

Ode to E Pluribus Unum for Sunday June 23 2024

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AR 3664 at the Sun's Edge

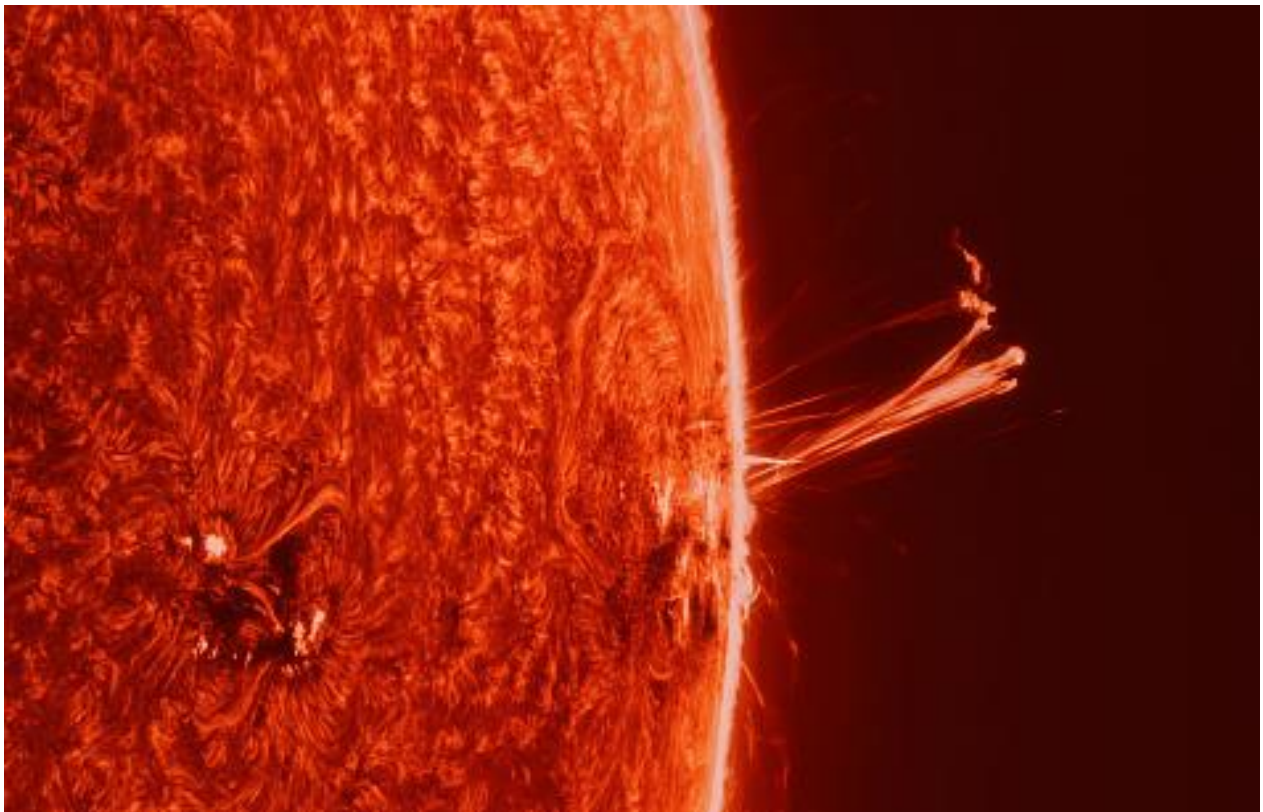


Image Credit & Copyright: Sebastian Voltmer

What did the monster active region that created the recent auroras look like when at the Sun's edge? There, AR 3664 better showed its 3D structure.

Pictured, a large multi-pronged solar prominence was captured extending from chaotic sunspot region AR 3664 out into space, just one example of the particle clouds ejected from this violent solar region.

The Earth could easily fit under this long-extended prominence. The featured image was captured two days ago from this constantly changing region.

On May 14th, the strongest solar flare in years was expelled (not shown), a blast classified in the upper X-class. Ultraviolet light from that flare quickly hit the Earth's atmosphere and caused shortwave radio blackouts across both North and South America.

Although now rotated to be facing slightly away from the Earth, particles from AR 3664 and subsequent coronal mass ejections (CMEs) might still follow curved magnetic field lines across the inner Solar System and create more Earthly auroras.

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Chinese 'Ascender' Leaves Moon



AVWeb

China's Chang'e-6 ascender module blasted off from the surface of the moon late Monday after receiving a container of rocks and soil from the landing module at its landing spot near the moon's south pole. The ascender went into a lunar orbit and will rendezvous with a reentry spacecraft to transfer the load. The reentry vehicle will head back to Earth later this month. The lander/ascender spent less than two days on the moon and it's been about a month since the whole system launched on what the Chinese said was a 53-day mission.

Besides showing the West that it can pull off a complicated mission like this, the effort will possibly be a scientific bonanza. The Chang'e-6 landed in an 8-mile-deep crater that was created more than four billion years ago. It's theorized that the impact uncovered materials from deep within the moon and if some of those got into the container then they should reveal information about the origin of the moon. It's also speculated there might be ice there that could be a fundamental resource for a future base camp. The reentry part of the system is expected to parachute onto the Inner Mongolian desert on June 25.

By Russ Niles -for AVweb, June 4 2024

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Drone Photo Awards 2024 Finalists



Copyright Credit: Siena Drone Photo Awards 2024

The Siena Drone Photo Awards has just revealed its shortlist of extraordinary aerial images for its 2024 edition.

The competition spans nine categories (People, Animals, Nature, Urban, Wedding, Sport, Abstract, Series and Video), with five stunning images selected in each.

<https://bit.ly/4e9bJGU>

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The Vulture and the Husbandman

By Louisa Caroline [aka Arthur Clement Hilton, b. 1851]

N.B. — A Vulture is a rapacious and obscene bird, which destroys its prey by plucking it limb from limb with its powerful beak and talons. A Husbandman is a man in a low position of life, who supports himself by the use of the plough. — (Johnson's Dictionary).

The rain was raining cheerfully,
As if it had been May;
The Senate-House appeared inside
Unusually gay;
And this was strange, because it was
A Viva-voce day.

The men were sitting sulkily,
Their paper work was done;
They wanted much to go away
To ride or row or run;
"It's very rude," they said, "to keep
Us here, and spoil our fun."

The papers they had finished lay
In piles of blue and white.
They answered everything they could,
And wrote with all their might,
But, though they wrote it all by rote,
They did not write it right.

The Vulture and the Husbandman
Beside these piles did stand,
They wept like anything to see
The work they had in hand.
"If this were only finished up,"
Said they, "it would be grand!"

"If seven D's or seven C's
We give to all the crowd,
Do you suppose," the Vulture said,
"That we could get them ploughed?"
"I think so," said the Husbandman,
"But pray don't talk so loud."

"O undergraduates, come up,"
The Vulture did beseech,
"And let us see if you can learn
As well as we can teach;
We cannot do with more than two
To have a word with each."

Two Undergraduates came up,
And slowly took a seat,
They knit their brows, and bit their
thumbs,

As if they found them sweet,
And this was odd, because you know
Thumbs are not good to eat.

"The time has come," the Vulture said,
"To talk of many things,
Of Accidence and Adjectives,
And names of Jewish kings,
How many notes a sackbut has,
And whether shawms have strings."

"Please, Sir," the Undergraduates said,
Turning a little blue,
"We did not know that was the sort
Of thing we had to do."
"We thank you much," the Vulture said,
"Send up another two."

Two more came up, and then two more,
And more, and more and more;
And some looked upwards at the roof,
Some down upon the floor,
But none were any wiser than
The pair that went before.

"I weep for you," the Vulture said,
"I deeply sympathise!"
With sobs and tears he gave them all
D's of the largest size,
While at the Husbandman he winked
One of his streaming eyes.

"I think," observed the Husbandman,
"We're getting on too quick.
Are we not putting down the D's
A little bit too thick?"
The Vulture said with much disgust
"Their answers make me sick."

"Now, Undergraduates," he cried,
Our fun is nearly done,
"Will anybody else come up?"
But answer came there none;
And this was scarcely odd, because
They'd ploughed them every one!

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A Comprehensive Guide to All 63 National Parks in America



Denali National Park and Preserve—Alaska
Photo courtesy of Wall Boat

Each one of the national parks has something new to explore whether that be historically, recreationally, or culturally. A number of them have also been recognized by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and designated as World Heritage sites — that’s a big deal — for their value to humanity, among other distinctions. The parks are also in flux, as all will be affected by climate change

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

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Lassen Volcanic National Park: an Alternative to Yosemite



(Credit: Getty Images)

Yosemite may get all the attention, but a road trip to Lassen's otherworldly landscape offers a hit of jaw-dropping natural beauty – without the crowds.

If Yosemite is the Disneyworld of California's national parks, Lassen Volcanic National Park is the county fair. But despite hosting just 11% of Yosemite's annual visitors to its otherworldly landscape, Lassen is no less awe-inspiring, yet its remote location and shorter season all help keep the crowds away.

<https://bit.ly/3Xnz8y7>

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The Ethereal Sounds a Joshua Tree Can Be Made to Make



*Kildall's speaker sits next to several Joshua trees.
Carlos Jaramillo for NPR*

When sunlight hits the plant, cells in its healthy leaves soak up lots of red and blue light, and reflect back most of the green – which is why the clusters of piercing leaves at the end of the Joshua tree's branches appear green to the human eye. (It's also why most plants on Earth appear green to us.)

The magic is part of Kildall's latest sound installation — a work he calls Infrared Reflections. He developed the piece as an artist-in-residence at Joshua Tree National Park this spring, and it transforms near-infrared light bouncing off the iconic scraggly yuccas into a shimmering mosaic of otherworldly music — essentially turning the Joshua tree into an instrument.

<https://bit.ly/3XfZsu5>

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Gen Zers Are Reversing a Teen Employment Trend



shironosov/ iStock

Gen Z is bringing back 2000s fashion, digital cameras — and jobs? That’s right, according to a recent [Axios report](#), Gen Z teens are working more than millennials did at the same age, changing up a decades-long decline.

Per data from the Bureau of Labor Statistics, about 38% of teens are working or looking for work, marking a 14-year high. The rate is still low compared to when boomers and Gen Xers were growing up — it was closer to 60% in the 1980s, but the number of teens in the labor force has been “steadily falling” since, dropping especially low in the 2000s.

Several factors are said to be contributing to the current uptick in teen employment, including higher wages and the need to support families amid inflation. Luckily, there’s been an increase in supply alongside the demand: Employers are expected to add [1.3 million summer jobs for teens](#) in the coming months.

Jean Twenge, a psychologist and author of *Generations*, explained that teens working is an overall good thing. “There is something lost when there are more young people who enter the workforce after college with no work experience,” she said. “When they learn those lessons about how important it is to show up on time and do a good job and sometimes you have to listen to the boss, all of it builds conscientiousness for later in life.” Check out a list of places hiring for part-time summer jobs.

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Volvo Unveils Autonomous Truck and Electric on Demand Service

Volvo Group North America has unveiled the Volvo VNL Autonomous, its first-ever production-ready autonomous truck, as well as Volvo on Demand, a Truck-as-a-Service (TaaS) initiative using 25 Class 8 Volvo VNR Electric trucks to accelerate battery electric vehicle adoption.



The Volvo VNL Autonomous, borne from a collaboration between Volvo Autonomous Solutions (V.A.S.) and Aurora Innovation, integrated the Volvo VNL Autonomous and the Aurora Driver, an SAE L4 autonomous driving system. The Aurora Driver consists of AI software, dual computers, proprietary lidar that can detect objects more than 400 meters away, high-resolution cameras, imaging radar, and additional sensors.

The new truck uses the Volvo VNL Autonomous and the Aurora Driver, an SAE L4 autonomous driving system.

Volvo

<https://bit.ly/3x67GKA>

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Breathing with the Forest



*An Immersive Experience
Emergence Magazine*

What is it like to be one of the largest organisms that has ever existed? How does it feel to host a vast web of relationships that anchor an ecosystem? In our special interactive online adaptation of Breathing with the Forest, you are invited to open your senses to what it might be like to be a part of the hidden forces that flow through the trees and mycelial networks of the Colombian Amazon rainforest. Surrounded by an ensemble of birdsong, moving water, and insect chirr, and guided by narration from acclaimed British actor Colin Salmon, synchronize the rhythm of your own breath with the cycles

of molecular exchange between soil, tree, and sky—finding where you end and the forest begins.

<https://bit.ly/4eb5AK9>

Make sure to turn on the sound (lower left)

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Why Was "Seahenge" Built Over 4,000 Years Ago?

The trees used to make Seahenge were chopped down around 2049 BCE.



Seahenge, also known as Holme I, was made of 55 half-split oak trunks placed in an oval shape with a larger upturned oak stump in the middle.

Image credit: Mark Brennand

Everyone knows about the stacked rocks of Stonehenge in South West England, but on the country's east coast, there's another prehistoric monument that's no less fascinating. Known as Seahenge, a researcher has re-investigated why the mysterious structure was built over 4,000 years ago.

Seahenge, also known as Holme I, was only discovered in 1998 when shifting sands revealed the monument along a beach in the village of Holme-next-the-Sea, north Norfolk. It consisted of 55 half-split oak trunks set in an oval shape measuring 7 by 6 meters (23 by 20 feet). In the center, a larger upturned oak stump had been placed in a pit.

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

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SAE Levels of Driving Automation™



SAE.org

What's New?

The new document adds several new terms along with substantial refinement and clarification of some concepts that have been misunderstood by readers of the previous version and restructures the definitions into more logical groupings. Notable changes to this version of the recommended practice include:

- Further clarity on the differences between SAE Level 3 and SAE Level 4.
- Additional terms and definitions for two distinct remote support functions: remote assistance and remote driving.
- The use of the "Driver Support Systems" name for SAE Level 1 and 2 driving automation systems.
- Classifications of sustained driving automation and definitions for vehicle types by groups.
- Defining and clarifying the concept of failure mitigation strategy.

<https://www.sae.org/blog/sae-j3016-update>

A lot of people I know can make it to Level 2

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NASA's X-59 Passes Milestone Toward Safe First Flight



The X-59 is the centerpiece of NASA's Quesst mission, which seeks to solve one of the major barriers to supersonic flight over land, currently banned in the United States, by making sonic booms quieter.

scitechdaily.com

NASA and prime contractor Lockheed Martin are developing the X-59 to reduce the sound of a sonic boom to a quieter "thump." The aircraft is at the center of NASA's Quesst mission, which will use it to gather data that could revolutionize air travel, potentially paving the way for a new generation of commercial aircraft that can travel faster than the speed of sound.

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

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Adages and Recognitions for a Sunny Sunday



Just once, I want the prompt for username and password to say, "*Close enough.*"

Becoming an adult is the dumbest thing I've ever done.

If you see me talking to myself, just move along. I'm self-employed.
We're having a meeting.

"Your call is very important to us. Please enjoy this 40-minute flute solo."

Does anyone else have a plastic bag full of plastic bags, or is it just me?

I hate it when I can't figure out how to operate the iPad and my tech support guy is asleep. He's 5 and it's past his bedtime.

Today's 3-year-olds can switch on laptops and open their favorite apps.
When I was 3, I ate mud.

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10 Weird Guinness Records



Most Big Mac Consumed
Anne Spratt

Donald Gorske, a man from Wisconsin, has consumed over 30,000 Big Macs in his lifetime, earning him the record for the most Big Macs consumed. His daily habit of eating two Big Macs has become a legendary feat, and he still claims to look forward to eating them every day...and his is probably the most normal in the list.

<https://bit.ly/4bOnz7t>

Huh. I here I thought they're all weird

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Neuralink's First Brain-Chip Human Implant Appeared Flawless...

...but there was a problem.



Noland Arbaugh is the first human trial patient to have a Neuralink implant.

Photo: Neuralink

Amount of data captured from the device declined, although the patient and the Elon Musk-owned company still staged a successful demonstration.

Arbaugh's implantation was on Jan. 28 and in the weeks after he was able to play the fast-paced racing videogame Mario Kart just by thinking, according to a video recording Neuralink played later. In late February the implant began capturing less data and Neuralink engineers sought to determine what was causing the decline.

In a blog post, the company revealed that a number of the chip's connective threads retracted from the subject Noland Arbaugh's brain, which hindered the implant's data speeds and effectiveness. The company offered few details about the incident — including exactly how the threads became detached. But the company said it was able to make the implant more sensitive to increase its performance even further.

Arbaugh, Neuralink's first human patient, has been a quadriplegic since 2016 following a diving accident. He was implanted with the chip in January as part of a trial called PRIME Study, short for Precise Robotically Implanted Brain-Computer Interface.

The intent is to study the safety of its implant and surgical robot and to test the functionality of its device, the company said in a 2023 blog post about recruiting trial participants.

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Highs and Lows of Living with Elon Musk's Brain Chip



*A stylized illustration of a chip being placed into a brain
(Image credit: Moor Studio/Getty Images)*

Thirty-year-old Noland Arbaugh says the Neuralink chip has let him "reconnect with the world"

Arbaugh says he was able to move a digital cursor within a week after the implant surgery. He does so in two ways. There's what he describes as "attempted movement"—or simply willing a paralyzed limb to do what it no longer can. By instigating movement of the muscles in his hand (which he says can still produce slight wiggles) and going through the mental motions of using a mouse with that hand, he can move a cursor around a screen with little effort. "It's very intuitive," Arbaugh says.

<https://bit.ly/3xhTaj2>

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Chords & Riffs

Christoph Willibald (Ritter von) Gluck (1714-1787)



*Gluck playing his clavichord (1775)
portrait by Joseph Duplessis*

Gluck was a composer of Italian and French opera in the early classical period. He gained prominence at the Habsburg court at Vienna where he brought about the practical reform of opera's dramaturgical practices.

With a series of radical new works in the 1760s, among them *Orfeo ed Euridice* and *Alceste*, Gluck introduced more drama by using orchestral recitative and cutting the usually long da capo aria. His later operas have half the length of a typical baroque opera.

Gluck's musical legacy includes approximately 35 complete full-length operas plus around a dozen shorter operas and operatic introductions, as well as numerous ballets and instrumental works. His reforms influenced Mozart, particularly his opera *Idomeneo*. He left behind a flourishing school of disciples in Paris, who would dominate the French stage throughout the Revolutionary and Napoleonic period. As well as Salieri, they included Sacchini, Cherubini, Méhul and Spontini. His greatest French admirer would be Hector Berlioz, whose epic *Les Troyens* may be seen as the culmination of the Gluckian tradition. Though Gluck wrote no operas in German, his example influenced the German school of opera, particularly Carl Maria von Weber and Richard Wagner, whose concept of music drama was not so far removed from Gluck's own.

Dance of the Furies Royal Opera <https://youtu.be/RRfiFJxbegc>

Dance of the Blessed Spirits Sternstunden Der Klassik <https://youtu.be/tfDJLjrLND8>
xGuitar by Andres Segovia <https://youtu.be/dmvr7pREVOc>

Both these dances should be in your music library.

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Ralph Lauren Unveils the Team USA Olympic Uniforms



*The surfer Caroline Marks in the opening ceremony look.
Credit...via Ralph Lauren*

Team USA will be wearing a navy blazer yet again as its members make their entrance in Paris next month. This is the fifth Summer Olympics for which Ralph Lauren has been the official outfitter of the American Olympic and Paralympic delegation, and the fifth time he has designed a navy blazer for the Summer Games. Plus ça change and all that.

<https://bit.ly/45BbnVs>

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A First-Class Version Double-Level Airplane Seat Is Here.



*Here's the lower level of the business-class/first-class version of the dual-level seat concept.
Francesca Street/CNN*

While the economy class concept imagines three seats on the top and bottom rows, this new concept, called "elevated class," envisages just one seat on the bottom row, and two on the top in a couch-style configuration. Each row is designed to be secluded, private and include the luxury trappings of elite travel – lie-flat bed, privacy and copious leg room.

The goal, according to Núñez Vicente?

"To make more space for more seats in the airplane. But also give the passengers an even better experience than they get today in business or first class."

<https://bit.ly/3XaU9wd>

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The Hidden Spaces on Planes That Are Off Limits to Passengers



*A rest room for pilots, located behind the cockpit of the Boeing 787 Dreamliner.
Roslan Rahman/AFP/Getty Images*

There are some secret areas on widebody aircraft, where the pilots and cabin crew go to rest during long flights. Passengers can't access them under any circumstance and they're well hidden from view.

They're called Crew Rest Compartments and their location on the plane varies.

<https://bit.ly/4egWwTY>

Well yeah, we want 'em well rested for a night at an exotic destination.

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LA Schools Ban Cellphones, Citing Distractions and Health



A school bus driver navigates while driving through downtown Los Angeles, California, U.S. July 19, 2023.

REUTERS/Mike Blake/File Photo Purchase Licensing Rights

School administrators across the US are grappling with how to handle widespread smartphone use by kids. About 70% of high school teachers say that students being distracted by cellphones is a major problem in their classrooms, according to the Pew Research Center.

The Los Angeles Unified School District Board of Education on Tuesday voted to ban smartphones for its 429,000 students in an attempt to insulate kids from distractions and social media that undermine learning and hurt mental health.

The board of the second-largest U.S. school district voted 5-2, approving a resolution to develop within 120 days a policy prohibiting student use of cellphones and social media platforms. The policy would be in place by January 2025.

<https://bit.ly/4c9fJpj>

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Blue Bird Is Making Its School Buses Safer With 3-Point Seat Belts



Bluebird

It wasn't until 1984 that the first U.S. state — New York — mandated the use of seat belts for vehicle occupants. The majority of the country would soon follow, and it's hard to imagine not having such laws today, given how many lives the devices save each year. Yet, school buses seem to be behind the times: most still use lap belts, rather than the much safer three-point ones that cars have.

One bus company is catching up, though. Blue Bird recently announced that it will make three-point seat belts the standard in all of its school buses, "an industry first," President Britton Smith told CBS News. They will come at no extra cost to customers.

Other new safety features include steering wheel-deployed air bags for drivers, high-intensity LED lighting systems, front and rear cameras, and lighted stop sign arms.

"This is a historic event," Mark Rosekind, a former administrator of the National Highway Traffic Safety Administration, said at an event announcing the changes last week, per School Transportation News. "Blue Bird deserves huge credit. Every bus manufacturer should have three-point belts on them. This is what real safety leadership looks like. Lives will be saved in the future."

Rear-facing seats next?

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Poetry Corner

And Wonder Everywhere



I am a guest
in God's garden

soft petals and long thorns.
Many trees block how far
I can see.
Wisdom drops me
to my knees
right here
where
I am now
in the thorns
and now into the fragrance
and now into the spider's web
woven as I make my bed
in fallen leaves
and spright daffodils
echoing each sun.
And I know now
what is asked of me
at this time
in the stillness
holding me
heart to heart
before this visit done.
Notice. Notice.
Be aware.
Gratitude fills me
here
and wonder,
everywhere.
Katherine Holden, June 2024

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"Eeny, Meeny, Miny, Moe": The Dark Theories—and Racist History—Behind the Childhood Rhyme



*An illustration of the counting-out game "eeny, meeny, miny, moe" from Clara E. Atwood's 'A Book of Nursery Rhymes,' published in 1901.
Wikimedia Commons // Public Domain (illustration)*

One of the theories about the counting-out rhyme involves human sacrifice.

A common way for kids to decide who's the undesirable "it" in a game of tag is to use the counting-out rhyme "eeny, meeny, miny, moe" (sometimes spelled "eenie, meenie, miny, moe"). You've probably just completed the verse in your head, but if not, here's a refresher:

"Eeny, meeny, miny, moe,
Catch a tiger by the toe,
If he hollers, let him go,
Eeny, meeny, miny, moe."

<https://bit.ly/3VpYie4>

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Willie Mays, Baseball Star of Prodigious Power and Grace

*The "Say Hey Kid," who could do it all, was arguably the greatest player in major league history.
AP*

Willie Mays, a perennial all-star center fielder for the New York and San Francisco Giants in the 1950s and '60s whose powerful bat, superb athletic grace and crafty baseball acumen earned him a place with Babe Ruth atop the game's roster of historic greats, died this past week. He was 93.

<https://www.nytimes.com/2024/06/18/sports/willie-mays-dead.html>

My baseball Pantheon is presided over by Willie Mays and Ted Williams.

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55 Beloved Regional Dishes from Across the U.S.



Whoopie Pie.

Rick Friedman/GettyImages

50 dishes on this list—from ham balls to Chugwater chili—have strong fandoms in their respective states.

A plausible explanation for the sensational success of Wegovy.

<https://bit.ly/4c5hq77>

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How the Square Root of 2 Became a Number



Nico Roper/Quanta Magazine

Useful mathematical concepts, like the number line, can linger for millennia before they are rigorously defined.

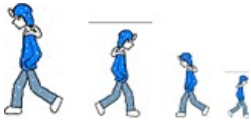
The ancient Greeks wanted to believe that the universe could be described in its entirety using only whole numbers and the ratios between them — fractions, or what we now call rational numbers. But this aspiration was undermined when they considered a square with sides of length 1, only to find that the length of its diagonal couldn't possibly be written as a fraction.

Next I'd like to know how the square root of -1 became a letter.

<https://bit.ly/4ccrawD>

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My Walking Thoughts



For Sunday June 23 2024

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“Up in the Air Junior Birdman”

I hummed this silly ditty as I took the runway and aligned the compass to the 130 heading.

Up in the air upside down... as I moved the throttle forward, gently at first then feeling what I assumed to be Lieutenant Winan's assistance, pushed it to the stop. A quick peek at the instruments showed the desired 2700 rpm and 48-inches of manifold pressure (MAP), comforting data points in the midst of accelerating thumps and thuds from the undercarriage and the short clubbing thunder where powerplant and airscrew chewed our way into the future.

Needs a little more right rudder I decided, sensing the Lieutenant Winans had come to the same conclusion.

Another quick peek into the cockpit—*huh, the airspeed needle is already off the stop*—in fact heading quickly toward the liftoff speed of 85 knots. So swiftly...so effortlessly...so...uh...I felt the stick come back into my hand and just like that we were airborne, our shadow slowly disengaging and moving forward and to the right in the early morning sunlight.

Gear up and 120 knots and almost immediately we settled into a gentle cruise climb at 140 knots. Even as my left hand tuned the rudder and elevator trim to relieve constantly changing pressures, it seemed Lieutenant Winans' hand was there as mine, taking no chances with me.

"Reduce to climb power (45-inches MAP and 2500 rpm) and start a left turn to parallel US 90," he said in a voice garbled by powerplant and airframe vibrations. The aircraft responded to this with only the slightest help from me and in few seconds it took me to check the instruments looking for signs of trouble, the town of Milton disappeared beneath the starboard wingtip 10,000 feet below.

"Level out at 11,500 feet and 190 knots," followed a moment later by, "Turn to a heading of North." We were entering the operating area clear of airways west of Crestview Florida where we began a lengthy series of aerobatic maneuvers beginning with increasingly steep turns in either direction. At 75 degrees and 3g's of acceleration I found I needed more power and a bunch of top rudder to maintain altitude, particularly when turning left.

We followed these with wingovers, the first of which fetched a laconic, "Raise the nose a little faster." On subsequent tries we finally achieved the target profile with the nose 45 degrees high and 45 degrees of bank after 45 degrees of turn, 90 degrees turn and bank as the nose slid through the horizon, then increasing backstick pressure to bring the aircraft back to level flight on the reciprocal heading. No comment from the back seat, which I took as good.

Barrel rolls, to me the most majestic of coordinated flight aerobatics, seemed far easier in the Trojan than they had been in the Mentor, though none on this first flight was anything to write home about. They would get better, I promised myself.

"Ok, let's see how you handle some loops and Cuban Eights."

We ended the airwork with a variety of low-speed clean and dirty stalls such as we might encounter in the landing pattern. The key to recovery I found was not only to lower the nose and return to wings-level but to bring the power on judiciously, accompanied by an aggressive use of right rudder.

Why right rudder? P Factor. If you're really interested, here's the explanation.

P-factor is the term for asymmetric propeller loading, that causes the airplane to yaw to the left when at high angles of attack.

Assuming a clockwise rotating propeller it is caused by the descending right side of the propeller (as seen from the rear) having a higher angle of attack relative to the oncoming air, and thus generating a higher air flow and thrust than the ascending blade on the left side, which at the other hand will generate less airflow and thrust. This will move the propellers aerodynamic centre to the right of the planes centreline, thus inducing an increasing yaw moment to the left with increasing angle of attack or increasing power. With increasing airspeed and decreasing angle of attack less right rudder will be required to maintain coordinated flight.

This occurs only when the propeller is not meeting the oncoming airflow head-on, for example when an aircraft is moving down the runway at a nose-high attitude (in essence at high angle of attack), as is the case with tail-draggers. Aircraft with tricycle landing gear maintain a level attitude on the takeoff roll run, so there is little P-factor during takeoff roll until lift off.

When having a negative angle of attack the yaw moment will instead be to the right and left rudder will be required to maintain coordinated flight. However negative angles of attack is rarely encountered in normal flight. In all cases, though, the effect is weaker than prop wash.

"Think you can find the field," Winans asked.

"Uhhh...," I struggled to orient myself to where we were in the training area.

"Ten o'clock at 15 miles," he said almost conspiratorially. "You see it?"

"Yes sir," I said immediately, though I didn't, and even with frantic searching despaired in my stupid response. I was just about to admit my dishonesty when I caught the glint of an aircraft in the distance and from there the unmistakable outlines of Whiting's runways.

It was time for the [Descent Check List](#) and my appointment with destiny...*Next Week.*

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New topic for your consideration

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SWAT Teams Galore

Maybe you share my concern for the number of SWAT teams—you know, those folks in combat gear known to break and enter without bothering to knock -- there are. It appears there are in excess of 60 such units in the employ of the United States Federal Government, these in addition to perhaps thousands of those fielded by state and local police activities.

Who knew AMTRAK or our National Parks needed paramilitary units empowered to shoot first and ask questions later...oh yes, I'm being a bit childish here, but you get the point don't you?

Federal agencies in the United States with SWAT Units.

U.S. Department of Energy

1. Special Response Teams (SRT)[105]
2. National Nuclear Security Administration (NNSA) - Special Response Force (SRF)[106]

United States Department of Defense

1. Special Reaction Teams (SRT) - United States Army Military Police Corps, Master-at-arms (United States Navy), United States Air Force Security Forces and United States Marine Corps Military Police have tactical units.

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1. U.S. Department of Homeland Security
2. Customs and Border Protection (CBP)
3. Office of Field Operations (OFO)
4. Special Response Teams (SRT)
5. Quick Reaction Force (QRF) - CBP National Capital Region based tactical team
6. U.S. Border Patrol
7. Special Operations Group
8. Border Patrol Tactical Unit (BORTAC)
9. Sector BORTAC
10. Border Patrol, Search, Trauma and Rescue (BORSTAR)
11. Federal Protective Service (FPS) - Rapid Protection Force (RPF)
12. Immigration and Customs Enforcement (ICE)
13. Homeland Security Investigations (HSI) - Special Response Teams (SRT)
14. Homeland Security Investigations (HSI) - Rapid Response Team (RRT)
15. Enforcement and Removal Operations (ERO)

Special Response Teams (SRT)

1. U.S. Coast Guard
2. Deployable Specialized Forces (DSF)
3. Tactical Law Enforcement Teams (TACLET)
4. Helicopter Interdiction Tactical Squadron (HITRON)
5. Maritime Engagement Team (MET)
6. Vessel Boarding Security Teams (VBST)
7. U.S. Secret Service
8. Counter Sniper (CS) Unit
9. U.S. Secret Service Uniform Division (UD) - Emergency Response Team (ERT)
10. U.S. Secret Service - Counter Assault Team (CAT)
11. United States Department of Justice

Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) - Special Response Teams (SRT)

1. Drug Enforcement Administration (DEA)
2. Foreign Deployed Advisory Support Team (FAST)
3. DEA Special Response Teams (SRT)
4. Federal Bureau of Investigation (FBI)

Critical Incident Response Group (CIRG)

1. Hostage Rescue Team (HRT)
2. Crisis Negotiation Unit (CNU)
3. Special Weapons and Tactics Teams (FBI SWAT)
4. Tactical Helicopter Unit (THU)
5. Federal Bureau of Prisons - Special Operations Response Team (SORT)
6. U.S. Marshals Service (USMS)
7. USMS Special Operations Group (SOG)
8. USMS - Special Response Teams (SRT)

U.S. Department of State

1. Diplomatic Security Service - Office of Mobile Security Deployments (MSD)
2. U.S. Department of the Treasury
3. U.S. Mint Police - Special Response Teams (SRT)

National Park Service

1. Special Response Teams (SRT)
2. Grand Canyon Special Response Team
3. Yellowstone Special Response Team
4. Western Region Special Response Team

Special Event and Tactical Teams (SETT)

1. Midwest Special Event and Tactical Team
2. Pacific West Region Special Event and Tactical Team
3. Southeast Region Special Event and Tactical Team
4. Blue Ridge North Carolina Tactical Tracking Team
5. U.S. Park Police Special Weapons and Tactics Team
6. United States Park Police, New York Field Office Special Weapons and Tactics (SWAT) Unit

Independent Federal Agencies

1. Amtrak Police - Special Operations Unit (SOU)
2. Central Intelligence Agency (CIA) - Security Protective Service (SPS) - Rapid Response Team (RRT) - Special Activities Center (SAC)
3. Federal Reserve Police - Special Response Team (SRT)
4. National Security Agency Police (NSAP) - Emergency Response Team (ERT)

5. Pentagon Force Protection Agency
6. Pentagon Police Directorate - Emergency Response Team (ERT)
7. U.S. Capitol Police - Containment Emergency Response Team (CERT)
8. Defense Intelligence Agency

State Police/Highway Patrol Agencies

The state police (state troopers) and highway patrols of the United States have tactical units.

1. Alabama Police Departments, County Sheriff's Department or Office and DPS
2. (ASPD's, CSODO's, DPS) - Special Emergency Response S.W.A.T Team (SERT)
3. Arizona Department of Public Safety Special Weapons and Tactics (SWAT) Team
4. California Highway Patrol - Special Weapons And Tactics (SWAT) Team
5. California Department of Corrections and Rehabilitation
6. Crisis Response Teams (CRT)
7. Special Service Unit (SSU)
8. Colorado Department of Corrections Special Operations and Response Team (SORT)
9. Connecticut Department of Correction Special Operations Group (SOG)
10. Connecticut State Police - State Police Tactical Unit (SPTU)
11. Delaware State Police - Special Operations Response Team (SORT)
12. Florida Highway Patrol - Tactical Response Teams (TRT)
13. Florida Department of Law Enforcement (FDLE) - Special Operations Teams (SOT)
14. Florida Fish and Wildlife Conservation Commission - Special Operations Group (FWCSOG)
15. Georgia Counter-Terrorism Task Force (CTTF) (State level multi-agency tactical team)
16. Georgia State Patrol - Special Weapons and Tactics (SWAT) Team
17. Hawaii Department of Public Safety Sheriff Division - Sheriff's Emergency Response Team (SERT)
18. Idaho Department of Correction - Correctional Emergency Response Team (CERT)
19. Illinois State Police - Tactical Response Team (TRT)
20. Indiana State Police - Emergency Response Team (ERT)
21. Kansas Highway Patrol - Special Response Team (SRT)
22. Kentucky Department of Corrections - Corrections Emergency Response Team (CERT)
23. Louisiana State Police - Special Weapons and Tactics (SWAT) Team
24. Maine State Police - Tactical Team
25. Maine Department of Corrections Special Operations Group

26. Maryland Department of Natural Resources Police Special Operations Division, Tactical Response Team
27. Maryland State Police
28. Special Tactical Assault Team Element (STATE)
29. Tactical Medical Unit (TMU)
30. Maryland Transportation Authority Police - Special Response Team (SRT)
31. Maryland Transit Administration Police - Visible Intermodal Prevention and Response (VIPR) Teams/Tactical Unit (formerly Special Response Team - SRT)
32. Maryland Maritime Tactical Operations Group (MTOG) - Joint federal, state, and local tactical unit specializing in maritime tactical operations
33. Massachusetts State Police - Special Tactical Operations Team (STOP)
34. Massachusetts Department of Correction Special Reaction Team (SRT)
35. Michigan State Police - Emergency Support Team (EST)
36. Minnesota Department of Corrections Emergency Response Team (ERT)
37. Minnesota State Patrol Special Response Team (SRT)
38. Nebraska Department of Correctional Services Special Operations Response Team (SORT)
39. New Hampshire Division of State Police - Special Weapons and Tactics (SWAT) Unit
40. New Jersey State Police - Technical Emergency And Mission Specialists (TEAMS)
41. New Jersey Transit Police - Emergency Services Unit (ESU)
42. New Jersey Transit Police - Conditions Tactical Unit (CTU)
43. New Mexico State Police - Tactical Team
44. New York State Police - Special Operations Response Teams (SORT)
45. North Carolina State Bureau of Investigation (SBI) - Special Response Team (SRT)
46. North Carolina Department of Correction Special Operations Response Team (SORT)
47. Ohio State Highway Patrol - Special Response Team (SRT)
48. Ohio Department of Rehabilitation and Corrections
49. Special Response Teams (SRT)
50. Special Tactics and Response (STAR)
51. Oklahoma Highway Patrol Tactical Team
52. Oklahoma Department of Corrections - Corrections Emergency Response Team (CERT)
53. Oregon State Police - Special Weapons and Tactics (SWAT) Team
54. Pennsylvania State Police - Special Emergency Response Team (SERT)
55. Pennsylvania Department of Corrections
56. Corrections Rifle Specialist Team (CRST)
57. Hostage Rescue Team (HRT)
58. Corrections Emergency Response Team (CERT)

59. Port Authority Police Department (PAPD) – Emergency Services Unit (ESU)
60. Rhode Island Department of Corrections Correctional Emergency Response Team (CERT)
61. Rhode Island State Police - Tactical Team, WMD Tactical Team
62. South Carolina State Law Enforcement Division (SLED) - Special Weapons and Tactics (SWAT) Team
63. Tennessee Highway Patrol - Special Operations Unit (SOU)
64. Texas Department of Public Safety
65. Ranger Division
66. Ranger Recon Teams (RRT)
67. Special Weapons and Tactics (SWAT) Team
68. Texas Department of Public Safety - Special Response Teams (SRT)
69. Texas Parks and Wildlife Department SCOUT Team (Tactical Response)
70. Utah Highway Patrol - Special Emergency Response Team (SERT)
71. Vermont State Police - Tactical Services Unit
72. Virginia State Police - Special Weapons and Tactics Teams (SWAT)
73. Virginia Department of Corrections - Tactical Support Unit (TSU)
74. Washington State Patrol - Special Weapons and Tactics (SWAT)

Local Police/County Sheriff Agencies

The police departments and sheriff's offices of thousands of towns, cities, and counties across the United States have tactical units, which are usually called Special Weapons and Tactics (SWAT), Sheriff's Emergency Response Team, (SERT), or Emergency Response Team (ERT). Some examples are below.

1. Anchorage Police Department Special Weapons And Tactics (SWAT) team
2. Denver Police Department - Special Weapons And Tactics (SWAT) Team
3. Columbus Indiana Police Department -Special Weapons and Tactics Team (SWAT)
4. Fairbanks Police Department Special weapons and tactics (SWAT) team
5. Miami Police Department - Special Threat Response: Special Weapons and Tactics Team (SWAT) and Hostage Negotiators
6. Nassau County Police Department - Bureau of Special Operations (BSO), Emergency Service Unit (ESU)
7. New York City Police Department - Emergency Service Unit (ESU), Critical Response Command (CRC) and Strategic Response Group (SRG)
8. Las Vegas Metropolitan Police Department - Special Weapons and Tactics Team
9. Los Angeles Police Department Metropolitan Division - Special Weapons and Tactics (SWAT) Team
10. Oakland Police Department - Special Weapons and Tactics (SWAT) Team
11. Portland Police Bureau - Special Emergency Response Team (SERT)

12. Tulsa County Sheriff's Office - Special Weapons And Tactics (SWAT) Team
13. Greensboro Police Department - Special Response Team (SRT)
14. Hawaii County Police Department - Special Response Team (SRT)
15. Honolulu Police Department - Special Weapons and Tactics (SWAT)
16. Kauai County Police Department - Special Response Team (SRT)
17. Maui County Police Department - Special Response Team (SRT)
18. Raleigh Police Department - Selective Enforcement Unit (SEU)

Maybe you'll take a minute this week to explain to me the necessity for all this firepower in the hands of people who are able to act in secret, or am I just worry wart.