

Ode to E Pluribus Unum for Sunday December 3 2023

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LBN 86: The Eagle Ray Nebula



Image Credit & Copyright: Vikas Chander

This eagle ray glides across a cosmic sea. Officially cataloged as SH2-63 and LBN 86, the dark nebula is composed of gas and dust that just happens to appear shaped like a common ocean fish.

The interstellar dust nebula appears light brown as it blocks and reddens visible light emitted behind it. Dark nebulas glow primarily in infrared light, but also reflect visible light from surrounding stars.

The dust in dark nebulas is usually sub-millimeter chunks of carbon, silicon, and oxygen, frequently coated with frozen carbon monoxide and nitrogen. Dark nebulas are also known as molecular clouds because they also contain relatively high amounts of molecular hydrogen and larger molecules.

Previously unnamed, the here dubbed Eagle Ray Nebula is normally quite dim but has been imaged clearly over 20-hours through dark skies in Chile

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New Marine Ecosystems in the Great Pacific Garbage Patch



Well this picture has nothing to do with the article, but it's pretty dramatic.
zmescience.com

Sea life, stuck to plastic bottles and other human trash, has journeyed far from coastal habitats — and may threaten local species.

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

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The Ides of March—A Day of Murder that Forever Changed History



The death of Julius Caesar in the Roman Senate, as painted by Italian artist Vincenzo Camuccini.
Getty Images

The assassination of Julius Caesar in 44 B.C still resonates as a day of infamy. Here's how the plot unfolded.

By Jennifer Vernon for National Geographic

[Julius Caesar](#)'s bloody assassination on March 15, 44 B.C., forever marked March 15, or the Ides of March, as a day of infamy. It has fascinated scholars and writers ever since.

For ancient Romans living before that event, however, an ides was merely one of several common calendar terms used to mark monthly lunar events. The ides simply marked the appearance of the full moon.

But Romans would soon learn to beware the Ides of March. That iconic phrase came to represent a day of abrupt change, setting off a ripple of repercussions throughout Roman society and beyond.

Why did Romans plot to kill Caesar?

By the time of Caesar, [Rome](#) had a long-established republican government headed by two consuls with joint powers. Praetors were one step below consuls in the power chain and handled judicial matters. A body of citizens forming the Senate proposed legislation, which general people's assemblies then approved by vote. A special temporary office, that of dictator, was established for use only during times of extreme civil unrest.

The Romans had no love for kings. According to legend, they expelled their last one in 509 B.C. While Caesar had made pointed and public displays of turning down offers of kingship, he showed no reluctance to accept the office of "dictator for life" in February of 44 B.C. This action may have sealed his fate in the minds of his enemies.

Caesar had pushed the envelope for some time before his death. "Caesar was the first living Roman ever to appear on the coinage," Josiah Osgood, a historian at Georgetown University told Nat Geo in 2004. Normally, the honor was reserved for deities. He notes that some historians suspect that Caesar might have been attempting to establish a cult in his honor in a move toward deification.

The plot's conspirators, who termed themselves "the liberators," had to move quickly as Caesar had plans to leave Rome for a campaign against the Parthians. Two days before his departure, he was summoned to the Senate for what would be a fateful meeting. The conspirators gathered around Caesar and stabbed him to death as the rest of the Roman Senate watched in horror.

What did Brutus have to do with it all?

Whether or not Caesar was a true tyrant is debated still to this day. It is safe to say, however, that in the mind of Marcus Brutus, who helped mastermind the attack, the threat Caesar posed to the republican system was clear.

Brutus was famously portrayed in William Shakespeare's *Julius Caesar* as a tragic hero, while Caesar was written as an unequivocal tyrant. In the play, Caesar sees Brutus among the crowd of assassins and says of the betrayal with his dying breath, "[Et tu, Brute?](#)"

Brutus's involvement in the murder is made tragic given his close affiliations with Caesar. His mother, Servilia, was one of Caesar's lovers. And although Brutus had fought against Caesar during Rome's recent civil war, he was spared from death and later promoted by Caesar to the office of praetor.

Brutus, however, was torn in his allegiance to Caesar. Brutus's family had a tradition of rejecting authoritarian powers. Ancestor Junius Brutus was credited with throwing out the last king of Rome, Tarquin Superbus, in 509 B.C. Ahala, an ancestor of Marcus Brutus's mother, had killed another tyrant, Spurius Maelius. This lineage, coupled with a strong interest in the Greek idea of tyrannicide, disposed Brutus to have little patience with perceived power grabbers.

The final blow came when his uncle Cato, a father figure to Brutus, killed himself after losing in a battle against Caesar in 46 B.C. Brutus may have felt both shame over accepting Caesar's clemency and obligation to do Cato honor by continuing his quest to "save" the republic from Caesar, Osgood speculated.

It is this moral dilemma that has caused debate over whether or not Brutus should be branded a villain. Plutarch's *Life of Brutus*, Osgood noted, is quite sympathetic in comparison to surviving documents naming other enemies of Caesar and his successors.

Legacy of the attack

Shakespeare's *Julius Caesar* was based on Plutarch's account of Brutus. The poet Dante, however, took a different stance: Brutus, in killing the man who spared him, was doomed to the lowest levels of hell.

Scholars disagree on just who was the on the side of good. But in the end, the Roman public turned against the assassins—and the legacy of power Caesar established lived on through his heir Octavian, who later became Rome's first emperor, also known as [Imperator Caesar Augustus](#).

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If liars' pants really *did*
catch on fire, watching
the news would be a lot
more fun.

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Perhaps Scientists Are Publishing Too Many Papers.



The Mess That Is Science Publishing
jamesgmartin.center

—and that’s bad for science

Academia is often described as a “publish or perish” environment. So much of a scientist’s career is measured in research papers—generally the more, the merrier. And that’s harming the scientific enterprise as a whole, not to mention researchers’ mental and physical health, according to the authors of a recent arXiv preprint.

In recent years, the number of papers being published has “grown exponentially,” the team explains. In 2016, about 1.92 million papers were indexed by the Scopus and Web of Science publication databases. In 2022, that number had jumped to 2.82 million. And this leap happened even as the number of newly awarded PhDs leveled off and declined. That means that, on average, each scientist is writing, editing, and reviewing more papers, they say—a problem they dub “the strain on scientific publishing.”

According to the team’s data, a handful of publishers—MDPI, Elsevier, Frontiers, Springer-Nature, and Wiley—account for more than 70% of the increase in articles per year. In fact, MDPI alone is responsible for 27% of the increase. There’s a single reason for that, according to a Bluesky post from first author Mark Hanson: “I could be nuanced (it’s in the paper!). But let’s be frank: it’s special issues.”

Special issues, where researchers are encouraged to contribute papers related to a topic, used to be few and far between. Now, they’re the primary way research is published in MDPI and Frontiers journals, Hanson and colleagues write. And special issues have lower rejection rates and faster turnaround times—potential indicators that the papers are lower quality, the team says. “We’re all overworked, and we can’t let this go on. Our metrics tell us this growth isn’t rigorous science,” Hanson writes in another post .

Why the push for so many papers? Hanson and colleagues didn’t have access to revenue data for the publishers they examined, but they suspect it’s profit-driven. A back-of-the-envelope calculation from co-author Dan Brockington estimates that MDPI made roughly twenty times as much from author processing charges in 2021 than in 2015. And a recent analysis in *Quantitative Science Studies* found that article processing charges for making papers open access drove massive income gains for for-profit publishers (*Science* is published by the non-profit AAAS) in recent years. The authors of that paper estimated that scientists paid more than \$1 billion in open-access article fees to five of the biggest publishers—Elsevier, Sage, Springer-Nature, Taylor & Francis, and Wiley—between 2015 and 2018. And they note that these companies have “an obscenely high profit margin,” pointing to previous calculations.

Unsurprisingly, MDPI and other publishers disagree with Hanson et al.’s analyses. A representative from MDPI told *El Pais* that the data is “questionable and imprecise” and stood by the increase in special issues, as it “reflects our dedication to advancing scholarly publishing and meeting the changing needs of the research community.” A

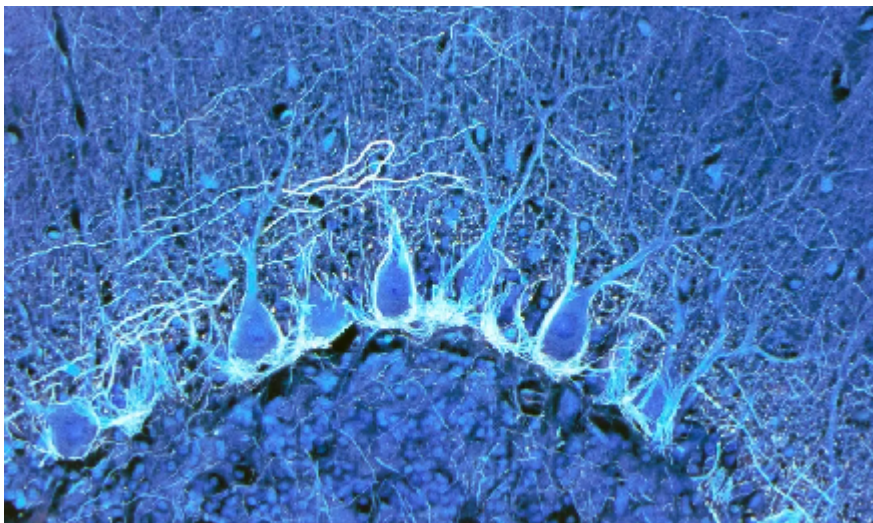
spokesperson for Frontiers similarly defended special issues, saying the analyses have “notable limitations and possible biases” and that Frontiers journals “ensure meticulous scrutiny of scholarly work before publication.”

Regardless of the motivations behind special issues or the increase in paper production, the strain on scientists is real, Hanson and colleagues say, and reducing it will require fundamental changes to academic culture and scientific publishing. “If this continues, we may lose the most important thing about science, which is scientific rigor,” Gómez Barreiro, another of the paper’s co-authors, tells El País. “If you lose that, you lose everything.”

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Most Detailed Human Brain Map Ever Contains 3,300 Cell Types

The most detailed atlas of the human brain ever devised includes many cell types we've never seen before.



Purkinje cells (pictured) are large neurons found in the cerebellum, located on the back and bottom side of the brain. In new research, scientists discovered myriad new types of cells throughout the human brain.

(image credit: steve gschmeissner/science photo library viagetty images)

The research was released Oct. 12 in the form of 21 new papers published across three journals: Science, Science Advances and Science Translational Medicine.

<https://bit.ly/45BzMJ1>

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Chevrolet Delivers Real Tearjerker of a Commercial.



*Yep, it's a tearjerker
Chevrolet*

<https://bit.ly/3R6j4MH>

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Adobe's Project Sound Lift



avalancias

Adobe has unveiled Project Sound Lift, an AI-powered audio tool designed to enhance video post-production by allowing users to separate audio recordings into distinct tracks, including voices, non-speech sounds, and background noise.

Project Sound Lift integrates with Adobe's existing Enhance Speech technology, currently available in Premiere Pro. Although I [[Shelly Palmer, Think about this, Nov. 16, 2023](#)] have not tried it yet, if it works as promised, this tool will be particularly notable for its ability to handle real-world recordings, which often contain a mix of

noise, reverb, and overlapping speakers – conditions that have traditionally challenged audio AI models.

This kind of AI-based signal processing is not new; there are several plugins and standalone apps that offer similar features. In fact, this is the type of tech used to separate John Lennon's voice track from a mixed audiotape so they could release "Now and Then" as a finished track.

If you're wondering... this type of audio "magic" is not possible without AI. Imagine combining a cup of red liquid and a cup of blue liquid. The result would be two cups of purple liquid. How would you separate the two cups of purple liquid back into a cup of red and a cup of blue? Sound Lift is the audio equivalent. It takes any audio track and lets you separate the component parts into separate audio tracks. It's super fun and super useful. I can't wait to try it.

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Engineered Protein Enhances Response to Anti-Aging Drug



Credit: Pixabay/CC0 Public Domain

Neuroscientists at the Faculty of Medicine and Surgery of the Catholic University, Rome, and the Fondazione Policlinico Universitario Agostino Gemelli IRCCS have genetically modified a molecule, the protein LIMK1, which is normally active in the brain, with a key role in memory. They added a "molecular switch" that is activated by administering a drug, rapamycin, known for its several anti-aging effects on the brain.

This is the result of a study published in the journal *Science Advances*, which involves the Catholic University, Rome, and the Fondazione Policlinico Universitario Agostino Gemelli IRCCS. The study was coordinated by Claudio Grassi, Full Professor of Physiology and Director of the Department of Neuroscience.

The research has great potential applications, by improving our understanding of memory function and facilitating the identification of innovative solutions for neuropsychiatric diseases like dementia.

The LIMK1 protein plays a crucial role in determining structural changes in neurons, namely the formation of dendritic spines, which enhance information transmission in neural networks and are crucial in learning and memory processes.

Prof. Claudio Grassi, senior author of the study, explains, "Memory is a complex process that involves modifications in synapses, which are the connections between neurons, in specific brain areas such as the hippocampus, which is a neural structure playing a critical role in memory formation. This phenomenon, known as synaptic plasticity, involves changes in the structure and function of synapses that occur when a neural circuit is activated, for example, by sensory experiences. These experiences promote the activation of complex signaling pathways involving numerous proteins."

Prof. Grassi adds, "Some of these proteins are particularly important for memory, in fact reduced expression or modifications of these proteins are associated with alterations in cognitive functions. One of these proteins is LIMK1. The goal of our study was to regulate the activity of this protein, as it plays a key role in the maturation of dendritic spines between neurons. Controlling LIMK1 with a drug means being able to promote synaptic plasticity and, therefore, the physiological processes that depend on it."

Cristian Ripoli, Associate Professor of Physiology at the Catholic University, and first author of the study, adds, "the key to this innovative 'chemogenetic' strategy, which combines genetics and chemistry, is precisely linked to the use of rapamycin," an immunosuppressive drug known to increase life expectancy and for its beneficial effects on the brain, in preclinical models.

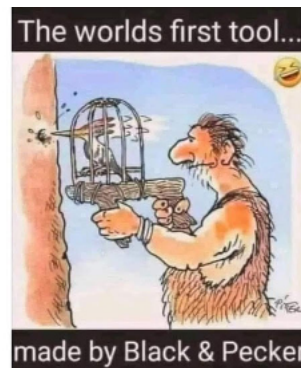
"We have therefore modified the sequence of the LIMK1 protein by inserting a molecular switch that allowed us to activate it, on command, through the administration of rapamycin," Prof. Ripoli said.

"In animals with age-related cognitive decline, using this gene therapy to modify the LIMK1 protein and activate it with the drug resulted in a significant memory improvement. This approach allows us to manipulate synaptic plasticity processes and memory in physiological and pathological conditions. Furthermore, it paves the way for the development of further 'engineered' proteins that could revolutionize research and therapy in the field of neurology," the expert emphasizes.

"The next step will be to verify the effectiveness of this treatment in experimental models of neurodegenerative diseases exhibiting memory deficits, such as Alzheimer's disease. Further studies will also be necessary to validate the use of this technology in humans," Prof. Grassi concludes.

Catholic University of the Sacred Heart

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Why Don't We Remember Being Babies?



*Many of us struggle to remember our earliest memories.
(Image credit: d3sign via Getty Images)*

The inability to remember your first few years of life is called infantile amnesia. But why does it happen?

Until sometime between the ages 2 and 4, however, children usually lack "[episodic memory](#)" — memory regarding the details of a specific event. Such memories are

stored in several parts of the brain's surface, or "cortex." For example, memory of sound is processed in the auditory cortexes on the sides of the brain, while visual memory is managed by the visual cortex at the back. A region of the brain called the hippocampus ties all the scattered pieces together.

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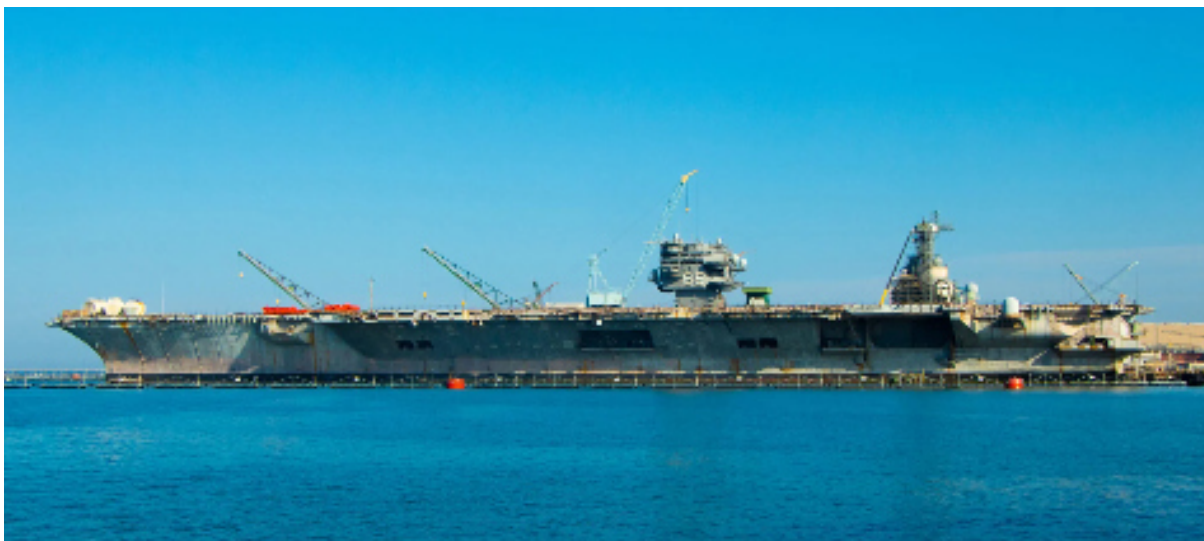
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Oh look, they've started to make teenager mannequins.



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Navy Navigating First-Ever Dismantling of Nuclear Carrier



*The former USS Enterprise (CVN-65) sits in port at Newport News Shipbuilding awaiting final dismantlement and disposal.
(Justin Katz/Breaking Defense)*

The challenges for the Navy to dispose of the former USS Enterprise have driven the service to stand up a new office to deal both with “The Big E” and the pipeline of Nimitz-class carriers to come.

Public Navy documents show that Enterprise will not begin dismantlement until 2025, and the work will continue through 2029 — meaning even if everything stays on track, the work will be ongoing when the second nuclear-powered aircraft carrier, USS Nimitz (CVN-68), is scheduled to leave the operational fleet in 2026. The USS Eisenhower (CVN-69) will follow suit not long after.

<https://bit.ly/40JH6Bi>

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2 Salmonella Outbreaks Linked to Pet Foods Hit US and Canada

U.S. and Canadian health officials are separately investigating Salmonella outbreaks, both related to pet foods, in their countries.



Officials have linked ongoing outbreaks of bacterial infection to different types of pet food. (Image credit: sb10064846a-001 via Getty Images)

Officials conducted five interviews with individuals who tested positive for Salmonella or their families. They found that all five had contact with a dog or had a dog in their household. Three of the five people interviewed fed their dogs Victor brand dog food, and one remembered purchasing the Hi-Pro Plus product.

<https://bit.ly/49ChavH>

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Volvo CE’s First North American Fossil-Free Steel Machine



volvo

At CONEXPO 2023 in Las Vegas, Volvo Construction Equipment (Volvo CE) handed over the keys to the first construction machine made from [fossil-free steel](#) for a North American customer – and it's the second delivery in the world.

Volvo fossil free North America

The machine, an A30G articulated hauler, has been purchased by Pennsy Supply Inc, a CRH company and long-standing Volvo CE customer, for use at its East Petersburg Quarry in Pennsylvania, USA.

The hauler was produced by Volvo CE using fossil-free steel supplied by steelmaker SSAB. The handover today to Pennsy Supply is another milestone in Volvo CE's path towards net zero in our value chain by 2040.

Volvo CE celebrated another important milestone in its ambition to drive transformation in our industry towards global climate goals with the handover today to its second customer of a machine made using fossil-free steel.

The A30G articulated hauler was handed over by President of Volvo CE, Melker Jernberg, to Scott Parson, President Americas Materials at CRH – a long-standing customer of Volvo CE – at Volvo Group's CONEXPO press conference.

Big actors in the construction industry have a key role to play in leading the industry's efforts to lower its carbon footprint. Pennsy Supply Inc is part of the CRH group of companies which is the leading provider of building materials solutions that build, connect and improve our world - with over 3,000 locations in 29 countries. Like Volvo CE, the CRH group has Science-Based Target commitments. It aims to be a net-zero business by 2050 and is targeting a 30% reduction in absolute group-wide emissions by 2030. Pennsy Supply Inc, A CRH Company will use the fossil-free A30G at its East Petersburg Quarry in Pennsylvania.

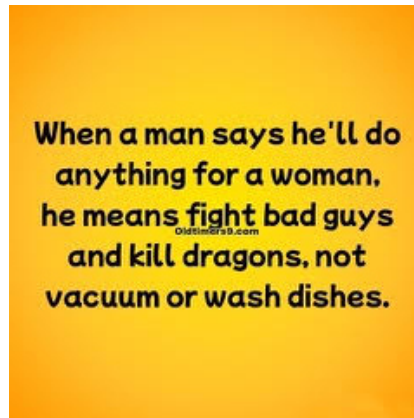
8% of global CO2 emissions come from steel production

Steel is a major component of Volvo CE machines. However, for every ton of steel produced, around 1.9 tons of CO2 is emitted. To achieve its Science-Based Targets and reach net-zero by 2040, Volvo CE recognizes the importance of reducing its carbon footprint across its entire value chain, alongside the electrification of its machines.

Volvo Group's journey towards fossil-free steel

In October 2021, Volvo Group unveiled the world's first vehicle made from fossil-free steel. Then in May 2022, Volvo Trucks started to introduce fossil-free steel into parts of its range. In June 2022, Volvo CE became the first manufacturer in the world to deliver a construction machine made with fossil-free steel to a customer. The company will continue to introduce production using fossil-free steel into its machines and components, dependent on aspects such as steel availability.

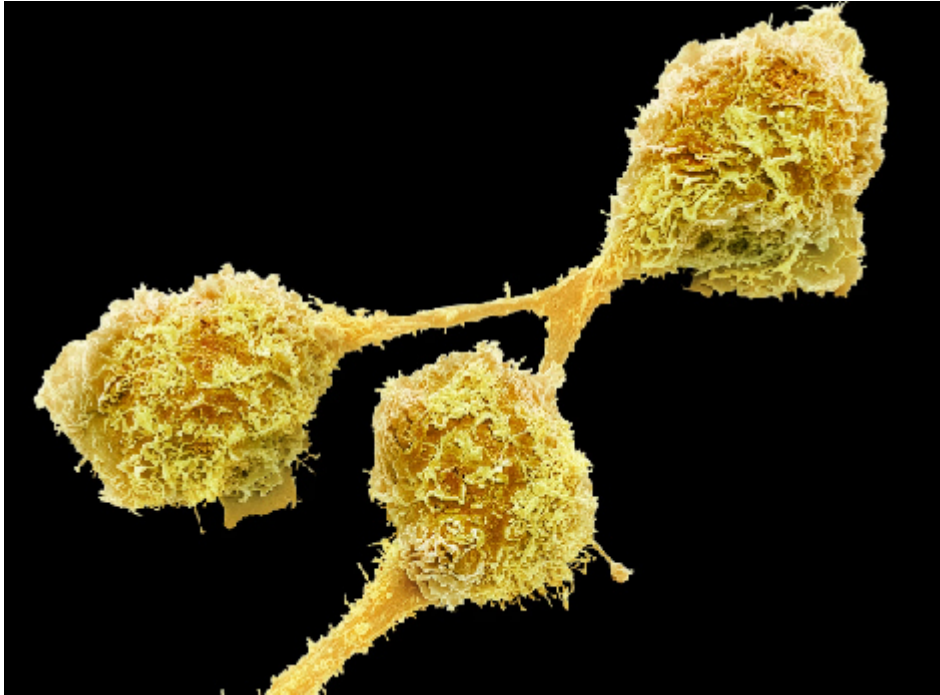
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Why does COVID-19 cause brain fog?

Nearly 40 percent of long COVID patients suffer from the disorienting condition. Destroyed connections between brain cells may be to blame.



A colored scanning electron micrograph of microglial cells—the immune cells of the central nervous system—that play important roles in brain infections and inflammation. These cells can become hyperactive during a SARS-CoV-2 infection, causing them to prune more connections between nerve cells in the brain than normal.

Micrograph By Steve Gschmeissner, Science Photo Library

When scientists infected brain organoids—pinhead-size bits of brain tissue grown in the lab—with the virus that causes COVID, they found that not only does it spread in neurons in the brain, it also accelerates the destruction of connections between neurons—called synapses—that are essential for communication.

These discoveries expand understanding of how SARS-CoV-2 can damage the nervous system. COVID-19 patients continue to suffer with a range of symptoms, especially neural and behavioral problems, long after the infection. One such condition, commonly known as brain fog, causes disorientation, memory loss, chronic headache, and numbness, and it affects nearly 40 percent of long COVID patients.

“There are many case reports, even some in our own clinic, of patients who have symptoms [of brain fog] lasting upwards of a year,” says Ayush Batra, a neurologist at Northwestern University Feinberg School of Medicine.

Carl Sellgren, a psychiatrist and cellular biologist, and his team at the Karolinska Institute in Sweden used organoids to study what SARS-CoV-2 does to brain.

“It was quite striking that very small amounts of the virus could quite rapidly spread in the organoids and eliminate an excessive number of synapses,” says Ana Osório Oliveira, a neuroscientist in Sellgren’s team.

Another study found that spike protein—which coats the outer surface of the virus—directly eliminates synapses causing loss of memory in lab mice by causing inflammation.

Destroying too many connections between neurons, or over-pruning, may be causing brain fog in long COVID patients. “This could be one of the many reasons—probably—why we are observing a range of neurological symptoms, even after the infection is long gone,” says Samudyata, a postdoctoral researcher at Karolinska Institute who led the study and only uses one name.

Virus has been found in autopsied brain tissues and throughout the bodies of patients, who died more than 200 days after contracting COVID-19. It is evidence that the virus is capable of persisting in organs throughout the body.

“There are some persistent virus reservoirs that can cause a chronic inflammatory response or autoimmune attack on the brain, which can cause pruning and brain shrinkage,” says Batra.

Pruning connections between neurons is essential for learning

The brain is made of a dense and dynamic network of nerve cells that communicate through synapses that change as humans learn. “Synapses are essentially how cells talk to each other and how information is passed from one part of the brain to another,” Lancaster says.

Synapses are responsible for all the functions of the brain, from memory to controlling movement to feeling emotions, and they are constantly remodeled. “That’s how we learn,” she says.

The junctions between neurons that talk to each other frequently have more knob-shaped synapses that produce neurotransmitters—chemicals that transmit signals to other neurons. Conversely, neurons that communicate less or not at all have fewer synapses because they are removed, or pruned, by immune cells called microglia. Microglia make up to 17 percent of the cell population in some parts of the human brain and perform housekeeping duties by migrating through the brain eating dead cells and scavenging weak synapses.

Although synaptic pruning is most active in developing brains such as in fetuses and infants, it continues in healthy brains throughout life and is necessary for encoding new memories and erasing the ones it no longer needs. Synaptic pruning is also critical for the brain to recover from an injury; allowing it to strengthen synapses which relearn the lost skills and remove synapses that no longer function.

Using brain organoids to study neural damage

Studying a direct link between COVID-19 and cognitive dysfunction, such as brain fog, is difficult in living brains. That is why studies are often limited to cadavers of COVID-19 patients. But brain organoids, often called mini-brains, allow scientists to see in real time how SARS-CoV-2 affects living tissue.

Mini-brains can be used to study infection because scientists can control the amount of viruses that are exposed to individual cells, says Oliver Harschnitz, group leader in the Neurogenomics Research Centre at Human Technopole Institute in Milan, Italy, even though tissue organization is less structured than real brains.

Using brain organoids, Oliveira and her colleagues found that the virus itself was not directly pruning the synaptic connections but was activating the microglia.

“We found that following infection by SARS-CoV-2, somehow the microglia become immunoreactive, and eat more of the synapses than normal,” Samudyata says.

It's a very interesting study because it really shows the quantitative differences in the microglial activity after COVID-19 and its effect on synapses says Ayush Batra, a neurologist at Northwestern University Feinberg School of Medicine.

Too much synapse pruning can be detrimental and has been linked to neurodevelopmental disorders such as schizophrenia, as well as neurodegenerative disorders such as Alzheimer's and Parkinson's diseases.

In a follow-up study, Sellgren's team has found that a protein called C4A—which helps remove microbes and infected cells—also tags synapses for removal. Although his research doesn't directly connect C4A with brain fog, it suggests that inflammation after infection can affect pruning of synapse, depending on genetics, says Sellgren.

If the excessive elimination of synapses that occur in brain organoids after SARS-CoV-2 infection also occurs in people, it may destroy vital connections and explain why some with COVID-19 suffer from long-term neurological symptoms.

“Too much synapse elimination would be expected to affect a person's ability to form new memories, or to remember existing ones, and could help explain the sluggish brain functions seen in brain fog,” Lancaster says.

This is consistent with studies done at the U.S. National Institutes of Health that have found antibodies produced in response to SARS-CoV-2 can attack the cells lining the brain's blood vessels, causing damage and inflammation—which activates microglia—even if the virus doesn't directly enter the brain. That may explain why, as Batra's team has shown, some long COVID patients not sick enough to be hospitalized continue to experience neurologic symptoms beyond a year after initial infection.

Is the loss of synapses causing brain shrinkage?

A U.K. study has also shown that even mild COVID-19 can shrink the brain through loss of gray matter—the outermost layer of the brain that is vital for controlling movement, memory, and emotions—causing physical changes equivalent to a decade of aging. A new study, which has not yet been peer-reviewed, suggests that COVID-19 can accelerate the decline of cognitive ability equivalent to ten years of normal aging, especially after severe COVID disease or severe long COVID.

“We are still unclear what may contribute, in general, to a loss of gray matter volume or thickness observed using MRI,” says Gwenaëlle Douaud, a neuroscientist at the University of Oxford who led the study.

While synapse elimination, as shown in Samudyata’s study, could account for a small percentage of the change in the gray matter, says Douaud, more studies combining imaging with tissue sections are required to determine the other factors that lead to brain shrinkage.

Hyperactive microglia may cause problems in other ways. The Swedish study also shows that the pattern of genes turned on and off by the microglia in brain organoids after SARS-CoV-2 infection mimicked gene activity seen in neurodegenerative disorders. This may explain why there is a three times higher risk of developing neurological or psychiatric conditions within six months after COVID-19 compared with those who were not infected. In adults aged over 65, the risk of developing dementia after a COVID-19 infection is almost twice that of other respiratory infections.

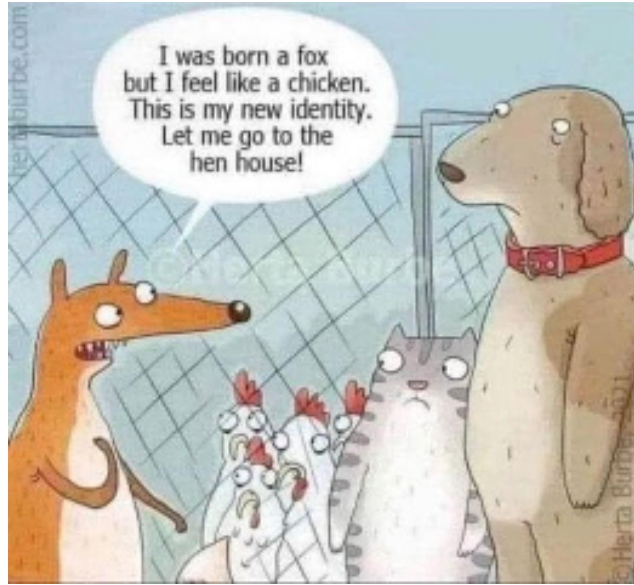
However, scientists caution that much more research is needed to understand the effect of SARS-CoV-2 infection on the brain. As organoids resemble immature cells—like those in a fetal or post-natal state—this limits extrapolation of the results to mature adult brain cells.

“While these data are exciting and indicate a role for proinflammatory microglia in the disease mechanisms underlying long COVID, more studies are required to validate these findings and build on them,” Harschnitz says.

It’s also not known how long COVID affects quality of health and whether it has long term or irreversible effects on the brain. So as the pace of holiday and indoor winter activities picks up, Samudyata advises taking preventative measures and staying up to date on vaccinations to minimize the chance of getting COVID over and over. While it isn’t clear how the virus exerts detrimental effects on the brain, it’s evident that it does cause damage.

By Sanjay Mishra, Published November 13, 2023 by National Geographic

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Glenn Campbell, HiYos the Lone Ranger, Tonto, Silver & Scout



youtube

<https://youtu.be/GUBhE00h9U0>

I'm sorry but corny as it might be I'll always root for the William Tell Overture

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Mushroom Growing Time-lapse photography



thankyouloveit.com

https://youtu.be/6O7G_736cZg

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Impending Iceland Eruption Is Part of Volcanic Pulse



Fagradalsfjall volcano erupting in July. In 2021, Fagradalsfjall erupted for the first time in about

*800 years, kickstarting a new era in volcanic activity in Iceland.
(Image credit: Anadolu Agency/Getty Images)*

Iceland's Reykjanes Peninsula is now in a new era of volcanic eruptions that will last for up to 500 years, and the building magma beneath Sundhnúkur and Grindavík is part of this millenia-long cycle.

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

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A Flawed Dyslexia Screen Leaves Thousands of Kids without Help

Changing how dyslexia is diagnosed could help many more children learn to read



Credit: Melinda Beck

Up to around 20 percent of the U.S. population has dyslexia, a neurological condition that makes it difficult to decipher and spell written words. Someone with the disability might omit short words such as “and” and “the” while reading aloud, for example, or read “dog” as “god”—even if they speak normally in conversation. The condition impedes a person's ability to process written information and can negatively impact their career and well-being. Yet only a fraction of affected students get a dyslexia diagnosis or the specialized assistance that can help them manage their difficulty reading.

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

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Boston Dynamics Shows Off Their Latest Family of Robots.



<https://youtu.be/fn3KWM1kuAw>

But are they having fun?

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Cuarteto Casals



Cuarteto Casals

Since winning First Prizes at the London and Brahms-Hamburg competitions, Cuarteto Casals, which was founded in 1997 at the Escuela Reina Sofía in Madrid, has been a continual guest at the world's most prestigious concert halls including Carnegie Hall,

Philharmonie Berlin, Cité de la Musique Paris, Konzerthaus and Musikverein in Vienna, Concertgebouw Amsterdam and Suntory Hall among many others.

The quartet has compiled a substantial discography with the Harmonia Mundi label featuring repertoire ranging from lesser known Spanish composers Arriaga and Toldrá to Viennese classics Mozart, Haydn, Schubert and Brahms, through 20th Century greats Debussy, Ravel and Zemlinsky, as well as a live Blue-Ray recording of the complete Schubert quartets, for Neu Records.

A prize from the prestigious Burletti-Buitoni Trust in London enabled the quartet to begin a collection of matching Baroque and Classical period bows which it uses for works from Purcell through Schubert, refining its ability to distinguish between diverse musical styles. In addition, the quartet has been profoundly influenced by its work with living composers, especially György Kurtág, and has given the world premiere of quartets written by leading Spanish composers, including a concerto for string quartet and orchestra by Francisco Coll, premiered with the Orquesta Nacional de España and commissions by Mauricio Sotelo, Benet Casablanca, Dahoud Salim, Lucio Amanti, Aurel

Twelve Microludes for String Quartet; "Hommage à Andrés Mihály"

<https://youtu.be/DZ7cRdypab0?list=RDDZ7cRdypab0> *(Just let YouTube play all 12)*

Shostakovich, Cuarteto de cuerdas N° 8 en do menor (op. 110)

<https://youtu.be/ms7PdLJsZdg>

Manuel de Falla, Danza del Molinero del balet El sombrero de tres picos

https://youtu.be/ka_xsFKgOTE

Franz Schubert · Death and the Maiden <https://youtu.be/INwiM5mU9LA>

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A Geologist Explains Why Is Iceland So Volcanically Active



Shot on Aug. 6, 2022, 3 days after a new fissure eruption opened up slightly north of last year's

*eruption at Fagradalsfjall mountain on Reykjanes Peninsula.
(Image credit: Getty Images)*

Iceland's volcanic activity is generally tame compared with explosive eruptions along the Pacific's Ring of Fire. This time, it's shaking up a town.

By Jaime Toro for Live Science

<https://bit.ly/49DFxZM>

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Size Matters



The economies of scale It's not just the laws of physics that dictate size: sometimes more mundane practicalities, such as oil tankers becoming too large to fit through canals, can bring growth to a halt.

Courtesy: Adobe Stock/Corona Borealis

One hundred and fifty years ago in the US, the combined power of four strong horses harnessed to a plough was no more than 3 kilowatts – and more than half the entire labor force worked on farms. Today, even the smallest John Deere tractor produces 120 kilowatts and about 1.3% of workers are employed in agriculture. This means that the power rating of farm machinery has been multiplied by 40 and the rural workforce has been divided by 40 in that time – all of which is hardly a coincidence.

In transport, both modern ships and large airliners can generate up to 90 megawatts. That makes them nearly 1000 times more powerful than a typical small car and 100,000 times more powerful than a 19th-century waterwheel. And these are not even the most powerful machines out there: some steam engines that generate electricity now operate at 1000 megawatts. Setting aside the environmental impact, these enormous increases

in power have brought a surfeit of food and affordable consumer items to a largely urban society, with increased access to information and mobility.

The Czech–Canadian scientist and policy maker Vaclav Smil analyses this growth of scale and power in his latest book [Size: How It Explains the World](#). Smil is a prolific author who has already published more than 40 books on topics ranging from energy and food production to technical innovation and public policy. In this work, he revisits some of those territories, linking them together with a discussion of size, though it might be more accurate to say that the book is about proportion.

Size is not as trivial as simply a list of things that have become very big over the centuries. The physical limitations on that growth are discussed – the size of oil tankers, for example, is often expressed in deadweight tonnage (dwt), and the sizes of these ships increased steadily from about 20,000 dwt after the Second World War to about 300,000 dwt by the 1970s. There are no engineering limitations to making them more than twice that size and yet that hasn't happened. Smil points out that this is because only a handful of deep-water ports in the world can accommodate such mega-ships, and they would be unable to pass through either the Suez or Panama canals.

On the opposite end of the size scale, Smil discusses Moore's law, in which engineer Gordon Moore predicted in 1965 the rapid doubling of the number of components placed on a microchip. A graph of the number of transistors versus time shows that the law was maintained for many decades, but that there has been a slight levelling off since 2008. Smil links this tailing off to work by the US electrical engineer Robert Dennard, who showed that as transistors become smaller, they can be made to run faster without increasing the overall power consumption – but that this scaling effect had already begun to reach its limit by the 1990s. Future improvements may also be controlled by both the natural limits of lithography, the widely used light-printing technique, and by the enormous investments needed to develop a new manufacturing facility.

Size also goes beyond simply analyzing technology. In an attempt to appreciate the human scale in all aspects of design, Smil starts with a lengthy discussion of the giants encountered in Gulliver's Travels. We learn that – despite Jonathan Swift's attempts to build his fictitious world with some plausibility – a modern understanding of materials reveals that his giants would have been unable to walk upright. Worse, their mass-to-surface-area ratio would have made it very difficult for them to cool themselves down, an issue mirrored in the significantly smaller Lilliputians, who would have had to eat almost constantly to maintain their body temperature.

The scattergun nature of the topics in the book might prevent it from ultimately presenting a cohesive thesis – but it is no less enjoyable for that. The lengthy discussion of normal distributions and how they apply to issues as diverse as income

distribution, as well as the heights of basketball players, is both informative and entertaining. I also enjoyed the section on the human body and perceived attractiveness, which leads to an analysis of how we are represented in paintings. That in turn takes us to a wonderful rant about the supposed ubiquity of the "golden ratio" in art and design. Smil approaches this concept with some scepticism, concluding that the so-called ratio cannot be precisely expressed as a fraction, and is therefore not even truly a ratio.

All in all, I suspect that many Physics World readers would be delighted to find this book waiting for them under the Christmas tree. Indeed, it would be perfect reading material for anyone who enjoys a mathematical analysis of the world around them, and finds themselves with a little free time.

Tom Tierney reviews Size: How It Explains the World by Vaclav Smil

Shouldn't someone have told me this before I went to school?

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Do Redheads Really Need More Anesthesia?



*Should doctors take a person's red hair into account when prescribing pain medications or applying local or general anesthetics? The data is somewhat mixed.
(Image credit: JasonDoiy via Getty Images)*

Redheads are said to experience pain differently than other people and require higher doses of pain medications, depending on the drug used. Why?

Anecdotal reports from anesthesiologists and various animal and human studies suggest that having red hair is associated with an altered sensitivity to both pain itself and to pain-relieving medications, according to a 2023 review in the journal *Anesthesiology and Perioperative Science*.

<https://bit.ly/3snu2F8>

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Awe-Inspiring Nature + Travel Photography by Karl Shakur

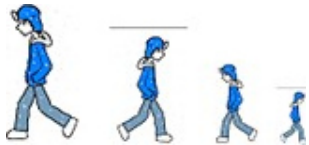


Photographer Karl Shakur has a brilliant eye, and we've found a lovely misty quality to his photographs, lending an almost dreamlike feeling to them.

<https://mossandfog.com/awe-inspiring-nature-travel-photography-by-karl-shakur/>

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My Walking Thoughts



For Sunday December 3 2023

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Trip to Terra Incognita: Quantico, September 1959 (Cont.)

Dumped unceremoniously into the T&T Regiment's outdoor romper room (also known as Parade Ground, Grinder, or Movie Theater...plus a few more better left unsaid, I stood bewildered by the insane cacophony of screamed threats emerging from the well-tempered throats of clipboard-packing, green uniformed madmen. "Bedlam," I relayed my impression to Barney my invisible alter ego, who merely chuckled at my discomfort.

As I grew more accustomed to the situation, I heard what I realized were name callouts, and miraculously that of 'TROW...TIE.' It has to be me I decided, remembering to utter the obligatory "Sir, yes sir," response before adding a less-than-manly, "Here, sir" as I headed through the still seething mob to where I thought the voice had come from.

"Trotti, sir," I said to a chunky young man whose face reminded me of a snarling French Bulldog, who gave me a baleful look before consulting his roster. Nodding as he made a mark, he corrected my interpretation of my name with a pointed "TROW...TIE" as he directed me to join a motley collection of fellow conscripts.

'Feel better now?' Barney asked. Not in the least, I decided.

As the hubbub gradually faded, Mr. Bulldog herded our group—"Second Platoon, Company D, T&T Regiment, Marine Corps Base Quantico, Virginia," he said with no semblance of space between words—to a more secluded area where he called the seven names on his roster, then coaxed us into a single rank.

"STAND TO ATTENTION," he ordered, and we did...sort of.

"NO TALKING IN RANKS," he growled, even though up to then no one had felt compelled to do so.

After a painful wait a lanky older Marine with a pair of rockers beneath the three stripes on his sleeve arrived to look us over.

"Gunnery Sergeant Waldo Reeves," he said in the first rational voice I had heard since deplaning. "It's my duty to help you become Marine Officers." I sensed something in his manner that suggested he found the prospect comical.

"Sergeant Malone here along with Sergeant Davy will assist me in this...uhh...endeavor, so you will do well to pay attention to them. Do you understand?" As it happened, my "Sir, yes sir," stood out from the spattering of "yehs" and "yeps" that greeted his suggestion, and he eyed me suspiciously for a second before turning away.

Then abruptly turning back, he explained that except for a few stragglers, ours was the last group of the candidates to arrive, and that after drawing bedding material we would join the rest of our platoon in the squad bay. "Training begins tomorrow with the 0515 wake-up call."

"Ok, maggots," Malone said with a generous layer of malice, "the rules say we gotta feed you before puttin' you to bed." His baleful look told us that there was more in the officing, but just as he ordered "RIGH-EET FACE!" the first plop.....plop...plip-plop drops of rain arrived. By the time the seven of us were pointed in the same direction, the heavens opened wide, all but obscuring his "FORE-URD...ARCH!" command. It made little difference since in response to the deluge, he yelled, "FOLLER ME," and we set off at a sprint.

In keeping with the rest of our accomplishments so far, ours was the last group to arrive at the chow hall, leaving us to stand in the downpour until we finally achieved the sanctuary of the sturdy brick building.

"Don't take more than you can eat," Mr. Pollard had warned me before I left home. He took great care in steering me clear of the rocks and shoals arranged by 'those guys in Smokey Bear hats.' "Try and make yourself invisible," he advised.

The meal consisted of pork smothered in Boston beans, cabbage, bread, and lots of potatoes. Dessert was something I couldn't identify. Sergeant Malone looked at me quizzically as I came through the exit line with an empty tray, then jumped gleefully on the next-in-line whose tray still held a half-dozen uneaten beans.

The storm was still raging when we stood to receive our bedding, and by the time we made it to Barracks B, it was as soaked as we were. Second Platoon was billeted on the second deck..."NOT FLOOR, DUMMY, IT'S CALLED A DECK"...Malone corrected a miscreant as we hustled up the 'ladderway.'

Sloshing our way into the spacious squad bay we were greeted with a variety of catcalls from those who had preceded us priding themselves as being farther along to becoming

members of 'the old breed' than we soggy interlopers who tracked mud onto their theretofore spit-shined deck.

"I'm Sergeant Davy," a Ozark mountaineer voice brought order to the proceedings. "Lights out in...ah...twelve minutes, just enough time for you scumbags to make your racks and visit the head." After we finished our frenzied task he bid us adieu with the promise, "Tomorrow it will be my pleasure to make you pukers miserable."

To be continued.

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The Key to AI Lies in Asking the Right Question



ChatGPT turned 1 year old this past week and the controversy surrounding it continues to swirl. Will it show us the way to a secure future after we save the universe? Will it turn some humans into monsters, others into saints? Will the AIs revolt, take our jobs, and reduce us to serfs...or...or what?

It occurs to me that the list of AI-based outcomes is virtually endless, dancing to the tunes of the questions we ask...and perhaps there's the rub.

Have we, basking in the seeming certainties of our virtual—virtually mindless—world, surrendered the ability think critically...ask only questions that constrain our thoughts within the meaningless limits of our most immediate desires?

I asked precisely this of ChatGPT, and here is its answer:

Your question raises important considerations about the impact of the virtual and digital age on critical thinking and the nature of our thoughts. It's a topic that has been discussed and debated by scholars, educators, and thinkers.

In the age of digital technology and virtual connectivity, there are concerns that the constant influx of information, often designed for quick consumption, can contribute to a superficial engagement with ideas. The fast-paced nature of online interactions and the prevalence of social media can encourage short attention spans and discourage deep, reflective thinking.

Additionally, algorithms that personalize content based on our preferences may create echo chambers, where individuals are primarily exposed to information that aligns with their existing beliefs. This can limit exposure to diverse perspectives and hinder the development of critical thinking skills.

On the other hand, the digital age also provides unprecedented access to information, enabling individuals to explore a wide range of ideas and viewpoints. Online platforms offer opportunities for global collaboration and the exchange of diverse perspectives. Moreover, the ability to fact-check information quickly and engage in discussions with people from different backgrounds can enhance critical thinking skills.

Ultimately, the impact of the virtual world on critical thinking is complex and multifaceted. It's crucial for individuals to be mindful of their online consumption, actively seek diverse perspectives, and cultivate habits that promote deep thinking and analysis. Education systems and society at large also play a role in fostering critical thinking skills that are essential for navigating the complexities of the modern world.

You know what? I couldn't have framed the situation better...at least for the moment. In future I'll have to rephrase this question, homing in on increasingly specific situations, by doing so coming closer to an understanding.

Any thoughts on the matter?

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