

Ode to E Pluribus Unum for Sunday December 31 2023

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Supernova Remnant Cassiopeia A



Image Credit: NASA, ESA, CSA, STScI; D. Milisavljevic (Purdue University), T. Temim (Princeton University), I. De Looze (University of Gent)

Massive stars in our Milky Way Galaxy live spectacular lives. Collapsing from vast cosmic clouds, their nuclear furnaces ignite and create heavy elements in their cores. After only

a few million years for the most massive stars, the enriched material is blasted back into interstellar space where star formation can begin anew.

The expanding debris cloud known as Cassiopeia A is an example of this final phase of the stellar life cycle. Light from the supernova explosion that created this remnant would have been first seen in planet Earth's sky about 350 years ago, although it took that light 11,000 years to reach us.

This sharp NIRCam image from the James Webb Space Telescope shows the still hot filaments and knots in the supernova remnant. The whitish, smoke-like outer shell of the expanding blast wave is about 20 light-years across. Light echoes from the massive star's cataclysmic explosion are also identified in Webb's detailed image of supernova remnant Cassiopeia A.

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2023 Advances in Science

2023 in Physics

From the smallest scales to the largest, the physical world provided no shortage of surprises this year.



*The Nobel prize was awarded to three professors: Pierre Agostini (Ohio State University, USA), Ferenc Krausz (Max Planck Institute, Germany) and Anne L'Huillier (Lund University, Sweden).
Physics World*

It has often been said that each time we look at the universe in a new light — or through a new lens — we see things we never imagined. NASA's James Webb Space Telescope has delivered on that promise. At the turn of the year, astronomers announced that the telescope's golden, honeycombed eye had stolen glances of the universe's first stars. JWST has also seen the light from galaxies that glowed some 300 million years after the great big clap that created the universe as we know it. In JWST images, those galaxies are "just so stupidly bright," said Rohan Naidu of the Massachusetts Institute of Technology. Now, astronomers are struggling to explain how those galaxies grew so big so fast, as their size and precociousness defy expectations.

<https://bit.ly/3GYRV9G>

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2023 in Biology

In a year packed with fascinating discoveries, biologists pushed the limits of synthetic life, probed how organisms keep time, and refined theories about consciousness and emotional health.



*During 2023, Quanta turned a spotlight on important research progress into the nature of consciousness, the origins of our microbiomes and the timekeeping mechanisms that govern our lives and development, among many other discoveries.
Ibrahim Rayintakath for Quanta Magazine (cover);*

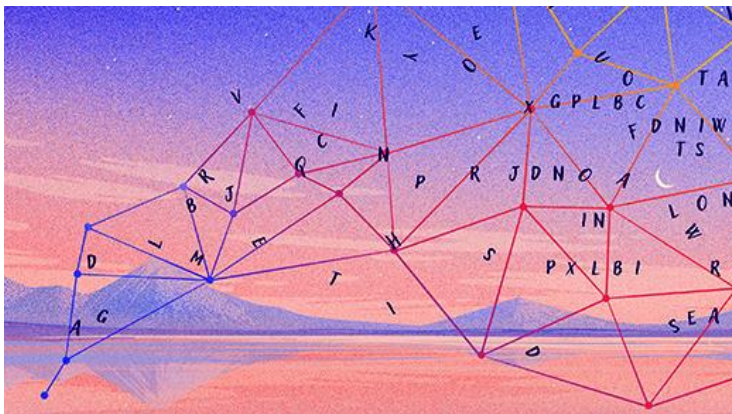
Revolutions in the biological sciences can take many forms. Sometimes they erupt from the use of a novel tool or the invention of a radical theory that suddenly opens so many new avenues for research, it can feel dizzying. Sometimes they take shape slowly, through the slow accumulation of studies, each one representing years of painstaking work, that collectively chip away at the prevailing wisdom and reveal a stronger, better intellectual framework. Both kinds of revolution unleash avalanches of new ideas and insights that improve our understanding of how life works.

<https://bit.ly/3TA68S4>

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2023 in Computer Science

Artificial intelligence learned how to generate text and art better than ever before, while computer scientists developed algorithms that solved long-standing problems.



In 2023, computer scientists made progress on a new vector-driven approach to AI,

fundamentally improved Shor's algorithm for factoring large numbers, and examined the surprising and powerful behaviors that can emerge from large language models.

Myriam Wares for Quanta Magazine (cover);

The year brought many other advances in computer science. Researchers made subtle but important progress on one of the oldest problems in the field, a question about the nature of hard problems referred to as "P versus NP."

<https://bit.ly/487uI10>

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History Buffs Will Dig These 5 Science Stories From 2023



Christiaan Huygens' telescopes weren't as good as his rivals', even though his lenses (a few shown with a portrait of Huygens) were well made. That may be because the 17th century astronomer needed glasses.

Rijksmuseum Boerhaave, Leiden

Science occasionally gives us clearer views of the distant past. This year, researchers opened windows into the life and times of ancient Romans, impressionist painters and other towering historical figures.

<https://www.sciencenews.org/article/science-history-stories-2023>

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Favorite Animal Stories of 2023



Even without a brain, the tiny Caribbean box jellyfish can learn to avoid obstacles, research revealed in 2023.

J Bielecki

From birds repurposing antiavian architecture to jellyfish that can learn, here are dispatches from the animal kingdom that we went wild for in 2023.

<https://bit.ly/3trbbcl>

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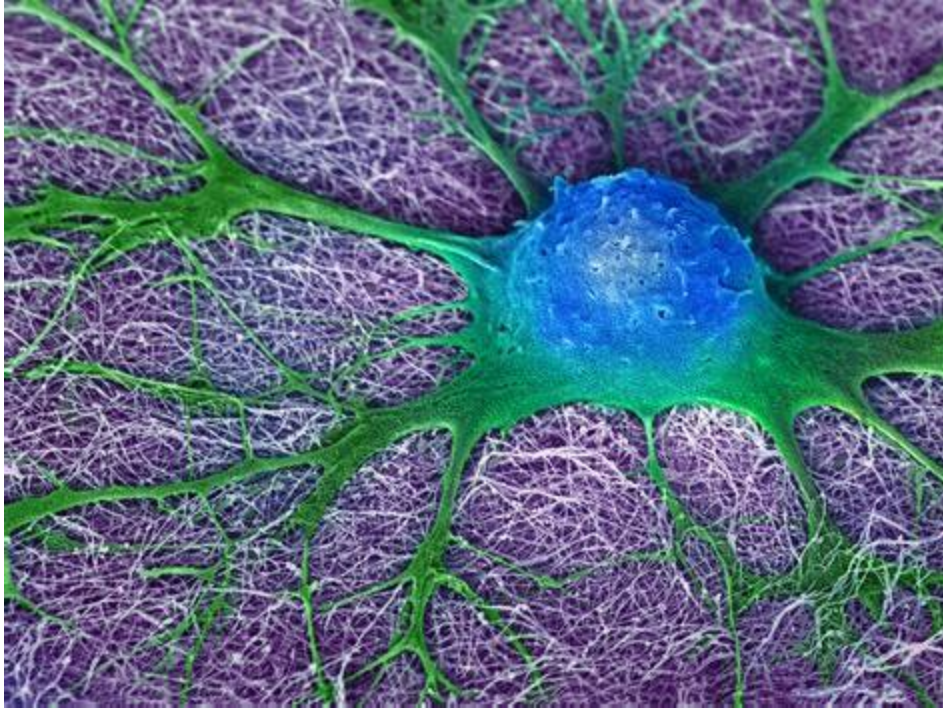
**One Millionth of
a Mouthwash**

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One Microscope

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In Pregnant Mice, New Neurons Grow as Babies Do



A growing mouse neural stem cell
flickr

Pregnancy triggers an abundance of physical changes. Blood volume spikes dramatically, organs shift to accommodate the growing fetus, and circulating hormones influence everything from mood to digestion. Some research has shown that getting pregnant also changes the brain, causing [long-lasting structural changes](#) in regions responsible for social cognition. Now, experiments in mice suggest that pregnancy can even [drive the growth of brand new neurons](#).

Adult mice possess a handful of neural stem cells, which allow their brains to remain plastic throughout life. According to a new Science study, pregnancy activates some of these cells, giving rise to new neurons in the olfactory bulb. These neurons heighten the female mouse's sense of smell, allowing her to recognize the scent of her offspring more easily. This growth doesn't last very long, however, and tapers off completely by the time pups have finished weaning.

In people, the growth of new neurons or neurogenesis occurs quite infrequently in the adult brain, though it has been implicated in learning and memory. These findings in mice raise the possibility that neurogenesis could also occur during our pregnancies, neuroscientist Gerd Kempermann writes in a related Perspective. After all, smell helps form bonds between parents and newborns in our species, too. "It is tempting to speculate," he writes, "that this function relies on pregnancy-induced neurogenesis in the human olfactory bulb."

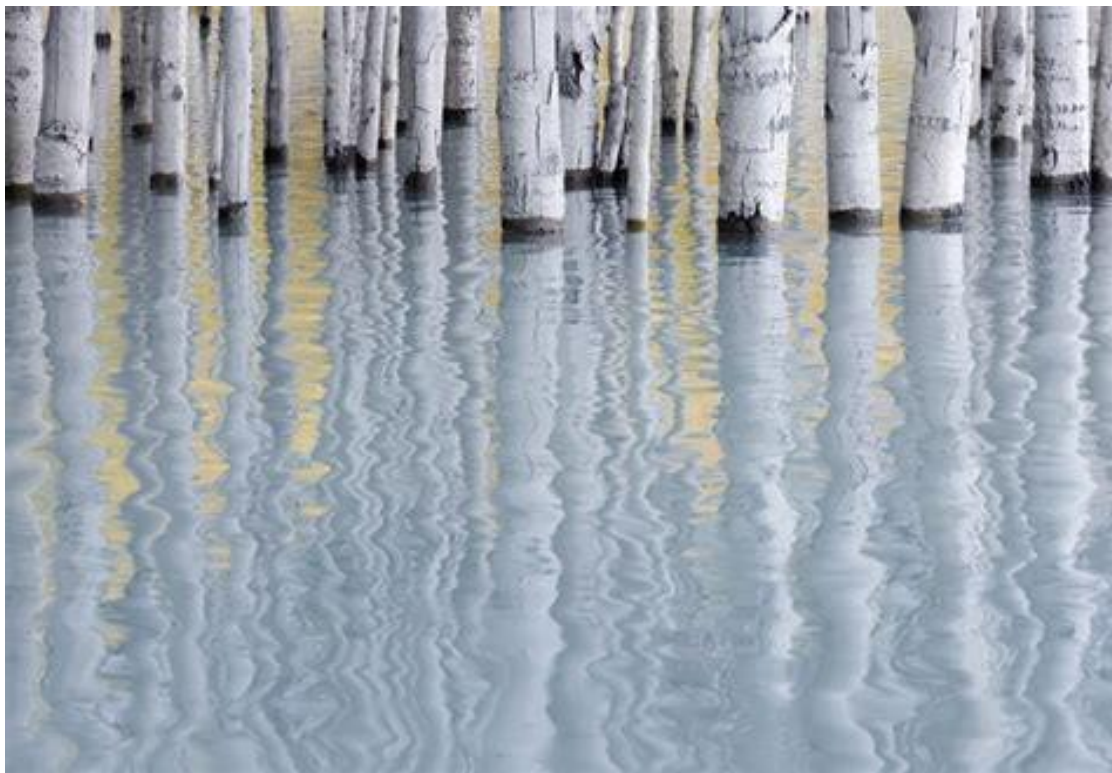
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Positive proof of global warming



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Winners of the 2023 International Landscape Photographer of the Year Contest



mymodernmet.com

There were over 4,000 entries to the contest, which is now in its 10th year. In addition to the main prizes, the competition also hands out special awards that change each year. In 2023, awards for the best Aerial, Seascape, Black and White, Desert, and Ice & Snow photos were also handed out.

Many different facets of the natural landscape were highlighted through these categories, and these international photographers saw their creative talents rewarded, whether they spent time in the forest or bundled up on an iceberg.

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2023 in Medicine

Are Self-Checkouts a Cautionary Automation Tale

If you've ever tried to buy fruit at a self-checkout kiosk, you know it can be a nightmare.



Fending off a line of impatient customers while trying to make sense of illegible bar codes is not for the weak.

And once the machine starts screaming to “wait for assistance,” it’s all over.

It’s not just you — while the handy kiosks were once the apple of every big retailer’s eye, more companies are turning their backs on the tech, per The Atlantic:

Walmart removed self-checkouts entirely from some of its stores and is redesigning others.

Costco is cracking down on card-sharing by staffing its self-checkout lines more heavily.

ShopRite brought cashiers back into stores after a flood of customer complaints.

What they do have going for them: machines don’t ask for PTO, catch the flu, or demand better pay or benefits — all things that corporations love to avoid.

But kiosks come with their own nuisances

According to a 2021 survey, 67% of customers said they’ve experienced a self-checkout “fail.”

Plus, they can be high-maintenance for stores, too:

- They often break, with buggy and unreliable tech.
- Kiosk maintenance can be costly, requiring specialized IT support.
- They contribute to the ~\$100B retail shrink problem, from both theft and scanning mistakes.
- And they’re expensive. Four lanes of self-checkout kiosks cost stores an average of \$125k to install.

Replacing employees with self-checkout kiosks can cause other issues, such as messy or understocked shelves, worsened customer service, and accessibility issues for wheelchair users and people with limited vision.

In the future...

... stores may keep the self-checkouts and the employees.

Kroger is testing a model that relies entirely on self-checkout but won’t reduce the amount of cashiers; employees will instead assist customers with the checkout process at kiosks.

Alternatively, there’s always the Amazon Go model: no checking out at all.

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With A-Fib on the Rise, Researchers Focus on Treatments

Atrial fibrillation is an electrical malfunction. But what triggers it remains a mystery.



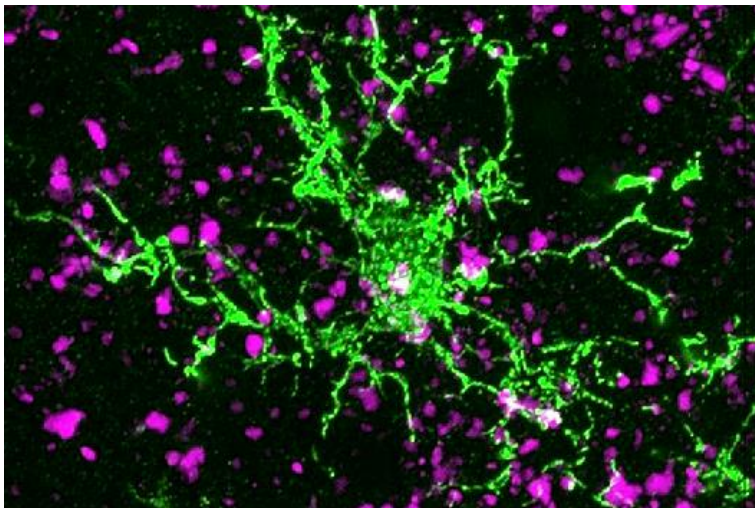
Some patients with atrial fibrillation describe the feeling as that of a fish flip-flopping in their chest. Others say it's like the flutter of a butterfly's wings, an effect modeled in this image.

<https://bit.ly/3QTtvTJ>

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How Huntington's Disease Begins Before Symptoms Appear

Study blocks cognitive symptoms in mice, advancing efforts at early intervention



A microglia cell (shown in green) and corticostriatal synapses (purple) from a patient with Huntington's disease.

Image: Dan Wilton

<https://bit.ly/3QFozSj>

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During Pregnancy, a Fake 'Infection' Protects the Fetus

Cells in the placenta have an unusual trick for activating gentle immune defenses and keeping them turned on when no infection is present. It involves crafting and deploying a fake virus.



Kristina Armitage/Quanta Magazine

The idea of cells activating immune defenses preemptively “very much violates one of the views that immunologists have,” said Jonathan Kagan, an immunobiologist at Boston Children’s Hospital and Harvard Medical School who was not involved in the new study.

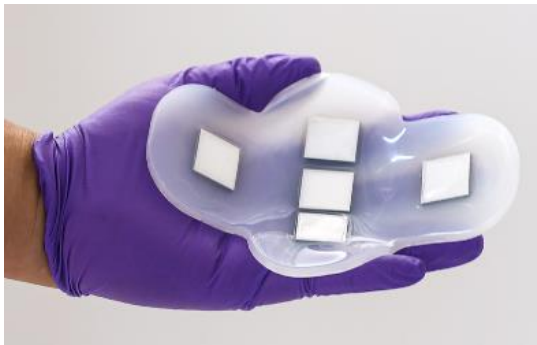
But the placenta breaks these rules, according to the new research. Somehow, it turns on defenses before they are necessary and then leaves them on without harming itself or the fetus.

<https://bit.ly/46nRnV7>

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A New Ultrasound Patch Can Measure How Full Your Bladder Is

The wearable device, designed to monitor bladder and kidney health, could be adapted for earlier diagnosis of cancers deep within the body.



A wearable ultrasound monitor can image the bladder and determine how full it is. The MIT-

developed device could help patients with bladder or kidney disorders more easily track whether these organs are functioning properly.

Credits: Photo courtesy of the researchers.

In a new study, the researchers showed that their patch can accurately image the bladder and determine how full it is. This could help patients with bladder or kidney disorders more easily track whether these organs are functioning properly, the researchers say.

This approach could also be adapted to monitor other organs within the body by changing the location of the ultrasound array and tuning the frequency of the signal. Such devices could potentially enable earlier detection of cancers that form deep within the body, such as ovarian cancer.

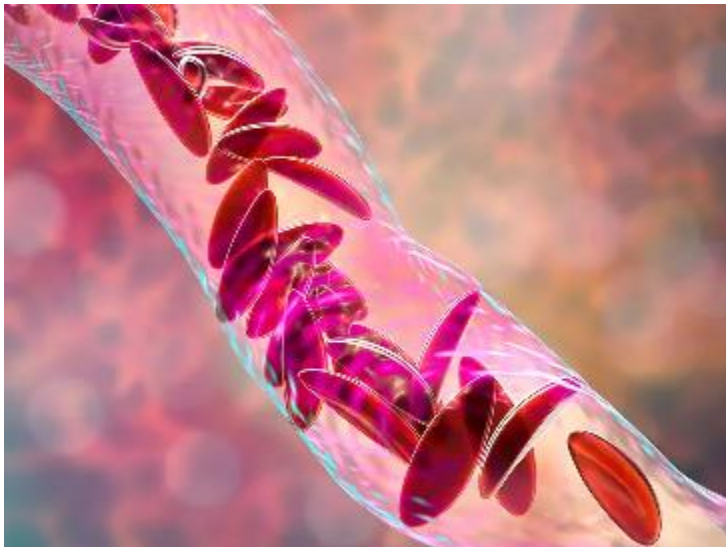
<https://bit.ly/3GdkYWA>

Gee whiz. And here I thought I had that metric covered. Do you think our government paid for this? Maybe someone's cousin got the contract.

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The World's 1st CRISPR Therapy Has Just Been Approved

U.K. regulators have approved the use of a CRISPR therapy called Casgevy to treat two inherited blood disorders. But what is it and how does it work?



Sickle-cell disease causes red blood cells to become C-shaped and sticky, so they clog up blood vessels.

(Image credit: Dr_Microbe via Getty Images)

Exa-cel, also known by its brand name Casgevy, received its first regulatory approval on Nov. 16, 2023 from the U.K. Medicines and Healthcare products Regulatory Agency (MHRA) to treat two debilitating blood disorders: sickle cell disease and transfusion-

dependent beta-thalassemia. Advisors to the U.S. Food and Drug Administration (FDA) determined that the drug was safe for clinical use in late October, and the FDA itself is expected to rule on whether to approve the treatment by December.

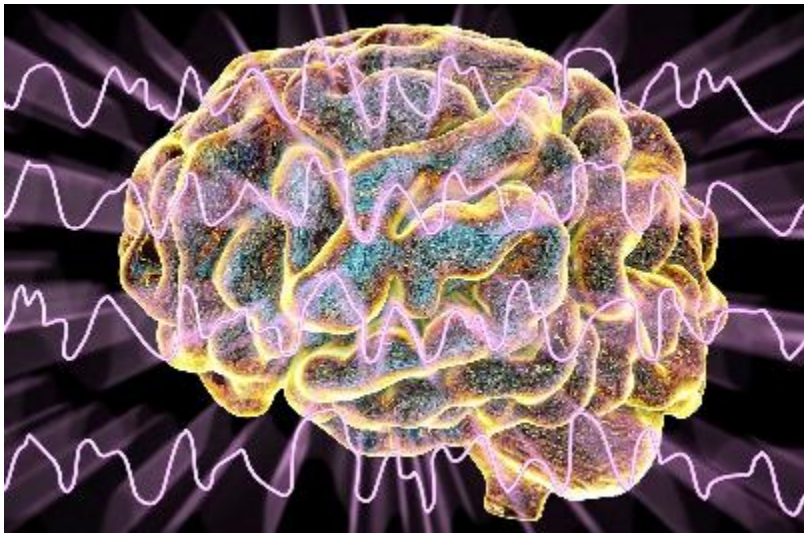
By Emily Cooke for Live Science

<https://bit.ly/412xOR8>

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A Brain-Monitoring Device Takes Guesswork Out of Anesthesia

The automated device pairing brain activity and dosing kept two macaques sedated for 125 minutes



Combining brain-monitoring equipment with drug-dosing algorithms could one day help anesthesiologists give patients just the right dose of anesthetic to stay sedated during medical procedures.

Kateryna Kon/Science Photo Library/Getty Images

A new brain-monitoring device aims to be the Goldilocks of anesthesia delivery, dispensing drugs in just the right dose.

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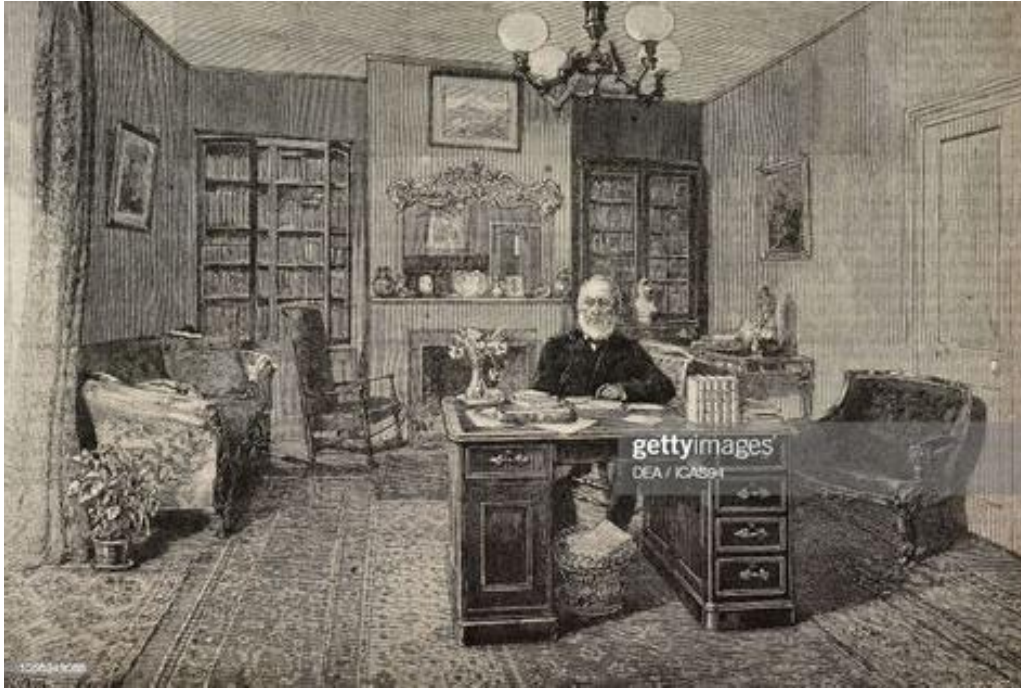
By Erin Garcia de Jesús for Science News

I thought that's what anesthesiologists do. Here again, I wonder who got the contract.

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Poetry Corner

John Greenleaf Whittier (1807-1892)



John Greenleaf Whittier in his study at Amesbury, engraving from The Illustrated London News, No 2787, September 17, 1892.

(Credit: DEA / ICAS94 / Getty Images)

John Greenleaf Whittier was a leading American Quaker poet and a passionate supporter of the abolition of slavery.

Born on a farm into a Quaker family, he had limited formal education. His poem, 'The Exile's Departure', was published in the Newburyport Free Press. Its editor, William Garrison became his friend and associate in the abolitionist cause. He went on to edit newspapers in Boston and Haverhill and the New England Weekly Review in Hartford, Connecticut, the most important Whig journal in New England.

He continued writing verse, sketches, and tales, and published his first volume of poems, 'Legends of New England'. His fiery antislavery pamphlet, 'Justice and Expediency', made him prominent activist in the abolition movement, and for a decade he was probably its most influential writer.

Among his other poems are, 'Voice of Freedom', 'Maud Muller', 'The Brewing of Soma' which had the hymn for which he wrote the words, Dear Lord and Father of Mankind, and 'Snow-Bound: A Winter Idyll'. His verse is often marred by sentimentality and poor technique, but his best poems are still read for their moral beauty and simple sentiments and are regarded as an important voice of his age.

Burning Driftwood

Before my drift-wood fire I sit,
And see, with every waif I burn,
Old dreams and fancies coloring it,
And folly's unlaid ghosts return.

O ships of mine, whose swift keels cleft
The enchanted sea on which they sailed,
Are these poor fragments only left
Of vain desires and hopes that failed?

Did I not watch from them the light
Of sunset on my towers in Spain,
And see, far off, uploom in sight
The Fortunate Isles I might not gain?

Did sudden lift of fog reveal
Arcadia's vales of song and spring,
And did I pass, with grazing keel,
The rocks whereon the sirens sing?

Have I not drifted hard upon
The unmapped regions lost to man,
The cloud-pitched tents of Prester John,
The palace domes of Kubla Khan?

Did land winds blow from jasmine flowers,
Where Youth the ageless Fountain fills?
Did Love make sign from rose blown bowers,
And gold from Eldorado's hills?

Alas! the gallant ships, that sailed
On blind Adventure's errand sent,
Howe'er they laid their courses, failed
To reach the haven of Content.

And of my ventures, those alone
Which Love had freighted, safely sped,
Seeking a good beyond my own,
By clear-eyed Duty piloted.

O mariners, hoping still to meet

The luck Arabian voyagers met,
And find in Bagdad's moonlit street,
Haroun al Raschid walking yet,

Take with you, on your Sea of Dreams,
The fair, fond fancies dear to youth.
I turn from all that only seems,
And seek the sober grounds of truth.

What matter that it is not May,
That birds have flown, and trees are bare,
That darker grows the shortening day,
And colder blows the wintry air!

The wrecks of passion and desire,
The castles I no more rebuild,
May fitly feed my drift-wood fire,
And warm the hands that age has chilled.

Whatever perished with my ships,
I only know the best remains;
A song of praise is on my lips
For losses which are now my gains.

Heap high my hearth! No worth is lost;
No wisdom with the folly dies.
Burn on, poor shreds, your holocaust
Shall be my evening sacrifice!

Far more than all I dared to dream,
Unsought before my door I see;
On wings of fire and steeds of steam
The world's great wonders come to me,

And holier signs, unmarked before,
Of Love to seek and Power to save,—
The righting of the wronged and poor,
The man evolving from the slave;

And life, no longer chance or fate,
Safe in the gracious Fatherhood.

I fold o'er-wearied hands and wait,
In full assurance of the good.

And well the waiting time must be,
Though brief or long its granted days,
If Faith and Hope and Charity
Sit by my evening hearth-fire's blaze.

And with them, friends whom Heaven has spared,
Whose love my heart has comforted,
And, sharing all my joys, has shared
My tender memories of the dead,—

Dear souls who left us lonely here,
Bound on their last, long voyage, to whom
We, day by day, are drawing near,
Where every bark has sailing room.

I know the solemn monotone
Of waters calling unto me;
I know from whence the airs have blown
That whisper of the Eternal Sea.

As low my fires of drift-wood burn,
I hear that sea's deep sounds increase,
And, fair in sunset light, discern
Its mirage-lifted Isles of Peace.

Barbara Frietchie

Up from the meadows rich with corn,
Clear in the cool September morn,

The clustered spires of Frederick stand
Green-walled by the hills of Maryland.

Round about them orchards sweep,
Apple- and peach-tree fruited deep,

Fair as a garden of the Lord

To the eyes of the famished rebel horde,

On that pleasant morn of the early fall
When Lee marched over the mountain wall,—

Over the mountains winding down,
Horse and foot, into Frederick town.

Forty flags with their silver stars,
Forty flags with their crimson bars,

Flapped in the morning wind: the sun
Of noon looked down, and saw not one.

Up rose old Barbara Frietchie then,
Bowed with her fourscore years and ten;

Bravest of all in Frederick town,
She took up the flag the men hauled down;

In her attic window the staff she set,
To show that one heart was loyal yet.

Up the street came the rebel tread,
Stonewall Jackson riding ahead.

Under his slouched hat left and right
He glanced: the old flag met his sight.

"Halt!"— the dust-brown ranks stood fast.
"Fire!"— out blazed the rifle-blast.

It shivered the window, pane and sash;
It rent the banner with seam and gash.

Quick, as it fell, from the broken staff
Dame Barbara snatched the silken scarf;

She leaned far out on the window-sill,
And shook it forth with a royal will.

"Shoot, if you must, this old gray head,
But spare your country's flag," she said.

A shade of sadness, a blush of shame,
Over the face of the leader came;

The nobler nature within him stirred
To life at that woman's deed and word:

"Who touches a hair of yon gray head
Dies like a dog! March on!" he said.

All day long through Frederick street
Sounded the tread of marching feet:

All day long that free flag tost
Over the heads of the rebel host.

Ever its torn folds rose and fell
On the loyal winds that loved it well;

And through the hill-gaps sunset light
Shone over it with a warm good-night.

Barbara Frietchie's work is o'er,
And the Rebel rides on his raids no more.

Honor to her! and let a tear
Fall, for her sake, on Stonewall's bier.

Over Barbara Frietchie's grave
Flag of Freedom and Union, wave!

Peace and order and beauty draw
Round thy symbol of light and law;

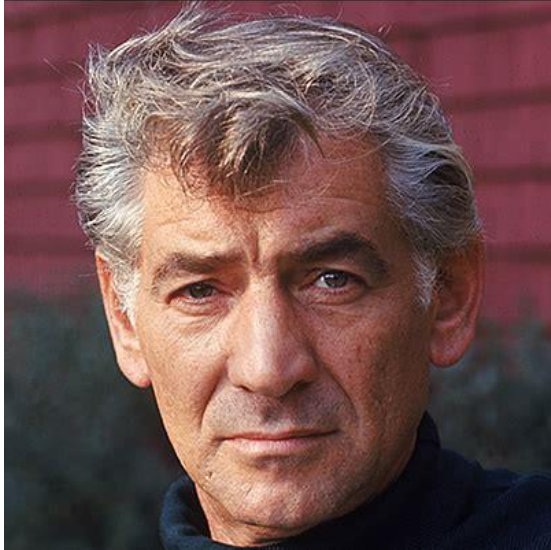
And ever the stars above look down
On thy stars below in Frederick town!

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Strings and Chords

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Leonard Bernstein's Age of Anxiety



elimiradomnocturno

Foss https://youtu.be/JE_vVWGcaAw?list=PLcvFO4lyuy_uMiQW98uTfLgdAKGA-gUts

Zimerman <https://youtu.be/Q-aU2Se1RHw?list=RDQ-aU2Se1RHw>

When I first heard this in 1956, I thought here was the opening salvo by an American composer who would rise to become one of the 'greats' in the classical form. He did become great, but in another genre, where his *On the Town*, *Candide*, and *Westside Story* achieved fame...along with his performing and conducting activities.

The first recording I heard back then was with Lukas Foss on piano. I prefer it to the more recent one conducted by Bernstein with Krystian Zimerman at the keyboard, but you be the judge.

For purists, his first work was Symphony No. 1 (Jeremiah), and yes, his lifestyle was...well how about 'complicated.'

In my estimation he made the wrong choice, opting for glitter rather than substance...but nobody asked me, and anyway, what the heck do I know.

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Gustavo Dudamel



artistsasvaliente

Gustavo Dudamel will leave the Los Angeles Philharmonic for the New York Phil in 2026...a sad loss for the City of the Angels, but a great opportunity for the 42-year old Venezuelan conductor.

Watch here as he leads his charges through a rehearsal of Stravinski's Firebird Suite, followed by a performance of the Finale of the Suite.

Gustavo Dudamel rehearses "The Firebird" suite with the LA Phil

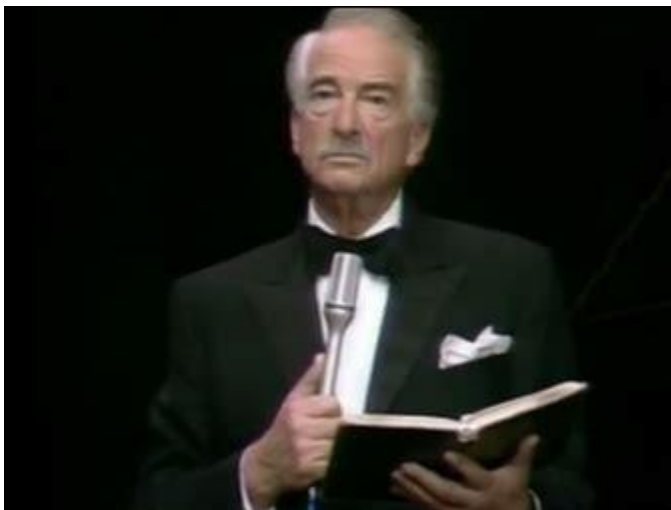
https://youtu.be/x_gi7MIQkqo

Stravinsky: Finale - Suite from The Firebird / Los Angeles Philharmonic

<https://youtu.be/rYcz-g8WpMc>

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Victor Borge - Performance at the White House



youtube.com

<https://youtu.be/ei9VVDNxCc8>

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This and That

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The Economics of Unused Gift Cards



Zachary Crockett / The Hustle

Every year, Americans spend billions of dollars on gift cards. But what happens to the money when the cards aren't redeemed?

<https://bit.ly/47eoScP>

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Remember Those Hot Wheels You Had as a Kid?



mattel

They're still popular and worth a fortune now.

Kids are still playing with Hot Wheels, those gleaming toy Camaros, Cougars and Corvettes you got for Christmas or your birthday, years and years ago.

But those kids, who are sending new and even wilder-styled cars skittering across the floor today, are your kids, or maybe grandkids, and find the toys as irresistible as you did in 1968 or later.

And it's not just the target audience of kids ages 3 to 10 playing with them these days. It's now adults collecting them, sometimes paying Ferrari-sized amounts of money for rare models.

<https://bit.ly/48AGPnh>

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Oreo Is Introducing New Flavors

Oreo is introducing 3 new flavors — including one inspired by a classic NYC treat.



These three new cookies hit stores on Jan. 3, 2024.

<https://bit.ly/41miUpf>

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Kraft's Newest Mac & Cheese Is Ditching Cheese



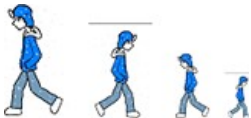
*Kraft is rolling out plant-based mac and cheese.
Courtesy Kraft Heinz Company*

In a press release, Kraft said that less than 30% of consumers end up becoming repeat purchasers of similar plant-based mac and cheese products because “taste and texture remain their largest pain points.” However, the company believes that the “iconic” Kraft Mac & Cheese brand will “address consumers’ plant-based preferences and evolving needs” with its creamy texture that buyers are familiar with.

<https://bit.ly/3GpCVI0>

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My Walking Thoughts



For Sunday December 31 2023

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Trip to Terra Incognita: Quantico, September 1959 (#4)

Incoming Physical Eval

“One...two...tha-rhee..four...one...two...tha-rhee..four,” accompanied by the crunch of boots that after a few ragged moments magically became synchronized, the hypnotic refrain alternating from 120 to 240 beats per minute under the vocal baton of Gunnery Sergeant Reeves. Ours is just one of 12 50-man units see-sawing back and forth in columns across the hard-packed ‘grinder’ that will be our principal playground for the next three months. All at once our tribe becomes fatally unglued when gunny issues a new command, “Left oblique...huh!”

"Platoon...halt!" he yells in exasperation. "Ok, you clowns," he says derisively, "who here knows what 'oblique' means," and before waiting for a response continues with, "Bull doogies, candidates. If you knew *what*, you'd of turned 45 degrees to the left and continued to march, not stumble around like a bunch of frat house drunks."

Aligned once again, we found ourselves transitioning from line-ahead to oblique, to flank, and to-the-rear until we accomplished the maneuvers with...well not precision, but at least absent tragedy until at last it was our turn to undergo the evaluation of our physical condition.

If memory serves correctly, minimum standards were 20 pushups, 40 sit-ups, 10 pull-ups, 100-yard dash in 15 seconds, a quarter mile in 90 seconds. As I said at the beginning, I was in the best shape of my life, so I raced through the exercises close to the top of the group imagining the accolades I would receive for my stellar performance.

Wrong. If anything, high marks as much as failures were a mistake as they made you 'noticed' by the keepers...bad joss.

"Ok, TROW...TIE," Sgt. Bulldog said with derision, "let's see how well you do on the obstacle course."

To be continued.

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Onward and Perhaps Upward into 2024



With all the uncertainty before us, two things stand out in bold relief: 2024 is a leap year and later in the year what I will call the quadrennial hogwash election process that culminates on Tuesday November 5th.

This is the last time I will mention in *My Walking Thoughts* the evolution that has come to represent the divisive hallmark of democracy whose chief metrics no longer lie with a bulge in the middle of a straight line but rather a horseshoe where the most disparate

elements of the electorate come together to create a challenge to what was once an orderly and somewhat predictable process.

Is this disrupted situation now worse than in 'my day?' I don't know other than to suggest that what we seem to have left in the slipstream is the notion that ours is a government of law, not people...that it is the office we salute, not the office holder. Was it ever thus? I think so but maybe it's just a figment of my romantic imagination.

Will we be better off on November 6th, 2024? *Absolutely*, if for no other reason than winners and losers alike will need at least a day or two to image before launching campaigns for their next hurrah.

I have a thought here: Rather than wishing one another vapid "happy new year" greetings, how about setting aside February 29th as a day of reflection on what we can do to make our political horseshoe straighter...a little less contentious.

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