Weekly Progress Roundup

Colossal Biosciences has resurrected the dire wolf, maternal deaths hit all time low, scientists create groundbreaking maps, and more.

MALCOLM COCHRAN

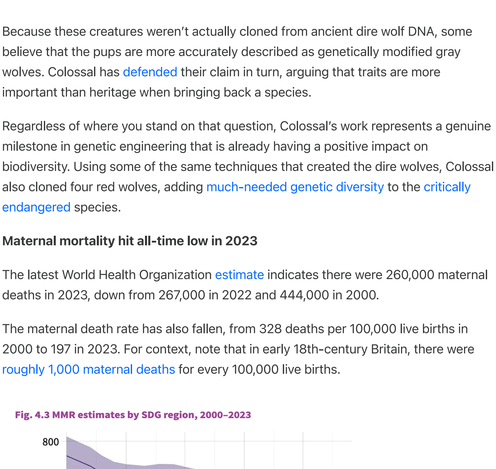
APR 13, 2025

Colossal Biosciences has resurrected the dire wolf, or something like it

News broke this week about Colossal Biosciences' most recent achievement: resurrecting the dire wolf, a larger extinct cousin of the modern gray wolf.

After sampling some dire wolf remains, scientists at the biotech company were able to identify the genes that gave dire wolves their distinct features—namely larger size, stronger muscles, and pale fur. Using that information, they made a few targeted edits to gray wolf nuclei, developed them into embryos, and implanted them into domestic dogs.

The end result was three animals, named Romulus, Remus, and Khaleesi, that closely resemble the extinct predator.



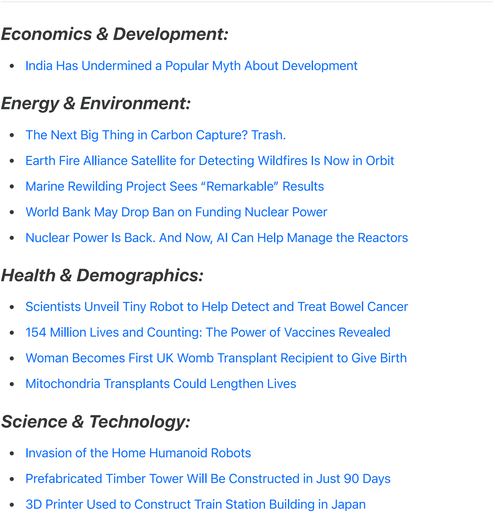
Because these creatures weren't actually cloned from ancient dire wolf DNA, some believe that the pups are more accurately described as genetically modified gray wolves. Colossal has defended their claim in turn, arguing that traits are more important than heritage when bringing back a species.

Regardless of where you stand on that question, Colossal's work represents a genuine milestone in genetic engineering that is already having a positive impact on biodiversity. Using some of the same techniques that created the dire wolves, Colossal also cloned four red wolves, adding much-needed genetic diversity to the critically endangered species.

Maternal mortality hit all-time low in 2023

The latest World Health Organization estimate indicates there were 260,000 maternal deaths in 2023, down from 267,000 in 2022 and 444,000 in 2000.

The maternal death rate has also fallen, from 328 deaths per 100,000 live births in 2000 to 197 in 2023. For context, note that in early 18th-century Britain, there were roughly 1,000 maternal deaths for every 100,000 live births.



Humanity maps the Earth and its creatures

Over the last few weeks, scientists have released a number of groundbreaking maps, including:

- The most detailed map of the Antarctic landmass in history
- Complete genomic sequences of six ape species
- A map of a cubic millimeter of mouse brain

That last one has a fun story behind it. Apparently, in 1979, the Nobel prize-winning biologist Francis Crick predicted that such a feat would never be possible.

A good reminder to be cautious when betting against human ingenuity!

Economics & Development:

- India Has Undermined a Popular Myth About Development

Energy & Environment:

- The Next Big Thing in Carbon Capture? Trash.
- Earth Fire Alliance Satellite for Detecting Wildfires Is Now in Orbit
- Marine Rewilding Project Sees "Remarkable" Results
- World Bank May Drop Ban on Funding Nuclear Power
- Nuclear Power Is Back. And Now, AI Can Help Manage the Reactors

Health & Demographics:

- Scientists Unveil Tiny Robot to Help Detect and Treat Bowel Cancer
- 154 Million Lives and Counting: The Power of Vaccines Revealed
- Woman Becomes First UK Womb Transplant Recipient to Give Birth
- Mitochondria Transplants Could Lengthen Lives

Science & Technology:

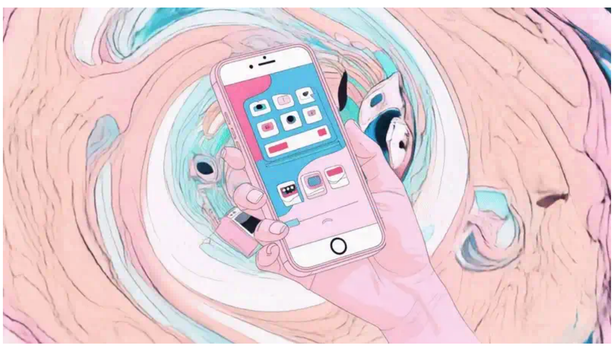
- Invasion of the Home Humanoid Robots
- Prefabricated Timber Tower Will Be Constructed in Just 90 Days
- 3D Printer Used to Construct Train Station Building in Japan
- Papa Johns Wants AI to Transform Pizza Ordering
- Google Unveils a Next-Gen Family of AI Reasoning Models
- Zipline Drone Delivery Takes Flight in Texas with Walmart
- Waymo Adoption Speeds Are Increasing
- Waymos Crash a Lot Less than Human Drivers
- Waymo to Begin Data Collection in Tokyo with Driver-Operated Test Rides
- Waymo to Offer Self-Driving Rides in Silicon Valley

America's Commodity Appetite: Evidence of Dematerialization

America's economy has grown better at extracting more value from less stuff.

MARIAN L TUPY

APR 10, 2025



A new study by Iddo K. Wernick from the Rockefeller University's Program for the Human Environment titled "Is America Dematerializing? Trends and Tradeoffs in Historic Demand for One Hundred Commodities in the United States" offers a remarkable portrait of how much the United States has changed in terms of material consumption since 1900.

The study examines the usage trends of 100 commodities—including iron ore, chickens, gallium, and titanium—and shows that a nation that started the 20th century with a seemingly bottomless appetite for raw materials pivoted dramatically around 1970. This pivot, which paradoxically coincided with the first Earth Day, marked a moment when the American economy began a decades-long march toward what Wernick calls "relative dematerialization." In essence, "dematerialization" refers to the gradual uncoupling of resource use from economic growth.

In *Superabundance: The Story of Population Growth, Innovation, and Human Flourishing on an Infinitely Bountiful Planet,* Gale L. Pooley and I document a parallel phenomenon on the global stage, finding that resources become more abundant over time. Our key insight is that *time prices*—or the time required to earn the money to buy a specific good—have been falling for almost two centuries for almost all commodities. Although Wernick focuses on physical consumption patterns within the United States, his study corroborates a related idea: Increasing efficiencies allow Americans to produce or obtain more output from fewer inputs, which helps to keep price increases in check.

The Rockefeller paper breaks commodities into three groups based on their trends from 1970 to 2020. The first group consists of only eight commodities—including gallium, titanium, and chicken—for which demand grew faster than gross domestic product (GDP), showing that certain products vital to the modern economy (and the dinner table) can still outpace the broader economy. The use of the second group of 51 commodities, such as petroleum and nitrogen fertilizer, grew more slowly than overall GDP but increased in absolute terms. That relative decoupling translates to lower intensity of use: We consume more resources as our economy expands but *less* per dollar of economic output.

Finally, the use of the third group—41 commodities, including iron ore, cadmium, asbestos, and even water—experienced declines in both absolute consumption and intensity of use. According to Wernick, some of these, like asbestos, fell out of favor due to safety concerns, while others, like iron ore, lost ground because of new manufacturing technologies, such as electric arc furnaces, which made recycling more economical. Once indispensable commodities saw demand shrink, underlining the fact that most resources need not remain economically essential in the long run.

Wernick's study also acknowledges the role of globalization in shifting the patterns of resource use: Certain energy-intensive or pollution-heavy production processes have migrated offshore, meaning the United States can appear more material-efficient while importing finished goods that embed resource usage from elsewhere. But that shift is neither absolute nor one way: The United States also exports large quantities of agricultural products, effectively shipping out "embodied" water, fertilizer, and cropland. These exchanges do not cancel each other out, but the global supply chain, which allows resources to flow to where they are most valued, benefits everyone.

Critics of this optimistic narrative often point to the "Jevons paradox," whereby increased efficiency leads to cheaper commodities and triggers higher total consumption. The evolution of the American economy after 1970 certainly raises intriguing questions. Was relative dematerialization achieved at the cost of higher economic growth, which slowed around the first Earth Day? Is dematerialization a product of market-driven efficiencies or a result of government-imposed environmental laws and regulations?

Looking into the future, what will happen to American resource use as the United States becomes an information powerhouse? Although computing is electricity-intensive, it can create massive value with little use of physical commodities. And what if we are on the cusp of using incredibly dense fuels to generate that electricity, as the deals between tech companies and new nuclear companies might indicate?

The march of technological progress, combined with the deregulation and economic growth drives promised by the second Trump administration, may yet provide answers to those questions.

All told, Wernick's findings confirm that, while the American economy has never ceased to crave materials—including metals, foods, and newly indispensable high-tech elements—it has grown better at extracting more value from less stuff. Our ingenuity is decoupling growth from sheer material input, though whether that trend can be sustained over the long run remains an open question.

Why Modern Humans Distrust Technology

The answer lies in our evolutionary past.

MARIAN L TUPY

APR 08, 2025

The history of human flourishing is a story of technological progress. From the taming of fire to the Industrial Revolution, our species has found ways to reshape the world, turning scarcity into abundance and hardship into comfort. Yet, when it comes to some of today's concerns—climate change, food security, deforestation—the instinctive response is rarely technological optimism. Instead, the prevailing narrative emphasises social change: reducing consumption, altering human behaviour, and enforcing collective restraint.

Why do so many people reflexively favour social solutions—carbon taxes, regulations, lifestyle changes—while discounting the promise of technological breakthroughs? The answer lies in our evolutionary past and in the way our minds have been shaped to solve problems. As psychologist William von Hippel has noted, humans evolved for social solutions rather than technological ones. That cognitive legacy continues to influence how we approach modern challenges, often leading us to dismiss the very innovations that could provide scalable, lasting solutions.

For most of our history, human survival depended less on technological ingenuity and more on cooperation and social cohesion. Our ancestors did not invent their way out of problems; they solved them through alliances, negotiations, and collective rulemaking. Food shortages, for instance, were addressed not by developing advanced agricultural techniques—those came much later—but by rationing resources, redistributing wealth within the tribe, and reinforcing norms against hoarding.

This survival strategy shaped our psychology. Over generations, humans became attuned to social fixes as the primary way to navigate crises. We evolved to seek consensus, enforce norms, and reward conformity—traits that helped small groups function efficiently in an unpredictable environment. As a result, when confronted with modern challenges, we instinctively default to social regulation over technological adaptation.

Today, this bias manifests in the way we talk about, for example, climate change. The dominant discourse does not emphasise nuclear fusion, carbon capture, or geoengineering, despite their potential to dramatically cut emissions. Instead, we hear calls for people to consume less, fly less, drive less, eat differently—as though the best way to tackle a global problem is through personal sacrifice. This isn't a rational economic approach; it's a deeply ingrained cognitive reflex.

Beyond evolutionary psychology, several well-documented cognitive biases reinforce our scepticism toward technological solutions. One of the most powerful is negativity bias, the tendency to focus more on potential downsides than on possible benefits. Innovations—especially large-scale ones like nuclear power or geoengineering—are often accompanied by uncertainties. A nuclear plant meltdown is a vivid disaster; the slow, cumulative benefits of abundant clean energy are far less emotionally gripping.

Similarly, the availability heuristic skews our perception of risk. When we think about environmental disasters, we can readily picture hurricanes, wildfires, and melting ice caps because they dominate the news cycle. But few can just as easily imagine the gradual improvement of solar efficiency, battery storage, or direct air capture technologies, even though these developments are advancing every year. The more available a mental image is, the more likely we are to see it as relevant. Since climate catastrophes are widely publicised while technological progress happens quietly, we develop a distorted sense of urgency and inevitability.

Then there's linear thinking, the assumption that current trends will continue indefinitely. If emissions are rising and temperatures are increasing, many assume the trajectory will continue unchecked—unless human behaviour radically changes. What this ignores is the power of nonlinear technological breakthroughs to disrupt trends entirely. Few in 1970 predicted that agricultural innovation would allow us to feed four billion more people than seemed possible at the time. Similarly, few today can conceive of how energy revolutions might render current emissions concerns obsolete.

Another reason technological solutions struggle for mainstream acceptance is that moral frameworks dominate the climate debate. The prevailing rhetoric paints fossil fuel consumption as a sin, framing climate action as an ethical obligation rather than an engineering challenge. The underlying assumption is that suffering is virtuous—that real change requires sacrifice, restraint, and a return to a simpler way of living.

This moral framing naturally privileges social solutions over technological ones. Cutting emissions through sacrifice feels righteous; solving the problem through innovation seems like cheating. But history shows that progress has always come from overcoming limitations, not submitting to them. Fewer people today still argue that the solution to food insecurity is simply to eat less; yet many advocate that the best way to combat climate change is to consume less energy rather than produce it more cleanly.

This view is not only misguided but actively harmful. By demonising industry and technology, we risk stifling the very innovations that could ensure prosperity while reducing environmental impact. We should not ask, "How can we get people to use less energy?" but rather, "How can we produce abundant, clean energy?" We should focus not on curbing human ambition, but on directing it toward better outcomes.

The tendency to discount innovation is not new. Time and again, humanity has misjudged its own capacity for problem-solving. In the nineteenth century, urban planners feared cities would collapse under the burden of horse manure, failing to anticipate the automobile. In the 1960s, experts predicted mass starvation due to overpopulation, not foreseeing the Green Revolution, which vastly increased crop yields.

Even within the energy sector, past environmental concerns have been rendered irrelevant by technology. The deforestation crisis of the nineteenth century—caused by the need for wood as fuel—was solved not by conservation, but by the discovery of coal and oil. Today's fear that renewables can never scale ignores the potential of next-generation batteries, advanced nuclear, and synthetic fuels to transform the landscape.

If history teaches us anything, it is that human ingenuity consistently outperforms doomsday predictions. That does not mean we should ignore environmental challenges. It means we should approach them with the mindset that has served us best—problem-solving through innovation, not retreat.

Climate change and other environmental concerns can be challenging, but they are not insurmountable. The solution is not to limit prosperity, but to decouple it from environmental harm through better technologies. Energy abundance, clean industry, and new materials are the future—not austerity, restriction, and economic regression.

Recognising the psychological roots of our bias against technological solutions is the first step toward overcoming it. The next step is to embrace a rational optimism—one that acknowledges risk while also investing in the solutions that history shows will prevail. The world has never been saved by fear, but it has been saved—again and again—by human ingenuity.