politicians, the legislation is a low-cost way to seemingly solve a bipartisan issue. "I saw this as a threefold bill: saving a baby's life, keeping a young lady from making the worst decision of her life and being charged with manslaughter, and giving more of those who want to be parents the opportunity for a baby," Representative Donna Givens, the Republican freshman legislator who sponsored the bill in Alabama, told me at the ceremony.

◀ Photos of fire stations in Mobile, Prattville, and Daphne, which installed baby boxes after Alabama's 2023 legislation. The temperature-controlled devices alert staff when the door is opened



PHOTOGRAPHS
BY CHARITY
RACHELLE
FOR TIME

Some places are even spending public funds for these boxes. In 2022, Indiana set aside \$1 million to install and promote safe-haven boxes, and San Antonio budgeted \$500,000 in 2024. In a May bill, Missouri earmarked \$250,000 to help install at least 25 more baby boxes. Lawmakers in states including Tennessee and Arkansas have introduced legislation that would ensure that every county in the state has a baby box. “It’s just growing like wildfire,” Givens says.

But as baby boxes spread, other people are questioning whether this is the best way to support women in crisis. Dozens of doctors, politicians, adoption advocates, ethicists, and lawyers wrote a letter in November 2024 to the U.S. Secretary of Health and Human Services arguing that the boxes “are fraught with unintended harms and negative consequences.” The letter argues that the boxes are unregulated and uninspected by the government, which means they could potentially endanger infants; that the lack of face-to-face interaction in a baby-box surrender deprives mothers of any counseling or medical help after the difficult task of birthing the baby alone and then giving it away; that the anonymous nature of the boxes means that children won’t have any way to know their family or medical history; and that the boxes may also help conceal crimes like rape, incest, or human trafficking.

Lori Bruce, a professor of bioethics at Yale University and one of the letter’s main signatories, says the proliferation of baby boxes and the fanfare surrounding them—most are featured in local news when they open—might lead women to feel as if abandoning their infants is the only choice with support or investment behind it.

“The signs on these boxes don’t provide options; they don’t say you can go to a hospital, where there may be funds to help you keep your baby,” Bruce says. In many ways, the boxes overlook the trauma of surrendering a child, she says, even though “the absolute vast majority of parents who feel that they have to relinquish their child experience unrelenting grief and trauma that never goes away.”

Some critics also argue that the money being spent on boxes would be better spent on giving women the financial and emotional support they need to raise their children. Gretchen Sisson, a sociologist at the University of California, San Francisco, and the author of the 2024 book *Relinquished: The Politics of Adoption and the Privilege of American Motherhood*, interviewed dozens of mothers who gave up their newborns for adoption between 2000 and 2020. Most said they would have kept their babies had they had things like a car seat, for example, or an extra \$1,000 to spend on the child’s care. Most regretted giving their babies up for adoption and went through a long period of depression after the relinquishment.

There’s little evidence that these boxes actually reduce infant-abandonment rates, especially since all U.S. states already allow women to anonymously surrender their newborns at hospitals and fire stations. In Germany, where the first baby boxes appeared around 2000, studies showed they led to no reduction in infant death or abandonment.

Yet since the vast majority of women can’t get abortions anymore in places like Alabama, which passed a near total abortion ban in June 2022, many local politicians are settling on baby boxes as a solution.

“To be a pro-life state, you have to give options,” Matt Simpson, an Alabama state Republican representative who voted for the 2023 state bill that allowed baby boxes, told me at the ceremony. “You have to give that next step. It can’t just be, ‘Well, we’re antiabortion.’”

FIGURING OUT WHAT TO DO with a newborn a mom doesn’t feel equipped to raise is a centuries-old problem. Some medieval churches in Europe had devices called foundling wheels that would allow people

to anonymously leave an infant inside a hatch that would rotate into the building and alert someone waiting on the other side. But in the U.S., abandoning an infant under any circumstances was largely illegal until the late 1990s.

Then, after a few incidents in which infants were found abandoned and dead, Texas passed the country’s first safe-haven law, also known as the Baby Moses law, in 1999. It allowed parents to anonymously surrender an unharmed newborn to staff at designated locations. The rest of the country soon followed.

Though the details of safe-haven laws vary by state, most say that during a short window of time—often up to 30 to 45 days after a baby is born—a parent can anonymously relinquish an infant without fear of prosecution if certain requirements are upheld. (The baby must be alive and healthy, for instance.) The laws establish safe-haven locations and stipulate that the baby be turned over to the state, though in some states, private adoption agencies are allowed to take custody of the child. Most states allow parents to try to reclaim their child if they change their mind within 30 days or so.

Safe-haven laws were pushed by the anti-abortion movement, which held that for some women without access to social and economic resources, relinquishing that newborn is the most noble thing she can do, says Laury Oaks, a professor at the University of California, Santa Barbara,

‘IT’S JUST GROWING LIKE WILDFIRE.’

—DONNA GIVENS, ALABAMA STATE REPRESENTATIVE AND SPONSOR OF THE STATE’S BABY-BOX BILL

and the author of *Giving Up Baby: Safe Haven Laws, Motherhood, and Reproductive Justice*. It’s not a coincidence that these laws were passed right after the end of traditional welfare, which was eliminated in 1996, in an era when women had less support and had to work in order to receive benefits, she says.

Oaks argues that safe-haven laws signal a problem with how a society operates and are not a solution to unplanned pregnancies. They create a dichotomy, she says, in which poor women may feel that they have to do the “right thing”: give up their child. Otherwise they risk being a “bad” mother. “My interests are in turning it around and saying, ‘What safety nets are we missing from our society?’” she says. “I don’t want to be in a society where it is condoned for a person to give birth alone, then be responsible for



getting the newborn to a certain place in order not to be prosecuted.”

Still, people appear to be using safe-haven laws. In 2024, 156 babies in the U.S. were relinquished under safe-haven laws, according to the National Safe Haven Alliance. By contrast, 39 babies were illegally or unsafely abandoned—a 70% decrease from 2004, when more safe-haven laws started going into effect. Infant homicides decreased by 67% in the decade or so after safe-haven laws were introduced, according to the U.S. Centers for Disease Control and Prevention.

Safe-haven laws surfaced in the *Dobbs* Supreme Court case, when Justice Amy Coney Barrett asked why these laws would not be a solution for people to relieve themselves of the “burdens of parenting.” In the final *Dobbs* decision, the majority Justices argued that today, women have “little

▲
Safe Haven Baby Box representative Caitlin Kelly in Daphne, Ala., on June 10

reason to fear” that their babies will not find a suitable home, in part because of safe-haven laws.

IN THE U.S., almost every baby box is sold by a single Indiana nonprofit: Safe Haven Baby Boxes. The device is essentially a big temperature-controlled drawer installed on the side of a building with a lot of information printed on the outside, including the phone number for a crisis line run by Safe Haven Baby Boxes that helps guide people through the process of surrendering a child. When a person opens the drawer and places a baby in the bassinet inside, three separate alarms sound to alert first responders, and an orange bag falls out with information about what rights a parent has, and what a mother’s body experiences after birth.

Safe Haven Baby Boxes are the brainchild of Monica Kelsey, a former medic who founded the company after seeing a baby box on a trip to South Africa in 2015. Kelsey, who was adopted as an infant, sketched out the design for her boxes on an airplane napkin.

Kelsey’s idea hit a nerve. In June 2020, there were just 29 baby boxes throughout the country, and now there are more than 10 times as many. Baby boxes are spreading in large part because of Kelsey, who has an active presence on TikTok. She was abandoned at birth at an Ohio hospital in 1973 (and later learned, when she tracked down her birth mother, that she had been conceived after her mother was raped). She says that she wants to stand up for other children who were relinquished at birth. “This is my legacy,” she said in one TikTok video as she blessed a baby box. “I will forever walk with these moms as they choose something safe for their child, and I will forever walk with these kids and show them their worth.”

Caitlin Kelly, a Mississippi nurse, says she lobbied for baby-box legislation to be passed in Mississippi after a friend showed her Kelsey’s videos on TikTok. “I said, ‘Well, why don’t we have that here?’” says Kelly, who has four children, including two who are adopted, and who is a representative for the company.

There are certainly families ready to adopt the babies surrendered in these boxes. In 2024, eight babies were surrendered to Alabama, for instance, four of whom were hospital surrenders and four of whom were left in baby boxes. The state found families for all of them.

Adoptions can occur quickly. The National Safe Haven Alliance recommends that parents be allowed to reclaim their parental rights within at least 30 days after relinquishment. But that’s not allowed in some states, including Alabama. “There’s no take-backs, no changing your mind,” says Amanda Mancuso, deputy director of children and family services for the Alabama department of human resources.

In Alabama, adoptive parents can get permanent custody of the child within six weeks, says Mancuso. That’s a rapid timeline in a country where most adoptions can take a year or longer.

Still, for many, baby boxes are not a reminder of a tragedy for a woman who carried a baby, gave birth alone, and then abandoned that child. Instead, they're seen with joy.

"It's a fun thing for our foster and adoptive workers," Mancuso says. Families who want to adopt usually want babies, and through these surrenders, care workers can make a family's dream come true. "We have a lot of families who are interested in these children," she says, "and we want to serve those families and serve those children."

COMPARED WITH OTHER safe-haven options, the value of baby boxes is an open question. Micah Orliss, a psychologist and founder of the Safe Surrender Clinic at Children's Hospital Los Angeles, argues that leaving a baby in a box does not add any benefit to the current safe-haven system in many states, in which a mother engages in a "warm handoff," surrendering her baby to a medical professional or EMT.

California, for instance, has dramatically lowered infant-abandonment rates through public-awareness campaigns, he says; the state does not have baby boxes. "The baby-box approach needlessly raises the risk of a child being unattended or overlooked if the system fails in some way," Orliss said in testimony opposing a 2025 Connecticut law that would have authorized such devices. (The bill did not pass.) "It also prevents any scrutiny in the circumstances of surrender, in which the mother may be coerced into relinquishing their baby."

Nationally, baby boxes are not used nearly as frequently as face-to-face surrenders. Kelsey's group has facilitated 234 face-to-face surrenders through its hotline, which counsels women who might want to surrender their babies, but just about 62 babies have been left in boxes since Kelsey started the organization, according to Kelly, the nurse and company representative.

Even many safe-haven groups oppose baby boxes, arguing that the boxes don't deal with the root issues that would force a woman to abandon her baby. The National Safe Haven Alliance, for instance, says it tries to keep families together and provide as many resources to a woman as possible while she's pregnant and after she gives birth. "There's a place for anonymous surrender, but is that what we want to push?" says Leah Kipley, assistant director of the National Safe Haven Alliance. "That's what's been around since the Middle Ages."

Sometimes new parents just need someone to listen, says Nick Silverio, founder of the Florida nonprofit A Safe Haven for Newborns, which helps women who are considering surrendering their infants (and which opposes baby boxes). Last year, Silverio received a call through his organization's 24/7 hotline from a weeping mother who had gone to a fire station to surrender her baby and found the station empty. He calmed her down by talking about her baby, he says, and eventually sent her diapers and wipes and helped her come to the decision to keep it.

Even moms who surrender their babies can have second thoughts, he says. Over the course of two decades, his organization has helped six moms who surrendered their babies and came back for them in a



▲
Father Connor Plessala dedicates the baby box in Daphne, Ala.

short period of time after learning a family member would help, he says.

By bypassing the face-to-face meeting, boxes make it much harder for a trained professional to check in on the mother and make sure she had time to think through her decision and doesn't want the baby back. "Placing a baby in a box eliminates all contact with the surrendering parents and probably reduces the health care professional's ability to determine if the baby is sick, injured, abused, neglected, trafficked, or if the mother needs help," Silverio says.

There can also be consequences down the line, say adoptee-rights groups, who argue the complete anonymity of baby boxes makes it nearly impossible for adoptees to gain any information about their birth parents and extended families. "It's unethical, it denies civil rights to adopted people, it denies the right of the non-relinquishing parent," says Marley Greiner, the co-founder of Bastard Nation, an adoptee-rights group, who writes the blog Stop Baby Boxes Now!

Baby boxes in other countries often facilitate the face-to-face interaction missing in the U.S. model. In Germany, for instance, the organization that sponsors baby boxes puts an ad in the paper when a baby gets dropped off offering to help the mother. About half of the time, the mother goes



back to the facility to pick up the child, according to one 2018 analysis of the German program.

Yet Safe Haven Baby Boxes says that it offers an option women need—that it was “never intended to be a replacement for face-to-face relinquishments or any other safe-surrender options.” The organization says that “relinquishment in a baby box is only intended to expand the options for a mother in crisis.” The group also runs a 24/7 crisis line that it says offers mothers “every possible supporting service and option including a parenting plan, adoption plan, referrals to pregnancy resource centers, face to face surrenders, and, as a last resort, assistance with a safe surrender in a Safe Haven Baby Box.”

The organization says that there are still mothers who want anonymity because they feel judged, have arrest warrants, or are involved with child services for their other children. “The anonymous option takes away the fear and judgment and stigma that might come along with a face-to-face safe-haven surrender,” says Kelly.

**‘WE DON’T WANT TO
ACKNOWLEDGE THE MOTHER.’**

—GRACE HOWARD, SAN JOSÉ STATE UNIVERSITY

OTHER COUNTRIES OFFER AN ALTERNATIVE to baby boxes that many advocates say is better for both mother and child. It’s called confidential birth, and it allows a woman to remain anonymous while receiving prenatal care, giving birth in a hospital, and learning her options, including temporarily placing her baby elsewhere or surrendering it to a third-party organization that will take care of it while she recovers. This helps protect the mother’s mental and physical health while letting her decide what is best for her and her child, advocates say.

After lawmakers in Germany determined that anonymous surrenders deprived children of the chance to learn anything about their parentage, Germany passed a confidential-birth law in 2014. (A German ethics council had also found that baby boxes are a “one-sided” response that does not ensure medical care for the mother or child.) Under the law, a pregnant woman can pursue a confidential birth by calling a 24/7 hotline and getting referred to a nearby counselor. She shares her real name with the counselor and gets access to prenatal and pregnancy care. The counselor does not share her name with anybody else, but her child can, upon turning 16, access the mother’s personal details and contact her. The law also provides a pathway for a woman to regain custody of her child.

Confidential birth is also available in Japan, which has strict abortion regulations and high stigma around single parenting. Studies have shown that almost 40% of women in Japan using confidential birth ultimately decided to keep their children, Bruce says. And in Austria, during the first 10 years of a law that allowed anonymous birth, 90% of women using the country’s safe-haven law gave birth in a hospital.

In the U.S., one of the big obstacles to confidential birth is that birth services must be billed to someone, whether private insurance or Medicaid. That might mean that bills, or other correspondence about the birth, could be sent to a woman’s home, where an abusive partner, for instance, might find them.

But advocates call confidential birth a key way to reprioritize mothers in birth discussions. “We don’t want to acknowledge the mother, or think about the birth mom in crisis,” says Grace Howard, a professor at San José State University and the author of *The Pregnancy Police: Conceiving Crime, Arresting Personhood*, which follows state attempts to criminalize and surveil pregnant women. “If we acknowledge the mother, then we look at the people adopting these brand-new infants, and it’s not romantic anymore. It’s a tragedy.”

One irony of baby-box laws is that they purportedly guarantee freedom for mothers at the same time that many states are taking control over women’s reproductive health in other ways. Alabama, for instance, has made it hard for women without insurance to get access to birth control; its attorney general has vowed to prosecute people who help women cross state lines to get an abortion; its ban on abortion has made it difficult for women to get treated when they’re having a miscarriage.

For all the attempts to control what women are doing during pregnancy, less attention is paid to how they do after birth. The state’s focus shifts, lightning fast, to the baby, and resources for the mothers fade away.

At the baby-box blessing in Daphne, Ala., none of the speakers mentioned the struggles of mothers during and after pregnancy, or the trauma that can follow them after relinquishing a child. Their tone was upbeat, and their focus was on the happy life a child could have—would have, they were sure—should they ever end up in this device.

“We hope this is never used, but if it is, it gives a choice to someone in need,” Daphne’s Mayor Robin LeJeune told me inside the fire station. “If that choice is life, you can’t go wrong.” □

TELEVISION

Inside The Upside Down

As Stranger Things comes to an end, the stakes for Hawkins—and for Netflix—couldn't be higher

BY ELIANA DOCKTERMAN/

ATLANTA, LOS ANGELES, AND NEW YORK CITY

*The cast of
Stranger Things
photographed in
New York City
on Aug. 23*

PHOTOGRAPHS BY
MICHAL PUDELKA FOR TIME





Matt and Ross Duffer have been dying to destroy Hawkins for a decade.

Their show *Stranger Things* became a phenomenon when it debuted in 2016 and has achieved unrivaled popularity in a fractured TV landscape. But the identical twin showrunners knew it would stretch credulity if the citizens of their '80s-era Spielbergian hamlet continued to live in a town overrun by extradimensional threats. So for years, they kept the series' supernatural showdowns to abandoned malls and far-flung Soviet prisons. But now, in the fifth and final season of Netflix's biggest show, the brothers can finally unleash hell on Main Street.

I step onto the Atlanta set in July 2024, ready to watch the mayhem unfold. It's day 135, about halfway through filming, and somewhere between 400 and 500 cast and crew members are working today. Nearly 100 camo-clad extras mill outside the library and enjoy shawarma beside fake bloodied corpses. Stuntmen wait to be thrown into the air by people in gray bodysuits with orange ping-pong balls attached to their heads, who will be transformed into monsters called Demogorgons by the magic of CGI. And it's not even the biggest scene they're shooting this year. "The sets were no less ambitious than the ones I used with Marvel," executive producer Shawn Levy tells me later. Levy directed his last two episodes of *Stranger Things* between wrapping *Deadpool & Wolverine* and starting a *Star Wars* film. "It happens to be a television series, but it's epic storytelling by any metric."

On the day of my visit, the Duffers are directing a series of sequences that, when stitched together, will look like a single shot. From inside a dilapidated Radio Shack, they call, "Action!" Mike, played by now 22-year-old actor Finn Wolfhard, herds a group of children away from danger. "By the end of this scene," visual-effects supervisor Michael Maher tells me, "just about everyone you see standing up is going to be dead except the kids." Ninety minutes and three takes later, Wolfhard wanders

over to the Duffers' monitors and declares the shot looks "sick." Ross agrees.

When the brothers conceived of *Stranger Things* in 2013 as a series inspired by childhood favorites like *Stand by Me* and *E.T.*, they had no idea it would become one of the most profitable shows ever. Data firm Parrot Analytics estimates the series has brought in 2 million new subscribers and over \$1 billion in revenue for Netflix since 2020, the year it started tracking data. And each new installment has grown in cost and ambition. "It puts pressure on every season because it has to perform better than the one prior to it in order to continue to justify growing the scale of the show," says Matt.

Ross jumps in: "We were nervous about Season 4." It reportedly cost \$30 million per episode, \$270 million total, among the most expensive seasons of television ever made. Three years later, Season 4 still sits atop Netflix's most-watched list based on the number of hours viewed, at 1.8 billion. "It was such a relief when it got the viewership it did because you don't want to scale down for your final season."

"Or an abbreviated final season," Matt says. "These were all possible realities." Netflix will not confirm costs for the final installment. But in early October, Puck reported that Netflix spent \$50 million to \$60 million on each of the eight episodes, for a total of nearly half a billion dollars—close to double the previous season's sizable spend. "We don't operate in a bottomless reservoir of cash," Levy says. "Blank checks? No. Big checks? Yes."

Since the show premiered nine years ago, the TV landscape has shifted dramatically. Netflix is doubling down on cheaper reality and international programming. Disney is trimming its costly Marvel slate. Even Apple, which bankrolls series like *The Morning Show* and *Severance* at a reported \$150 million to \$200 million a season, is spending less. Studios are scrambling for shows like *The Pitt* that can be made for a mere seven

figures per episode. TV is scaling down. And yet *Stranger Things* is scaling up.

For Netflix, it's worth the risk. Though the streamer does not release much viewership data, over two years of reporting, one thing becomes clear: *Stranger Things* is Netflix's most valuable property, spawning Halloween costumes, a Tony-winning play, an upcoming animated series, and—if all goes well—at least one spin-off. For the final season, they are trying to achieve Barbie-level cultural saturation with *Stranger Things* partnerships: Nike sneakers, Pandora jewelry, Squishmallow stuffies, *Dungeons & Dragons* games, and even Palermo's frozen pizza.

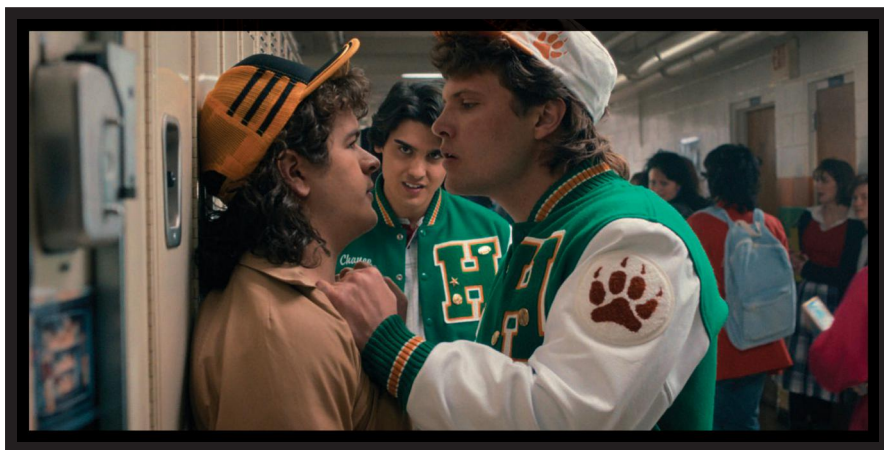
Unlike Disney or Warner Bros., Netflix doesn't possess a deep library of intellectual property to endlessly reboot; it only started producing originals in 2012. Instead, it must license proven stories or build franchises from scratch. And the competition is catching up: in 2021, 80% of the shows on the Nielsen's weekly top 10 lists were Netflix originals, according to the Entertainment Strategy Guy, an oft-cited industry newsletter. Midway through this year, that number is down to 52%. To hold on to subscribers, Netflix needs hits like *Stranger Things* more than ever.

That's why the Duffer brothers' latest move raised eyebrows. This summer they signed a deal with Paramount, which promised them theatrical releases—a dream come true for creators who once described themselves to me as "more movie guys than TV guys." It's a sharp break from Netflix, whose co-CEO Ted Sarandos told TIME in April that movie theaters were an "outmoded idea for most people."

Still, the Duffer brothers say they want to continue building the *Stranger Things* Universe at Netflix. But how expansive—and expensive—that universe becomes may depend on how the series finale is received. "I think everyone was pretty worried, honestly," Wolfhard



PREVIOUS SPREAD: MATARAZZO: UNIQLO; TURTLENECK: LOEWE; TROUSERS: SINK; MAXMARA LOOK; MCLAUGHLIN: THOM BROWNE; JACKET, PANTS, SHOES: AMIRI; SWEATER: BROWN; ISABEL MARANT LOOK; MEJURI EARRINGS; SCHNAPP: YSL LOOK; WOLFHARD: GABRIELA HEARST LOOK; THESE PAGES: STRANGER THINGS: NETFLIX



▲ Ross and Matt Duffer, above, created a nostalgic show that has evolved over time; left, Matarazzo is confronted by bullies in Season 5

tells me over Zoom a year after my set visit. “The way that *Game of Thrones* got torn to shreds in that final season, we’re all walking into this going, ‘We hope to not have that kind of thing happen.’” He fiddles with his oversize headphones. “But then we read the scripts. We knew that it was something special.”

DRONES CIRCLE the Atlanta set, intruders trying to sneak unauthorized footage of the final season. Unlike other

genre epics like *House of the Dragon* or *Shogun*, which are based on pre-existing material, nobody knows how *Stranger Things* will end. That’s a source of intrigue—and an opportunity for leaks. A sense of paranoia pervades the lot.

A year later in their edit bay in Los Angeles, the twins are still guarded. They show me a comically mundane sequence of Lucas (Caleb McLaughlin) and Robin (Maya Hawke) pushing an elevator button in a hospital. It betrays

very little—except that Lucas is visiting Max (Sadie Sink), who has been comatose since the end of Season 4 and apparently remains so midway through Season 5. Dramatic musical cues imply that she will be enlisted in some plan to fight the villain. When I try to coax information out of Sink a few weeks later, she laughs: “They wouldn’t have kept me around if they didn’t have a purpose for me. They would have killed me off.”

The edit suite looks like a dorm room, full of fanboy figurines like a life-size Funko Pop of *Stranger Things*’ protagonist Eleven (played by Millie Bobby Brown) that guards the front door in her blond wig, clutching her favorite snack, Eggo waffles. The twins sit on adjacent black couches in front of a TV.

Stranger Things speaks to a generation that grew up renting VHS tapes from Blockbuster and trading Stephen King paperbacks. The show begins with the

disappearance of a boy named Will (Noah Schnapp). His frantic mother (Winona Ryder) enlists the help of the town's reluctant sheriff (David Harbour) while Will's older brother (Charlie Heaton) recruits his crush Nancy (Natalia Dyer) and her boyfriend Steve (Joe Keery). Meanwhile, Will's nerdy buddies encounter Eleven, a girl raised in a lab with telekinetic powers. She rescues Will from the Upside Down, a parallel dimension that threatens to swallow Hawkins, their fictional Indiana town, whole. But the show's dangers aren't limited to supernatural creatures—sinister scientists, Soviet spies, and government cover-ups loom large.

A final boss emerges: Vecna (Jamie Campbell Bower), a patient from the same lab as Eleven. At the beginning of Season 5, Vecna has disappeared. The gang must hunt him down while avoiding the military, which has imposed a quarantine to cover up the portal that Vecna opened between the Upside Down and Hawkins.

If this all sounds like the fever dream of two boys who gorged on Wes Craven and John Carpenter, that's because it is. The Duffer brothers, 41, grew up in Durham, N.C., and have been writing stories together since the fourth grade, when they directed a movie based on the fantasy card game *Magic: The Gathering*. They pointed a camcorder at friends shooting Nerf arrows and wearing Freddy Krueger masks while a boom box played the scores of Tim Burton movies. Trying to break into Hollywood, the Duffers wrote for the M. Night Shyamalan-produced TV show *Wayward Pines* and made a feature that got shelved for years. Frustrated by the dearth of opportunities, they created their own.

Levy, then known for family-friendly movies like *Night at the Museum*, was not in the TV business. But, in 2015, a beautifully rendered booklet outlining a limited series landed on his desk. It included iconic images from *A Nightmare on Elm Street* and *Close Encounters of the Third Kind*, all in service of a story about a missing boy. Two days later, the Duffers were sitting in Levy's office.

"They were not a slick meeting," says Levy. "Frankly, they seemed like two young adult brothers who had spent most of their lives talking only to each other." They refined the pitch for



▲ From left: Millie Bobby Brown, Noah Schnapp, and Gaten Matarazzo are all grown up

then Netflix executive Cindy Holland, who shepherded early Netflix breakouts like *Orange Is the New Black* and *House of Cards*. The company was willing to take a risk on these unknown writers if their show could add value to the streamer's then small catalog. While most studios write big checks only to proven properties with built-in audiences like *Star Wars* or *The Lord of the Rings*, Netflix's need for homegrown hits compelled them to invest more and more into each season of *Stranger Things*, and it delivered. It's now something vanishingly rare: an original blockbuster. "It's been an advantage in a lot of ways creatively," says Bela Bajaria, Netflix's chief content officer. "We were always going to lean into what's the next big, bold idea rather than what's the IP in the library."

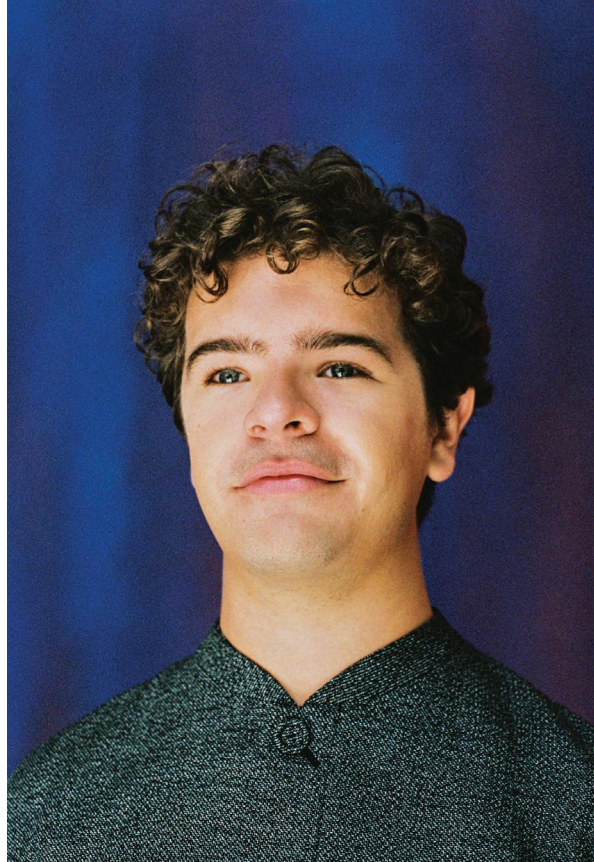
The Duffers' pitch assured networks that the limited series would leave "no loose ends." But the streamer saw franchise potential. "Netflix made us write this big mythology document halfway through Season 1, which at the time we really didn't want to write," says Ross.

Matt continues: "So we went in and pitched Season 2, and it was basically all five seasons. And Cindy just said,

"That's way too much." She advised them to spread it out. "I'm glad we did it because then we had a huge grab bag of ideas, and we sprinkled it throughout all five seasons." (The Duffers and Holland will reunite at Paramount, where Holland now heads up streaming.)

Though the Duffers developed *Stranger Things* as fodder for nostalgic grownups, they also tapped into the magic of watching a Stephen King adaptation as a kid with your fingers covering your eyes. The tween audience only grew as each year a new crop of young viewers discovered the show in Netflix's library. But its popularity exploded in the spring of 2022 with "Dear Billy," an episode in which Max escapes Vecna to the tune of Kate Bush's '80s anthem "Running Up That Hill." Thirty-seven years after its release, the song hit No. 1.

The Duffers attribute the success of that season in part to COVID-19 delays, which allowed them the rare luxury of finishing the scripts for the season before filming began. But the pause exacerbated a running joke among fans that the kids have clearly outgrown the bikes they ride around Hawkins. In real life, they're adults: Schnapp is about to graduate college, McLaughlin sports a beard, and Brown is married with a baby. The brothers bristle at the critique when, they say, many shows feature 20-somethings playing teens. Still, they



‘Everyone was pretty worried, honestly. The way *Game of Thrones* got torn to shreds in that final season.’

—FINN WOLFHARD, ACTOR

felt it was time to offer the fans closure. “We can’t kick any more cans down the road,” says Matt. “Every character’s arc has to be resolved.”

I’M EXPLORING A TUNNEL on the set in Atlanta when I nearly trip over Barb’s body. Covered in inky black vines made partly of spray-painted pool noodles, the dummy’s lips purple and slightly agape with a giant bleeding gash on her neck, the fan-favorite character is half-buried in the ground. Like Will, Nancy’s friend Barb (Shannon Purser) was pulled into the Upside Down in Season 1. Unlike Will, she never made it back. No one cared—except for the fans. #JusticeForBarb going viral was one of the first indications that *Stranger Things* was a sensation. The Duffers didn’t get it.

“The one note that we consistently got back was, ‘What about Barb?’ And we’re like, ‘It’s a show about Will,’” says Ross, rolling his eyes.

“Netflix kept harassing us about it,” adds Matt. “And it turns out they were right.” And now she is back, or at least her body is.

Netflix representatives drive me in a golf cart around the sprawling *Stranger Things* campus. I watch what appears to be a hallucination in which Holly—Nancy and Mike’s baby sister from Season 1 who is now played by 13-year-old Nell Fisher—wanders through a

labyrinthine orange rock formation in a ’50s-era blue A-line dress, reminiscent of *Alice in Wonderland*, blood smeared across her forehead. She turns a corner and looks in horror as Henry Creel (Bower), the person who will eventually become Vecna, staggers forward in pain.

Hilary Leavitt, the president of the Duffers’ Upside Down Pictures, begins to explain how the scene connects to the *Stranger Things* stage production, *The First Shadow*, which premiered on London’s West End before transferring to Broadway earlier this year. Holly’s old-fashioned outfit is an important detail given that Henry Creel acquired his powers in a Nevada cave in the 1950s and, later, when I visit Henry’s sister Alice’s room, there’s an *Alice in Wonderland* picture hanging on the wall—though I’m distracted by a Raggedy Ann doll with a missing eye and a demonic-looking stuffed bunny. As Leavitt leads me down the rabbit hole, the brothers exchange a look, and Matt half-jokingly asks Leavitt not to spoil the season.

Everyone on set is quick to mention the twins’ unusual connection. “They do finish each other’s sentences. They’ll rarely not check in with each other before rendering an opinion, but that checking in is largely nonverbal,” Levy says. They also used to write scenes individually and argue over edits. It took forever. Now, they write simultaneously

in the same Google doc while sitting on opposite sides of the room with headphones on, editing each other as they go. They call it working as a hive mind.

The Duffers’ fingerprints are all over the set. WSQK “The Squawk” 94.5 FM was built to mimic the Art Deco radio station from the Duffers’ hometown. “We did the mall, the arcade, the video store, the skating rink,” says production designer Chris Trujillo. “We’re messing with another touchstone of Americana.” Squawk will serve as the headquarters for the gang as they rebel against the military. “This is where the kids are prepping their hijinks,” says Trujillo. The Duffers add that one of the key inspirations for this season is *Home Alone*—specifically the booby traps. Another is *Terminator 2*; that movie’s star, Linda Hamilton, will play a government scientist named Dr. Kay.

Balancing the core of each character with the show’s evolving tentpole status hasn’t been easy. Harbour’s haunted small-town cop has transformed into an action hero who wields a flamethrower. “The model for TV is *Gilligan’s Island*. Gilligan is always wearing the red shirt and the bucket hat. He’s always going to respond to a situation in a Gilliganesque way,” says the actor. “*Stranger Things* sometimes tries to push the boundaries of that while still maintaining the character as a source of comfort.”

By midnight on set, the cast and crew have settled into that sluggish yet giddy feeling you get staying up all night at summer camp. The lights are so bright that they create the disorienting sense that it’s dawn. The Duffers debate how many takes they’ll need: Matt thinks seven, and Ross shakes his head. “More,” he groans. “How many times are we allowed to throw these guys?”

he says, referring to the stuntmen in fatigues strapped to wires. “Thirteen?”

When I fly back to New York in the wee hours of the morning, I can spot the show’s floodlights from the airplane.

SCHNAPP WAS NERVOUS about crying on camera for the first time. At 11, he was new to acting when Season 1 began filming. So Ryder stepped in. “She was also a child actor, so I think she understood the quirks of having to run to set, cry, then go take a biology test,” he says. “She was like, ‘Oh sweetie, I’ve got you.’ I still do this today.” He demonstrates the technique, holding his hands up and slowly taking five deep breaths.

Several of the young actors say they were lucky to have adults on set looking out for them. But nobody could mitigate the particular challenges of being young and operating in an adult world. “It’s just a symptom of what filmmaking can be, which is chaotic,” says Wolfhard. “As a child actor, you’re trying to make things easy for people. You don’t know how to speak up for yourself. You don’t know how to ask for a break.”

The show’s popularity didn’t help. “It was incredible and subconsciously terrifying to be 13 and all of the sudden everyone knows who you are,” he says. He remembers an overwhelming moment from Season 4: “I was having normal first-relationship struggles and juggling COVID and the show. Halfway through a scene I started hyperventilating. It was kind of like a fishbowl because a lot of the extras are fans. It culminated in sort of a panic attack.” McLaughlin, now 24, and Gatén Matarazzo, 23, pulled him aside and reassured him that they were feeling the same pressure.

That stress hasn’t changed, although the reactions of the young cast have. One difference between the first and final season? “We got along!” says Brown, laughing. “We stopped fighting.” They do admit to regressing to their younger selves on set. “When I’m around Gatén and Finn and Noah, I’m probably the most childish I’ve ever been,” McLaughlin says. “We’re doing these jokes from when we were, like, 12 years old. It’s easy because we grew up together.” The Duffers tailored the scripts to match the actors’ real-life energy.

But Brown, 21, had a slightly different



From left: Sadie Sink, Finn Wolfhard, and Caleb McLaughlin spent their childhoods on sets in Atlanta

experience. “[The Duffers] really got to understand the boys’ personalities,” she says. “Whereas Eleven, you can’t really write to me, because she grew up in a laboratory, and she has powers, and has such a traumatic past.”

Brown, unlike the boys, also had to face sexism. In the spring, she made a video responding to articles that accused her of looking older than her age. When asked what she would say to other young women who face trolling, she’s circumspect: “I don’t really have much to say on the matter. But I’m always going to be a source of advice from the experience I’ve been through.” Brown has carved out a successful career starring in big-budget Netflix projects but has chosen to build a life away from the limelight on a farm in Georgia with her husband, baby, and (at the time of publication) 86 animals.

Navigating the spotlight has also been complicated for 21-year-old Schnapp in part because of an important connection between his character and his real life. Will came out as gay last season, and Schnapp himself came out at 18—but only after spending years struggling to answer questions from journalists

about his sexuality. “When I was younger, I was obviously very scared of talking about it,” he says. “They would pry and ask me, ‘Is he gay? Are you gay?’ I was 12, 13. I didn’t know what to say.”

As the young actors stare down their post-*Stranger Things* future, the Duffers have sought to foster their careers when possible. Sink got an offer to be in Darren Aronofsky’s *The Whale* while filming Season 4. Sink says she’s grateful to the showrunners for working around her schedule so she could leave for two months. “It opened up a new channel of vulnerability to work on this grounded character in a movie without special effects,” she says. “They would have gotten a much different performance out of me in Season 4 if I hadn’t done that.”

After long days of filming, much of the cast decamped to houses in a nearby neighborhood, many within walking distance of one another. Sometimes, they met up at the neighborhood bar. “Yes,” Sink, 23, says. “It might be crazy for some people to hear, but we’re old enough to drink now.”

IN THE SPRING, I attend plays starring Denzel Washington, Paul Mescal, and George Clooney. None elicit the level of frenzy I experience at *Stranger Things: The First Shadow*, where the audience screams to the point of drowning out dialogue whenever the name of



‘It happens to be a television series, but it’s epic storytelling by any metric.’

—SHAWN LEVY, EXECUTIVE PRODUCER

a character from the show is mentioned. Ushers roam the aisles flashing lights at people trying to film scenes on their phones. A girl a few seats down clutches a nightmare-inducing Demogorgon plushie purchased in the lobby.

Kate Trefry, a *Stranger Things* writer who co-wrote the *First Shadow* story with the Duffers and *Harry Potter* and *the Cursed Child* scribe Jack Thorne, tells me that 60% of the primarily young theatergoers who come to the show have never been to a play before. “I think the response is the pure shock and joy of seeing something performed live for the first time,” Trefry says. “If you’ve been watching stuff on your computer your entire life, and then you go to the theater and all of a sudden, action is happening, that’s pretty visceral.”

The spectacle sets up an elaborate origin story for Vecna and ties into the final season. At the end of the show, Netflix’s “Next Episode” button appears to not-so-subtly remind the crowd to tune in this fall. I ask Bajaria what *Stranger Things*’ final season needs to achieve to justify the no-doubt hefty cost. To Bajaria, the obvious benchmark is cracking Netflix’s list of the most popular shows ever. But it’s about more than just the numbers: “The other part is, do fans love it?” Netflix measures that love in metrics like a 14% boost in Eggo sales after Season 1 or a 600% search increase

in *Dungeons & Dragons* after Season 4.

And Netflix will stoke the conversation by releasing the season in three parts: four episodes the day before Thanksgiving, three on Christmas Day, and the series finale on New Year’s Eve. Netflix executives suggested debuting the movie-length finale on its own to head off spoilers. “Everybody thought it was a good idea,” says Bajaria, “for people to be caught up and have that shared experience of watching it together.”

Christopher Hamilton, a streaming expert at Parrot Analytics, expects the series finale to be a “victory lap” regardless of fan reception. “Attention is attention. Even if people are up in arms, they are going to watch it,” he says. “*Game of Thrones* was obviously controversial. But the finale set a series record. And [the prequel] *House of the Dragon* has been huge.”

Given *Stranger Things*’ success, it’s surprising the streamer hasn’t mined the IP even more aggressively. The Duffers are producing two upcoming Netflix shows, *Something Very Bad Is Going to Happen* and *The Boroughs*, though neither ties into *Stranger Things*. Levy claims the creative team has turned down “opportunities that would have been low-hanging fruit but didn’t feel organic to our story.” Yet in June, the Duffers told me they did have an idea for a *Stranger Things* sequel. “I’m kind of

surprised there hasn’t been more pressure [from Netflix],” says Matt. “They would love us to go in and pitch it, but they haven’t forced us to do it.”

I press Bajaria on why Netflix hasn’t done just that. “We’ve always talked about it loosely,” she says. “For them and for us, it was really important to make sure that all of their focus, time, and energy was being spent on making sure they deliver an incredible last season that people love.” She pauses. “But I’ll say when they’re ready, I’m ready.”

Netflix—and the fans—may have to wait. Season 1 of *Stranger Things* premiered nine long years ago. “We write pretty quick,” says Matt. “I’m sure most people, if they heard me say that, would laugh because they think we’re so slow. But we’re writing, basically, five to six movies in a season.” And with the Paramount deal in place, the brothers now have even more on their plates.

When I reach out in late September to both Netflix and the showrunners to ask about the franchise’s future, both decline to comment. But it is clear any continuation would demand the brothers’ involvement. “It either has to come from us or someone who comes to us super excited about an idea, not from Netflix. Otherwise you’re just making stuff to be making it, and then it’s going to diminish the brand,” Matt told me in June. “You’ve seen that too many times.”

Creatively, a long pause may not be a bad thing. Just as Ryder returned to the *Beetlejuice* franchise 36 years after the original, there’s always a chance the cast could revisit the show that made them stars. “I would love to play Dustin at another point in my life. It would definitely have to be a long time from now,” says Matarazzo. “But if in 15 years they call, I would be lying if I said I wouldn’t jump on that instantaneously.” —*With reporting by* SIMMONE SHAH

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SHINMEI Holdings Co., Ltd.
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Uematsu Home Medical Clinic,
Yusui-Kai Uematsu Clinic
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Koushi-Kai Medical Corporation,
Okuhara Dental Clinic
Chairperson

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Issei Yamamoto
Turing Inc.
CEO

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Ishin-Kai Medical Corporation
Ginza Oda Clinic, Boao International Hospital (China).
Chairperson and Director

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As times evolve and trends come and go, truly successful businesses are guided by leaders with long-term vision—those who not only adapt, but turn challenges into opportunities for growth and innovation.

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TIME100

CLIMATE LEADERSHIP FORUM

On September 24, TIME convened top climate leaders for the second-annual TIME100 Climate Leadership Forum, featuring a series of conversations to spotlight solutions and encourage action.

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WALLY ADEYEMO FORMER DEPUTY SECRETARY AND CHIEF OPERATING OFFICER, U.S. TREASURY; GREG JACKSON FOUNDER AND CHIEF EXECUTIVE OFFICER, OCTOPUS ENERGY; SYLVIA EARLE EXPLORER-AT-LARGE, NATIONAL GEOGRAPHIC; FOUNDER AND CHAIR, MISSION BLUE; ARUNABHA GHOSH CEO, COUNCIL ON ENERGY, ENVIRONMENT AND WATER AND SPECIAL ENVOY FOR SOUTH ASIA, COP30; JON CREYTS CHIEF EXECUTIVE OFFICER, ROCKY MOUNTAIN INSTITUTE

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BEST INVENTIONS

FOR OUR ANNUAL LIST OF THE YEAR'S MOST EXCITING INNOVATIONS, *TIME* EDITORS HUNTED THROUGH PRODUCTS AND SERVICES TO SELECT 300 INVENTIONS THAT MAKE THE WORLD BETTER, SMARTER, OR JUST MORE FUN

PHOTOGRAPHS BY SPENCER LOWELL FOR TIME

ROBOTICS

THE ROBOT IN YOUR KITCHEN

Figure 03

BY BILLY PERRIGO/SAN JOSE, CALIF.

A DOZEN OR SO YOUNG MEN AND WOMEN, EYES obscured by VR headsets, shuffle around a faux kitchen in a tech company's Silicon Valley headquarters. Their arms are bent at the elbows, palms facing down. One stops to pick up a bottle of hot sauce from a counter, making sure to keep her hands in view of the camera on her headset at all times. Like her colleagues, she wears a T-shirt emblazoned with the word *HUMAN*.

Meters away, two humanoid robots, with bulbous joints and expressionless plastic domes for faces, stand at a desk. In front of each is a crumpled towel; to its right, a basket. In slow movements, each robot grabs a towel by its corners, flattens it out, folds it twice, and deposits it into the basket. More often than not, the towel catches on the edge of the basket and the robot freezes. Then an engineer steps in and returns the towel to a crumpled heap, and the sequence begins again.

This was the scene at the Silicon Valley headquarters of Figure AI on an August morning. The three-year-old startup was in a sprint ahead of the October announcement of its next robot, the Figure 03, which was undergoing top-secret training when *TIME* visited. The robots folding towels were the company's previous model, the Figure 02, operating the same software that the Figure 03 will use, and which, along with the headsetted human "pilots," were collecting data to train the new robot. Figure hopes the Figure 03 will soon become the first robot suitable for carrying out domestic chores in the home, as well as all kinds of manual labor. They hope it will be their first mass-producible humanoid, eventually even working on its own production line. The launch is a critical moment for this startup of 360 people, which in September announced it had secured \$1 billion in investment at a valuation of \$39 billion, and which counts Nvidia, Jeff Bezos, OpenAI, and Microsoft among its investors. (Salesforce, whose CEO and co-founder Marc Benioff owns *TIME*, was also announced as an investor in September.)

Humans have been making robots for decades. Moving robotic shelves sort packages for Amazon, robotic arms assemble cars across the auto industry, and entire factories in China operate with the lights out because they employ no humans at all. But for the most part, these robots look markedly unhuman, are built for tightly scoped tasks, and



**COMPANIES ARE
RACING TO CREATE
THE FIRST VIABLE
HUMANOID ROBOT**

tend to operate in controlled environments, segregated from their human peers. Achieving “general robotics”—building a humanoid robot that can navigate the unpredictabilities of the world with the same fluidity as a person—has for decades remained a distant dream.

Until now. Dozens of companies are racing to be the first to create a viable humanoid robot. Figure faces stiff competition from Tesla's Optimus division and China's Unitree, among many others. The size of the opportunity they are chasing is roughly \$40 trillion, according to Figure AI's CEO Brett Adcock, who arrives at that number by calculating the value of all the labor in the global economy. Figure stands out among its rivals because it is overtly targeting putting robots in the home—a domain that many of its competitors believe is still many years away. “Every home will have a humanoid,” Adcock says. “We think there will be billions in the workforce, doing work every day.” General robotics, he proclaimed in July, would be solvable within 24 months. Perhaps 18.

Of course, tech CEOs are known for making exaggerated claims. But Adcock's optimism is at least partially grounded in real progress. In the past three years, computer scientists have developed AI that for the first time can do something that approaches “understanding” our messy world. These neural networks can take an image or video

and tell you what appears to be going on. They can follow complex, vague, or open-ended instructions. They can simulate reasoning. These advancements have significantly lessened the once fearsome challenge of developing a machine that can cope with the unpredictability of earthly affairs. To boot, the hundreds of billions of dollars sloshing around the AI industry has given investors plenty of cash to back up their optimism.

At launch, the Figure 03 isn't ready for domestic use, Adcock says. "We want the robot to be able to do most things in your home, autonomously, all day," Adcock says. "We're not there yet. We think we can get there in 2026." Before that, it will be made available to a list of Figure's partners for testing. In September, TIME witnessed the Figure 03 load items into a dishwasher and clear clutter from a table. It had more trouble when faced with folding T-shirts.

ADCOCK, 39, IS a serial entrepreneur who founded Figure AI in 2022, after becoming convinced that humanoid robots were the future. Within a year, the company had built a hulking robot with exposed wires—the Figure 01. A year after that, they built the sleeker Figure 02. In 2024, Figure signed its first customer, BMW, and began putting its robots on the factory floor. In April, the companies expanded that partnership, with multiple Figure 02 robots "working 10 hours a day, five days a week" at BMW's Spartanburg, S.C., factory, a spokesperson for the carmaker said in a statement. "The parts loaded by the robot are incorporated into the BMW X3, which is assembled at the plant."

It is an ordinary sight at Figure's offices to see Figure 02s wandering past conference rooms, or venturing out into the parking lot with supervision. But when TIME first visits in August, the Figure 03 is tightly under wraps behind a set of locked security doors. I catch my first glimpse of the new robot—or at least, a disassembled version of it—laid out on what looks like an operating table covered in some 30 whirring actuators, wires, and circuit boards. Among the Figure 03's improvements over the Figure 02: its moving joints are smaller

and stronger; its components are 90% cheaper to manufacture; its hands are slimmer, with tactile finger pads and a camera in the palm for delicate tasks; its battery is less prone to catching fire. When I finally see a fully assembled version, its sleek figure makes plain that it is a lighter machine overall—a feature designers say is intended, in part, to make it less intimidating.

Even though the robot is barely completed, the Figure team is bullish that future advancements will come thick and fast. Adcock says Figure's internal neural network, called Helix, is capable of learning new tasks with staggeringly small amounts of data; its current towel-folding abilities have come from only 80 hours of video footage. That's where the pilots come in, tasked with filming themselves carrying out tasks that Figure wants its robots to master. Adcock's argument that data is the biggest missing piece makes some sense: large language models proved that "scaling" neural networks on masses of data could yield miraculous general capability improvements. But its corollary—that major performance increases are just around the corner—is also a convenient way for this company with huge costs, an unproven product, and no publicly disclosed revenue to justify its soaring valuation.

I'm given a demonstration of what executives say will be a new "memory" feature that ships with the Figure 03. (An android butler, of course, is of no use if it cannot remember where to put your laundry.) A Figure 02 stands at a table, upon which lies a white cap, a gray cap, and a blue cap. Corey Lynch, Figure's head of AI, performs a version of the test of object permanence given to babies: he places a set of keys under the blue cap, then switches the positions of the hats on the table. An engineer types: "Show me my keys." The robot picks up the correct hat, revealing the keys. It's a demonstration of what Lynch says is an essential capability for domestic robots.

In an audio studio, a limbless Figure 03 demonstrates another new capability—responding to voice prompts, rather than text—with a prank: engineers invite me to ask the robot a question, only for it to respond lucidly in my own voice, which they

OUTDOORS

SKI-SEASON SAVER

Snow Secure Insulation Mat

Finnish firm Snow Secure's white polystyrene mats, laid on top of natural or manufactured snowdrifts at the end of ski season, both insulate and shield from sun and rain to retain the snow when it gets warmer. They were recently adopted in North America, including at resorts in Idaho and New Mexico.

—Alison Van Houten

SPORTS & FITNESS

PORTABLE WEIGHTS

Beyond Power Voltra I

The Voltra I shrinks a weight room into a shoebox-size device for strength training without a gym. Once mounted to a wall or other sturdy anchor point, an internal motor can generate up to 200 lb. of resistance. A touch screen lets users toggle modes to imitate resistance bands or traditional weights. —Ashley Mateo

AEROSPACE

SPACE INTERNET

AST SpaceMobile BlueBird

AST SpaceMobile produces satellites with the largest commercial antennas ever deployed in low-earth orbit. Five of its BlueBirds are already circling, and even larger satellites planned would enable peak transmission speeds of 120 Mbps, new benchmarks for space-beamed internet.

—Marina Koren

GREEN ENERGY

GRAINS OF ENERGY

Polar Night Energy Sand Battery

Polar Night Energy's first industrial-scale sand battery went into operation this summer, using sand to store wind and solar energy as heat. It now contributes heating for the 5,000 residents of Pornainen, Finland, using crushed soapstone left over from a fireplace manufacturer. —M.K.

have apparently cloned using AI. It's an impressive but profoundly unsettling experience.

It's clear that innovation is proceeding quickly at Figure. Believe it or not, folding a towel even some of the time is seen as an impressive achievement in today's robotics industry, given how many unique forms crumpled fabric can take. Even more striking is that most of the capabilities I'm being shown aren't the result of separate programs that are individually loaded onto the robot, according to the company. They are instead all being learned by the same Helix neural network. It is structured a bit like our own cognition. One part, "system one," is comparable to our nervous system. "System two" is more like our logical brain. It includes an open-source AI reasoning model trained on text and imagery from the internet, and helps the robot understand the scene and decide what actions to take. Then it sends messages to system one, which translates those directives into instructions that tell the dozens of motors in the robot exactly what to do, up to 200 times per second.

A third neural network, called "system zero," handles base reflexes like balance. The engineers explain that the robot's balance and locomotion have been trained in a simulated environment with slopes, obstacles, and interfering forces, where it has been run for hundreds of thousands of virtual hours. There aren't yet simulations that mimic the real world with enough fidelity to be useful for training more complex tasks—hence the ongoing need for human pilots. The company will spend much of the new \$1 billion on its balance sheet hiring humans to collect first-person video data, Adcock says. Figure is currently filling an entire loft on its San Jose campus with varied kitchen and factory layouts, and will soon also begin collecting data from inside residential and business properties owned by its investor Brookfield. In this way, Helix will soon go from being trained on thousands of hours of video data to millions.

Some roboticists aren't convinced by this strategy. "To think we can teach dexterity to a machine without ... being able to measure touch sensations ... is probably dumb [and] an expensive mistake," wrote Rodney Brooks, the



co-founder of Roomba maker iRobot, in a September blog post. "Simply collecting visual data ... alone can't possibly be enough to infer how to be dexterous."

Whatever the answer to this open question, Figure will soon find it out. If it works, it's possible that collecting data to train robots will become an increasingly large segment of the labor market, just as it already has for the many thousands of digital workers who train cloud-based AI models. But those jobs might not last long; once a skill has been learned, it can be loaded onto Figure's entire fleet of robots forever. And the company may eventually collect increasing portions of its training data not from humans but from simulations, or even its own growing fleet of robots.

A CENTRAL TRUTH about today's AI is that it is unpredictable. But a hallucination by a chatbot is annoying; a hallucination by a robot could be deadly. Adcock professes to take safety seriously. He is testing a Figure 03 in his

own home, where he has young children. (There the machine is subject to "hardcore babysitting," he says.) Figure also has an internal version of Isaac Asimov's famous three laws of robotics, which state that a robot cannot allow harm to come to a human, through action, inaction, or another's orders. Adcock declines to share details of Figure's three laws, saying they're proprietary. Getting safety right is the main barrier between Figure and the trillion-dollar opportunity of general robotics. "Getting the robot to be extremely safe in the home long-term is a really hard problem, maybe one of the hardest problems we face," he says. In fact, it is a cascading set of problems: making sure the robot doesn't cause harm accidentally; making sure the "reasoning" model in its system-two brain makes safe decisions; and ensuring that when the system-one nervous system must bypass system two to respond quickly to some environmental change, these reflexive actions are not also unsafe. Then there's making

GREEN ENERGY

POWER UP

Bluetti Apex 300

This 80-lb. portable power station is ready for campsites, RV and van-life nomads, and home blackouts. It's the first to offer 12,000-watt bypass capability, enough to simultaneously run heavy appliances (like a dryer) and even charge an electric car. It can be recharged via gas generator or solar panels.

—Natasha Frost

HEALTH & WELLNESS

TREATING BV

Wisp Male BV Partner Treatment

In March, a landmark study demonstrated that although bacterial vaginosis (BV) affects only women, sexual contact plays a key role in transmission, so treating male partners prevents recurrence in women. Within a month, Wisp launched the first prescription antimicrobial treatment regimen for male partners. —Charlotte Hu

FOOD & DRINK

LASTING LONGER

Tropic Nonbrowning Banana

To extend shelf life and reduce food waste, Tropic this year introduced the first nonbrowning banana. The banana, made using precision gene-editing techniques, stays fresh at least 12 hours after peeling and doesn't brown as easily.

—Catherine Boudreau

TRAVEL

QUICK CHARGE

ESR CryoBoost Foldable 3-in-1 Magnetic Charging Station

This charging stand meets cutting-edge induction standard Qi2.2, and ESR's cooling tech uses a quiet, ultra-thin fan to cool devices (instead of just cooling the charger); it keeps things 4°C cooler than non-CryoBoost Qi2.2 products and therefore boosts battery more quickly. —Alison Van Houten

sure that the robot's memory, which includes all the most intimate details of your home life, is safe from hackers. If it's any consolation, the Figure 03 is at least designed to not be strong enough to be physically harmful. "You'll be able to overpower all the robots," Adcock says. "And outrun them."

And that's before you get to the question of data collection. Because Figure needs more data to train its robots, the company plans to eventually use data from people's home robots to train future models, Adcock says. Figure has "every intention to do the right thing with everybody's data," including scrubbing personal information from it and using image blurring before using it for training, he says.

All of which might make putting a Figure robot in one's home a daunting proposition. Competitors such as Texas-based Apptronik, which works with Google on humanoid robots, are first targeting industrial use cases—leaving the home as a goal to be tackled in years to come, once the safety and reliability challenges are solved. "I want a robot in my house as much as anyone does," says Jeff Cardenas, Apptronik's CEO. "I'm tired of folding my laundry. But there's a lot of things that we want to solve and make sure we get right before that can scale."

IF THERE'S EVEN a small chance that this audacious company can succeed in its goal, the implications would be world-changing. With the global population expected to peak this century before heading into decline, the arrival of robots could allow the world economy to continue growing even as human labor becomes less abundant. Robotic labor could cause the cost of goods and services to plummet, potentially enabling an improved quality of life for all. If the arrival of the domestic robot is anything like the arrival of the washing machine and the dishwasher, it might be a boon for women, on whom the majority of domestic burdens still fall. And as the global population shifts elderly, robots might play a crucial role in helping people to grow old with dignity.

But liberating humans from work would also mean liberating them from

their paychecks. Robots can perform labor for longer than eight hours per day, and they don't demand breaks, rights, or wages. Populations would lose their bargaining power, and robot police and armies could turbocharge forms of coercive control. In Adcock's imagined future, the AI and robotics revolutions will need to be accompanied by something like a universal basic income. But there's also an alternate future—perhaps one that more resembles the current political economy—where tech trillionaires lock in their new power, sideline the state as a political force, and usher in a world where most people are trapped in a permanent underclass.

"This technology has a tremendous potential to provide value, and provide good, but if it just makes large corporations richer, that's not going to be a good outcome," says Hans Peter Brondmo, a former vice president at Google's Everyday Robot project. "I believe [robotics] is less of a technological challenge, and more of a policy challenge. We need to fundamentally rethink the social contract."

Asked about the potential for his inventions to cause suffering rather than liberation, Adcock counters with optimism. "When you have automation systems that can basically do everything a human can, and that will ultimately build themselves and self-replicate, I think the cost of goods and services collapses to a point where it raises wealth for everybody," he says. "This new age of technology is going to be very prosperous for everybody in the world."

On a sunny morning in September, Adcock welcomes a TIME video and photo team into his weekend home in the Bay Area. The Figure 03 is ready now, having been completed just a week earlier, and five of the robots take shifts demonstrating their capabilities on camera. One robot puts dishes into a dishwasher with an impressive degree of accuracy. Another loads laundry into a washer-dryer—but is still unable to pick up items that it drops. Yet another 03 has trouble folding T-shirts. The robot clearly has a long way to go. But a week ago, it didn't exist. —With reporting by DILYS NG



FOOD & DRINK

WASTE-FREE SPARKLING WATER

Aerflo System

“Aluminum cans are only around 50% recyclable in the United States,” says Aerflo co-founder Buzz Wiggins. “The rest goes to waste.” His company’s solution—a water bottle with a svelte carbonation unit built right into the lid—aims to reshape the \$40 billion sparkling-water industry. Launched in 2024, the company miniaturized its design and worked with the U.S. Department of Transportation to become the first federally permitted business to ship CO₂ through the USPS. Its mail-in refill program cycles its carbon capsules back to its New Jersey facilities for reuse, eliminating more than a million single-use containers in a year.

—Alison Van Houten

MEDICAL & HEALTH CARE

HORMONE-FREE IUD

Sebela Miudella

Approved by the U.S. Food and Drug Administration in February, Miudella is the first hormone-free copper IUD in the U.S. to achieve this designation in 40 years—and the smallest available. Its flexible nitinol frame compresses into a smaller insertion tube, conforms to different uterine shapes, and allows for strategic placement with less material, reducing heavy bleeding and cramping. “You shouldn’t have to trade off ... for a highly effective contraceptive,” says Kelly Culwell, an ob-gyn and head of research and development at Sebela Women’s Health. Miudella comes in a tapered inserter—making insertion easier—and prevents pregnancies for up to three years. —Laurny Higgins



SPORTS & FITNESS

RECOVERY ON THE GO

Hyperice and Nike Hyperboot

Your feet and ankles act as your body’s suspension system—the foundation of every step, stride, or jump. Hyperice’s Normatec leg sleeves, which provide

compression to increase blood flow, have gained popularity as a muscle-recovery tool, but are bulky when worn, immobilizing the wearer. Founder Anthony Katz set about redesigning all the components of the leg sleeves into what’s essentially a puffy high-top sneaker. The new Hyperboot from Hyperice and Nike fuses compression and heat to loosen the fluid lining ankle and foot tissues so you can move more easily and reduce the risk of injury. —Ashley Mateo

PHOTOGRAPHS BY PETER GARRITANO FOR TIME

MEDICAL & HEALTH CARE

TESTING FOR BRAIN INJURY

Abbott i-STAT TBI

During head traumas like concussions, the brain's cells release two proteins. Abbott's i-STAT TBI (traumatic brain injury) test takes only about 15 minutes to check for these biomarkers, offering a much quicker alternative to CT scans. The medical community long thought a TBI blood test was impossible, largely because of the blood-brain barrier. "It was a tall order, and there was no road map," Dr. Beth McQuiston, medical director of diagnostics, says. It got FDA approval in 2024, and MotoAmerica has already used it during motor-cycle races. —Kali Hays



OUTDOORS

AN ICE-FREE COOLER

Anker Solix EverFrost 2

This electric cooler doesn't require ice, can stay cold for days, and is quick to charge ahead of a camping trip or another off-grid adventure. Chinese company Anker Solix invented a battery-powered, air-cooling technology for the EverFrost 2, which comes in three sizes. The 40-liter version is easily powered up by a wall outlet, and cools to a set temperature within minutes. (Other charging options are a car socket, USB-C cord, or portable 100-watt solar panels—which Anker Solix also sells.) A mixture of beer, produce, meats, and snacks fits inside. Two caveats: it's very heavy, and costs \$600 to \$760. —Catherine Boudreau

FOOD & DRINK

LAB-GROWN FATS

Savor Butter

Savor is making animal-free fats that chemically match the real stuff, but have lower CO₂ emissions, water use, and land use than their agriculture-based counterparts. Starting with water and either carbon dioxide or methane, the food-tech firm uses a thermal process to build fatty acid molecules, which can then form fats like milk fat and butter. It launched Savor Butter in March, adding a little rosemary and thyme extract for grassy under-notes. It behaves, and tastes, just like regular butter. Savor has been used in Michelin-starred restaurants like SingleThread and Atelier Crenn, and even made a collection of chocolate bonbons, on sale in December.

—Charlotte Hu



SUSTAINABILITY

FIGHTING FLOODING

Kind Designs Living Seawalls

Anya Freeman loved living in Miami Beach—except for the frequent flooding. So she founded Kind Designs, which puts a thoughtful spin on seawalls, structures that have protected vulnerable shorelines for decades. The company's Living Seawalls are 3D-printed from a nontoxic concrete mixture, and can be custom shaped to suit local flora and fauna: mangrove roots in Miami, barnacles and seagrass in New York. Their richly textured surfaces dissipate waves while providing habitats for sea life. Since October 2024, Kind Designs has installed nine Living Seawalls across the Miami-Fort Lauderdale area, and won grants from the U.S. Navy and Air Force to fortify their coastal bases. —Marina Koren



ROBOTICS

A PERSONAL VIDEOGRAPHER

HoverAir X1 Pro Max

The catch-22 of documenting life's moments is that you have to step out of those moments to capture them. Not with the HoverAir X1 Pro Max, an action camera that's small enough to slip in a pocket. The device flies alongside users as they carve down a ski slope or run across a ridgeline, shooting 8K video and tracking them using AI. Built-in sensors help avoid collisions, but it's also made from an aerospace-grade material that's flexible and tough enough to survive an inevitable crash. —A.M.

MEDICAL & HEALTH CARE

SIMPLIFYING CLONING

Colossal Biosciences Noninvasive Blood Cloning

Cloning can be a vital tool for saving some of the 47,000 species threatened with extinction. Colossal Biosciences—the company that famously de-extincted the dire wolf—has found a way to make it easier. Cloning previously involved harvesting skin or tissue cells from the donor animal, but Colossal has successfully cloned animals using endothelial progenitor cells (EPCs), which line blood vessels and can be harvested with a simple blood draw. EPCs are also heartier than skin cells, and divide faster. "As biodiversity loss accelerates worldwide," says CEO and co-founder Ben Lamm, "EPCs offer a more humane, efficient pathway to safeguarding genetic heritage for future generations."

—Jeffrey Kluger

EDUCATION

AI GUARDRAILS

Turnitin Clarity

As concerns about AI-fueled cheating mount, Turnitin is trying to use the tech to support students and educators. Clarity, its software now being piloted by scores of high schools and universities, features a digital platform where students draft assignments and—when teachers permit—access approved AI tools that provide feedback rather than answers. Educators can review version histories to see how submitted assignments were created, to detect AI use and whether anything was plagiarized.

—Jared Lindzon



DESIGN

A COMPACT SYNTHESIZER

Telepathic Instruments Orchid ORC-300

Tame Impala's Kevin Parker took making music one step further and made a new instrument. His brainchild, the Orchid ORC-300, is a compact synthesizer with a single octave of keys that can fit in a backpack and lets players create complex chords with minimal musical expertise or technical dexterity. Why chords specifically? "Every song's got to have chords," he says. "They're the part that slows me down when I'm writing." Although there are plenty of tools to make songs sound polished, Parker says "there aren't many things to help with the actual genesis of the song." The first 4,000—released in two drops—sold out in hours.

—Craig Wilson

CONSUMER ELECTRONICS

DESIGN FOR CLARITY

Nothing Headphone (1)

High-end headphones tend to use lightweight plastics in neutral colors. British brand Nothing eschews this mass-market logic with its Headphone (1), over-ear headphones with rectangular, translucent ear cups and metal components. Veteran audio firm KEF helped make the headphones sound superb, while Nothing's industrial designers ensured every physical control is distinguishable by touch alone. Co-founder and CEO Carl Pei describes Nothing's design aesthetic as "retrofuturistic engineering meets human warmth," and says most of the company's customers are young creatives. "We don't have to be liked by everybody," Pei says, "but we have to have a group of people who really love us." —C.W.



AEROSPACE

NEW STRIDES ON THE MOON

Firefly Blue Ghost

In March, Firefly Aerospace's Blue Ghost lander became the first private spacecraft to land successfully on the moon. In cooperation with NASA, Blue Ghost carried 10 scientific instruments, including a laser reflector to measure the moon's shape and precise distance from Earth. Firefly plans to launch another lander next year to the moon's far side, followed by launches in 2028 and 2029, with the goal of creating a path for humans to return to the lunar surface. "As more humans return to the moon," says Firefly CEO Jason Kim, "we want them to have the supplies they need to sustain life." —Jeffrey Kluger

COURTESY TELEPATHIC INSTRUMENTS. POSHA



TOYS & PLAY

THE EVERYTHING TOY

Biggest Little B Is for Ball

B Is for Ball is the toy for every parent who swore up and down they wouldn't let baby gear take over their home. The colorful, two-piece silicone ball starts as a teether for babies, and as they grow, it becomes a bath toy, a stacking toy, and a toy for open-ended active and imaginative play for older kids. The sky is the limit, and that's exactly the point. "I wanted to create a universal and timeless tool for discovery and learning—and do it in a way that solves parents' frustrations and respects our environment," says founder Stephanie Fu. Bonus: it can go in the dishwasher.

—Leslie Horn Peterson



FOOD & DRINK

ROBOTIC HOME CHEF

Posha

One job many people want AI to take: cooking dinner. Posha is about the size of a microwave (and fits under standard kitchen cabinets), with a burner, stirring attachments, ingredient containers, and a touchscreen to control it all. Pick a recipe from the frequently updated digital library and follow Posha's ingredient prep instructions. Then walk away—Posha adds ingredients and cooks, using AI cameras to adjust (like adding water if too dry) just as a human would. It can do only one-pot dishes for now, but the recipe range is impressive. The tikka masala was delicious.

—Emma Barker Bonomo

AEROSPACE

EYES ON THE SKIES

Vera C. Rubin Observatory

Astronomy's newest telescope is a cosmic paparazzo, taking about 1,000 pictures of the southern sky every night from a mountaintop in Chile. With giant mirrors concentrating starlight into a 3,200-megapixel camera, the Vera C. Rubin Observatory is expected to reveal billions of cosmic objects in the next decade, and could solve tantalizing mysteries—including whether another planet exists beyond Pluto. Sandrine Thomas, the deputy director of Rubin's construction, calls it a "discovery machine"; in a preview this summer, Rubin snapped more than 2,000 never-before-seen asteroids. It is expected to begin full operations by the end of the year.

—Marina Koren

ENTERTAINMENT & GAMING

BLOCKBUSTER GAMING CONSOLE

Nintendo Switch 2

The original Nintendo Switch rewrote the rules for portable gaming. Its 2025 sequel increases the power without sacrificing portability. A sampling of its impressive stats: the new model can run at 4K on TVs, while the on-device 7.9-in. HDR display runs handheld titles at 1080 p and 120 Hz, meaning there's no flicker during gameplay. Its 12 GB of LPDDR5X memory also helps keep sprawling open worlds stutter-free. Launched in June, the console sold 3.5 million units in its first week—making it Nintendo's fastest-selling hardware ever. —Chris Stokel-Walker



BEAUTY

A BETTER INFRARED HAIR DRYER

L'Oréal AirLight Pro

L'Oréal's first-ever professional hair dryer was designed in partnership with the startup Zuvi, which released a first-of-its-kind infrared hair dryer a few years ago. This machine, which uses both infrared light and conventional convection, goes further. With over 150 patents, it has a 17-blade motor surrounded by tungsten-halogen bulbs that produce infrared light to dry hair faster than standard dryers. But hair-drying is about more than speed. L'Oréal says the AirLight Pro results in smoother hair than convection-only dryers, because infrared light efficiently dries hair surfaces while leaving internal moisture intact. —Jessica Klein

MANUFACTURING & MATERIALS

COMPOSTABLE BAGS

Sway TPSea Flex

Plastic bags are one of retail's biggest eco-bugbears. But Julia Marsh, CEO and co-founder of Sway, created an environmentally friendly alternative with TPSea Flex: a glossy, translucent film spun from farmed seaweed that can be fed through legacy plastic-bag lines and matches polyethylene's toughness, but is fully compostable. Marsh launched TPSea Flex in 2024 after testing 400 different formulations in her garage, and has attained \$8.5 million in funding to date—plus a client list including J.Crew and Prana. “We will be tripling volumes every year, and we have functionally no limit on capacity,” Marsh says. About 100,000 lb. of TPSea Flex will end up in millions of shopping bags this year. —C.S.W.



GREEN TECH

PROTECTING HOMES FROM WILDFIRES

Frontline Defense System 2

In early 2025, wildfires destroyed more than 12,000 properties in Los Angeles County—but only two of the 61 homes protected by Frontline Defense's fire-safety system were lost. The system installs spray nozzles on roofs and other key areas around the property; when Frontline's app detects a fire nearby, they release water for 20 minutes per hour that's then supplemented with Class A firefighting foam, creating a perimeter of protection around the house. The service is now available in 12 Western states and is installed on roughly 2,000 homes. “People are realizing they have to take matters into their own hands,” says CEO Harry Statter.

—Micheline Maynard



HEALTH & WELLNESS

COOLING HOT SLEEPERS

Sleep Number ClimateCool

When considering comfortable sleep temperatures, people are “always thinking of their thermostat vs. their bed,” says Rajasi Mills, head of health at Sleep Number. The company's ClimateCool smart bed is premised on the idea that the bed's temperature is essential to getting a good night's sleep. Rather than pushing cool air through the bed, its “dynamic airflow system” uses fans to draw heat away from the body through the mattress's breathable cover and cooling ceramic gel layers. It can cool up to 15° overnight, and couples can customize temperatures on each bed side, along with firmness. —J.K.

MEDICAL & HEALTH CARE

PRINTING A NEW ACL

Brinter 3D BioPrinted Tissue

Ruptured rotator cuffs and torn ACLs heal slowly after conventional suturing—then often fail when the joint gets back to work. Brinter 3D-prints three-layer implants using bio-inks made from living cells and biomaterials, whose polymer core provides strength while the printed collagen covers guide new cells to rebuild the tendon. The company, headquartered in Wake Forest's regenerative-medicine hub, is currently testing its printed outputs in animal trials and in the National Laboratory aboard the International Space Station. “We could literally have one of our implants in a human by the end of next year,” co-founder Tom Alapaattikoski says. —C.S.W.



FOOD & DRINK

THE FIRST LAB-GROWN SEAFOOD

Wildtype Salmon Saku

In May, Wildtype's cultivated salmon became the first cell-grown seafood to receive approval from the U.S. Food and Drug Administration. (Lab-grown chicken was approved in 2023.) It was a long-awaited milestone for co-founders

Justin Kolbeck and Aryé Elfenbein, who believe that cultivated proteins will help improve food security and lessen the environmental ramifications of commercial fishing.

By year's end, Wildtype's sushi-grade salmon saku will be served in restaurants in San Francisco, Seattle, Aspen, and beyond. Meanwhile, the company in September joined cell-cultivated-chicken maker Upside Foods in a lawsuit against Texas to fight a new law banning the sale of cultivated foods in the state.

—Derek Rose



ACCESSIBILITY

POINT-AND-CLICK SMART-HOME RING

Lotus Ring

Dhaval Patel has spent his life relying on crutches to walk, and would often leave lights on rather than struggle to get up to adjust them. Eventually, the former Apple engineer quit his job to build Lotus, an accessibility device that lets you turn a light switch or a TV on or off simply by pointing at it. Press a button on the rechargeable ring—the battery lasts four to six months—and an infrared signal triggers specialized covers that flip switches without any rewiring, apps, or the need to get up. It's like a universal remote you can wear. —C.S.W.

HOUSEHOLD

KEEP FOOD FRESH IN A BLACKOUT

Beko Solar-Powered Off-Grid Performance Refrigerator

Beko last year rolled out its first solar-powered refrigerator in South Africa, which has been beset for years by rolling blackouts due in part to an aging power grid. The country has both the pressing need and the sunshine for solar refrigeration, says Alper Goynusen, technical leader of R&D for power electronics at Beko. The first refrigerators cost 10,000 rand (around \$500) and were distributed in partnership with local governments and the U.N., but Beko plans to sell a model directly to consumers next year. When the power goes out, Goynusen says, "you postpone to wash your clothes ... but you need to keep your food fresh."

—Craig Wilson



BEAUTY

**COOLING LED
FACE MASK**

Shark CryoGlow

To design its first skin-care product, SharkNinja convened panels of dermatologists, aestheticians, behavior scientists, and “skinfluencers,” says Danielle Lessing, SVP of global product development. Hundreds of prototypes and multiple clinical studies resulted in the CryoGlow LED face mask. Like other LED masks, it uses three types of light to kill acne-causing bacteria and stimulate collagen production, which reduces fine lines; unlike other LED masks, it has cold metallic plates under the eyeholes to simultaneously reduce redness and puffiness. The team took design cues from ski goggles and VR headsets, Lessing says, to make sure the mask would fit snugly yet comfortably. —Jessica Klein

MEDICAL & HEALTH CARE

**DEVELOPING
GROUNDBREAKING
NEUROTECHNOLOGY**

Synchron Stentrode

Synchron’s brain-computer interface, or BCI, aims to enable people who are paralyzed or have severe motor impairment to control smartphones or other digital devices using only their thoughts. The investigational device, a tiny array of electrodes, is implanted into a blood vessel in the brain without requiring surgery, similar to how stents are placed. “It’s transformative that there’s now a potential therapy to overcome a broken nervous system,” says CEO and founder Tom Oxley. The Brooklyn-based company has conducted two clinical trials—one patient was recently shown controlling an iPad, a first for a BCI—and is preparing for a larger-scale study in the coming months.

—Erica Sweeney

TRANSPORTATION

**SMARTER
SCHOOL BUSES**

First Student Halo

School buses shuttle over 26 million kids annually in the U.S. Aiming to increase their reliability and safety, school-transport giant First Student launched Halo, a tech platform for school buses, in February. With hardware upgrades—including tablets, cameras, sensors, and wi-fi—Halo enables adaptive routing, GPS tracking, and real-time updates for parents and staff, AI-powered telematics for avoiding hazards, and predictive analytics to anticipate maintenance needs. First Student president and CEO John Kenning says, “Drivers are better supported, parents have greater peace of mind, and districts are more efficient.” This fall, it rolled out in 46,000 vehicles. —Matt Alderton

ARTIFICIAL INTELLIGENCE

**FILLING WEATHER-
FORECASTING GAPS**

WindBorne Systems Atlas

The best weather-forecasting systems still lack data from large swaths of the planet’s atmosphere, like over oceans where major storms often develop. WindBorne is closing data gaps with Atlas, its growing constellation of long-lasting weather balloons that measure temperature, wind speed, pressure, humidity, and other factors. The company feeds the data into its own AI model to produce forecasts more accurate than those of government agencies. This year, the National Oceanic and Atmospheric Administration (NOAA) began buying Atlas sensor data to help fill gaps in the agency’s forecasting capabilities, following Trump Administration cuts. WindBorne CEO John Dean says that he wants to expand the NOAA partnership, but that weather forecasts should remain a public good.

—Catherine Boudreau



COURTESY AIRZEN



HOUSEHOLD

A CLEANER'S DELIGHT

Dyson PencilVac

Dyson's slick PencilVac is the slimmest cordless vacuum on the market (in Europe and Asia for now, coming to the U.S. in 2026), housing its motor and canister inside its handle. To compress the layout, Dyson

designed a version of the smaller, faster motor used in its popular hair tools. The PencilVac's head pivots 360 degrees, contains four spinning "fluffy cones" that ball up hair and prevent tangles, and emits green LED light that highlights targeted dust specks. With lower suction than the brand's larger vacuums and weighing less than 4 lb., the PencilVac is best for small spaces and touch-ups—and for that, it's a marvel of engineering.

—Emma Barker Bonomo



DESIGN

POCKET PROJECTOR

Aurzen Zip Tri-Fold Portable Mini Projector

From wallets to laptops, the key to portability is foldability. Entertainment is no exception, according to Aurzen, whose new pocket-size Zip Tri-Fold projector puts projection in the palm of your hand. It features a patented Z-shaped design, wi-fi-free screen mirroring, zero-latency auto-focus, a full-screen vertical mode tailored to playing TikToks, and it unfolds into a built-in adjustable stand. "Whether I'm projecting a family slideshow or sharing a quick game session with friends on a road trip, Zip turns ordinary moments into shared adventures," says Mike Zeng, Zip's product director. —M.A.

WEARABLE TECHNOLOGY

A LEAP FORWARD

Meta Ray-Ban Display

Mark Zuckerberg's September demonstration of Meta's Ray-Ban Display and its accompanying Neural Band didn't go off without a hitch—the tech glitched a few times onstage—but they are impressive. A 600-by-600-pixel display on the right lens can field texts and calls without pulling out your phone. The unique electromyography wristband receives electrical signals from the twitches in forearm muscles, letting users pinch and pull windows and tap out messages innocuously. The Neural Band lasts 18 hours between charges; the glasses—prescription or non—last six. It feels a world away from where the technology was just a few years ago.

—Chris Stokel-Walker



CONSUMER ELECTRONICS

A SCREEN-FREE DIGITAL CAMERA

Camp Snap

Nostalgic for childhood summers taking photos without filters, parents Brian and Melanie Waldman created Camp Snap, a kid-friendly, screen-free digital camera. A modern take on film and disposable cameras, the Snap point-and-shoot takes 500 shots per USB-C charge. With schools and summer camps increasingly adopting screen-free policies, the camera provides an alternative. "We wanted our own kids to experience that freedom while still capturing memories," says Brian, the company's CEO. This year, the company added a Pro version and a screen-free digital video camera to its lineup.

—Matt Alderton

REUSE & RECYCLE

AN AI RECYCLING SORTER

AMP One

Americans who participate in recycling programs mean well, but more than three-quarters of their refuse ends up in the trash. "People are lazy—the recycling bin gets full and they put it in their garbage can," says AMP CEO Tim Stuart. "Our technology can extract that." In Portsmouth, Va., AMP is using AI-powered scanners to make sure less waste ends up in landfills. After garbage collection, organic material is sorted and sent for composting, while plastics and aluminum are sold to recyclers. This year, AMP is negotiating a 20-year partnership with Portsmouth's South-eastern Public Service Authority to process 500,000 tons of garbage a year. "It's a blueprint for lots of municipalities," says Stuart. —Micheline Maynard



TOYS & PLAY

CUSTOMIZE AN ICONIC DOLL

Mattel Barbie You Create

Adults are actually fueling growth in the toy market by buying for themselves, and Mattel says a third of grownups who buy Barbies aren't just collecting: they're customizing. "Over the years we've seen an active community of fans and

collectors bring their own creativity to Barbie," says Kim Culmone, SVP and global head of doll design.

So in March the toymaker launched You Create Barbie, a \$100 kit that comes with three interchangeable heads and three articulated bodies, plus wigs, clothing, and accessories to let enthusiasts get creative. And even though they're marketed to adults, the dolls are just as hardy and ready for kid play as ever. —Leslie Horn Peterson

CONSUMER ELECTRONICS

A TV BREAKTHROUGH

Samsung Micro RGB

Most premium TVs still rely on a single, large white or blue backlight filtered through color layers, a setup that can mute vibrancy and waste energy. Samsung's Micro RGB TV instead uses individually controlled red, green, and blue LEDs tens of microns wide, giving richer, more lifelike colors and cutting power use by 20%. "Micro RGB is a breakthrough in premium TV technology," says Taeyong Son, EVP of Samsung's visual display business. The first Micro RGB TVs ship this year for \$29,999 each. Samsung's glare-free glass and an onboard AI engine further refine each scene's crispness and color. —Chris Stokel-Walker



TRANSPORTATION

AN AFFORDABLE EV

BYD Seagull

If you're American, you'd be forgiven if you've never heard of Chinese automaker BYD. But in much of the world, the electric-vehicle company is a household name. The BYD Seagull (branded as the Dolphin Surf in some markets), the company's star and cheapest offering, cost 73,800 renminbi (about \$10,300) when it launched. It's a compact hatchback, the simplest version of which has a 30-kWh battery, a 55-kW motor, a range of 190 miles, and a top speed of 81 m.p.h. Does the world want a tiny electric car? It seems so. In June, the 1 millionth Seagull rolled off the production line. It launched in 15 European markets earlier this year. —Craig Wilson

HOUSEHOLD

A FAN THAT FOLLOWS YOU

Dreo TurboPoly Fan 707S

Keeping cool is tricky. Fans are one weapon, but their dutiful oscillations don't always hit the spot. Dreo's TurboPoly Fan 707S, which can be adjusted to stand from 39 to 44 in. high, has a millimeter-wave radar sensor built in that tracks where you are in a room, and "adjusts its airflow towards the individual," says Joshua Gunn, vice president of Dreo. "[It's] our next evolution of what fans could be." The standing fan can blow air 110 ft. and fill a standard room in less than a minute at a noise level below 25 dB.

—C.S.W.



MEDICAL & HEALTH CARE

TREATING THE UNTREATABLE

Every Cure MATRIX

Fewer than 25% of recognized diseases have treatments that are approved by the U.S. FDA. The nonprofit Every Cure's MATRIX platform uses AI to figure out which already-approved drugs could help patients with completely different conditions—a process called drug repurposing. So far, the Every Cure team has identified or advanced 14 repurposed drugs that have become effective treatments for five rare diseases. "It's so gratifying and rewarding when you see someone improve on a drug that the system wasn't advancing for them," says co-founder and president Dr. David Fajgenbaum. —Angela Haupt



SPORTS & FITNESS

A BETTER BASEBALL BAT

Louisville Slugger Pro Prime TPD1

A long-ball barrage has sparked a craze. The New York Yankees hit a record-tying 15 home runs in their first three games of the 2025 season. Some players used Louisville Slugger's odd-looking Torpedo Prime bats, which move the fat sweet spot closer to the handle, where players are more likely to strike the ball. Now wood-bat sales for the maker of Louisville Sluggers are up some 20% year over year. "Really good players have had fantastic success with it," says VP of manufacturing Bobby Hillerich. "It's proof in performance." Former Yankees analyst Aaron Leanhart, an MIT-trained physicist, is credited with inventing it.

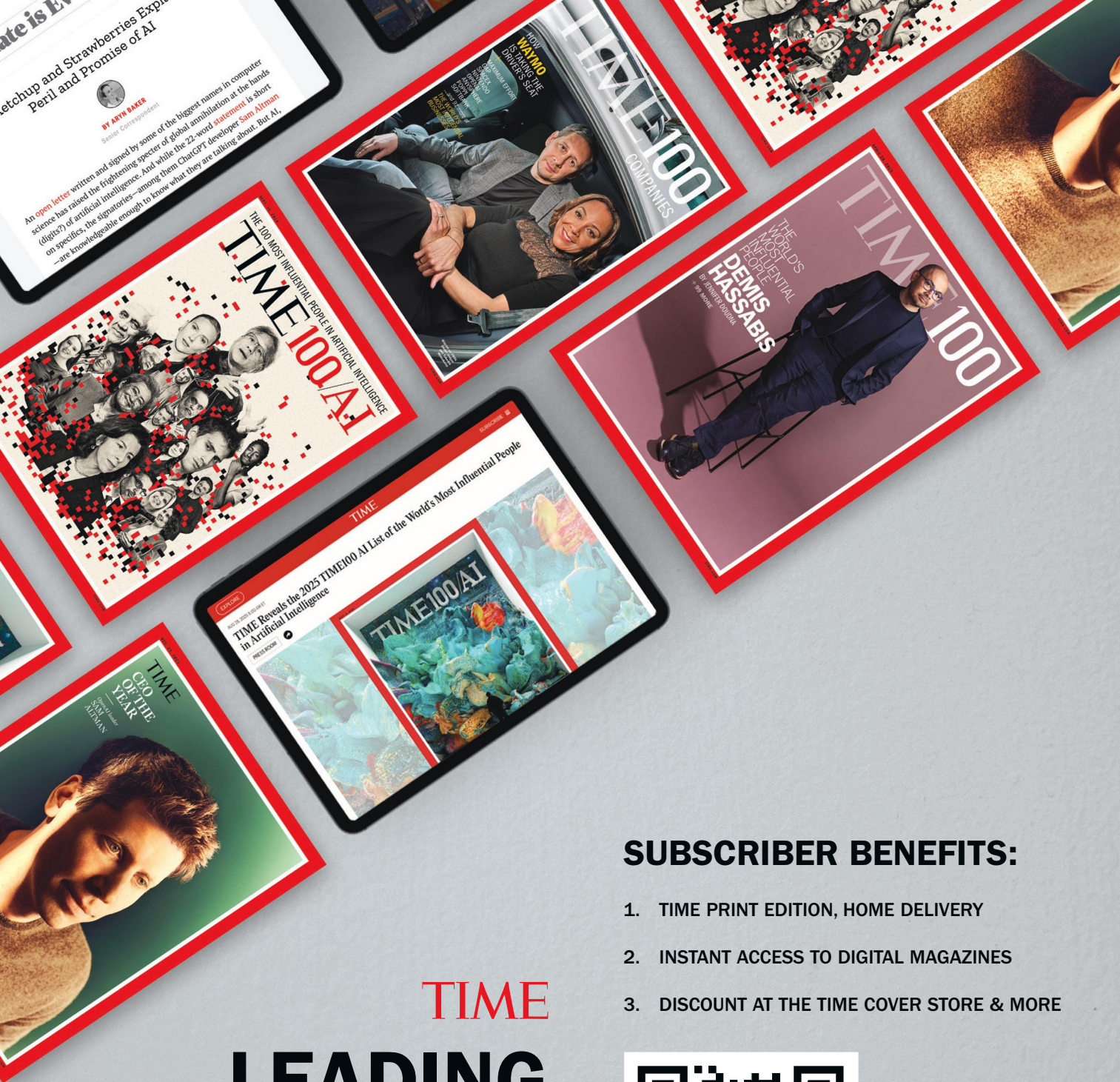
—Sean Gregory

APPS & SOFTWARE

MORE AFFORDABLE HOMEBUYING

Zown Down Payment Boost Program

Saving for a down payment is no small feat. The digital real estate platform Zown aims to make homebuying more affordable and efficient. Buyers are matched with licensed Zown agents, who are paid hourly based on performance, not commission; when buyers find a home, Zown receives a 2.5% commission from the seller but returns 1.5% to buyers to bolster their down payment. Except for home viewing, it handles deals entirely remotely. "Our secret sauce is building customer relationships digitally," says CEO Rishard Rameez. The startup expanded to California in May and has completed over \$300 million in transactions. —Novid Parsi



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Time Off



A DEEPER DIVE

BY ESTHER ZUCKERMAN

With time, and new showrunners, *Nobody Wants This* leaves divisiveness behind in its second season

INSIDE

BEN STILLER'S ODE
TO HIS PARENTS

KATHRYN BIGELOW
RETURNS WITH A THRILLER

TIM ROBINSON'S COMEDY
OF GRIEVANCES

THE VETERAN TELEVISION WRITER JENNI Konner knows how to tune out bad press. After all, she spent six seasons as the co-showrunner of HBO's *Girls*, the lightning-rod series that was bashed as frequently as it was hailed for its brilliance. "Having been on *Girls* for so many years, we're pretty hardened to the world's criticism in a lot of ways," she says.

But even if she's more or less inured to critiques, that doesn't mean Konner hasn't heard them, which makes our conversation over Zoom one October morning an unusual one. Konner knows that I had some harsh words for the first season of Netflix's *Nobody Wants This*, her latest project, which drops its second season on Oct. 23.

Konner didn't work on the episodes where I detected a mean-spirited depiction of Jewish women. (The precise words I used, in a piece written for this magazine about their portrayal in the show's first season, were "nags, harpies, and the ultimate villains of this story.") She took on showrunning duties alongside her fellow *Girls* alum, Bruce Eric Kaplan, following Season 1. The series, loosely based on creator Erin Foster's real-life romance with her husband, is a rom-com about the relationship between shiksa podcaster and Foster stand-in Joanne (Kristen Bell) and her rabbi boyfriend Noah (Adam Brody).

Now, Konner is eager to know whether I've changed my tune—"So did you like this season?" she asks early in our nearly hour-long conversation.

The truth is: I did.

UNDER KONNER AND KAPLAN, *Nobody Wants This* has grown into a more settled and expansive show. Now that Joanne doesn't need to learn Judaism 101, the narrative is more about the trickiness of relationships in their various stages than a non-Jewish person encountering the religion for the first time. This allows the writers to delve into Joanne and Noah's dynamic beyond their butterfly-inducing makeout sessions, as well as interrogate the marriage between Noah's brother Sasha (Timothy Simons) and his wife Esther (Jackie Tohn). The latter storyline allows the series to correct one of my main frustrations: the Esther of Season 1, in my view (as a culture critic and a real-life Esther), was a one-dimensional rhymes-with-witch standing in the way of Joanne and Noah's happiness.

Konner isn't comfortable speaking about choices made before she came on board (Foster served as showrunner for that season alongside Craig DiGregorio), but she says she was a fan from the start. When it debuted a little over a year ago, *Nobody Wants This* was largely praised for its breezy, modern take on the rom-com, but I was not the only critic who took issue with its portrayal of Jewish women. Foster, who converted to the religion, told the *Los Angeles Times*, "I think it's interesting when people focus on 'Oh, this is a stereotype of Jewish people,' when you have a rabbi as the lead. A hot, cool, young rabbi who smokes weed. That's the antithesis of how people view a Jewish rabbi, right?"

While many assumed Jewish creatives were brought in after the reviews, Konner says Netflix and 20th Television reached out to her before the public had seen any of it.



Simons and Tohn, above, as Sasha and Esther in Season 2

Konner, left, with Brody and Bell on set

She then recruited Kaplan to join her, and Rabbi Sarah Bassin was brought in to consult throughout the season.

"I found it so winning and funny and fresh, so it was just sitting down with Erin and making sure she wanted to learn how to do the other parts of the job," Konner says. "She clearly knows how to do the writing and the creative parts, and she really has this incredible sense of what the show is."

Konner, a child of two TV writers herself, has spent much of her career as a sort of shepherd of great ideas, working with inexperienced creators to help their projects come to life. But she didn't necessarily intend to fall into that role. When she met *Girls* creator Lena Dunham, she had just broken up with her writing partner, and thought she would strike out on her own. "Then I met Lena and was like, well, except for this one," she says.

This arrangement has now become her calling card. She's had similar positions as executive producer on *Single Drunk Female*, created by Simone Finch; *Deli Boys*, created by Abdullah Saeed; and now *Nobody Wants This*. "I really think I'm good at spotting talent," Konner says. "That is something I feel a lot of pride in." In Konner's opinion, the TV world is not currently set up for new voices to succeed. She wants to help make that possible.

"I think showrunner is a four-person job that they give to one person," she says. "Great voices are getting



lost by the system because there's nothing organic that [says] a writer should be good at having a conversation with an executive or looking at a budget."

Konner likes to keep her colleagues close and have multiple balls in the air. After she was tapped for *Nobody Wants This*, she recruited Kaplan so she could keep up with *Deli Boys* and other projects in development. She and Kaplan also brought along other *Girls* alums including writer Sarah Heyward and directors Jesse Peretz, Jamie Babbit, and Richard Shepard, who is Konner's husband.

ANY PERCEIVED CHANGE in *Nobody Wants This*, Konner attributes not to an intentional course correction, but just to the reality of having more episodes to explore the characters. "No one was developed who weren't the four main characters," Konner says of the first season's 10 episodes. "These shows are 21 to 22 minutes each."

A similar thing happened on *Girls* with Elijah (Andrew Rannells), Hannah's college ex who came out as gay, and Shoshanna (Zosia Mamet), who in Season 1 was largely defined as a chat-box virgin. Both characters deepened in that show's later installments.

In *Nobody Wants This*, the main reason Esther has grown so much in Season 2, Konner explains, is because narratively, they no longer needed a foil for Joanne and Noah now that the pair has pushed past the obstacles

presented in Season 1. The tension now is built around whether the agnostic Joanne will feel compelled to convert to Judaism, and how that decision impacts Noah's career aspirations.

"It would be not interesting to tell another story of Esther getting in the way of that relationship," she says. "So what's the story of Esther?" Without spoiling the details of her arc, Konner shares the questions that now preoccupy the character: "Why did she marry Sasha? Why did he marry her? Here they are with a teenager, and it's that thing where you look at your spouse and go, 'Is that all there is?'"

Esther remains the tough woman introduced last season and maintains her snarky edge, but the plot allows her to become a friend to Joanne, not just a mean girl making fun of her.

"The secret of Esther is that she is great and helpful and funny, you just have to get through the way she is giving you that help," Konner says, citing one sequence where she grabs Joanne's phone to email another challenging woman in Joanne's orbit, Noah's mother Bina (Tovah Feldshuh).

'She may not be likable, but she's relatable, and that's how I feel about these characters.'

JENNI KONNER, CO-SHOWRUNNER

Bina hasn't fully softened, but Konner points out it's not as if Bina likes any of the Jewish women who dated her sons either. Konner sees her as like a "mob boss"—"Tony Soprano without the charm"—and her trick for humanizing the character is keeping in mind that all of Bina's actions are taken with her family in mind. A scene of tentative bonding between the imposing matriarch and Joanne's more brash and flighty sister Morgan (Justine Lupe) also makes it clear Bina's not entirely conniving even if she's not exactly likable either. For that matter, the same could be said of Morgan, a "tough customer" in Konner's words.

LIKABILITY CAN BE a cudgel against female characters, and, thanks to *Girls*, Konner is used to dealing with questions on that subject. "What we always said about *Girls* is, she may not be likable, but she's relatable, and that's how I feel about these characters."

Konner explains that in the writers' room, Foster will tell a story involving her husband—who is Jewish though not a rabbi—and while some of the staff will relate to Foster, others will see themselves in her spouse. "I go, 'OK, even within this room, people are recognizing themselves in it, so probably people in the world are also going to recognize it,'" she says. "And if they don't, they go, 'Ugh, that girl reminds me so much of a girl I hate. I can't wait to watch her more.'"

It's true: When we first get on our call, I tell Konner about how I specifically identified with one plotline this season. Joanne tags along with Noah when he's presiding over a baby-naming ceremony for an influencer that Joanne knew in childhood, played by Brody's real-life wife Leighton Meester. Joanne still holds a grudge because at a childhood sleepover this girl cut off the hair of Joanne's prized American Girl doll, Felicity. I tell Konner that a frenemy in my youth decapitated one of my dolls in secret and I've held it against her ever since.

"This happened to our script supervisor," Konner says. "And the girl still denies it." I reveal I've never confronted the doll criminal in my life. "I think it's time, Esther," she says. □

FEATURE

Mining the origins of a showbiz family

BY ESTHER ZUCKERMAN

BEN STILLER DIDN'T WANT TO INSERT HIMSELF INTO HIS documentary *Stiller & Meara: Nothing Is Lost*.

The actor and director intended to make a movie about his parents, the revered comedic duo of Jerry Stiller and Anne Meara, and at first felt "self-conscious" about his own presence. But when he started to show friends the film—which premiered at the New York Film Festival in early October before it's set to debut in theaters Oct. 17 and on Apple TV+ Oct. 24—he heard a similar refrain: "I'm not really seeing that much of you in it."

He realized he had a role to play.

"The thing that was missing was probably my perspective on my parents, but also my perspective on my own relationships as affected by growing up with them," he said in a phone call while on a break from shooting another family-themed project, the fourth *Meet the Parents* movie.

If he was exposing his parents, he also had to expose himself: "It became clear that it would feel weird or disingenuous to open up these private moments that my parents had and, as a filmmaker, not be looking at my own stuff, and including that in some way, because it felt like I would be judging them."

As such, *Stiller & Meara: Nothing Is Lost* is a complicated look at generations of Stillers. It functions, perhaps primarily, as a tribute to Jerry and Anne and their legacy. But through the inclusion of intimate recordings that Jerry made, it demonstrates how their comedic bickering on-stage was mirrored by genuine tension in prior moments. Meanwhile, Stiller interviews his wife Christine Taylor, and their children, Ella and Quin, to understand what he inherited from his famous parents in terms of both his talent and personal shortcomings.

"I think the deeper that you go into learning about your parents, and not about them as parents but just as people, [it] always gives you a different perspective on your own life. I really do feel like the experience of delving in gave me more empathy for them," Stiller says.

THE BACKBONE OF THE MOVIE is the wealth of material that Jerry left behind when he died in 2020, five years after Meara in 2015. Onscreen, Stiller documents how he and his sister Amy were responsible for combing through family memorabilia as they cleaned up Jerry and Anne's longtime apartment on the Upper West Side so it could be sold.

But behind the scenes, Stiller was listening to the more than 100 hours of recordings that his father had made. He describes the experience as a "strange thing, to get transported back into these moments in time."

These tapes would start as a record of his and Anne's rehearsal or writing process, but Jerry would leave them running even when the conversation devolved into



'I had to kind of guess or intuit what my parents might feel about this.'

BEN STILLER,
DIRECTOR

real-life arguments, some of which we hear in the film.

Stiller, at first, was surprised to hear those moments of argument, but they also unlocked an angle on his parents' narrative for him: He could chronicle the ups and downs of a creative partnership and how that bled into their personal relationship. From there, he ended up exploring how, despite his own frustration with his parents' absence for periods in his youth, he too became an intense workaholic like his dad in ways that resonated with his own children.

Stiller & Meara: Nothing Is Lost offers a standard bio-doc look at how a Jewish boy and a Catholic girl fell in love and became the most prominent American couple in comedy in the 1960s, regulars on *The Ed Sullivan Show*. Amy and Ben were born into their parents' fame and trotted out for talk-show segments at young ages, immediately grandfathered into the act.

Along the way, Stiller traces how



his mother longed to be a dramatic actress, eventually getting to explore her chops on the stage in plays like *The House of Blue Leaves*, and how his father had a late-in-life revival playing George's father, Frank Costanza, on *Seinfeld*. But the film is also raw and sometimes dark, as the son grapples with Meara's struggles with alcohol and how this longtime marriage, which lasted over 60 years, wasn't always so rosy.

"I had to kind of guess or intuit what my parents might feel about this, knowing them. I think what I got to was this version of the movie that hopefully represented, in terms of the balance of it, what their relationship was always about, which, for me, was based in this deep love and caring for each other," Stiller says.

MAKING THE MOVIE was a five-year process, during which Stiller and Taylor reunited after a period of separation. Ultimately, Taylor as well as her

Top and bottom left: Stiller with his parents, Anne Meara and Jerry Stiller

Center: Ben and Amy Stiller in the documentary

Bottom right: the Stiller family in an undated photo

and Stiller's children were very open to talking onscreen about their sometimes complex feelings about Stiller's own dedication to his work at the expense of his time at home. At the same time, *Stiller & Meara: Nothing Is Lost* makes the case that show business is, inevitably, a family enterprise.

"When people see the movie, you can see how organic it was for my sister and I to be a part of this world," Stiller says. (His sister would also grow up to become an actor, once appearing opposite her mother on *King of Queens*.) "It was our reality and it's what we grew up in, and we loved it when we were kids. The flip side was, it took our parents away from us, which any creative endeavor does. You have a creative parent, part of them is going to be dedicated to their creativity, if they're a real artist. They can't deny that."

Now, Stiller's own children are feeling that pull to follow in their parents' and grandparents' footsteps. Ella is a Juilliard graduate who is joining the upcoming season of *The Comeback* following a stint off-Broadway. Both younger Stillers had roles in *Happy Gilmore 2*, alongside their dad. Stiller recognizes that the movie enters an ongoing conversation about nepotism in Hollywood, but he hopes it makes viewers understand what it means to come from a world of performers.

"For me, this really was like, hey, this is what our lives are, this is what it's about," Stiller says.

REVIEW

A knife's-edge nuclear drama

BY STEPHANIE ZACHAREK

SOMETIMES MOVIES REACH US IN A PLACE beyond mere assessment: you walk away from the thing you've just seen not really knowing if you'd call it good or bad, but you know something has shifted inside you. That's the effect of *A House of Dynamite*, directed by Kathryn Bigelow and releasing 15 years after she became the first woman to win the Oscar for Best Director, for *The Hurt Locker*. The picture is precise, potent, ingeniously constructed. But even though it focuses on the nuts and bolts of how the U.S. government might respond to a nuclear attack, there's something ghostly and unreal about it too. Without spelling out any grim details, it lays bare all sorts of global realities we don't want to think about. This is a real-world horror movie that's unsettling for all that it doesn't show.

The premise is straightforward and sleek: a nuclear missile is headed for the American Midwest, but no one knows which country launched it. If it's not intercepted, it will hit its target in roughly 20 minutes. The film unfolds within that time frame, its events relayed from multiple points of view, including that of a young major stationed in the Pacific (Anthony Ramos), a deputy adviser who's forced to fill shoes he's not ready for (Gabriel Basso), a Secretary of Defense who can barely reckon with the reality unfolding before him (Jared Harris), and, finally, the President himself (Idris Elba), who's fairly new to the job when the crisis hits.

In Washington, Captain Olivia Walker (Rebecca Ferguson) receives news of the missile launch and responds with concern but not alarm—the belief, at the beginning, is that somehow this is a misreading or a mistake. Still, everyone is waiting for the guidance of POTUS, and for several seemingly interminable minutes, his video screen in the Situation Room is a blank square. Where is he? The quiet bustle of the room heightens to a low-level buzz of stress. A cantankerous general, Tracy Letts' Anthony Brady, braces himself for orders: Will the President decide to counterattack? And how will he know what to do, when no one knows who's responsible?

As the minutes tick by, more urgent calls go out to various specialists and experts, though no one has any clarity on the whole. The movie is divided into sections, each showing this unsettling turn of events from a different character's



^
Elba as POTUS,
with the fate of the
world in his hands

**Ignorance
is bliss, but
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perspective. Lines of dialogue are repeated from section to section; sometimes we'll see a character saying something we'd previously heard only as part of a phone call, and the context shifts slightly. It's all part of a mosaic that changes shape and tone from second to second.

A HOUSE OF DYNAMITE is one of the most stressful viewing experiences I've had in years. It's a movie with a seemingly endless number of moving parts, cut (by Kirk Baxter) with diamond precision. In researching it, screenwriter Noah Oppenheim—who was president of NBC News before he began writing for film—interviewed military specialists and others who have spent decades preparing for a catastrophic nuclear event, as the rest of us go about our day-to-day stuff. Ignorance is bliss, but how much of it can we afford?

In the years after the U.S. bombed Hiroshima and Nagasaki, Americans were haunted by the possibility of nuclear warfare. Our fears showed up in the movies, too, in Cold War dramas like Sidney Lumet's 1964 *Fail Safe*. Yet even though the chances of nuclear destruction have hardly receded, we now think about it less. What if you and your community were wiped out in a flash or, probably worse, left to survive in a scorched, barren world? And if the scenario of *A House of Dynamite* were to play out in real life, whom would you want at the helm of the government, making potentially world-ending decisions? Bigelow takes the unthinkable and puts it right in front of us. We can ignore the alarm if we want. But that doesn't mean it's not blasting. □

REVIEW

Two gifted actors, one punishing sci-fi farce

THE HUMAN RACE IS IN A SORRY state, and here comes Yorgos Lanthimos with an aggressively wicked black comedy to tell us all about it. Haven't you heard? Many of us no longer get our news from "the news." We embrace nutty conspiracy theories to justify our own beliefs, and we blindly trust our corporate overlords even as they drain our lifeblood. Not only that, but the bees are dying. These are all good reasons to feel bummed out, but leave it to Lanthimos to express his dismay in the most arch and self-congratulatory way possible. To paraphrase an old *Peanuts* cartoon, Lanthimos loves mankind; it's people he can't stand.

Bugonia begins with a plot and a duo of plotters: Jesse Plemons plays Teddy, a sad-eyed loner with a brain-numbing job and a fondness for bees, which he keeps in the yard of his mildly shabby house. He's a guy who knows the *truth* about things—he's researched it all on the internet—and he's schooling his sweet, naive cousin, Donny (Aidan Delbis), in his findings.

Teddy is a man in pain: he has watched his ailing mother (Alicia Silverstone) suffer through a supposed cure that has in fact put her in a coma. But he has a plan to make things right. Together, Teddy tells Donny, they'll save the world. His plan is to kidnap Emma Stone's Michelle Fuller, the soulless head of a giant technocorporation that puts profits over people. Teddy believes that Michelle is an alien being from Andromeda, sent to Earth to destroy it. Once he and Donny have her chained up in their basement—after first shaving her head, so the Andromedans won't be able to use their fancy technology to locate her via the DNA in her hair—all Teddy has to do is coerce her into summoning her mother ship so he can gain entrance and negotiate Earth's freedom with her overlords.

Maybe that makes *Bugonia*—a

reimagining of Jang Joon-hwan's 2003 science-fiction comedy *Save the Green Planet*—sound sort of fun, and the movie does contain some ridiculously over-the-top exploding-bodies gore. Plus Lanthimos is working with actors he clearly likes: Plemons and Stone both appeared in his last film, 2024's tedious bummerama *Kinds of Kindness*. They're gifted performers who know what they're doing.

BUT IN BUGONIA, Lanthimos lets his poker-faced sadism run free. It's probably supposed to be grimly funny to watch Teddy send 400 volts of electricity coursing through a bound-and-gagged Michelle, after putting on Green Day's "Basket Case," cranked up to 11 to drown out her screams. Lanthimos and cinematographer Robbie Ryan shoot the sequence discreetly, so you hear more than you see. But do we really want to watch any character played by Stone—or by any actor, really—be brutalized that way?

Lanthimos isn't a filmmaker you can write off entirely. He can surprise

you with a movie like *The Lobster*, which sidles up to some mournful truths about human loneliness with the wayward agility of a hermit crab, or the strange and fanciful *Poor Things*, also starring Stone, and a grand showcase for her intelligence and physical ingeniousness.

She's a bold, creative performer, and she's terrific in *Bugonia*, laceratingly funny in cold-blooded-executive mode as she rushes impatiently through the recording of a diversity-training video, and wholly convincing, with her nubbly shaven head, as a wily Joan of Arc determined to out-

wit her captors.

Stone gets her true shining moment in the movie's surprise ending, which, largely because of her, feels tender, mournful, and funny at once. But Lanthimos allows us the grace of that ending only after he's put us through the wringer, maybe even boring us a little along the way. The world isn't pretty, and Lanthimos is shouting the news. If only he would tell us something we don't already know. —S.Z.

Lanthimos loves mankind; it's people he can't stand



Stone (with Delbis and Plemons): a CEO kidnapped for the sake of planet earth

REVIEW

Curb your conspiracy theory

BY JUDY BERMAN

RON TROSPER IS LOSING IT. THE HBO COMEDY *The Chair Company* traces the unraveling of this suburban family man, played by co-creator Tim Robinson, who believes he's stumbled upon a criminal conspiracy following a minor workplace humiliation. But that conspiracy tends to manifest in the form of universal contemporary annoyances. "You can't get a hold of anybody," Ron rants after his investigation leads him into customer-service hell. "That's the problem with the world today. People make *garbage*, and you can't talk to anybody. You can't complain, you can't get an apology. I wanna scream at 'em!"

The character will be familiar to anyone who knows Robinson's work. In his Netflix sketch show *I Think You Should Leave* and recent feature *Friendship*, the comedian portrays men who are hilariously, uncontrollably angry for reasons they don't seem to fully understand. In his nitpicking and narcissism, the relatability of his grievances, and his unhinged methods of redressing them, Ron also resembles a younger, Middle American version of Larry David's *Curb Your Enthusiasm* antihero. He's a great character—one portrayed with the explosive mix of awkwardness and rage Robinson has perfected and placed in situations that are funny because they're absurd, but also because, despite their surreal trappings, they speak to modern discontents. It's all just entertaining enough to make up for the show's scattershot storytelling.

Ron is, at once, an average guy and a mess of insecurities. At home, he's overshadowed by an impressive wife (Lake Bell) and teenage son (Will Price), as well as his daughter's (Sophia Lillis) upcoming wedding. (She and her wife-to-be want to marry in a "haunted barn.") Now that his dream business venture has failed, he has returned to a stressful job at a construction company. All it takes is one blip to send him down the rabbit hole. Sometimes his quest for the truth takes the shape of a prototypical thriller—rendezvous at dive bars, threats issued by shadowy goons in parking lots. Other times, Ron is a terminally online Larry, typing screeds into customer-support forms and cursing out chatbots.

ROBINSON'S STYLE OF COMEDY may not be best suited to long-form narrative. Writer-director Andrew DeYoung's *Friendship*, which cast him as a lonely guy who befriends, alienates, then



Robinson's Ron finds indignities in the most innocuous places

Ron is like a terminally online Larry David

becomes fixated on a cool neighbor (Paul Rudd), has some great moments but falters midway through because of a predictable plot. In the six *Chair Company* episodes I screened (out of eight), Robinson and co-creator Zach Kanin don't make the conspiracy thriller funny so much as they use its tropes to connect characters and situations that are, in themselves, very funny.

Robinson has a genius for channeling society's ambient toxic vibes, in abstract but eerily evocative ways, through his odd alter egos. *Friendship* is a fun-house mirror of the male loneliness crisis. Yet his sensibility is most potent in the concise scenarios of *I Think You Should Leave*. From the guy who won't stop making filthy comments on an "adult" ghost tour to the one in the hot-dog costume who insists he had nothing to do with the crash of a hot-dog-shaped car, these characters embody the anger, mendacity, immaturity, and allergy to accountability that define so many of today's most powerful men without explicitly addressing politics. *The Chair Company*'s hero is the other side of that coin, a disempowered man whose earnestness brings him only embarrassment and whose attempts to find someone to blame for his misery only dig him deeper into it. Ron's crusade against corporate shadiness (and shoddiness) never generates much suspense. But whether he strikes you as an everyman Larry David or as a modern-day David taking on a faceless Goliath, his plight is bound to resonate.

The Chair Company airs Sundays on HBO and streams on HBO Max

Jacinda Ardern The former Prime Minister of New Zealand on leadership, optimism, and being filmed at close quarters

The new HBO documentary *Prime Minister* is about your style of leadership, which emphasizes compassion and humanity. Does it feel like your approach is not winning right now? Certainly the alternative approach is very dominant. But it is not the only approach. There are examples of leaders around the world who have at their core the values of empathy and kindness. Mark Carney [of Canada] and Anthony Albanese [of Australia], two recently elected Prime Ministers, both used that critical election-night speech, where you set out your agenda and your vision, to talk about kindness.

You made this movie with your now husband Clark Gayford. He caught a lot of intimate moments, including when you're about to resign and wondering what to wear. Was there a plan to make a documentary from the beginning? Clark started picking up his camera, because he's a broadcaster. I imagine in his mind was, "I'm seeing moments that no one else is seeing that might end up being important, or might just be good for our family." So, no, there wasn't that set plan. He had to be resilient, because I chastised him, I ignored him, and I told him off. I really credit him for persevering.

There's a moment where you're feeling the weight of the job. He asks why you don't delegate more. And you respond in a way that suggests that was not constructive feedback. Did you have a rule about what made the final cut? He was the director of photography and a producer. But there's a reason that he's not the editor or the director. The first time I saw the film in full was after it was submitted to Sundance. You just have to trust that if they're using footage of you in real life, then it's going to tell the story.

Why is Ernest Shackleton, who saved his shipwrecked crew, but battled drink and died broke, a hero of yours?

I admire his leadership in the face of difficult circumstances. He did not succeed at most of the things he set out to do, but he never lost sight of the priority of bringing people together, unifying them around a purpose, and maintaining their optimism.



Would a guy have cared less about what people were saying about them? Is that why more guys go into leadership? I think it's actually more a question of personality than gender, what type of leader you want to be and how sensitive you are to the feedback of voters. Nor do I believe, therefore, that empathetic leadership is the domain of women. We don't say, I'll only teach my daughter kindness, generosity, and curiosity. The values of being a good human should be the values of being a good leader.

You were given access to \$20 million by Melinda French Gates' Pivotal Ventures for causes of your choice. Have you found anything? One of the projects we're funding is ending maternal mortality in humanitarian crises. Postpartum hemorrhaging is the most common cause of women losing their lives in birth. It is entirely preventable. In areas of conflict and crisis, relatively straightforward measures are not reaching women who need it the most.

You had global attention for a period. Most leaders do not have as much road still in front of them after it fades as you do. A. Do you miss the attention or any part of it? And B. How do you figure out what to do next? Being out of the spotlight is something I'm quite delighted by. However, as time has passed and I've looked to what is the next useful thing to do, I've discovered I still need to use my albeit small spotlight to talk about the alternatives to the type of leadership we're seeing now, and to keep trying to be useful on things like climate change and violent extremism and issues that women in public life face. Public profiles and being useful, I've discovered, go together.

—BELINDA LUSCOMBE

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