

OPUNTIA 557



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Opuntia is published by Dale Speirs, Calgary, Alberta. It is posted on www.efanzines.com and www.fanac.org. My e-mail address is: opuntia57@hotmail.com When sending me an emailed letter of comment, please include your name and town in the message.

BEAKERHEAD 2023

2023-09-16

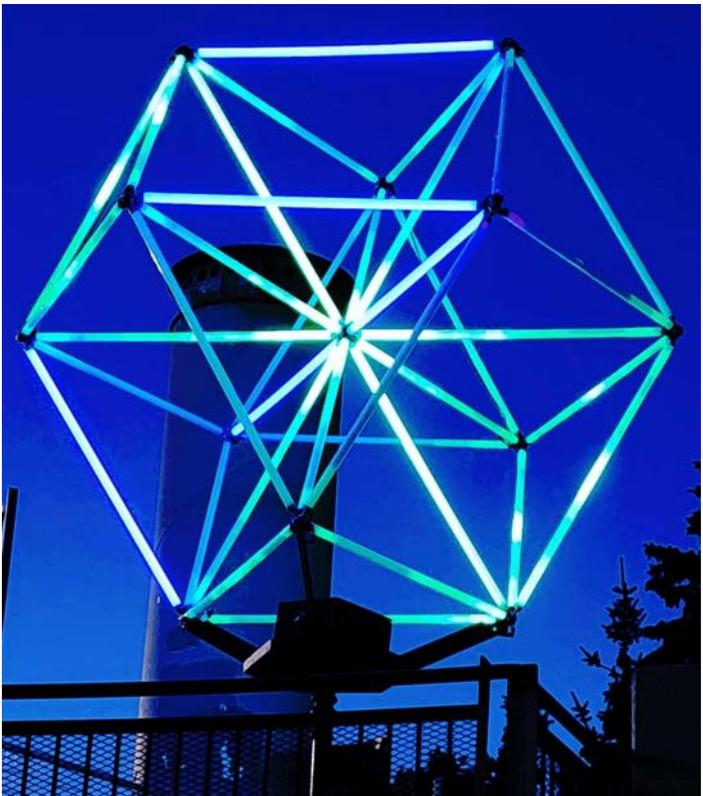
photos by Dale Speirs

[2015 to 2019 and 2021 Beakerhead reports appeared in OPUNTIA #322, 353, 391, 424, 455, 510, and 535. The event was cancelled in 2020.]

Beakerhead is Calgary’s annual techno art festival. This year it moved to the west end of the downtown core at Millennium Park and along 11 Street SW adjacent. More art than techno this year.

For the steampunks, there were these steam puffers, with piston rods busily puffing out steam at intervals. At right is a close-up of the pistons. Notice how the diaphragms are variously in or out on the steam pistons.





STEAMPUNK REVIEWS: PART 8

by Dale Speirs

[Parts 1 to 7 appeared in OPUNTIA #364, 393, 412, 457, 485, 509, and 535.]

Agatha.

Phil and Kaja Foglio had a series of comics and novels about Agatha Heterodyne. She lived in Mechanicsburg, Romania, along the River Dyne. I reviewed the first novel in OPUNTIA #412.

The family seat was Castle Heterodyne, built atop the source of the Dyne, and overlooking the main drag of Mechanicsburg, called the Avenue of Schemers. Europa, as it was, was part of Pax Transylvania.

AGATHA H. AND THE CLOCKWORK PRINCESS (2012) was a quest across war-torn Europa. Agatha Heterodyne fled from the bad guys, Baron Klaus Wulfenbach and company, and traversed the land to Mechanicsburg.

She joined a circus troupe for cover, hiding in plain sight as a performer. Across the 460 pages of the novel (hardcover edition) she collected plot coupons. She dealt with a variety of humanoid robots known as clanks, both friend and foe.

The Baron had his own problems. Ruler of an empire he might be, but try and get good help these days. His Jaegers were not assembled with the pro version of software. Clanks needed a lot of maintenance and repair, a point many science fiction novels overlook.

Lots of battles, although mainly fought between clanks. Eventually Agatha won her way through. The road was clear to Mechanicsburg.

AGATHA H. AND THE VOICE OF THE CASTLE (2014) dealt with Agatha's attempts to claim her inheritance. There was a usurper named Zola claiming the estate, on top of which the Empire was after Agatha..

The castle was controlled by an artificial intelligence which not only had to be convinced of her rights but was insane.

A multitude of characters and contestants were introduced. Mechanicsburg's largest industries were tourism, exports of live snails and trilobites (the town sat

on a huge fossil deposit), and smuggling. The nobles of the Empire struggled with each other for power.

Airships came and went at regular intervals, if only to remind the reader this novel was alternative history. It's a rule. You can't have AH or steampunk without them dirigibles floating by every so often.

The castle yearned to travel and see the world, wishing it was a yurt in the Mongol hordes, not stuck in one location for eternity. There was much to-ing and fro-ing around the castle and the Mechanicsburg district, which didn't resolve much.

As this novel was part of an extended story arc, there was no conclusion. Zola was triumphant, Agatha was incompetent, and the plot lurched into the next novel.

Which was AGATHA H. AND THE SIEGE OF MECHANICSBURG (2020). Agatha Heterodyne and her friends were rushing to repair the castle as the Empire moved to crush it. Part of the problem was internal family feuds. Agatha had to deal with her mother, aunts, cousins (including Zola), and uncles. Not quite as friendly as a Thanksgiving dinner.

The revival of the castle was problematic. It knew how to disappear people through trapdoors into bottomless pits. The good news was that the torture chamber was well lit in shades of pink because it specialized in psychological torture. Not a big deal.

Baron Wulfenbach commanded the Empire's troops. The first soldiers into Mechanicsburg were cannon fodder he was just as happy to be rid of, such as the Undead of the Glorious Dawn. His airships were shredded in mid-flight by the castle.

Castle Heterodyne had a myriad of steampunkish defenses, including assorted mechanical giants. The battle over, Agatha announced she would rule with an iron fist (her words).

One Pill Makes You Larger.

CURIOUSER AND CURIOUSER (2017) by Melanie Karsak was subtitled "Steampunk Alice In Wonderland". Well, what the heck, having spotted the

novel on Amazon, I decided to give it a try. The steampunk and alternative history credentials were quickly asserted in the first few pages. The novel appeared to be set in 1851 because the Crystal Palace had just been opened.

There were steam-powered buggies and clockwork horses in the streets, plus the obligatory airships sailing overhead. Can't have steampunk without airships. There's a law requiring them, I believe.

The alternative history came immediately with Lord Dodgson. Alice was his assistant, a young woman now, not the girl of the book. This was an anachronism because the book wasn't published until 1865 and the original Alice was born in 1852. One can suppose, therefore, that the Crystal Palace was part of the alternative history and not built until the early 1870s.

Rabbit was an albino street urchin. Caterpillar, once known as William, was a crime boss, whose syndicate dealt in drugs, gambling, and tarts (not the baked kind).

The Mad Hatter owed gambling debts to Caterpillar he couldn't pay. He was about to have six of his fingers chopped off but Caterpillar was willing to be nice if Alice helped out with a task. Steal the Koh-i-Noor diamond from its display at the Crystal Palace.

There were flashbacks throughout the novel, filling in Alice's past. She and William had worked as thieves, big-time stuff, not petty theft. Their relationship had broken off but she still had feelings for him.

Caterpillar didn't want the diamond for himself. He had failed in a job for the Queen of Hearts, who demanded the diamond as reparation. Otherwise it would be off with his head.

Most of the novel was a tour through the London underworld. Alice and William busily collected plot coupons when not planning the diamond heist. They frequently took airship taxis about town and dodged steam lorries when walking across the street.

The Queen of Hearts kept her youthful beauty by drinking and bathing in the blood of young virgin girls. Her demands were becoming so excessive that even the underworld denizens were dismayed.

She began screaming "*Off with their heads!*" at the slightest provocation. She wanted the Koh-i-Noor as a powdered ingredient in a formula that would grant her immortality. Alice supplied a fake diamond.

The Queen of Hearts prepared and drank the formula after casting a spell. Unfortunately the goddess to whom the spell was cast was angry at the fake ingredient and pulverized the Queen. With that, Alice and William reconciled, and so to a happy ending.

Steamy Olde England.

LADY OF DEVICES (2011) by Shelley Adina was the first novel in a steampunk series about Claire Trevelyan, 17 years old in 1889. Victoria was Queen but Charles Darwin's son was prime minister.

Steam ruled. Mail was delivered in capsules placed in underground pneumatic tubes, not only within city as did happen in our timeline, but across the country. Steam buggies and trains were a matter of course.

Claire's father lost the family fortune on bad investments, so she had to go to work for a living. Being scientifically minded, she went into the manufacture of explosive devices, always and everywhere a moneymaker. In the underworld she was known as the Lady of Devices.

She met Andrew Malvern, an engineer, after which the plot developed. Most of the novel was set-ups for what would undoubtedly transpire in future installments.

Claire had to put up with as much chauvinism in the underworld as with the upper classes. She had to pick her way carefully, not only threading between steam buggies in the street but between established interests in both high and low society.

ALTERNATIVE HISTORY REVIEWS: PART 13

by Dale Speirs

[Parts 1 to 12 appeared in OPUNTIA #67.1E, 68.1B, 291, 303, 304, 312, 336, 370, 453, 470, 501, and 535. See also the cumulative subject index of OPUNTIA for others.]

Short Stories.

“Gentlemen: Please Note” by Randall Garrett (1957 October, ASTOUNDING, available as a free pdf from www.gutenberg.org) was an alternative history told in letters.

The first letter was dated 1957 as a framing device for the subsequent letters dated in the late 1660s. The missive mentioned in passing the French War of 1948. Further on was a remark about the Austro-Hungarian Empire still causing trouble, so the reader can surmise there were no two world wars.

The subsequent letters were one-sided correspondence to Isaac Newton. He decided to go into practical mathematics, rather than stay at a university and study conic sections. His ideas, however, were not accepted, whether calculating ballistics of cannons or the optimal shape of wine barrels.

Eventually he decided to go into the Church, rising high on the basis of his masterpiece PRINCIPIA THEOLOGICA. The final letter to him praised him for his work in explaining how Christianity worked. As the archbishop wrote:

The Church has always held that those whose entire lives have been lived in holy purity and in the Grace of God would hold a higher place in Heaven than those whose lives have been sinful, even though God, in His graciousness, has forgiven them their sins.

But no one had shown how this might be so. Your analogy, showing how the white light of the sun may be graded into the colours of the rainbow, ranging from red to violet, illustrates wonderfully how Our Lord will grade His chosen servants on the Last Day, when the sinful souls of the damned are cast into Darkness.

Anthologies.

BROKEN TIME BLUES (2011) was an anthology of 12 stories edited by Jaym Gates and Erika Holt. The theme was weird history of the Roaring Twenties. Most of the stories didn’t appeal to me, however competently they may have been written, but I’ll mention a couple.

Starting off was “The Sharing” by James L. Sutter. World War One ended abruptly when the aliens landed. They wanted to learn why humans fought organized wars, to which our species had no answer.

The aliens became telepathic after drinking alcoholic beverages, which certainly helped the American government enforce Prohibition. One of the aliens made a field trip to a speakeasy, with some interesting results.

“The Purloined Ledger” by Ari Marmell was about a private investigator helping Chicago police. Twas the Roaring Twenties and a crime boss had used magic to hide his ledger book.

If the accounts could be found, they would name who had been paid off with how much cash and for what reason, none of it legal. The trick had been to magick the numbers and words into other books. The other trick would be getting them back into order for the court trial.

ALTERNATE HISTORY SHORT STORIES (2023) was an anthology of 33 stories, some original and some reprints. No editor credited and despite the recent date of publication, I bought this at Chapters Indigo at a remaindered price. I pick a few stories to review.

“The Syllabus” by Rebecca Buchanan was a class course schedule on creating alternative history. Not writing it, but actually changing history of different worlds as experiments. I’m glad we don’t live in an alternative history where, for example, a nutty billionaire could be elected president of a country or people could ruin lives with a libelous tweet.

“Herd Mentality” by Jay Caselberg diverged to a Germany where Albert Einstein had stayed, and a mad scientist cloned 250 copies of him. Those clones were now spread around the world, most of them successful oligarchs. They were now middle-aged men and began to worry about cloning the next generation of Einsteins to succeed them.

“The Ifs Of History” by Joseph Edgar Chamberlain was originally published in 1907 and is a collection of numerous counterfactuals of a couple of pages each.

Just to name a few:

If The Moors Had Won The Battle Of Tours

If Columbus Had Kept His Straight Course Westward

If The Spanish Armada Had Sailed At Its Appointed Time

If Alexander Hamilton Had Not Written About The Hurricane

Some of the divergences were obscure, but Chamberlain was careful to explain their backgrounds. A great proportion were about the War Between The States. When those counterfactuals were written, the larger proportion of American readers knew the war from personal experience or what their parents told them. The war was not old history.

“The Intervention” by Guy Prevost was based on the fact that for a month in 1913 both Stalin and Hitler were living in Vienna, although they probably never met. An interdimensional alien, disguised as a human, arrived with the purpose of killing both men.

Both men were paranoid enough to spot the alien. While it was lining up to kill Hitler, it forgot to watch for Stalin, who got it with a knife. The two men passed each other, eventually to meet again a couple of decades hence.

Many of the stories were wish fulfillment, such as Tsar Alexander II surviving his assassination and going on to make Russia a modern liberal democracy. In another story a time traveler warned the Incas of the coming of the Spanish and made them ready with vaccines and flintlock rifle technology.

Others seemed rather trivial, such as a ballerina in the gaslight era whose skirt did not catch fire when she brushed against a footlight, as happened in our timeline.

All told, a fairly good anthology with a good mix of classics and new fiction.

THE DAWN OF TELEVISION: PART 6

by Dale Speirs

[Parts 1 to 5 appeared in OPUNTIA #309, 367, 446, 470, and 499.]

Although television technology was available in the 1930s, mass market broadcasting was delayed by the Great Depression and World War Two. Not until 1948 did television become widespread.

By 1955 television had essentially destroyed old-time radio. Since the radio networks were rushing to become television networks, there was never any taboo on old-time radio shows against mentioning television.

In the early 1950s, many series aired on both radio and television simultaneously. Often a popular topic for radio episodes was the resistance of some people in adopting the new-fangled television.

Early Adopters.

THE LIFE OF RILEY was a comedy series that aired on radio from 1941 to 1951. Episodes are available as free mp3s from www.otrr.org/OTRRLibrary

This was a domestic sitcom about Chester A. Riley, his wife Peg, and their two teenaged children Junior and Babs. He was an abusive father, hot-tempered, and constantly leaping to false conclusions. Archie Bunker was a paragon of virtue compared to him. Chester’s neighbour Gillis often led him astray, usually by starting a sentence “*I know a guy ...*”.

“Two TVs For Father’s Day” aired on 1950-06-16, written by Alan Lipscomb and Reuben Ship. Chester was upset because Junior, Babs, and Peg didn’t stay at home in the evenings but went off individually to visit friends to watch television.

Chester was adamant that there would be no television set in his house. He told Peg he was waiting for the improved model: “*Some day they’ll put on entertainment*”. What he didn’t know was Peg had bought him a television set as a surprise Father’s Day present.

Various misunderstandings stretched out the episode, with bad advice from Gillis and thoughtful advice from Digby O’Dell, the friendly undertaker.

O'Dell convinced Chester to buy a television set, both unaware of Peg's set. It all worked out in the end with the Rileys becoming a two-television set household. Yes, he gave in to the dark side.

Early Consequences.

THE GREEN HORNET aired on old-time radio from 1936 to 1952. The main writer was Fran Striker, who also wrote THE LONE RANGER. While not strictly a spin-off, the Green Hornet, wealthy newspaper publisher Britt Reid, was the grand-nephew of John Reid, the Lone Ranger.

Britt and his faithful valet Kato operated in disguise, specializing in the fight against conspiracies and racketeering. What they learned in their undercover investigations became front-page scoops for Britt's newspaper. The radio series is available as free downloads from the Old Time Radio Researchers at www.otrr.org/OTRRLibrary

"Face In The Television" aired on 1949-02-10 just as television began its ascent to mass media that would within a few years kill off old-time radio. A woman was at a boxing match and then later watched the highlights on television.

She had been a gun moll in her younger days. The camera had panned over the audience and she saw herself. She also saw several gangsters congregated at the back, men who were supposedly on the lam in Mexico or hiding out elsewhere in the country.

She hollered to the police, and soon enough Britt's reporters picked up the story. They kept it off the front page until they could get more dirt on the gangsters and a few unfortunate murder victims whose cases needed solving.

A tape of the television report was used to produce what today we call freeze-frames but back then were called photo blowups. The hunt was on for the gangsters on television. The Green Hornet and Kato did the major work before letting the police think they solved the crimes.

The criminals discovered that the old ways were disappearing. Conspiracy charges could now be based on the unblinking eye of the television camera. Taking the opportunity to relax at a public event while organizing a new syndicate was fraught with new perils.



BAWAH HA! HA!: PART 18

by Dale Speirs

[Parts 1 to 17 appeared in OPUNTIA's #371, 372, 378, 388, 391, 393, 397, 409, 422, 427, 434, 451, 475, 491, 502, 522, and 543.]



Being a philatelist, I send away for commemorative postmarks such as this.

Immortality.

THE SHADOW, as the opening blurb put it, was in reality Lamont Cranston, wealthy young man about town. He had traveled to Tibet where he learned how to cloud minds so that people could not see him, only hear him.

His voice also changed when he became invisible, courtesy of switching to a crystal microphone. He always announced himself as The Shadow with maniacal laughter, the original bwah-ha!-ha!. Episodes are available free from www.otrr.org/OTRRLibrary The series lasted until 1954.

“Murder From The Grave” aired on 1941-04-06. Dr Metzger invented a secret solution that revived the dead. He raised up a convict who had, in Metzger’s words, been perforated.

The criminal, known only as Mr X, promptly murdered him and stole the remaining solution to resurrect his henchmen. Because Metzger had restored Mr X's face with plastic surgery, no one on the side of the law knew what he looked like.

Lamont Cranston was asked by a hospital doctor named Hawkins to help investigate Metzger’s experiments. The police were only looking into the murder. Margo Lane tagged along as always.

Hawkins found Metzger’s notebook. Among other things, he wrote that his chemical had to be injected every 24 hours to sustain life. Mr X was an ungrateful patient and as violent as he was before.

A clue was a small broken mirror, evidently broken in a rage by Mr X. That suggested the facial surgery was not a success. Hardly was that explained when the hospital morgue attendant came running in. A horribly disfigured man waving a gun came in and stole some bodies.

The gang of revived gangsters started a crime wave. They were invulnerable because bullets didn’t affect them. After one was captured, The Shadow interrogated him in a prison cell. The man had been without an injection for almost 24 hours and was desperate.

He started to blab all in exchange for a promise that The Shadow would get him more of the elixir but died first. Cranston chose an elaborate plan to masquerade as a dead gangster named Dutch Carson.

Lane got herself kidnapped as she so often did. The Shadow came to the rescue as he always did. He smashed the bottle of the solution, so the gangsters decided to go out with a bang. A mass murder would at least immortalize them. The Shadow put the kibosh on them and their time ran out.

INNER SANCTUM MYSTERIES was a radio anthology series which aired from 1941 to 1952 and is available free from www.otrr.org/OTRRLibrary. The episodes ranged from mystery to fantasy to horror.

“Elixir Number Four” aired on 1945-10-30 with Boris Karloff as the star and again on 1946-02-12 with Richard Widmark in the leading role. Emile Tepperman, a popular pulp author, wrote the script. I have the latter episode with Widmark as Alex Gregory.

Professor Jarmin invented Elixir #4, an immortality formula. The professor’s daughter Elaine, a nursing student, was courted by Alex Gregory. While waiting for her to dress for a night out, Alex wandered into the professor’s laboratory.

Jarmin had his back to Alex and was talking to himself. Alex saw on a desk the professor’s diary. That day's entry had a single Latin phrase. Alex was able to read most of it but didn’t understand one of the words.

Later that night after his date with Elaine, he checked a dictionary and got the complete translation: “*In Elixir #4 I have the secret of perpetual life*”. Alex understandably became obsessed with the thought of immortality. He went to Jarmin’s laboratory. Once again the professor was talking to himself.

Alex confronted him and demanded the elixir. Jarmin understandably refused, so Alex slugged him and then poisoned him to get the elixir. Alex injected the elixir into himself and became immortal.

He didn’t want a murder charge, so he cleaned up the laboratory and went home. The next morning he returned, ostensibly to visit Elaine but to establish an alibi when they went into the laboratory and found her father’s body. Alex was horrified when they entered. There was no body in sight.

In retrospect he realized that Jarmin had taken a dose of the elixir. Once the poison wore off, the elixir revived him. The question was where he had gone. Elaine knew nothing of that and thought her father was dead. She wanted to try a séance to see if she could communicate with him.

Meanwhile Alex had his doubts about his conversion. He asked Elaine to test his blood, using as an excuse he feared he might have anemia. She did and found his blood was a new type like none ever known.

Her excitement about the discovery chilled Alex. If people learned he was immortal, he would become a target. The séance was scheduled and Alex was determined she wouldn’t leave it alive.

He would kill her with a hypodermic that would simulate heart failure. Before he could do so, the voice of the professor was heard from beyond the grave. Alex panicked and babbled out a confession.

The room lights suddenly came up and police swarmed the room. Elaine told Alex that the reason her father talked to himself in the laboratory was because he was speaking into a wire recorder as a method of taking notes.

After finding his body, she had it removed and listened to the recordings. They were somewhat ambiguous, so she set up the séance as a means of confirmation. Alex was sentenced to life imprisonment.

Creating Life.

From the radio series THE SHADOW came “The Gibbering Things”, written by Alonzo Deen Cole and aired on 1943-11-26. Lamont Cranston and Margo Lane were visiting her aunt Susan Prentice, who lived near the haunted woods.

During the intro, a passing mention was made of Professor Alexander Sirghoff, who lived in the middle of the woods. The alert listener will immediately tag him as a mad scientist.

The locals scoffed at the legend of haunting, although one man mentioned some transients had disappeared in the woods. Gibbering noises were occasionally heard, and he figured Sirghoff kept monkeys. Either that or they were screech owls. Arriving at Aunt Sue’s, they found her missing.

Strange sounds emanated from the woods, a storm isolated them, the telephone lines were down, and other clichés were applied. Cranston and Lane saw strange tiny footprints leading into the woods. Coming out of the woods was Sirghoff, who explained he was tracking an escaped monkey. He carried on and left them.

They went into the house where Lane carried on when she saw a horrible face in the window. Going back outside, they found a man’s body with a clean puncture, as if he had been attacked by a giant leech.

Good cause for The Shadow to visit Sirghoff and accuse him of dastardly things. Having forewarned his enemy, The Shadow left and made way for the middle commercial. The Blue Coal announcer went into a detailed explanation

about a remarkable new invention called the automatic heat regulator. Today we call it a thermostat.

The announcer burred about how the device would maintain a steady house temperature. No need to get up in the middle of the night to shake the coal in the furnace. The regulator automatically opened and closed a damper on the furnace to maintain a steady heat.

But enough of science fictional inventions such as thermostats. There were noises in the night. Lane was kidnapped by the professor, whose laboratory was underground in the woods.

He babbled to her about how he had created the gibbering things from single cells. He was a god, greater than nature (his words), and got in a few bwah-ha!-ha!s. They fed on human blood and she would be milked.

Much screaming by Lane. The Shadow was trapped with the things. Aunt Sue and the transients were there, kept for the blood. The transients got justice by trapping Sirghoff with his critters. He was quickly drained of his blood.

In the epilogue, Cranston explained how he survived. The gibbering things were not monkeys but terrestrial eldritch creatures. The Shadow swung himself up to a large overhead pipe along the ceiling out of their reach and awaited events.

Shrinking Things.

“Parking, Unlimited” by Noel Loomis (1950 May/June, FUTURE SCIENCE FICTION STORIES, available as a free pdf from www.gutenberg.org) was about an inventor Slim Coleman who found a way to shrink inanimate objects. The handwaving explanation was that his device slowed electrons down to near zero, thereby causing the atoms to shrink.

There’s no use inventing something unless you can make money, so his idea was to create a parking garage that could hold tens of thousands of cars in a single city block downtown. Drivers left their vehicles with an attendant, who took the car out of sight where it was shrunk.

Too many of these stories shrink things without accounting for the mass. Coleman shrank the cars to hand size but they still weighed the same. He had to figure out how to move them into their tiny stalls since he couldn’t pick them

up or push them. Lots of practical details to sort. Alas, things went wrong when one car was expanded by mistake and burst its stall. Then the police came.

Creating Things.

THE ALBUM OF DR MOREAU (2021) by Daryl Gregory was about a boy band Wyld Boyz, who were genetically engineered human-animal hybrids.

Bobby the ocelot was the cute one, Matt the bat was the funny one, Tim the pangolin was the shy one, Devin the bonobo was the romantic one, and Tusk the elephant was the smart one.

Their producer Dr M, real name Maurice Bendix, was the dead one, slashed and gouged to death. The boys were the prime suspects. Police detective Luce Delgado and her partner Mickey Banks had the headache of investigating the murder amidst a sea of screaming fans.

Prima donas everywhere in the hotel, including Mrs M. Like an Agatha Christie novel, there were too many clues and, in the end, too many perpetrators. Think of the Orient Express in a Las Vegas hotel. An amusing read, all told.

“On The Threshold” (2020) by William Meickle (from his chapbook LAB, available from Amazon print-on-demand) was about two players at the game of God. The physicists managed to create electromagnetic bubbles that were miniature universes. When the universes tried to expand out of the quantum foam, there was a black swan that kept them in check.

Frankenstein.

Frankenstein’s monster (it never had a name in the original novel) has been a byword for two centuries. I reviewed previous pastiches about the monster in OPUNTIA #391, 427, 488, and 522.

Rod Serling’s television anthology series NIGHT GALLERY used brief vignettes between the longer plays. One of these was “Junior”, which aired on 1971-10-06, written by Gene Kearney.

A typical suburban home, where the parents were woken by their toddler crying for a glass of water. The father got out of bed and stumbled into the child's bedroom with a glass of water. A quick glimpse of the child revealed a miniature Frankenstein, in the flat-topped Boris Karloff style.

ANGELIKA FRANKENSTEIN MAKES HER MATCH (2022) by Sally Thorne was about the sister of Baron Victor Frankenstein. She was husband hunting but couldn't find a suitable mate.

Angelika did what any Frankenstein would do and built her own. A handsome hulk he was, whom she named Will. Trouble was, he had his own mind, unfortunately blank about his past. The amnesia sent him off questing to learn who he, or at least his brain, had been, with Angelika trailing behind.

Basically a rom-com, with all the alarums and misunderstandings which come with that genre. Not that I'm an expert, mind you, but I once saw a Jennifer Anniston movie. The book had happy endings all around for both Angelika and Victor.

Inventing Things.

AN EXPERIMENT IN GYRO-HATS (1910) by Ellis Parker Butler is available as a free download from www.gutenberg.org The narrator Henry was a dealer in hats, not just selling but designing them. He had always been irked by top hats, which he considered to waste space. A foot fills the shoe and a hand fills the glove but top hats did nothing useful with their volume.

His daughter Anne was in love with Walsingham Gribbs. The trouble, as seen by both her and her father, was that Gribbs staggered when he walked. Not a drinking man. He was still traumatized by his father's death years ago and had a logical explanation for his staggering.

Henry thought a top hat with a gyroscope would solve the problem. The hat had to be tight on the head to work. Straps were undignified but the gyroscope could be used to spin a vacuum pump. The hat would then be held on by suction.

Testing the hat by Henry produced some awkward moments but the principle seemed sound. Gribbs tried it out. At first the hat worked perfectly, stopping his staggering. As he walked outside, he slipped on the front steps and fell.

The hat hit the ground hard enough to bend the spindle of the gyroscope. It began spinning the hat and thereby Gribbs. As he helplessly revolved, Anne rushed to get a stepladder and spike, then standing next to him she punctured the lid of the hat. That destroyed the vacuum and released Gribbs from the hat. Saved!

QUIET PLEASE was an anthology series of weird fiction and science fiction that aired on radio from 1947 to 1949, written and produced by Wyllis Cooper.

"The Pathetic Fallacy" aired on 1948-02-02. The subject was a differential integrator computer, which in those days meant three rooms full of vacuum tubes and mechanical relays. 81 technicians were needed to operate the computer.

The narrator Quinn explained to a group of reporters that the machine was an electromechanical brain. One of the reporters queried if the device was really a brain. Quinn said he was just using a pathetic fallacy, that is, the attribution of human emotions to inanimate objects.

Another reporter, Alice King, asked what the machine was good for. Quinn said it could solve complex mathematical problems in minutes that would take a team of mathematicians a decade. Alice then stymied him by asking how he knew the solution was correct.

Quinn recovered by saying the programmers tested the computer with simpler problems, then escalated the complexity step by step. He began by demonstrating $2 + 2$, but the computer answered 5. Repeated trials produced wildly different answers. Alice suggested that the computer heard Quinn's remark about the pathetic fallacy and retaliated to prove him wrong.

Needless to say, the problem made newspaper headlines and not in a good way. The laboratory staff went nuts trying to save the computer and their jobs, not necessarily in that order.

When Quinn was alone with the machine, it began talking to him. He called the reporters back in but the machine remained silent like Michigan J. Frog. Quinn gave up on the machine because it would only talk to him. He was ridiculed in the press.

Alice came back and prompted the machine to talk in front of her by making it jealous of her and Quinn. She talked it into behaving and giving only correct answers by threatening to take Quinn away. The machine was in love with Quinn.

Just Plain Mad.

THE MONSTER MAKER was a 1944 movie available in the 50-movie DVD box set “Mad Scientist Theatre”. Dr Igor Markoff developed a formula to create acromegaly. Because he could, that’s why. His target was concert pianist Anthony Lawrence, whom he managed to kidnap and inject with the serum.

Markoff would supply an antidote for big money and Lawrence’s daughter Patricia. She was much younger and rebuffed his advances. Events developed and so did the acromegaly.

There was a struggle in the denouement which Markoff lost the hard way. His laboratory assistant supplied the antidote. Lawrence once again played in concert.

The plot was predictable. Suitable for watching once on a rainy Sunday afternoon with nothing else to do. You can read a book during the dull passages.

NIGHTMARE CASTLE was a 1965 movie about mad scientist Stephen Arrowsmith, available in the 50-movie DVD box set “Mad Scientist Theatre”. He had his laboratory in a castle owned by his wife Muriel.

He caught her in bed with the gardener David and tortured both of them before electrocuting them. He kept their hearts in an urn and used their blood to rejuvenate his elderly maid Solange, who was transformed into a young beauty.

What he didn’t know was that Muriel’s sister Jenny inherited the estate. (Both sisters were played by Barbara Steele, well known as a scream queen.) His problem was solved when he married Jenny, at least until Muriel and David returned as ghosts to exact revenge. Not a pleasant ending.

FAR SPEAKING STORIES: PART 12

by Dale Speirs

[Parts 1 to 11 appeared in OPUNTIA #313, 327, 337, 361, 372, 389, 410, 444, 473, 505, and 533.]

The telephone and telegraph are science fictional devices. We can talk to someone on the far side of the continent or the planet. Communications that once took weeks or months became instantaneous.

LANDLINE (2014) by Rainbow Rowell was about Georgie McCool, who put her script writing career ahead of her husband Neal and their children. She was having regrets, which intensified when her landline telephone began connecting her to the past.

Having eventually figured out she had a magic telephone, Georgie began calling Neal in his younger days. She tried to make up for what she had done or hadn’t done, or would do or wouldn’t do, depending on what point in time was referenced.

This novel was an if-you-had-a-second-chance story. Eventually Georgie’s present caught up to her past. Her magic telephone brought her to a reconciliation.

SHERLOCK HOLMES AND THE TELEPHONE MURDER MYSTERY (2020) by John Hall was about the cutting-edge device that abolished distance in the late 1800s and sped up society’s pace of life.

Twass the summer of 1899. London was hot and sticky but Watson was on his way to the cool fresh air of the countryside. A telephone had just been installed at 221B Baker Street. Holmes was not entirely convinced of its utility but Watson found it most convenient.

Watson had been invited to a country estate at Belmont, converted into a hotel for the better sort of class who were active in the arts. The manor was up-to-date and had a telephone. The other guests were artists and musicians. Watson was there in his capacity as an author.

Alas, one of the guests did not survive past the first chapter. Benjamin Morgan, a photographer, departed this world involuntarily. He was stabbed through the heart while making a telephone call in the mansion’s phone booth.

Once the police cleared the mess away, and with their permission, Watson called London on that same device. He left a message for Holmes, who was out on a case, said Billy the page boy.

The message got through and Holmes arrived the next day. One of the guests was a writer Jeremy Lane, who was thrilled at the opportunity to write up the case as a novel. Watson wasn't worried by the competition.

Since the crime scene had been cleaned and mopped, Holmes began by going through the list of guests. He interrogated them one by one, with Watson tagging along.

Another guest and the main suspect was Peter Gregson, a sculptor. He had been seen quarreling with Morgan, had found the body, and his letter opener was the murder weapon. The latter proved nothing, as the guest rooms were unlocked and the letter opener could have been stolen by anyone.

Having interrogated the obvious suspects, Holmes worked his way down the chain to those who were above suspicion. There he had success.

Besides spotting the killer, who had done the deed in the heat of the moment, Holmes and the police discovered why they had been off course. Gregson, while innocent of the crime, had lied in a material way, enough to throw the investigation.

The narrative flowed smoothly with several winding turns. Sudden disclosures in the denouement changed the plot but at least were not hidden from the reader, as so many authors (including Doyle) have done. The book was a steady page-turner that I read in one sitting. Well recommended.

TRAIN OF EVENTS: PART 7

by Dale Speirs

[Parts 1 to 6 appeared in OPUNTIA #403, 416, 461, 489, 522, and 540.]

Novels.

DREAD JOURNEY (1945) by Dorothy B. Hughes was a mystery novel republished in 2019 by Otto Penzler. On a train journey from Los Angeles to Chicago, there was murder contemplated.

Vivien Spender was a Hollywood producer accustomed to discarding starlets on a whim. His most recent acquisition Kitten Agnew would not go quietly. She was fearful that Spender would dispose of her on the train journey. Somebody did, making her death look like natural causes.

She didn't die until three-quarters of the way through the novel. This allowed plenty of angst among the passengers and assorted psychological warfare. Spender seemed the obvious murderer but proof that would be admissible in court was needed.

In the absence of such proof, one of Spender's assistants decided to end him the same way, with a taste of poison in his drink just as the train pulled into Chicago. Justice is not only served in courts but by others.

ON THE WRONG TRACK (2007) by Steve Hockensmith was a novel in a series about brothers Gustav "Old Red" and Otto "Big Red" Amlingmeyer. They were cowpokes in the Old West of the 1890s who were tired of poking cows and decided to set up in the detective business.

Their inspiration came from dime novel detectives such as Nick Carter and Sherlock Holmes. Side note: To the readers of the 1890s, the Holmes stories were contemporary fiction, not gaslight period fiction as we think of them today. In the 1890s, Holmes was a cutting-edge detective using modern methods.

The brothers were hired by Southern Pacific to help police the railroads and yards. The excitement began on their first trip over the Sierras to San Francisco. They were told to be on watch for spies selling information about gold shipments and bandits seeking same.

The baggage man was murdered, shots were fired, and the Old West became the Wild West. A gang uncoupled the baggage and express cars from the rest of the train, hijacked the locomotive, and took off. The denouement ended with a train wreck and a reasonably happy ending.

Ye Olde Trains.

Edward Marston had a long series of novels about Detective Inspector Robert Colbeck, set in England during the middle 1800s. Working for Scotland Yard, he became by default a railroad detective.

Colbeck was assisted by Sergeant Victor Leeming and annoyed by their superior officer Superintendent Edward Tallis, a stick-in-the-mud kowtowner too easily frightened by aristocrats.

THE RAILWAY DETECTIVE (2004) was the first novel, taking place in 1851. The London to Birmingham mail train was hit by an organized gang, who stole several chests of gold sovereigns and the mail bags.

Colbert was assigned the case. There was a damsel in distress and plenty of infodumps about life back then. The heist had to have been an inside job because it only took minutes. The thieves used stolen keys and knew exactly where to go at what time.

Colbeck was hampered by just barely cooperative railway police who had been caught napping, and not just figuratively. Step by step, Colbeck traced those connected to the case. First the train crew, then the post office staff, then the bank staff.

The web spread up into high places. That caused difficulties for Colbeck because his commander kowtowed to high society. The evidence kept piling up enough to identify the ringleader as a Sir and a Major, a man whose status protected him, for a while at least.

At the last moment, as a tomato surprise, the revelation was made that the ringleader's wife had died in a train accident. He wasn't just after valuables but wanted revenge against the railway company.

THE EXCURSION TRAIN (2005) was the sequel. Inspector Robert Colbeck and his assistant Sergeant Victor Leeming were called in by the Great Western

Railway after a passenger was found dead with a noose around his neck. The train was taking a crowd of lowlife rabble to a bare-knuckles prize fight. Few of the passengers were sober.

The deceased was Jacob Guttridge, who had been a public hangman, so the motive seemed obvious. Later a second man was found dead on the train, also with a noose. He had been a prison chaplain.

Guttridge was not mourned by anyone, including his wife and son. There were excursions, literary not train, to show how English society behaved in 1852. The alarms came later as the police closed in on the culprit. The motive was, as expected, revenge for a man's father being hanged.

THE RAILWAY VIADUCT (2006) was the third in the series, this time mostly taking place in France. The suddenly deceased had been murdered on an English train crossing the Sankey Viaduct. The long fall didn't kill him because he had been stabbed through the heart before being thrown off the train.

The victim was traced to France, giving Robert Colbeck and Victor Leeming more problems than just the language barrier. Within living memory Britain and France had been at war, although now at peace. The Entente Cordiale was fifty years into the future, but Perfidious Albion was in common use in Europe in 1852.

A railroad under construction in France had its troubles not unconnected with the viaduct murder. The big boss, the one who hired the murderers, was an English noble who had fought against the French back when. The idea of a French railroad to the Channel coast was anathema to him, a spear pointed at England for the easy transport of troops to invade his sceptered isle.

Smoke Along The Track.

THE PRIVATE FILES OF REX SAUNDERS aired in the summer of 1951 and was a blatant imitation of Bulldog Drummond, including the opening sequence of foghorns and loud footsteps. Rex Saunders and his sidekick Alec roamed America as paladins. Ed Adamson wrote the episodes.

"Murder Is A Silent Companion" aired on 1951-07-11. Rex Saunders and his valet Alec were on a train trip when a woman named Jean Dixon made contact with him.

She said she was being stalked by a scar-faced man. Her husband Charles was in a coffin in the luggage compartment. Dixon and her luggage later vanished from her compartment.

Saunders searched the train. He and Alec were rendered unconscious en route but that was the usual slug-on-the-head routine that all radio detectives got each episode.

Back to the Dixon compartment. This time it was occupied by Scarface and a strange woman who claimed she was Dixon. Nothing more was said and the scene ended. Saunders surmised the body of the real Jean was lying along the railroad track far away.

Saunders had sent a telegram to police, who advised him that, years before, Charles Dixon had robbed a bank. The loot was never found. Charles had died in an automobile accident which might have been murder.

At their destination, Saunders and Alec tracked the coffin to a funeral home. They opened the coffin and found Charles alive, armed, and annoyed at them. The orchestra went berserk, then cut to a commercial for RCA radios.

That taken care of, the plot resumed. Charles and his loot went to find Jean, only to discover the imposter, named Shirley. She and Scarface, a la Steve, wanted the cash. Saunders was a few steps behind. Everyone was rounded up for one charge or another. As the train continued its trip, Saunders explained away all the loose threads to Alec.

THE ZERO HOUR was an unsuccessful attempt to revive radio drama that aired 1973-74. Available as free downloads from the Old Time Radio Researchers at www.otrr.org/OTRRLibrary

“Carnival Of Menace” aired on 1974-07-23 and was written by Glenhall Taylor. A circus was in transit by train, long obsolete even for the 1970s. The intro by Rod Serling did mention that most circuses performed in arenas rather than under canvas.

In this circus, two roustabouts, Rusty and Turk, had no loyalty to their masters. They planned to heist the show takings, about \$20,000, as the train rolled along. After doing so, Rusty killed his partner with a hammer. Turk screamed loudly as he fell off the train.

At this point, the episode cut to a commercial where comedian Jim Backus cheerfully urged listeners to relax in a La-Z-Boy recliner at unbelievable prices. “*Get comfortable!*”.

Back at the train robbery, Rusty explained to Turk’s girlfriend, called Princess after her role in the circus as a trick rider, that Turk had departed with his share of the loot. Rusty then put moves on her that wouldn’t succeed with a last-call woman.

The circus security chief Sheridan Lockman, known as Sherlock, was suspicious. He got a railroad crew to backtrack in a handcar, and they soon found Turk’s body. Upon learning of the death, Princess accused Rusty of killing Turk.

Jump cut to a Ford Supercab truck commercial. The perfect solution to hauling both passengers and cargo. Possibly corpses as well. Following on was a strange public service commercial about how wonderful love is for families. No really, I am not making that up.

Finally back to the murder, Sherlock called in the feds. Rusty tried to kidnap Princess at the next train stop but was swarmed by the law.

QUIET PLEASE was an anthology series of weird fiction and science fiction that aired on radio from 1947 to 1949, written and produced by Wyllis Cooper.

“Green Light” aired on 1948-01-26. Phil Connor was the narrator, a railroad man reminiscing about old times and regretting what might have been. He had lost a leg as a young man while working as a night-shift telegrapher on the railroad.

His girlfriend Addie was keeping him company on the shift one night. She encouraged him to be a little more ambitious and try for a day job with a telegraph company. They paid big money, \$96 a month (This would have been pre-WW1 according to the chronology of the story). A man could raise a family on that.

A storm blew up. Addie was nervous but Phil convinced her to stay. As they chatted, they heard an unscheduled train outside. It high-balled too fast into the curve and derailed. Phil telegraphed his dispatcher, who knew nothing about the train.

When Phil ran outside, he found nothing. Impossible to explain, and some time passed before he lived down the false alarm. Addie's brother Ham suggested it was a ghost train. Phil was determined to find out what happened.

Came the time when the ghost train reappeared. Phil switched the track light to red to stop the train, which it did. He went outside. The engine driver came over and told Phil he was to become fireman on the train. As they pulled out of the stop, the engine driver said his name was Casey Jones. Phil was later found beside the track with his leg cut off and no train wreck in sight.

Subways.

“Bell Biv Derailed” by B. Zelkovich (2022, from the anthology LOLCRAFT, edited by Michael Cieslak) was a late-night subway train ride through the tunnels of a big city.

The train stalled in an underground forest where a moose with tentacles on its face took an interest in the vehicle. After assorted mayhems had been committed, the train reverted back into the real world. Naturally no one believed what happened, and the accepted version was a train derailment.

THE AVENGER was a carbon-copy of The Shadow, produced by the same people. The market for such heroes was saturated and the show never succeeded. The first series aired during the 1941-42 season and has since vanished into the mists of time.

The second version aired during the 1945-46 season, written by Ruth and Gill Braun. This series was syndicated on transcribed disks and is now available free from the Old Time Radio Researchers website at www.otrr.org/OTRRLibrary

Jim Brandon was the alter-ego of The Avenger or perhaps vice versa. His lovely companion was Fern Collier, who was the only person who knew the true identity of The Avenger.

Brandon didn't learn any strange and mysterious powers in the Orient but instead relied on superscience devices. His two main gizmos were the Telepathic Indicator, a mind-reading device, and the Secret Diffusion Capsule, which made him invisible. The capsule was always heralded by a popping sound followed by the hissing of gas.

“The Subway Ghost” aired on 1945-10-19. Jim Brandon and Inspector White rode in the driver's cab of a subway train after reports of a ghost were received. The spot where the ghost appeared was where a subway employee had been killed two years before.

They saw the ghost standing in the middle of the track. The motorman slammed on the brakes but the train ran over the apparition. Dismounting, they examined the underside of the train and found nothing.

As they were doing that, there was a big bank robbery. Lester Stevens was the dispatcher on the subway line so Brandon called on him. He said the city had dozens of lawsuits from each incident from passengers claiming injuries after each sudden stop.

The ghost only appeared for the bank robberies up top. Brandon suspected there were extra materializations to diffuse suspicion. The thieves might be using the train as a getaway. Although several drivers saw the ghost, Mike Leary was the only one driving when the appearances coincided with a robbery. Brandon and the police took another ride with Leary and made him stop well before the spot.

They got out and inspected the location, which was near downtown. Leary was shot dead by a fake track walker who got away. They found a slide projector that was used to create the ghost. There was a jump cut to a conversation with the thieves which confirmed they were using the trains for getaways.

Throughout the narrative, Inspector White pish-poshed every clue as insignificant. The listener will wonder how he kept his job instead being demoted to foot patrol on the waterfront.

Brandon decided to investigate a tavern near the tracks in the roughest part of town. He took Fern Collier along to the dive. Until then she had no dialogue. They saw gang members going into a back room.

While Collier contacted the police, The Avenger went to listen in on the gang. Shots were fired but the police arrived in time. In the epilogue, Brandon explained the robberies took place downtown within range of a subway entrance.

The crooks hopped on the train when it made the stop at the ghost. They were dressed as subway employees, so other passengers weren't suspicious.

EDITION COLLECTING IN THE ERA OF PRINT ON DEMAND

by Dale Speirs

With one exception (THE HUNTING OF THE SNARK) I have never been an edition collector of books. Any old copy will do for reading. I have read many articles whose authors discussed all the printing editions of a book and, within each edition, the printing state. Too much esoterica for me.

I got to thinking about that recently when I received the latest batch of books ordered from Amazon.ca. Some books were printed by various publishers under their imprints. An increasing number of books I buy are self-published, as authors bypass bottlenecks at publishers who still think in terms of seasons or six-month scheduling.

Self-published books are almost entirely print-on-demand publications. Several years ago I noticed a wide variety of printing credits in the colophons of these books. They eventually coalesced into all the books being printed in Bolton, Ontario. This town is about 20 km northwest of Greater Toronto.

In the past year or so, all the POD books I ordered came from Acheson, Alberta, according to the colophon. Obviously Amazon.ca now has a presence there.

I was born and raised in Alberta, have spent my entire life here, and lived in various places throughout the province. The name was unfamiliar to me so I checked Google and discovered Acheson was a new town founded in the 1970s.

Acheson, named after a railway executive, is an unincorporated industrial district within Parkland County. The county is on the west side Alberta's capital city of Edmonton. During the middle 1970s I was a student in Edmonton at the University of Alberta. Acheson was born about the same time but I would not have noticed.

Completist collectors who want every imprint of a particular book now have an impossible task. Anyone ordering the book online will get it from the nearest POD facility.

A collector in southern Ontario will get a book with a Bolton colophon, while I get mine from Acheson. I have no idea how many other printing plants are owned by Amazon.ca, much less Amazon.com south of the border.

I still insist on print books for recreational reading. On an average day I stare at a screen for two or three hours while researching or writing. Too much as it is. The other advantage of print books is that they can't be suddenly deleted because the author was denounced by wokers or cancellers.

This is why I prefer my television series or movies on DVDs. Video has the additional problem that streaming services will delete items purely for tax reasons.

LETTERS TO THE EDITOR

[Editor's remarks in square brackets. Please include your name and town when sending a comment. Email to opuntia57@hotmail.com]

FROM: Garth Spencer
Vancouver, British Columbia

2023-09-01

[Re: OPUNTIA #555, When Words Collide convention report] Con reports! Panel reviews! Photos of grinning faces! Journey's end in faneds' meetings! Pictures of cacti! You restore my sense of order in the fan universe.

[I've been checking Google but have seen no other true reports on the WWC convention. Lots of fragmentary tweets or blog posts with one or two pictures, but nothing in detail.]

SEEN IN THE LITERATURE

Astronomy.

MacLeod, M., and A. Loeb (2023) **Breaking waves on the surface of the heartbeat star MACHO 80.7443.1718** NATURE ASTRONOMY 7:doi.org/10.1038/s41550-023-02036-3

Authors' abstract: *Massive astrophysical compact halo object (MACHO) 80.7443.1718 is a high mass, eccentric binary system exhibiting the largest-known-amplitude tidally excited oscillations.*

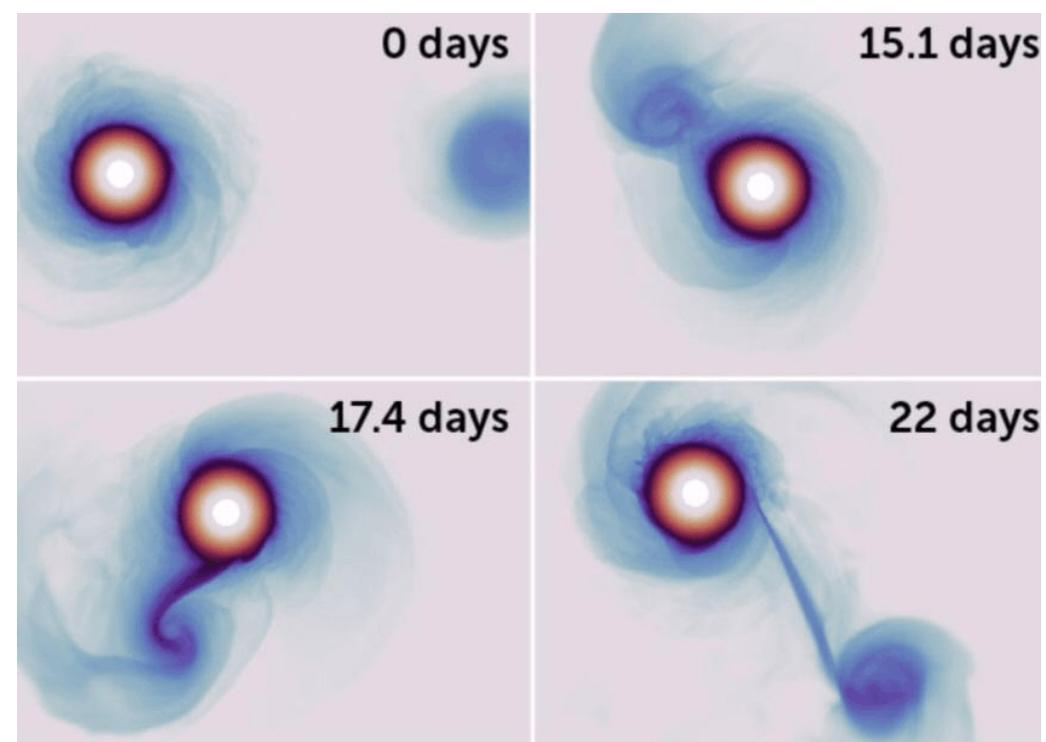
The system's $\pm 20\%$ photometric amplitude, along with the high mass of the primary star, $\sim 35 M_{\odot}$, make this the most extreme of the class of periodically perturbed 'heartbeat stars.'

Here, we use a hydrodynamic simulation to demonstrate that with each periaapse passage, an unseen companion star raises tidal waves so large that they break, shock-heating and dissipating energy and angular momentum on the surface of the star.

The shock-heated material forms a rapidly rotating circumstellar atmosphere, which is stripped and reassembled with each periaapse passage. The dissipation of nonlinear tides through surface wave breaking explains the super-synchronous rotation of the primary star, the evolution of spectral emission features and the observed decay of the binary orbital period.

Connecting these features demonstrates that MACHO 80.7443.1718 is a natural product of massive binary star evolution, and that it provides an ideal laboratory for the direct study of nonlinear tidal dissipation.

[Image is from this paper.]



Pan, Z., et al (2023) **A binary pulsar in a 53-minute orbit.** NATURE 620:doi.org/10.1038/s41586-023-06308-w (available as a free pdf)

Authors' abstract: *Spider pulsars are neutron stars that have a companion star in a close orbit. The companion star sheds material to the neutron star, spinning it up to millisecond rotation periods, while the orbit shortens to hours.*

The companion is eventually ablated and destroyed by the pulsar wind and radiation. Spider pulsars are key for studying the evolutionary link between accreting X-ray pulsars and isolated millisecond pulsars, pulsar irradiation effects and the birth of massive neutron stars.

Black widow pulsars in extremely compact orbits (as short as 62 minutes) have companions with masses much smaller than 0.1 solar masses. They may have evolved from redback pulsars with companion masses of about 0.1 to 0.4 solar masses and orbital periods of less than 1 day.

If this is true, then there should be a population of millisecond pulsars with moderate-mass companions and very short orbital periods, but, hitherto, no such system was known.

Here we report radio observations of the binary millisecond pulsar PSR J1953+1844 (M71E) that show it to have an orbital period of 53.3 minutes and a companion with a mass of around 0.07 solar masses. It is a faint X-ray source and located 2.5 arc minutes from the centre of the globular cluster M71.

PSRJ1953+1844 (M71E) was discovered in 2021 using the Five-hundred meter Aperture Spherical radio Telescope (FAST) by the FAST Galactic Plane Pulsar Snapshot survey and identified as a binary. Using the archival data from the FAST Globular Cluster Pulsar survey, its orbital parameters were determined.

Follow-up observations for timing started in September 2021. Its spin, astrometric and orbital parameters have been measured by means of pulsar timing. Its orbital period is 53.3 minutes.

The previous records of binary pulsar orbital periods were 75 minutes from the binary gamma-ray pulsar J1653-0158 and 62 minutes from the optical source ZTF J1406+1222.

Asteroids.

Ivanova, O., et al (2023) **Long-lasting activity of asteroid (248370) 2005 QN₁₇₃**. MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY 525:doi.org/10.1093/mnras/stad2294

Authors' abstract: We present the results of observations of asteroid (248370) QN₁₇₃ obtained during July 2021 to January 2022 with three telescopes. Our analysis revealed the presence of the dust tail for about half of a year.

The direct images of the asteroid were obtained with broad-band filters. No emissions were revealed in the spectra, and the spectrum of the asteroid closely matched that of a C-type asteroid.

Created colour and linear polarization variations along the tail were analysed. The asteroid demonstrated a redder colour compared to the Sun. Dramatic changes in dust productivity obtained in different filters were not detected.

The estimated asteroid size is 1.3 km. It is shown that large particles are concentrated around the nucleus, whereas smaller ones dominate in the tail. The evolution of (248370) QN₁₇₃ orbit and the orbits of the sample of the 464 short-periodic comets were followed.

Ten of them approached the asteroid's orbit. These objects are not genetically related, despite very close distance of their orbits for a relatively long time.

Planets.

Blaske, C.H., et al (2023) **Meteors may masquerade as lightning in the atmosphere of Venus**. JOURNAL OF GEOPHYSICAL RESEARCH: PLANETS 128:doi.org/10.1029/2023JE007914

Authors' abstract: Lightning in the atmosphere of Venus is either ubiquitous, rare, or non-existent, depending on how one interprets diverse observations. Quantifying when and where, or even if lightning occurs, would provide novel information about Venus' atmospheric dynamics and chemistry.

Lightning is also a potential risk to future missions, which could float in the cloud layers (~50 to 70 km above the surface) for up to an Earth-year. Over decades, spacecraft and ground-based telescopes have searched for lightning at Venus using many instruments, including magnetometers, radios, and optical cameras.

Two optical surveys (from the Akatsuki orbiter and the 61-inch telescope on Mt. Bigelow, Arizona) observed several flashes at 777 nm (the unresolved triplet emission lines of excited atomic oxygen) that have been attributed to lightning.

This conclusion is based, in part, on the statistical unlikelihood of so many meteors producing such energetic flashes, based in turn on the presumption that a low fraction (<1%) of a meteor's optical energy is emitted at 777 nm.

We use observations of terrestrial meteors and analogue experiments to show that a much higher conversion factor (~5% to 10%) should be expected. Therefore, we calculate that smaller, more numerous meteoroids could have caused the observed flashes.

Lightning is likely too rare to pose a hazard to missions that pass through or dwell in the clouds of Venus. Likewise, small meteoroids burn up at altitudes of ~100 km, roughly twice as high above the surface as the clouds, and also would not pose a hazard.

We investigate whether meteor fireballs could have produced the optical flashes that have been detected at Venus and attributed to lightning. We find that flashes from meteor fireballs are statistically likely to occur at the observed rates and brightness. There is no affirmative evidence that lightning is a hazard to missions that pass through or dwell within the clouds of Venus.

Chavez, E., et al (2023) **Evolution of Neptune at near-infrared wavelengths from 1994 through 2022.** ICARUS 404:doi.org/10.1016/j.icarus.2023.115667 (available as a free pdf)

Authors' abstract: Using archival near-infrared observations from the Keck and Lick Observatories and the Hubble Space Telescope, we document the evolution of Neptune's cloud activity from 1994 to 2022.

We calculate the fraction of Neptune's disk that contained clouds, as well as the average brightness of both cloud features and cloud-free background over the planet's disk.

We observe cloud activity and brightness maxima during 2002 and 2015, and minima during 2007 and 2020, the latter of which is particularly deep. Neptune's lack of cloud activity in 2020 is characterized by a near-total loss of clouds at mid-latitudes and continued activity at the South Pole.

We find that the periodic variations in Neptune's disk-averaged brightness in the near-infrared bands are dominated by discrete cloud activity, rather than changes in the background haze.

The clear positive correlation we find between cloud activity and Solar Lyman-Alpha irradiance lends support to the theory that the periodicity in Neptune's cloud activity results from photochemical cloud/haze production triggered by Solar ultraviolet emissions.

Planets: Snowball Earth.

[650 megayears ago, Earth froze over to the equator, known as Snowball Earth.]

Bowyer, F.T., et al (2023) **Biological diversification linked to environmental stabilization following the Sturtian Snowball glaciation.** SCIENCE ADVANCES 9:10.1126/sciadv.adf9999 (available as a free pdf)

Authors' abstract: The body fossil and biomarker records hint at an increase in biotic complexity between the two Cryogenian Snowball Earth episodes (ca. 661 million to about 650 million years ago).

Oxygen and nutrient availability can promote biotic complexity, but nutrient (particularly phosphorus) and redox dynamics across this interval remain poorly understood.

Here, we present high-resolution paleoredox and phosphorus phase association data from multiple globally distributed drill core records through the non-glacial interval.

These data are first correlated regionally by litho- and chemostratigraphy, and then calibrated within a series of global chronostratigraphic frameworks.

The combined data show that regional differences in postglacial redox stabilization were partly controlled by the intensity of phosphorus recycling from marine sediments.

The apparent increase in biotic complexity followed a global transition to more stable and less reducing conditions in shallow to mid-depth marine environments and occurred within a tolerable climatic window during progressive cooling after post-Snowball super-greenhouse conditions.

Li, M., et al (2023) **Deglacial volcanism and reoxygenation in the aftermath of the Sturtian Snowball Earth.** SCIENCE ADVANCES 9:doi.org/10.1126/sciadv.adh9502 (available as a free pdf)

Authors' abstract: The Cryogenian Sturtian and Marinoan Snowball Earth glaciations bracket a nonglacial interval during which Demosponge and green-algal biomarkers first appear. To understand the relationships between

environmental perturbations and early animal evolution, we measured sulfur and mercury isotopes from the Datangpo Formation from South China.

Hg enrichment with positive delta ¹⁹⁹Hg excursion suggests enhanced volcanism, potentially due to depressurization of terrestrial magma chambers during deglaciation. A thick stratigraphic interval of negative delta ³³S_{py} indicates that the nonglacial interlude was characterized by low but rising sulfate levels.

We propose that extreme temperatures and anoxia contributed to the apparent delay in green algal production in the aftermath of the Sturtian glaciation and the subsequent reoxygenation of the iron-rich and sulfate-depleted ocean paved the way for evolution of animals.

The Cryogenian Period [~720 to 635 million years (Ma) ago] includes the Sturtian and Marinoan Snowball Earth glaciations, which were separated by a nonglacial interval that preserves biomarker evidence for the rise to dominance of green algae and the first appearance of Demospongiae.

Ice extended to the equator for millions of years through the 717- to 661-Ma Sturtian glaciation and the >639- to 635-Ma Marinoan glaciation. During the ~56-Ma-long Sturtian glaciation, iron formations proliferated, requiring anoxic Fe²⁺-rich and sulfate-depleted deep waters.

Snowball Earth may have provided a bottleneck for some preglacial life-forms but melt ponds on the surface of ice and zones of sublimation were potential nurseries for the diversification of life.

Deglaciation of the Sturtian Snowball was achieved when atmospheric CO₂ levels and the planetary albedo reached a critical threshold of radiative forcing. Multicellular animals emerged during or soon after the Sturtian glaciation and expanded to measurable levels during the Cryogenian nonglacial interlude.

Satellites.

Schörghofer, N., and R. Rufu (2023) **Past extent of lunar permanently shadowed areas.** SCIENCE ADVANCES 9:doi.org/10.1126/sciadv.adh4302 (available as a free pdf)

Authors' abstract: *As the Moon migrated away from Earth, it experienced a major spin axis reorientation. Permanently shadowed regions (PSRs), which are thought to have trapped ices and are a main focus of lunar exploration, appeared and grew after this (Cassini state) transition and are often younger than their host craters.*

Here, we calculate the lunar spin axis orientation and the extent of PSRs based on recent advances for the time evolution of the Earth-Moon distance.

The solar declination reached twice its current value 2.1 billion years (Ga) ago, when the PSR areawas about half as large. The PSR area becomes negligible beyond 3.4 Ga ago.

The site of an artificial impact in Cabeus Crater, where various volatiles have been detected, became continuously shadowed only about 0.9 Ga ago, and hence, cold-trapping has continued into this relatively recent time period. Overall estimates for the amount of cold-trapped ices have to be revised downward.

Origin Of Life.

Egbert, M., et al (2023) **Behaviour and the origin of organisms.** ORIGINS OF LIFE AND EVOLUTION OF BIOSPHERES 53:doi.org/10.1007/s11084-023-09635-0 (available as a free pdf)

Authors' abstract: *It is common in origins of life research to view the first stages of life as the passive result of particular environmental conditions.*

This paper considers the alternative possibility: that the antecedents of life were already actively regulating their environment to maintain the conditions necessary for their own persistence.

In support of this proposal, we describe ‘viability based behaviour’: a way that simple entities can adaptively regulate their environment in response to their health, and in so doing, increase the likelihood of their survival.

Drawing on empirical investigations of simple self-preserving abiological systems, we argue that these viability-based behaviours are simple enough to precede neo-Darwinian evolution.

We also explain how their operation can reduce the demanding requirements that mainstream theories place upon the environment(s) in which life emerged. The claim that before evolution, systems could regulate their environment in a self-preserving manner, is not as radical as it might first appear.

Non-living phenomena participate in basic forms of negative feedback which regulate their surroundings in such a way that causes them to exist for a longer duration or in a broader set of conditions than would otherwise be possible.

A simple example involves glacial ice. Ice has a high albedo compared to land or ocean, reflecting a greater amount of thermal energy back into space. The more ice there is, the cooler its surroundings will be, making more likely the persistence of ice. Ice thus plays a role in maintaining the conditions necessary for its own persistence.

We describe four non-biological systems that demonstrate self-preserving behaviours: reaction-diffusion ‘spots,’ motile oil-droplets, ramified charge-transportation networks, and Bénard convection cells.

Each of these systems moves, or reconfigures itself in a manner that changes its environment (e.g., by moving to a different location) or changes the way that it interacts with its environment, and does so in a way that increases the likelihood of its persistence.

Paleobiology.

Heubeck, C., et al (2023) **Stromatolite-like structures within microbially laminated sandstones of the Paleoarchean Moodies Group, Barberton Greenstone Belt, South Africa.** ASTROBIOLOGY 23:doi.org/10.1089/ast.2023.0014

[Stromatolites are layers of slime algae or photosynthetic bacteria that build up into mounds. They are among the oldest known fossils and still exist today in some localities such as Shark Bay, Australia.]

Authors’ abstract: *We report abundant small calcareous mounds associated with fossilized kerogenous microbial mats in tidal-facies sandstones of the predominantly siliciclastic Moodies Group (ca. 3.22 Ga) of the Barberton Greenstone Belt (BGB), South Africa and Eswatini.*

Most of the bulbous, internally microlaminated mounds are several centimeters in diameter and formed at the sediment-water interface contemporaneously with sedimentation. They originally consisted of Fe-Mg-Mn carbonate, which is now largely silicified. Subtle internal compositional laminations are composed of organic matter and sericite.

Their presence for >6 km along strike, their restriction to the inferred photic zone, and the internal structure suggest that mineral precipitation was induced by photosynthetic microorganisms.

Similar calcareous mounds in this unit also occur within and on top of fluid-escape conduits, suggesting that carbonate precipitation may either have occurred abiogenically or involved chemotrophic metabolism(s) utilizing the oxidation of organic matter, methane, or hydrogen, the latter possibly generated by serpentinization of underlying ultramafic rocks.

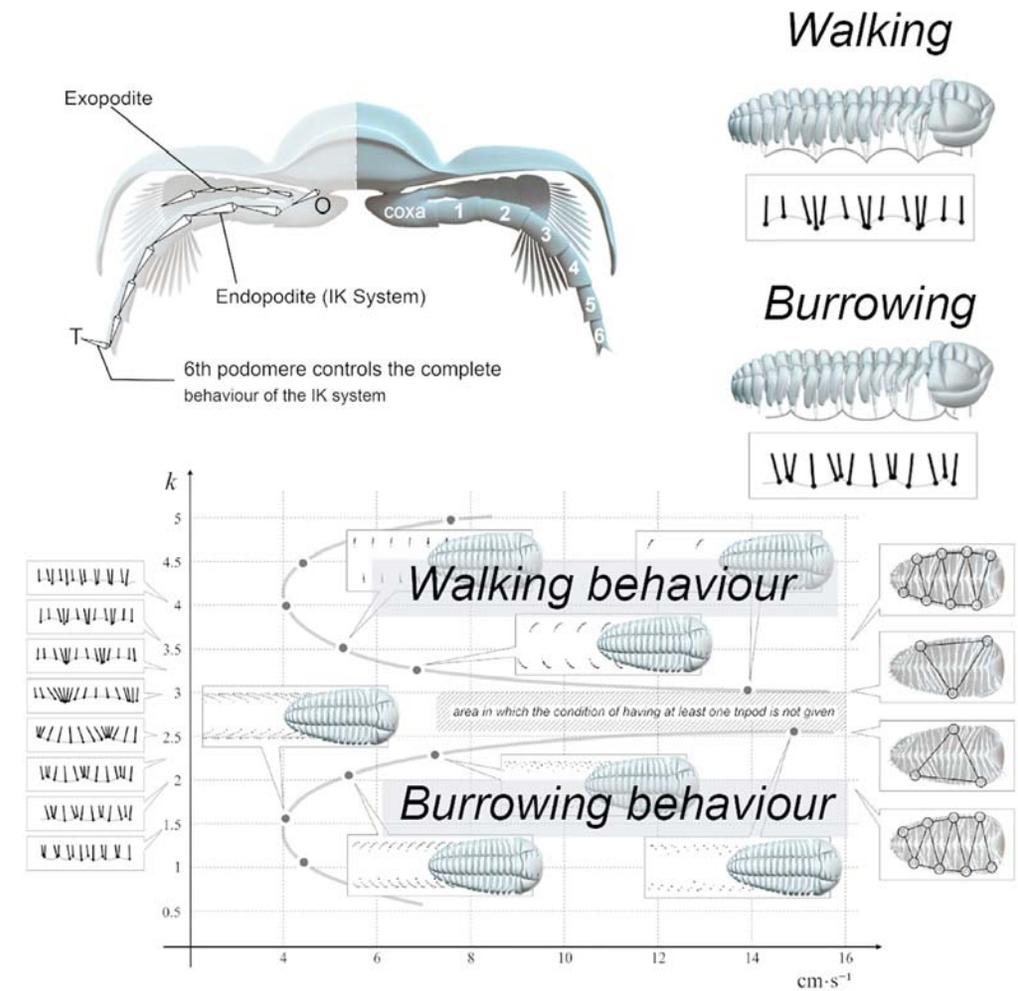
Alternatively or additionally, carbonate may have precipitated abiotically where heated subsurface fluids, sourced by the intrusion of a major Moodies-age sill, reached the tidal flats.

In summary, precipitation mechanisms may have been variable; the calcareous mounds may represent “hybrid carbonates” that may have originated from the small-scale overlap of bioinduced and abiotic processes in space and time.

Significantly, the widespread occurrence of these stromatolite-like structures in a fully siliciclastic, high-energy tidal setting broadens search criteria in the search for life on Mars while their possible hybrid origin challenges our ability to unambiguously identify a biogenic component.

Esteve, J., and P. Rubio (2023) **Understanding locomotion in trilobites by means of three-dimensional models.** iSCIENCE 26:doi.org/10.1016/j.isci.2023.107512 (available as a free pdf)

Authors' abstract: *Trilobites were one of the first animals on Earth to leave their imprints on the seafloor. Such imprints represent behavioral traces related to feeding or protection, in both cases implying different types of locomotion.*



Modeling how trilobites moved is essential to understand their evolutionary history and ecological impact on marine substrates. Herein, locomotion in trilobites is approached by means of three-dimensional models, which yielded two main gait types.

These two gaits reflect basic behaviors: burrowing and walking. This model reveals that trilobites could change their gait and consequently increase rapidly their speed varying the amplitude of the metachronal wave, a change independent from their biological structure.

Fast increases in speed enhanced the protection of trilobites against predators and sudden environmental crises. The trilobite body pattern constrained their gaits, controlled by the distance between the pair of legs and between legs in a same segment.

[Images are from this paper.]

Cooper, S.L.A., and E.E. Maxwell (2023) **Death by ammonite: fatal ingestion of an ammonoid shell by an Early Jurassic bony fish.** GEOLOGICAL MAGAZINE 160:doi.org/10.1017/S0016756823000456 (available as a free pdf)

Authors' abstract: *A remarkable specimen of the actinopterygian fish Pachycormus macropterus from the Early Jurassic (Toarcian) Posidonienschiefer Formation of Germany exceptionally preserves an unusually large ammonite inside its gut.*

The ammonite was swallowed by the fish, likely by accident, and represents the first direct evidence for an actinopterygian fish consuming an ammonoid.

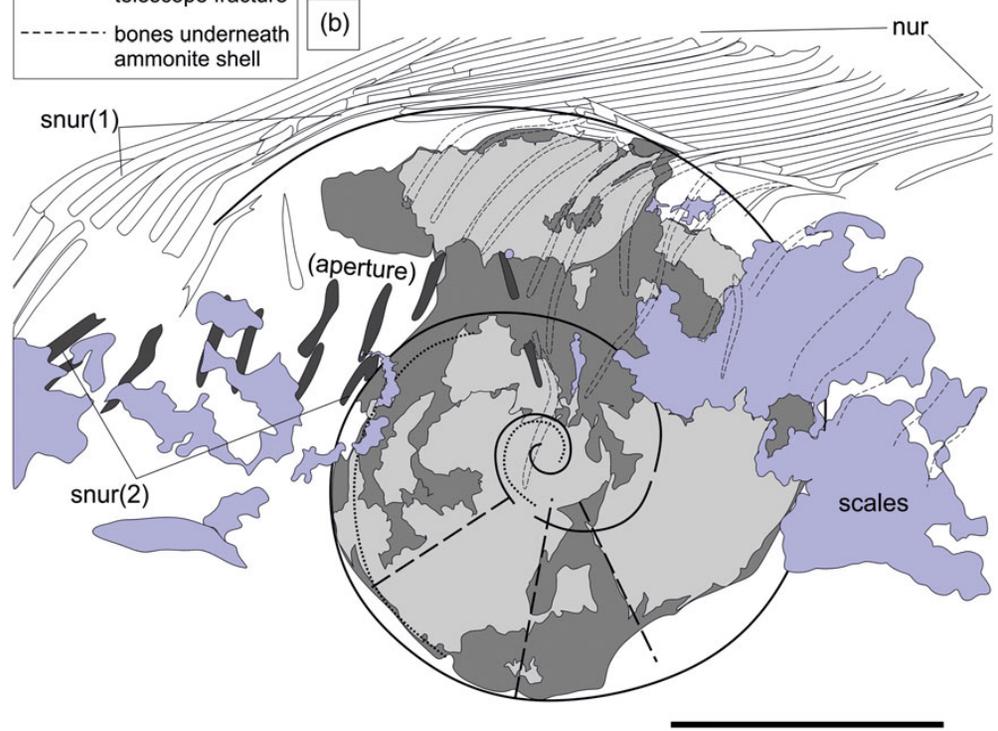
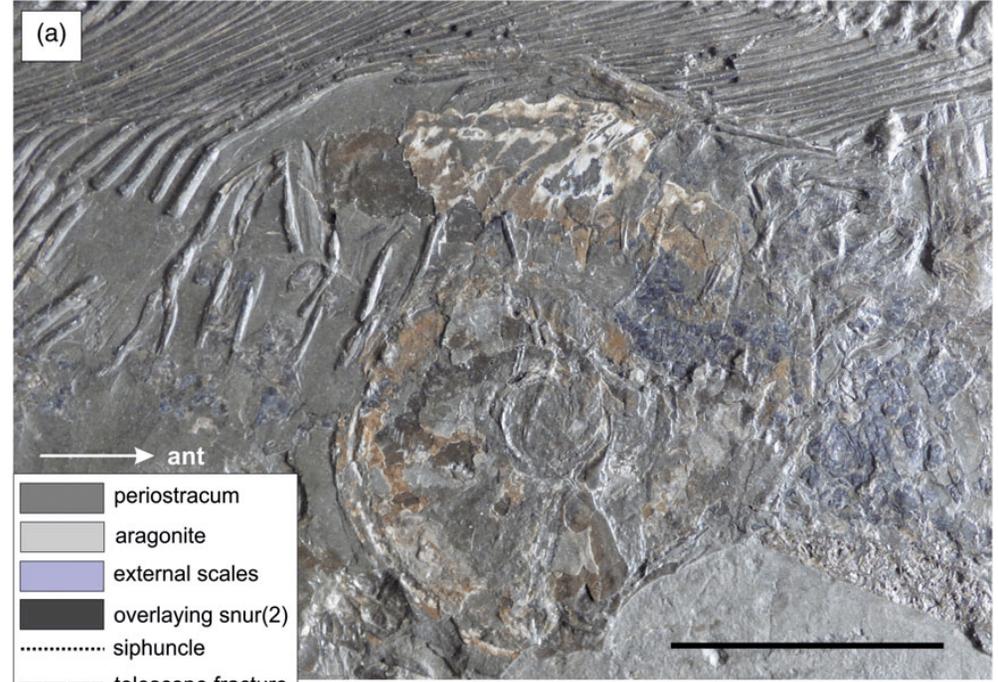
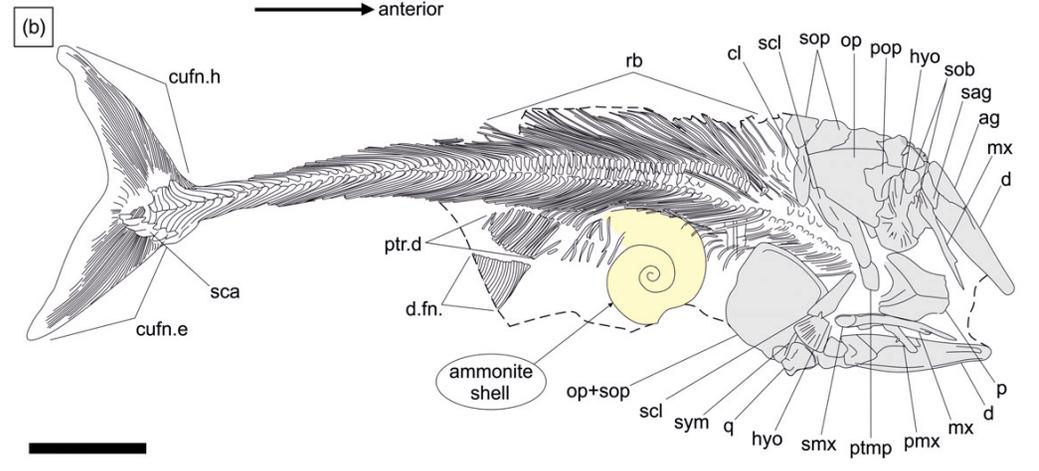
Exceptional aragonite preservation of the conch retaining partial nacreous lustre, combined with only minor acid etching of the shell, strongly indicates that the ammonite was ingested immediately prior to and was directly responsible for the fish's death. The fish's stomach provided a microenvironment protecting the aragonite from chemical dissolution.

SMNS 52472 represents the first direct evidence of an actinopterygian fish consuming an ammonite. The large size of the prey suggests that either

(1) the shell was attacked as result of mistaken identity or
 (2) the fish was feeding on the rotting ammonite creature when the shell was accidentally swallowed.

The ingestion of the ammonite was almost certainly fatal with SMNS 52472 representing the first documented case for a 'fatal last meal' in a pachycormid fish.

[Images are from this paper.]



Pohl, A., et al (2023) **Why the Early Paleozoic was intrinsically prone to marine extinction.** SCIENCE ADVANCES 9:doi.org/10.1126/sciadv.adg7679 (available as a free pdf)

[Continental drift had a major impact on extinctions. Supercontinents had fewer variations in climate and ecology, whereas dispersed continents, such as we have today, had more habitats where species could survive.]

Authors' abstract: *The geological record of marine animal biodiversity reflects the interplay between changing rates of speciation versus extinction. Compared to mass extinctions, background extinctions have received little attention.*

To disentangle the different contributions of global climate state, continental configuration, and atmospheric oxygen concentration (pO₂) to variations in background extinction rates, we drive an animal physiological model with the environmental outputs from an Earth system model across intervals spanning the past 541 million years.

We find that climate and continental configuration combined to make extinction susceptibility an order of magnitude higher during the Early Paleozoic than during the rest of the Phanerozoic, consistent with extinction rates derived from paleontological databases.

The high extinction susceptibility arises in the model from the limited geographical range of marine organisms. It stands even when assuming present-day pO₂, suggesting that increasing oxygenation through the Paleozoic is not necessary to explain why extinction rates apparently declined with time.

Xu, L., et al (2023) **A new avialan theropod from an emerging Jurassic terrestrial fauna.** NATURE 620:doi.org/10.1038/s41586-023-06513-7 (available as a free pdf)

Authors' abstract: *Birds are descended from non-avialan theropod dinosaurs of the Late Jurassic period, but the earliest phase of this evolutionary process remains unclear owing to the exceedingly sparse and spatio-temporally restricted fossil record.*

Information about the early-diverging species along the avialan line is crucial to understand the evolution of the characteristic bird bauplan, and to reconcile

phylogenetic controversies over the origin of birds. Here we describe one of the stratigraphically youngest and geographically southernmost Jurassic avialans, Fujianvenator prodigiosus gen. et sp. nov., from the Tithonian age of China.

This specimen exhibits an unusual set of morphological features that are shared with other stem avialans, troodontids and dromaeosaurids, showing the effects of evolutionary mosaicism in deep avialan phylogeny.

F. prodigiosus is distinct from all other Mesozoic avialan and non-avialan theropods in having a particularly elongated hindlimb, suggestive of a terrestrial or wading lifestyle, in contrast with other early avialans, which exhibit morphological adaptations to arboreal or aerial environments.

During our fieldwork in Zhenghe where F. prodigiosus was found, we discovered a diverse assemblage of vertebrates dominated by aquatic and semi-aquatic species, including teleosts, testudines and choristoderes.

Using in situ radioisotopic dating and stratigraphic surveys, we were able to date the fossil-containing horizons in this locality, which we name the Zhenghe Fauna, to 148 to 150 million years ago.



[Image shows a reconstruction of Fujianvenator prodigiosus.]

Authors' abstract: *Bees are the most significant pollinators of flowering plants. This partnership began ca. 120 million years ago, but the uncertainty of how and when bees spread across the planet has greatly obscured investigations of this key mutualism.*

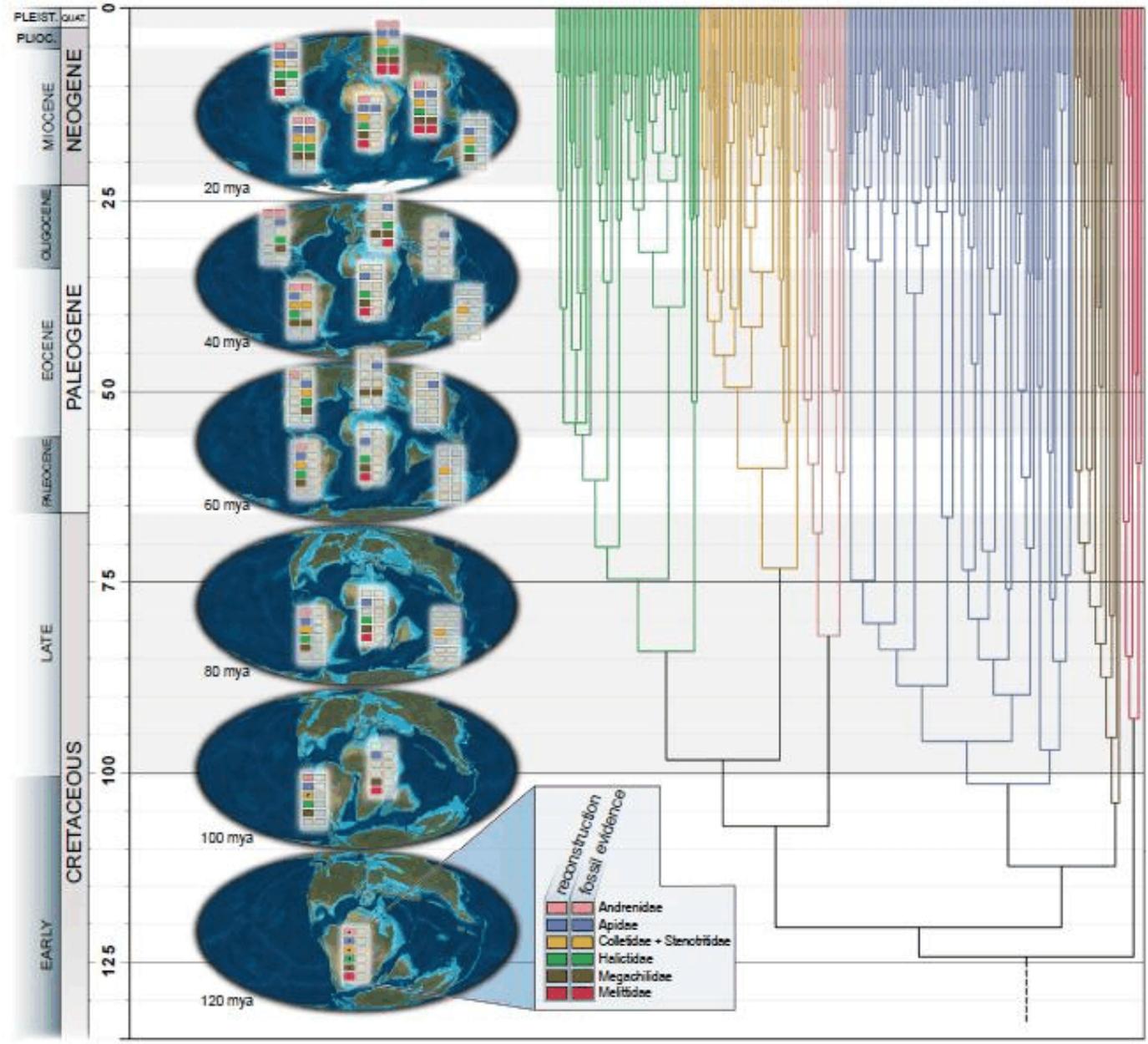
Bees likely originated in the Early Cretaceous, shortly before the breakup of Western Gondwana, and the early evolution of any major bee lineage is associated with either the South American or African land masses.

Subsequently, bees colonized northern continents via a complex history of vicariance and dispersal.

The notable early absences from large landmasses, particularly in Australia and India, have important implications for understanding the assembly of local floras and diverse modes of pollination.

How bees spread around the world from their hypothesized Southern Hemisphere origin parallels the histories of numerous flowering plant clades, providing an essential step to studying the evolution of angiosperm pollination syndromes in space and time.

[Chart is from this paper. It shows how bee families diversified as continental drift broke apart Gondwana (bottom of chart) and the new continents spread out (top map).]



Weil, S.S., et al (2023) **Body size and life history shape the historical biogeography of tetrapods.** NATURE ECOLOGY AND EVOLUTION 7:doi.org/10.1038/s41559-Article 9-023-02150-5 (available as a free pdf)

[A clade is a line of evolutionary descent.]

Authors' abstract: *Here we demonstrate that past biogeographic dispersal events often depended on species' traits, by analysing 7,009 tetrapod species in 56 clades. Biogeographic models incorporating body size or life history accrued more statistical support than trait-independent models in 91% of clades.*

In these clades, dispersal rates increased by 28 to 32% for lineages with traits favouring successful biogeographic dispersal. Differences between clades in the effect magnitude of life history on dispersal rates are linked to the strength and type of biogeographic barriers and intra-clade trait variability.

In many cases, large body sizes and fast life histories facilitate dispersal success. However, species with small bodies and/or slow life histories, or those with average traits, have an advantage in a minority of clades.

Body size-dispersal relationships were related to a clade's average body size and life history strategy. These results provide important new insight into how traits have shaped the historical biogeography of tetrapod lineages and may impact present-day and future biogeographic dispersal.

The rare occasions in species' evolutionary histories when populations successfully disperse across major geographic barriers, such as oceans, mountain ranges or deserts, can have major consequences for the distribution of life on Earth.

For example, long-distance dispersal from Africa to South America led to the evolution of over 90 species of New World monkeys, and a few chameleons rafting on vegetation from Africa to Madagascar is why today half of all living chameleon species are found in Madagascar.

However, we still know little about the determinants of these biogeographic dispersal events. While chance has a large role to play, species' traits could also influence outcomes of biogeographic dispersal events.

Species' traits are known to mediate active, short-distance dispersal in animals; however, traits are not necessarily related to biogeographic dispersal in the same manner as the mode of dispersal differs.

Short-distance dispersal is primarily determined by species' active movements, whereas in biogeographic dispersal (for example, in trans-oceanic dispersal) passive transportation plays a bigger role.

Several traits may be related to biogeographic dispersal success in animals, and body size and life history are likely to be crucial: body size determines relative energy requirements and hence resistance to stress, such as water and food shortage.

Indeed, recent findings show that large-bodied species have crossed biogeographic barriers more often than small ones in three reptile clades. Life history strategy, defined by the trade-offs between traits related to growth, reproduction and survival, can influence the likelihood of populations establishing in new locations.

Species with a fast life history strategy reproduce quickly, which makes founder populations more resistant to stochastic extinction. Species with a slow life history strategy, on the other hand, exhibit less demographic variability, which makes their populations more resistant to environmental stochasticity.

Zoology.

Bennison, A., et al (2023) **Handedness and individual roll-angle specialism when plunge diving in the northern gannet.** BIOLOGY LETTERS 19:doi.org/10.1098/rsbl.2023.0287 (available as a free pdf)

Authors' abstract: *Many vertebrates show lateralized behaviour, or handedness, where an individual preferentially uses one side of the body more than the other.*

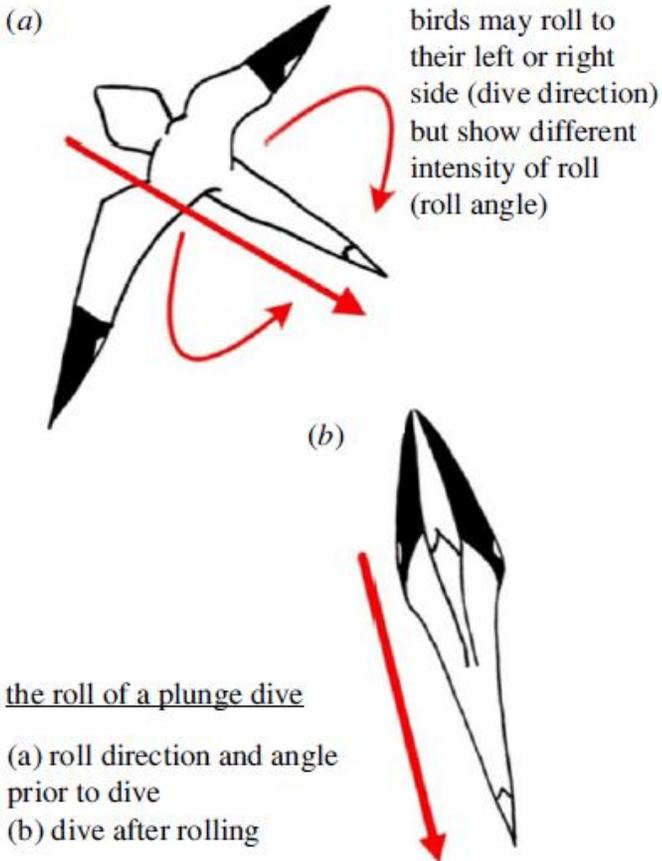
This is generally thought to be caused by brain lateralization and allows functional specializations such as sight, locomotion, and decision-making among other things.

We deployed accelerometers on 51 northern gannets, *Morus bassanus*, to test for behavioural lateralization during plunge dives. When plunge diving, gannets ‘roll’ to one side, and standard indices indicated that 51% of individuals were left-sided, 43% right-sided, and 6% ‘non-lateralized’.

Dive side lateralization was highly repeatable among individuals over time at the population level. Furthermore, roll angle was also highly repeatable in individuals even after controlling for lateralized state. Gannets show individual specializations in two different parts of the plunge diving process when attempting to catch prey.

This is the first demonstration of lateralization during prey capture in a foraging seabird. It is also one of the few demonstrations of behavioural lateralization in a mixed model approach, providing a structure for further exploring behavioural lateralization.

[Images are from this paper.]



Environmental Science.

Lynggaard, C., et al (2023) **Vertebrate environmental DNA from leaf swabs.** CURRENT BIOLOGY 33:R853-R854 (available as a free pdf)

Authors’ extracts: Here, we explore whether eDNA swabbed from terrestrial vegetation in a tropical biodiversity hotspot is a useful tool for vertebrate biomonitoring.

By swabbing leaves, we collected eDNA from 24 swabs at three locations in Kibale National Park, Uganda and used two metabarcoding systems to catalog the vertebrate taxa in the samples.

We detected 52 wild vertebrate genera, including 26 avian and 24 mammalian genera; 30 of these assignments could be refined to the species level.

The low tech and simple collection of leaf swab eDNA clearly makes it amenable to large citizen science initiatives.

Ultimately, it could easily be implemented in large-scale biomonitoring efforts targeting terrestrial vertebrates and serve as a strong tool for tracking changes in ecosystem composition and function as a result of anthropogenic activities to inform adaptive management strategies.

Speirs: Eventually, like other forms of eDNA tracking such as atmospheric eDNA, this method will be refined down to the levels of individuals, including humans. Someone walking through a forest or down a sidewalk will be tracked by their individual DNA. Such tracking will always be done for the greater good, he said ironically.

Conrad, C., et al (2023) **Anthropogenic uranium signatures in turtles, tortoises, and sea turtles from nuclear sites.** PNAS NEXUS 2:doi.org/10.1093/pnasnexus/pgad241 (available as a free pdf)

[Scutes are large scales or armour plate.]

Authors’ abstract: Chelonians (turtles, tortoises, and sea turtles) grow scute keratin in sequential layers over time. Once formed, scute keratin acts as an inert reservoir of environmental information.

For chelonians inhabiting areas with legacy or modern nuclear activities, their scute has the potential to act as a time-stamped record of radionuclide contamination in the environment.

Here, we measure bulk (i.e. homogenized scute) and sequential samples of chelonian scute from the Republic of the Marshall Islands and throughout the United States of America, including at the Barry M. Goldwater Air Force Range, southwestern Utah, the Savannah River Site, and the Oak Ridge Reservation.

We identify legacy uranium (^{235}U and ^{236}U) contamination in bulk and sequential chelonian scute that matches known nuclear histories at these locations during the 20th century. Our results confirm that chelonians bioaccumulate uranium radionuclides and do so sequentially over time.

This technique provides both a time series approach for reconstructing nuclear histories from significant past and present contexts throughout the world and the ability to use chelonians for long-term environmental monitoring programs (e.g. sea turtles at Enewetok and Bikini Atolls in the Republic of the Marshall Islands and in Japan near the Fukushima Daiichi reactors).

Pausas, J.G., and J.E. Keeley (2023) **Evolutionary fire ecology: An historical account and future directions.** BIOSCIENCE 73:doi.org/10.1093/biosci/biad059 (available as a free pdf)

Authors' abstract: Currently, there is plenty of evidence suggesting that we cannot understand the biodiversity of our planet without considering the key evolutionary role of fire.

First, fire has affected plant communities from the very origin of land plants, in the Silurian. Since then, fire regimes have been fluctuating as a consequence of changes in vegetation, climate, herbivores, and atmospheric oxygen concentration.

Therefore, fire is among the earliest disturbance processes in plant communities and among the earliest potential evolutionary pressures in land plants.

Second, fires were recurrent and predictable enough to select fire adaptive traits and contributed to the diversification of lineages, at least since the

Cretaceous but probably earlier. Therefore, fire has contributed to the evolution of many plant traits since early plant evolution.

Third, fire likely contributed to the spread and evolution of large lineages such as early angiosperms and C_4 grasses, and it is therefore responsible for the rise of species-rich savannas.

Fourth, fire ecology provides examples of how different regimes select for radically different adaptations across species. For instance, recurrent fires with low or with high intensity selects contrasting traits in plants (e.g., thick bark versus serotinous cones in pines).

Similarly, different fire frequencies also select quite different traits: high frequency (resprouting) and moderate fire frequency (post-fire seeding and the loss of resprouting). At the landscape scale, different fire regimes generate different evolutionary frameworks for a given environmental conditions (e.g., savannas versus forests).

Finally, fire ecology provides evidence that different selective regimes generate trait divergences among populations and therefore the evolution of fire related traits. Fire, by opening vegetation gaps, provides opportunities for the evolution of many light-demanding shade-intolerant species.

Speirs: The Canadian wildfires are not the result of climate change but a century of Smokey the Bear fire suppression. As a result, the original patchwork habitat of deciduous forests, grasslands, and new coniferous growth was replaced with thousands of square kilometres of old-growth spruce forests. But that will never be mentioned in the mass media.

Haque, F., and C. Fan (2023) **Fate of microplastics under the influence of climate change.** iSCIENCE 26:doi.org/10.1016/j.isci.2023.107649 (available as a free pdf)

Authors' abstract: This manuscript discusses the destiny of environmental microplastics and characterizes their fate considering the framework of the planetary boundary.

The major routes for microplastic discharge include the release of microplastic stored in the ice into the sea when the ice melts as a result of global

temperature increase, flushing of the plastic/microplastic debris from the shorelines into the adjacent water bodies as a result of increased rainfall, redistribution of the microplastics away from the source of plastic debris as a result of increased wind, and accumulation of microplastics in the soil as a result of drought.

Human Prehistory.

Charvet, C.J., et al (2023) **Transcription, structure, and organoids translate time across the lifespan of humans and great apes.** PNAS NEXUS 2:doi.org/10.1093/pnasnexus/pgad230 (available as a free pdf)

Authors' abstract: How the neural structures supporting human cognition developed and arose in evolution is an enduring question of interest. Yet, we still lack appropriate procedures to align ages across primates, and this lacuna has hindered progress in understanding the evolution of biological programs.

We generated a dataset of unprecedented size consisting of 573 time points from abrupt and gradual changes in behavior, anatomy, and transcription across human and 8 nonhuman primate species. We included time points from diverse human populations to capture within-species variation in the generation of cross-species age alignments.

We also extracted corresponding ages from organoids. The identification of corresponding ages across the lifespan of 8 primate species, including apes (e.g., orangutans, gorillas) and monkeys (i.e., marmosets, macaques), reveals that some biological pathways are extended in humans compared with some nonhuman primates.

Notably, the human lifespan is unusually extended relative to studied nonhuman primates demonstrating that very old age is a phase of life in humans that does not map to other studied primate species.

More generally, our work prompts a reevaluation in the choice of a model system to understand aging given very old age in humans is a period of life without a clear counterpart in great apes.

Muller, A., et al (2023) **The limestone spheroids of 'Ubeidiya: intentional imposition of symmetric geometry by early hominins?** ROYAL SOCIETY OPEN SCIENCE 10:doi.org/10.1098/rsos.230671 (available as a free pdf)

Authors' abstract: Spheroids are one of the least understood lithic items yet are one of the most enduring, spanning from the Oldowan to the Middle Palaeolithic. Why and how they were made remains highly debated.

We seek to address whether spheroids represent unintentional by-products of percussive tasks or if they were intentionally knapped tools with specific manufacturing goals.

We apply novel three-dimensional analysis methods, including spherical harmonics and surface curvature, to 150 limestone spheroids from 'Ubeidiya (ca 1.4 Ma), presently the earliest Acheulean occurrence outside of Africa, to bring a new perspective to these enigmatic artefacts.

We reconstruct the spheroid reduction sequence based on trends in their scar facets and geometry, finding that the spheroid makers at 'Ubeidiya followed a premeditated reduction strategy.

During their manufacture, the spheroids do not become smoother, but they become markedly more spherical. They approach an ideal sphere, a feat that likely required skilful knapping and a preconceived goal.

Acheulean bifaces are currently thought to represent the earliest evidence of hominins imposing a premeditated, symmetrical shape on stone.

The intentional production of sphere-like objects at 'Ubeidiya similarly shows evidence of Acheulean hominins desiring and achieving intentional geometry and symmetry in stone.

'Ubeidiya is situated in the Dead Sea Rift Valley, at the northern margin of the Red Sea-East African Rift System. Dated to ca 1.4 megayears ago, the site presently constitutes the oldest evidence of the Acheulean outside of Africa. Its geographical position in the southern Levant makes it a key site for exploring the first Acheulean hominin forays out of Africa.

Hu, W., et al (2023) **Genomic inference of a severe human bottleneck during the Early to Middle Pleistocene transition.** SCIENCE 381:doi.org/10.1126/science.abq7487

Authors' abstract: *Population size history is essential for studying human evolution. However, ancient population size history during the Pleistocene is notoriously difficult to unravel.*

In this study, we developed a fast infinitesimal time coalescent process (FitCoal) to circumvent this difficulty and calculated the composite likelihood for present-day human genomic sequences of 3154 individuals.

Results showed that human ancestors went through a severe population bottleneck with about 1,280 breeding individuals between around 930,000 and 813,000 years ago. The bottleneck lasted for about 117,000 years and brought human ancestors close to extinction.

This bottleneck is congruent with a substantial chronological gap in the available African and Eurasian fossil record. Our results provide new insights into our ancestry and suggest a coincident speciation event.

Hallast, P., et al (2023) **Assembly of 43 human Y chromosomes reveals extensive complexity and variation.** NATURE 620:doi.org/10.1038/s41586-023-06425-6 (available as a free pdf)

Authors' abstract: *The prevalence of highly repetitive sequences within the human Y chromosome has prevented its complete assembly to date and led to its systematic omission from genomic analyses.*

Here we present de novo assemblies of 43 Y chromosomes spanning 182,900 years of human evolution and report considerable diversity in size and structure. Half of the male-specific euchromatic region is subject to large inversions with a greater than twofold higher recurrence rate compared with all other chromosomes.

Ampliconic sequences associated with these inversions show differing mutation rates that are sequence context dependent, and some ampliconic genes exhibit evidence for concerted evolution with the acquisition and purging of lineage-specific pseudogenes.

The largest heterochromatic region in the human genome, Yq12, is composed of alternating repeat arrays that show extensive variation in the number, size and distribution, but retain a 1:1 copy-number ratio.

Finally, our data suggest that the boundary between the recombining pseudoautosomal region 1 and the non-recombining portions of the X and Y chromosomes lies 500 kb away from the currently established boundary.

The availability of fully sequence-resolved Y chromosomes from multiple individuals provides a unique opportunity for identifying new associations of traits with specific Y-chromosomal variants and garnering insights into the evolution and function of complex regions of the human genome.

The mammalian sex chromosomes evolved from a pair of autosomes, gradually losing their ability to recombine with each other over increasing lengths of the chromosomes, leading to degradation and accumulation of large proportions of repetitive sequences on the Y chromosome.

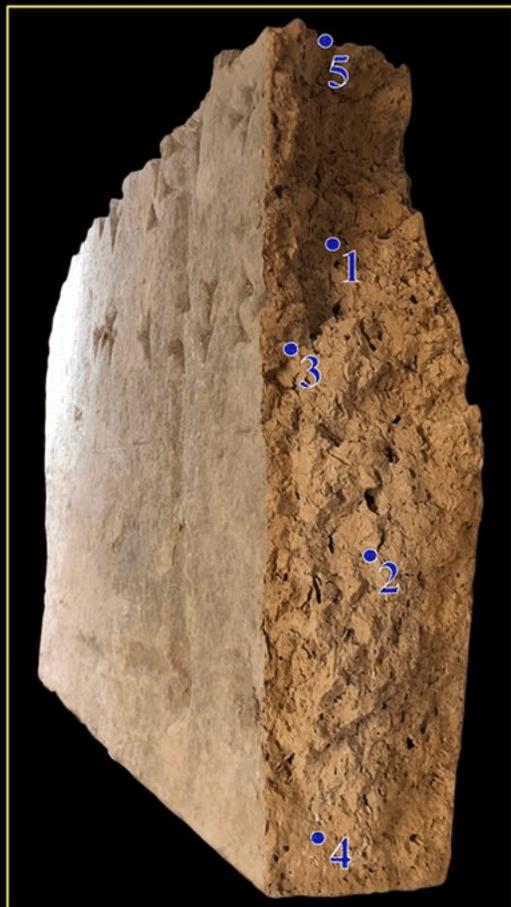
Arbell, T.P., et al (2023) **Revealing the secrets of a 2900-year-old clay brick, discovering a time capsule of ancient DNA.** SCIENTIFIC REPORTS 13:doi.org/10.1038/s41598-023-38191-w (available as a free pdf)

[In 2020, while handling a 2,900-year-old brick, archaeologists accidentally cracked it. Making the best of the situation, they analyzed the inside of the crack for ancient DNA.]

Authors' abstract: *The recent development of techniques to sequence ancient DNA has provided valuable insights into the civilisations that came before us. However, the full potential of these methods has yet to be realised.*

We extracted ancient DNA from a recently exposed fracture surface of a clay brick deriving from the palace of king Ashurnasirpal II (883-859 BCE) in Nimrud, Iraq.

We detected 34 unique taxonomic groups of plants. With this research we have made the pioneering discovery that ancient DNA, effectively protected from contamination inside a mass of clay, can successfully be extracted from a 2900-year-old clay brick.



In 1958, the National Museum received a group of objects from Nimrud, including the brick in question, in acknowledgement of the support. At the time when it entered the collection at the National Museum of Denmark, it had already broken into two pieces horizontally.

Due to their state, mudbricks are seemingly solid, yet delicate in nature. During an otherwise controlled handling in 2020, the lower half of the brick unfortunately split vertically into two pieces.

This event presented an opportunity for a scientific study of uncontaminated clay that could be dated with relative certainty. It was from this new uncontaminated break that the samples for this study were extracted.

[Images are from this paper. The top half shows the whole brick, and the lower half shows the sampling points on the vertical accidental fracture. The horizontal break was pre-existing.]

Modern Humans.

Zhang, L., et al (2023) **The fragility of artists' reputations from 1795 to 2020.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 120:doi.org/10.1073/pnas.2302269120

Authors' abstract: This study uses machine-learning techniques and a historical corpus to examine the evolution of artists' reputations over time. Contrary to popular wisdom, we find that most artists' reputations peak just before their death, and then start to decline.

This decline is strongest for artists who were most popular during their lifetime. We show that artists' reduced visibility and changes in the public's aesthetic taste explain much of the posthumous reputation decline.

We construct a massive historical corpus spanning 1795 to 2020 and build separate word-embedding models for each five-year period to examine how the reputations of over 3,300 famous artists, including painters, architects, composers, musicians, and writers, evolve after their death.

We find that most artists gain their highest reputation right before their death, after which it declines, losing nearly one standard deviation every century. This

posthumous decline applies to artists in all domains, includes those who died young or unexpectedly, and contradicts the popular view that artists' reputations endure.

Two mechanisms, artists' reduced visibility and the public's changing taste, are associated with much of the posthumous reputational decline. This study underscores the fragility of human reputation and shows how the collective memory of artists unfolds over time.

Min, J., et al (2023) **The association between coffee consumption and risk of incident depression and anxiety: Exploring the benefits of moderate intake.** PSYCHIATRY RESEARCH 326:doi.org/10.1016/j.psychres.2023.115307 (available as a free pdf)

Authors' abstract: *Accumulating evidence has reported the associations of coffee consumption with physical conditions and mortality, but the associations with mental disorders were limited.*

The objective of this study was to examine the associations of coffee consumption with incident depression and anxiety, and to assess whether the associations differed by coffee subtypes (instant, ground, and decaffeinated coffee) or additives (milk, sugar-sweetened, and artificial-sweetened).

In this prospective cohort study, we utilized data from the UK Biobank and included a total of 146,566 participants who completed the touchscreen questionnaire at baseline between 2006 and 2010.

During the follow-up, incident depression and anxiety were measured in 2016 using the Patient Health Questionnaire (PHQ)-9 and the Generalised Anxiety Disorder Assessment (GAD)-7, respectively.

Multivariable-adjusted logistic regression models and restricted cubic splines were used to assess the associations. Approximately 80.7% of participants reported consuming coffee, and most drank 2 to 3 cups per day (41.2%).

We found J-shaped associations between coffee consumption and both incident depression and anxiety, with the lowest risk of the mental disorders occurring at around 2 to 3 cups per day.

Results were similar for participants who drank 2 to 3 cups of ground coffee, milk-coffee, or unsweetened coffee. Our findings highlight that 2 to 3 cups of coffee consumption could be recommended as part of a healthy lifestyle to improve mental health.

Technology.

Ibrahim, H., et al (2023) **YouTube's recommendation algorithm is left-leaning in the United States.** PNAS NEXUS 2:doi.org/10.1093/pnasnexus/pgad264 (available as a free pdf)

Authors' abstract: *With over two billion monthly active users, YouTube currently shapes the landscape of online political video consumption, with 25% of adults in the United States regularly consuming political content via the platform.*

Considering that nearly three-quarters of the videos watched on YouTube are delivered via its recommendation algorithm, the propensity of this algorithm to create echo chambers and deliver extremist content has been an active area of research.

However, it is unclear whether the algorithm may exhibit political leanings toward either the Left or Right. To fill this gap, we constructed archetypal users across six personas in the US political context, ranging from Far Left to Far Right.

Utilizing these users, we performed a controlled experiment in which they consumed over eight months worth of videos and were recommended over 120,000 unique videos.

We find that while the algorithm pulls users away from political extremes, this pull is asymmetric, with users being pulled away from Far Right content stronger than from Far Left.

Furthermore, we show that the recommendations made by the algorithm skew left even when the user does not have a watch history. Our results raise questions on whether the recommendation algorithms of social media platforms in general, and YouTube, in particular, should exhibit political biases, and the wide-reaching societal and political implications that such biases could entail.

Hu, J., et al (2023) **Potential auto-driving threat: Universal rain removal attack.** iSCIENCE 26:doi.org/10.1016/j.isci.2023.107393 (available as a free pdf)

Authors' abstract: *Severe weather conditions pose a significant challenge for computer vision algorithms in autonomous driving applications, particularly regarding robustness.*

Image rain-removal algorithms have emerged as a potential solution by leveraging the power of neural networks to restore rain-free backgrounds in images.

However, existing research overlooks the vulnerability concerns in neural networks, which exposes a potential threat to the intelligent perception of autonomous vehicles in rainy conditions.

This paper proposes a universal rain-removal attack (URA) that exploits the vulnerability of image rain-removal algorithms. By generating a non-additive spatial perturbation, URA significantly diminishes scene restoration similarity and image quality.

The imperceptible and generic perturbation employed by URA makes it a crucial tool for vulnerability detection in image rain-removal algorithms and a potential real-world AI attack method.

Experimental results demonstrate that URA can reduce scene repair capability by 39.5% and image generation quality by 26.4%, effectively targeting state-of-the-art rain-removal algorithms.

[Images are from this paper.]

