
OPUNTIA 585

Halloween 2024

Opuntia is published by Dale Speirs, Calgary, Alberta. It is posted on www.efanzines.com and www.fanac.org. There is also an cumulative subject index to all issues available at those sites. 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.

NO LEAF PEEPING IN COWTOWN

2024-10-17

photos by Dale Speirs

Alberta is not a leaf peeping province. Most if not all of our deciduous trees turn various shades of yellow, with no red, orange, or purple vistas. Nothing like the spectacular views of the New England states or the Maritime provinces.

The cover photo was taken from the north bank of Glenmore Reservoir, not far from Chez Opuntia. The view looks due south to the best of Calgary foliage. Other photos here are from the north bank. At right is a larch. That's about the gamut for Cowtown leaf peeping.

I received a large envelope from a friend in Connecticut who mailed the piece with these stamps.

HALLOWEEN FOOD
photos by Dale Speirs

I didn't eat any of these but took smartphone photos in the supermarket.

BAD NEWS AT THE LIBRARY
by Dale Speirs

Not a complete surprise, but the Calgary Public Library was hit by a ransomware attack. The CPL shut down completely until October 16 when it re-opened but with no computer facilities of any kind. Books that would be overdue had their loan period extended. Fortunately paper books can't be hacked, so patrons could come in and read. No checkouts and no use of databases.

HALLOWEEN FICTION: PART 7
by Dale Speirs

[Parts 1 to 6 appeared in OPUNTIAs #427, 458, 486, 511, 536, and 559.]

Cozy Halloween Festivals.

MURDER AT THE PUMPKIN PAGEANT (2023) by Darci Hannah was the fourth novel in a food cozy series about Lindsey Bakewell of Beacon Harbor, Michigan. Living up to her surname, she operated a bakery. Nothing to do with her surname but she also solved murders in the best Marpleian manner.

Lindsey lived in a converted lighthouse with her Newfoundland dog Wellington and a goat Clara (in a converted boathouse; one does not keep goats in a house). She was having trouble with high school teenagers trying to break in and see what they thought was a resident ghost.

As the reader will surmise from the book title, Halloween was nigh. Lindsey's friend, a woman named Kennedy Kapoor, was an Internet influencer who arranged for The Ghost Guys to podcast live from the lighthouse on Halloween night.

Pause for digression. Cozy authors tend to be behind the times. By now most have acknowledged the existence of smartphones. In cozies, such devices generally go dead because Miss Marple didn't plug it into a recharger at her bedside table like everyone else. Alternatively she texted emergency messages to people who only turned on their phones once a day.

Darci Hannah mentioned Tik Tok and social media influencers, which puts her far ahead of most other cozy authors. Grannies and grandpas use email and texting today as much as their grandchildren. Too many Miss Marples are still at the flip phone stage, if that.

The bakery café was busy churning out apple cider doughnuts, baking pumpkin everything, delivering off-site catering, and hosting pumpkin carving by a busload of high school students. The kids were barely under the control of schoolteacher Leslie Adams.

The recipes were integrated as text into the novel. Lindsey described how she prepared an item not in point form as per standard recipes but descriptive

paragraphs in between events. This will make the reader hungry. Food cozies should never be read on an empty stomach.

A novelist Jordy Tripp was introduced as an annoyance to Lindsey and a setup for future trouble. Meanwhile, the big day arrived. The bakery staff were in costumes, as were many of the customers. The pumpkin pies flew off the shelf and for the adventurous there was pumpkin-flavoured coffee.

In the village, the Halloween Bash closed off a street for vendor booths and the Pumpkin Pageant costume parade. The Ghost Guys from the Travel Channel were at the Bash, getting second-unit footage before going to the lighthouse and livestreaming from there.

The ghost hunters used the standard clichés, such as green night vision goggles to make everything seem spookier. Every draft of cold air was declared to be the movement of a ghost. They used electronic detectors to check for ghostly magnetic fields. Since all the cameras and smartphones they were carrying generated stray currents, that gave them more proof that ghosts were there.

Kennedy followed with her own camera to get video for her blog. The show from the lighthouse was more spectacular than intended.

However the grand finale of Halloween night was completely unexpected. Somebody flipped on the interior lights. The sudden overload of the night vision goggles panicked the Ghost Guys and Kennedy, sending them screaming outside.

There was a big oak tree outside the door. As they fled, Kennedy ran straight into a body dangling from a branch. A real corpse, that of Leslie Adams, dressed in a clown costume.

Kennedy was wearing a GoPro camera on her head and the livestreaming caught everything. The village was in an instant uproar because so many folk were watching at home. The Deppity Dawgs didn't have to be called because they had been watching the show. Half the villagers likewise, who turned out to see an actual crime scene.

The next morning Lindsey relieved her stress by grilling apple pancakes. The detailed account of how she prepared the food padded out the text for a full page.

Kennedy, used to thinking of herself as the centre of the known universe, declared she was traumatized. She was annoyed that no one else cared, although her podcast going viral ameliorated her trauma somewhat.

Lindsey, Kennedy, most of the villagers, and the police all began investigating. Leslie hadn't been hanged but was murdered elsewhere and her body brought to the tree.

Police discovered her house had been tossed by unknown intruders. Leslie's dog Trixie was missing, so the search began for it. Leslie's husband Doug, a real estate developer, had died six months previously, which might be relevant.

As the village Miss Marples gathered and made plans, Jordy Tripp suddenly reappeared. He showed up at the halfway mark of the novel after vanishing from the opening pages. A tangled web began to be woven.

Tripp explained to Lindsey that he was researching a shipwreck that may have been caused by dereliction of the first lighthouse keeper. Following behind him was more intermittent characters, Grant Fairfield, who was an underwater archaeologist, and Leslie's daughter Cali, Fairfield's student.

Later the Marplers and Ghost Guys sat down in the lighthouse for a hearty meal of roast chicken. As they ate, they discussed the murder. One of the Ghost Guys had researched the place before coming.

The first lighthouse keeper Willy Riggs had been murdered on the job. The second keeper Arthur Adams was the ancestor of Doug. After working the lighthouse for several years, Arthur suddenly quit and bought massive amounts of local land.

He couldn't have paid for the land on a keeper's salary. There might be treasure still about the place. Doug had eventually inherited, and Leslie might have been eliminated to divert an inheritance.

The next morning Trixie showed up at the oak tree, apparently having followed her deceased owner's scent. The poodle was cold, wet, and hungry but Kennedy took over to provide care. That was one problem solved.

The bakery café did tremendous business as the residents came to gossip about both the murder and the rescue of Trixie. The gossipmongers mentioned Tripp had been seen about town with Leslie before she died.

Speculation ran amok. Did the original lighthouse keeper Adams see a shipwreck and not report it? Was there treasure still out there? Leslie and Doug Adams were experienced scuba divers. Did they find treasure?

The alarums continued. An intruder broke into the lighthouse and attacked Lindsey. Another character, high school teacher Mark Whitcomb, showed up and snooped about.

If there's one thing a Miss Marple hates, it is another amateur sleuth crowding in on her territory. Lindsey and Kennedy were indignant about him.

At the three-quarter mark of the novel, the toxicology report finally came back from the laboratory. The long delay was realistic, more so than television shows where lab tests come back in hours.

Leslie Adams was dead before being hanged from the tree. She had eaten poisonous Amanita mushrooms during her last meal. Disconcerting to learn was that a group of teenagers had been picking wild mushrooms and selling them to local restaurants. My thought was why any restauranteur would buy wild mushrooms from anyone.

Tripp came by the lighthouse and filled in the background about Adams and his descendants. There was a treasure map, location unknown, that would lead to gold. Guess where the map was thought to have been hidden.

Once the plot was sufficiently tangled, the novel rushed to a conclusion. Tripp fed poisonous mushrooms to more people, took Lindsey and Kennedy out on a small boat to dump them, and then went off to search for the treasure. The police got him the next morning.

The recipes appendix was predictable, starting off with Pumpkin-Spiced Latte, then Pumpkin Martinis. Following on were Pumpkin Scones, Pumpkin Chocolate-Chip Muffins, Savory Roast Chicken (with vegetables but no pumpkin), Apple Stuffing, Pumpkin Cheescake, and Frosted Pumpkin Sugar Cookies. No mushrooms anywhere.

Halloween Goes To The Dogs.

CATCH ME IF YOU CANDY (2023) by Ellie Alexander (pseudonym of Katherine Dyer-Seeley) was the 17th novel in a food cozy series about Juliet Montague 'Jules' Capshaw of Ashland, Oregon. She worked in her family's bakery Torte and by now was an experienced Miss Marple.

The village based its economy on tourism, mainly the summer-long Shakespeare festival. Halloween was big though, with everyone in costume, a parade, and assorted events which generally involved pumpkins. The bunting was up everywhere. On the evening of the day, the village held a costume parade. A big crowd, not only locals but tourists.

The bakery was counting on its Trick Or Torte bags, which contained sugar cookie cut-outs (ghosts and spiders), spiced cider mix, eyeball cake pops, and mummy munch (trail mix with black and orange candy).

One man in a dragon costume was found dead, slumped against the Torte bakery. A standard cliché in cozies, where anyone mortally wounded instinctively staggers to Miss Marple's store or house to die.

Jules got all shaky and weak, which was difficult to believe since she had seen so many bodies in the previous sixteen novels. One would think that instead she would be groaning "Not again!". As soon as the deceased was loaded into the ambulance, Jules recovered enough to go to a restaurant.

Anton Dudley, a dog trainer, was the defunct. He had been an outlander, so Ashland's death toll would not be affected. He was also a dog art collector who had big-money pieces in his collection.

In town were a film crew and a pack of dog wranglers, all fussing and feuding. The crew, the wranglers, the dogs, and all the amateur sleuths provided a potpourii of feuds and bad behaviour.

There might be connections to the Shakespeare festival. Although the season was over, the theatre was gearing up for next year, auditioning actors and production staff. Suspicion was thrown around like confetti.

All told, Halloween was quite the night to remember. To stretch out the festivities and make a little more money, the townfolk also celebrated el Día de

los Muertos over the following two days. Mexicans were thin on the ground in Ashland but any excuse for a party would do.

As Jules prepared sugar horns and Day of the Dead cakes, various friends and family wandered in and out of the bakery. This gave everyone a chance to hash out assorted bits of rumour, innuendos, and outright slander as to who the killer might be.

Jules went out and about digging up ugly stories. The dog lovers were a particularly nasty bunch. She still had a bakery to earn her living by, so she adjourned back to the kitchen at intervals.

The food recipes were integrated into the text, such as a full page describing how she prepared creamy chicken soup, with grilled sandwiches on the side. Then another page for cookie bars made from leftover Halloween candy. They were heavily blended with butter, white sugar, and brown sugar. Guaranteed to cripple any diabetic who only touched them.

The list of suspects continued to grow. Paranoia flooded the village. A mahjong set became the MacGuffin. Jules was swamped by a plethora of suspicious villagers, basically anyone she met.

The woman who last had the mahjong set was beaten by an intruder apparently looking for the set in her house. It had been stolen from her at a Halloween party she hosted the night before. Worse yet, someone stole one of the prize dogs the next day.

Jules was shaking all over so she did what most of us do, stress eat. She went to the bakery and began preparing pumpkin bread, details provided at length. A text message pulled her away before she could scarf down the bread.

The dog had been recovered but too many weird events were implicating too many suspects. A messy tangle for even the most astute Miss Marple. The murderer proved to be a woman who had only been mentioned occasionally but had wanted the victim's dog art collection enough to kill.

Jules recovered her sanity by baking some more, this time cardamom buns. And yes, two pages of detailed instructions integrated into the epilogue. Wrapping up the loose threads took a couple of chapters.

But finally the recipes appendix, beginning with Pumpkin Cupcakes. Next were Chicken And Stars Soup, Devil's Food Cupcakes, Halloween Cookie Bars (the ones made with leftover candy), Humble Omelet (what Albertans call Western Omelet), Trick-Or-Torte Latte (made with raspberry and blackberry juice), and Apple Decadence Cake.

Cozy Anthologies.

HALLOWEEN CUPCAKE MURDER (2023) was an anthology of three cozy novellas edited by Carlene O'Connor (pseudonym of Mary Carter). Each of these novellas were part of a series of food cozy novels.

The lead story was O'Connor's, also named "Halloween Cupcake Murder". The Miss Marple of that story was Tara Meehan of Galway, Ireland. She operated a salvage shop, what Canadians would call a secondhand store.

Halloween was coming up on the next Sunday, which meant the celebrations and merchant sales would go the entire weekend. Looking for Halloween decorations, Tara bought a small painting of what was said to be the first Samhain Festival.

She hoped to flip it in her store for a profit. The shopkeeper Val Sharkey, who sold it to her, did not long survive the transaction. He was murdered by someone who stuffed an orange cupcake into his mouth.

Not long after, someone broke into Tara's shop and left a Halloween cupcake for her. Suspecting it was poisoned, she dissected it with a knife and found there was a key baked inside.

Tara became embroiled with a secret society called the Samhain Six. They were more like a renaissance fan group with neo-paganistic pretensions. She had the painting appraised and learned it was a modern fake. Val had cheated her but conversely his solicitor told her he left his entire estate to her.

And so to the big night and the Halloween Mystery Tour. The shop was arrayed in Halloweenish displays for customers. Tara invited the Six to attend as they seemed harmless. Assorted alarums and excursions ensued.

Val had won some rare coins in a big-stakes poker game. The son of the loser was determined to get them back by any means. He infiltrated the Six under a

false identity to get at Tara, using the painting as a smokescreen. Didn't work and that was all there was.

"Mrs Claus And The Candy Corn Caper" by Liz Ireland (pseudonym of Elizabeth Bass) was about a Halloween celebration in Christmastown. A haunted ice castle was constructed and there was a bake-off.

Nick was grumpy about Halloween but everyone else was excited, including April, his second wife. She was from Oregon and loved a man in red and white uniform. She introduced the holiday to Santaland after marrying him.

Alas, events went awry. Someone had hijacked the major supply of candy corn from a warehouse. All the elves were abuzz. Meanwhile, a new bakery opened directly across the street from the old one.

Silver Bell had operated her bakery for years but her best baker Chestnut and an elf employee Wink Jollyflake went into business for themselves. Wink didn't survive past Chapter 2.

The deceased had stayed late to design and prepare a test cupcake for the bake-off. The cupcake had been partly eaten, so some suspected poison. Wink had a bump on his head which might have been from hitting the table edge as he fell.

April Claus went Marpleing in Santaland, dredging up family troubles and building up a list of suspects. Crinkles, the chief constable of Christmastown, was useless for anything more than illegally-parked reindeer. The blood tests showed no toxins but the attending physician was certain the death was murder.

More alarums followed and suspicion was scattered about like powdered sugar in a bakery. The murderer was a woman scorned, who then tried to eliminate April at the Halloween festival. Much ado and several struggles to the death but the fact remained that April was booked for the series.

"A Triple Layer Halloween Murder" by Carol J. Perry was the third novella. Perry was born in Salem, Massachusetts, on Halloween. This gives her the best credentials of any author for writing about that day.

The story at hand was part of a series about Lee Barrett of WICH-TV in Salem. Salem celebrated Halloween the entire month of October like a New England version of Mardi Gras. Pat Duncan, prominent businessman and owner of the Pretty Party Bakery, had gone missing. He was known to be a heavy gambler with debts everywhere.

Meanwhile Lee had been stuck with the bane of news reporters, the cute animal story. In this case the critter was a cat up a tree. The Fire Dept declined to rescue the cat, so Lee and her cameraman Old Jim did the job. The cat was recognized as Cupcake, Duncan's pet. Suddenly the story was serious.

Since Lee was a news reporter her sleuthing wasn't Marpleing per se but professional. Her boyfriend Pete Mondelo was a police detective, which gave her an inside advantage for the case.

As the Halloween parties got underway, Duncan's body was found in a cabin in the woods. Simultaneously his wife Dolores went around town paying off his debts with $100 banknotes. She said the cash was an inheritance but no one believed her.

The truth came out. For once Pat had actually been a winner. $10 million on a lottery ticket. He didn't want publicity so he arranged a split between himself, Dolores, and a friend, the latter to hide the win under his name. He got greedy and the predictable events followed

WHEN WORDS COLLIDE 2025

Calgary's annual readercon When Words Collide has a membership limit of 1,000 plus volunteers and guests. The event always sells out a few months before. Reports of previous WWC conventions appeared in OPUNTIAs #71, 253, 266, 282, 318, 350, 387, 421, 452, 481, 507, 532, 555, and 580.

The 2025 WWC will be held August 15 to 17 at a new location, the Sheraton Cavalier Hotel, 2620 - 32 Avenue NE. The Alexandra Writers Centre in Calgary are the organizers. They did a good job in 2024 and will no doubt do so again in 2025. Details from www.whenwordscollide.org

Numerous authors, editors, and publishers will be in attendance. The dealer bourse is restricted to books. The average customer buys in tote bags full.

WEIRD FICTION: PART 11
by Dale Speirs

[Parts 1 to 10 appeared in OPUNTIAs #412, 458, 484, 493, 501, 511, 536, 542, 559, and 577.]

Ghoul Hunters.

Victoria Laurie wrote a series about ghost hunters, not quite cozies but more humourous than standard ghost stories. The narrator was M.J. Holliday, who had two partners, Gilley Gillespie and Dr Steven Sable.

The latter financed the operation as a hobby. He was also canoodling with M.J. as more than a hobby. She called him Dr Delicious. He was handsome and rich. What else is there?

THE GHOUL NEXT DOOR (2014) returned the company from its tour of British ghosts to the USA, where they took a breather in Boston. No rest for the wicked, as M.J. Holliday was asked to help a friend of a friend named Luke. He was apparently possessed by a poltergeist.

M.J. and her crew set up cameras to watch Luke while he slept. One night he got out of bed, walked out, and later returned covered in blood. A young woman had been murdered that night, so the sleuthing began.

Assaults by psychotics were among the alarums. The death toll rose. Lots of shouting and snooping about houses both old and new. There's never a dull moment in Boston.

NO GHOULS ALLOWED (2015) worked on M.J. Holliday's back story. She had been estranged from her father Montgomery. He remarried to Christine Bigelow, so M.J. traveled back home to Valdosta, Georgia, to make up with him.

There was another reason. The happy couple were renovating Porter Manor, an antebellum mansion they had just bought. The contractors kept quitting because ghosts were sabotaging the work.

Porter Manor had belonged to an old-money family that fell on hard times and sold the property. When human remains were found drywalled in a hidden space that was closed for 45 years, attention shifted to a Porter descendant.

To flavour the mix, there were two ghosts going bump in the night, wreaking havoc in revenge for the Porter family misdeeds, which included murder. These things happen in the best of families.

A GHOUL'S GUIDE TO LOVE AND MURDER (2016) was the final installment of the series. The setting was Boston again. M.J. and the crew were mighty pleased that their film footage had been used for a movie titled The Haunting Of The Grim Widow.

They were rich, or soon would be, once the signing bonus and royalty cheques began flowing. M.J. Holliday married Heath Whitefeather, God was in his Heaven, and all was right with the world.

As part of the publicity for the movie, a local museum set up a display of paranormal artifacts. One of them was donated by Heath, a knife used to summon the demon Oruc. The reader does not have to be psychic to predict the theft of the knife and subsequent summoning.

Oruc did not come alone. He brought friends, nasty and brutish. There was a death toll and the alarums multiplied. Many thought the ghosts and demons were publicity stunts. The police didn't because they had to deal with the murders and violent assaults.

The instigators of the theft were rival ghostbusters hoping to upstage M.J. and her television show. They got theirs and so did all the released ghosts via magnetic dust. At the conclusion of the novel, M.J. learned she was pregnant and therefore retired from the business. That was no way to raise a child.

Paranormal Cozies.

According to her biography, Carol J. Perry truly was born in Salem, Massachusetts, on Halloween Day. Be that as it may, her paranormal cozies set in Salem are presumably not autobiographical. The protagonist of her Witch City Mysteries series was Lee Barrett, assisted by her psychic cat O'Ryan.

GRAVE ERRORS (2017) began with a letdown, as the town of Salem recovered from Halloween, its biggest day of the year and a much bigger event than in any other place. Lee Barrett's television production students at the academy suggested extending the celebrations to include Dia de Los Muertos.

Given the track records of both Lee and Salem, that was asking for trouble. The cemeteries were busier than a rush-hour freeway. Not everyone remembered to bury their dead. Between Lee having visions of glowing eyes and O'Ryan pointing out clues, there was a fair amount of excitement. The hurricane didn't help either.

The finale was on a dark and stormy night in a cemetery. The serial killer causing all the problems met her match when a ghost toppled a tall and very heavy tombstone onto her, crushing her dead. Officially the wind did it but Lee knew better. The Dia de Los Muertos celebrations were, however, a great success.

IT TAKES A COVEN (2018) started with Lee Barrett as the maid of honour for a friend's wedding. The novel began with them at a wedding cake tasting. Most of the women belonged to one coven or another. The death toll of the witches was already at three before the end of the first chapter.

Cable television station WICH-TV featured a late-night talk show by a tarot card reader. The management doubled down by hiring Lee as an investigative reporter as an unpaid intern. Expectations were low all around. At the time, Salem was swarmed by massive numbers of crows like never seen before. Lee proposed her first investigative report to be "The Great Salem Crow Invasion".

The story was bigger than it seemed because the crows were stripping fruit trees clean. That got the populace in an uproar since the jam and jelly crop was going to be a failure, not to mention fruit pies.

Almost as a sidelight, the death toll increased, the wedding plans continued, and an art theft ring was uncovered. Making cameo appearances was a talking pet crow named, inevitably, Poe. The bird and Lee's cat O'Ryan did vignettes and helpfully provided clues at intervals.

The culprit had been betrayed by a male witch and killed the other witches to confuse the trail. When finally caught, she blabbed all instead of keeping quiet. For no apparent reason, all the crows swarming Salem disappeared and the town returned to normal.

But not for long. BELLS, SPELLS, AND MURDERS (2018) took place during the Christmas season. A magical time elsewhere, but in Salem the word 'magical' meant something different.

The leader of a walking tour through Salem was the first victim, murdered in his office. Lee Barrett found his body of course. She was on the case as a news reporter for the cable station and was dating a local police detective, which came in handy. Her method of investigating was to sort out all the details on index cards. Note that well.

The deceased was Albert Eldridge. Among the plethora of suspects were a dozen street-corner Santas who reported to him. The alarums spread about town, such as break-ins and suspicious vans. A second murder freshened up the plot.

As the winter festivities continued, a blizzard moved in, taking down power lines and blacking out the town. In the midst of that, Lee had her encounter with the one of the killers. He failed to eliminate her because she was the series protagonist and he was only there for one book.

He and his accomplice had been stealing from a charity managed by Eldridge, who had caught on to the thefts and was therefore eliminated. The thefts weren't direct but done by overcharging for contract jobs and using shoddy materials. The culprit who tried to eliminate Lee stayed silent but his partner sang like a bird and brought both of them down.

Gimme That Old Time Radio.

THE WITCH'S TALE aired from 1931 until 1938 during the beginnings of broadcast radio. All episodes were written by Alonzo Deen Cole. Available as free mp3s from the Old Time Radio Researchers at www.otrr.org/OTRRLibrary

The narrator was a witch named Old Nancy, who did a lot of cackling, supposedly to add colour but very annoying in the aggregate. Perhaps it wasn't so wrong to burn witches after all. She introduced her cat Satan who would meow a couple times and then was heard no more.

There was a running gag involving Old Nancy's age. Each week in the intro she would declare that it was her birthday that day. In one episode she had just turned 122 years old, then in the next episode she would be 102, then 113, then 103, and so forth.

Even funnier, for those who were in the know, was that for most of the series Nancy's voice was done by a teenaged girl. She began doing the voice when she

was 13 after her predecessor, a 79-year-old woman, died in office. She was good at it though.

"The Haunted Crossroad" aired on 1937-10-12. The setting in rural Massachusetts was explained by three policemen standing about a crossroads in the midst of open fields. Talking in stage Irish, they told each other about the all murders there over the past decades. All the victims died from a stab in the back. All were policemen.

Two of the policemen left, and the third was dead before they reached the next turning. The dying man's screams brought the other two back but they saw no one else. They heard a woman cackling but saw nothing.

Further excitement followed at the crossroads. The cackler, if I may call her that, was identified as a phantom who had a noose dangling from her neck. The chief investigator had a handy book which identified the site as once having a gallows tree. The executed were buried there.

The rest of the plot hardly needs explaining. The book named the woman hanged there in 1721 and her curses recorded against all policemen who came after. The remedy was to excavate the crossroads and move her bones to a consecrated cemetery.

"The Devil's Number" aired on 1938-05-02. An American couple, Harry and Judith Oliver, were visiting an English manor house on Friday the 13th. Their host Mr Rockwell told them 13 was the Devil's number.

He went on to tell of an ancestor who was burned at the stake for good and sufficient reason. No church would bury his charred bones, so they were stored in an iron chest in the manor house cellar. The guests wanted to see that despite the protests of the butler.

Down went Rockwell and guests, while the butler stayed at the top of the stairs. Rockwell spun the stories about his ancestor's hope for revival with fresh blood. Judith promptly pricked her finger while looking into the casket.

Thirteen drops fell on the skull and kicked off the action. And so to bed for all, but not for long. Footsteps were heard in the hall. The revived ancestor came to life and made a right nuisance of himself.

Lots of bwah-ha!-ha!-ing, but when Judith was snatched, the scoundrel was destroyed by firing dum-dum bullets at him. Dum-dums have a cross carved on their noses to make them mushroom on impact. The crosses also had a religious impact, and sent the ancestor to eternity.

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 Evening And The Morning" aired on 1948-11-14. The setting was a cemetery. The narrator Dean asked if he could stay a few moments, pointing out that he was handcuffed and had a gun aimed at him. Dean plucked a flower from Alice's grave.

Mr Thorpe replied that if any of the deceased woman's friends had seen him then they might have lynched Dean. He had confessed to killing Alice. From there, as Thorpe and Dean walked along a path to a tree, the back story was filled in with flashbacks to a year prior.

Dean and Alice were at her husband Francis's funeral, walking after the graveside service was over. Francis had died in a motor accident. She was carrying a flower from his grave. Dean convinced her not to hang on to it but to toss it by the tree. The dialogue of Dean and Alice was pure soap opera. An organ gently warbled in the background.

Francis had been a writer, turning out supernatural stories. Alice redecorated their, now her, house but left his study as it was. He had almost finished a novel but she refused to let the publishers have it completed and printed.

Dean was in love with Alice. He made a mistake and referred to her as a widow. That remark angered her. She insisted she was Francis's wife. Dean realized she would never marry again, least of all him.

Thorpe and Dean sat by the tree. The story dragged on, and that was the correct word. Alice agonized endlessly. She told Dean point-blank she would never marry him.

Alice wanted to rejoin Francis but couldn't commit suicide because then she couldn't go to Heaven and reunite with him. She asked Dean to kill her. He refused. Later she began reading through Francis's library and came upon a book of superstitions.

Francis had used the book as a reference for his supernatural novels. One item in the book said that if a flower was plucked from a grave and then left elsewhere, then the soul of the deceased would be left forever where the flower landed.

Alice remembered the flower she had tossed by the tree. She went out there to find Francis's ghost and did, then told Dean. Jump cutting back to the present, Dean told Thorpe that was why he murdered her, so he could repeat the process and reunite Alice with Francis. He tossed her flower under the tree.

"Dark Grey Magic" aired on 1949-05-01. The narrator Meredith Barleycorn related buying a book on black magic. On his way home he tripped over a black cat. He thought someone had followed him from the bookstore. In short, a load of ominous forebodings.

Back home, he then read aloud a spell to summon a demon. There was a knock on the door, and a demon named Boj entered. It began teaching Meredith by trickery how to work black magic in the worst way.

Boj (it spelled its name out loud) refused to leave since it had been summoned by Meredith. What followed was a comedy of errors because Meredith was not a good learner. He kept messing up the spells, making Boj very angry.

Meredith was tricked into summoning his lost love Dixie, now a plump middle-aged battleaxe. Even Boj was frightened of her. Fortunately Meredith was able to escape her. Boj inadvertently gave away the secret of transmogrification, which allowed Meredith to turn Boj into something. But what?

No answer, just music and the closing credits. Then followed a news flash that the Berlin blockade had just been lifted. We forget sometimes how close the world was to nuclear war back then.

BLACKSTONE, THE MAGIC DETECTIVE was an old-time radio series that aired from 1948 to 1950. There were 79 episodes, written by Walter B. Gibson and Nancy Webb. Available as free mp3s from the Old Time Radio Researchers at www.otrr.org/OTRRLibrary

Each episode began with Don the announcer visiting Blackstone and Rhoda. He would spot some artifact in the clutter of the place and ask about it. Thereupon Blackstone would tell a tale. The episodes were 15 minutes with commercials, which were edited out in the mp3s, reducing them to about 12 minutes each. Quick and easy listening on your morning commute.

The character was based on a real magician Harry Blackstone Sr, although the plots weren't. Rhoda Brent played his assistant. In each epilogue Blackstone would explain a simple magic trick the audience could do at home.

"The Ghost In The Crypt" aired on 1949-08-07. Dwight Malcolm had inherited a fortune in uncut jewels from his Uncle Ned. Unfortunately the old man hid them somewhere in the manor house.

The widow wouldn't let Malcolm inside to search for the jewels. Other people declined to help him because the mansion seemed haunted. Flickering blue lights, strange noises, the usual sort of rubbish that ghosts get up to.

Blackstone and Rhoda agreed to help. Cut to a conversation between the widow and her manservant. They gave away the plot by telling each other that they had found the jewels and the ghosts were special effects.

When Blackstone and Rhoda arrived, screaming was added to the mix. Not them but the hired hand trying to warn them away. Mrs Malcolm tried her pitch with a shotgun but didn't succeed.

She was frightened into submission when her late husband's face appeared in the dark. Blackstone silenced her by making Ned's face suddenly appear in a dark room.

Blackstone had painted the face on Rhoda's cloak. Invisible by day, ghostly in the beam of a flashlight, the face frightened the widow into returning the jewels to Dwight.

SHERLOCKIANA: PART 44
by Dale Speirs

[Parts 1 to 43 appeared in OPUNTIAs #63.1B, 63.1C, 63.1D, 67.1D, 68.1C, 69.1E, 70.1A, 71.1B, 251, 253, 256, 261, 269, 270, 276, 288, 309, 333, 340, 348, 356, 359, 365, 370, 383, 397, 410, 416, 423, 433, 457, 470, 474, 486, 492, 496, 501, 510, 526, 539, 552, 561, and 571.]

The original Sherlock Holmes stories written by Sir Arthur Conan Doyle are referred to as the canon, while stories written by other authors are called pastiches.

In the canon stories, Watson mentioned about 100 cases as throwaway lines. Someday he would write up those cases but never did. My personal favourite was "Wilson, the notorious canary trainer". Pastiche writers have been mining those unwritten cases for decades.

Pastiches: Magazines.

SHERLOCK HOLMES MYSTERY MAGAZINE #30 (2022) is available as an Amazon print-on-demand. The issue began with an installment of "Ask Mrs Hudson". The theme of the letter writers was Holmes' supposed cruelty to dogs.

In a few of the canon stories, he killed a dog, most famously the big one roaming the moors. Hudson assured her correspondents that such incidents were of necessity and did not reflect Holmes' real views of canines.

"I'll Take A Pass On The Curried Mutton, Thank You" by O'Neill Curatolo was an essay on the practicalities of poisoning people. In the Silver Blaze canon story, a groom was sedated by spiking his curry with opium. Curatolo pointed out that most powdered drugs, medicinal or criminal, have bitter tastes, so putting them in spiced food was the only practical method to dose a victim.

Elizabeth Crowans wrote about Holmes' use of mixed martial arts. In the canon stories, Holmes was an expert in baritsu, a form of martial arts which is now extinct save for a few fans trying to recreate the method.

The correct name was bartitsu, introduced by an Englishman who had seen Japanese fighters using jujitsu and judo. After he died, bartitsu was replaced by straightforward Japanese and Chinese martial arts.

On to the pastiches. "The Paris Bargains" by Hal Charles (pseudonym of Hal Blythe and Charlie Sweet) was set in Paris. The nameless French narrator met a young nameless Englishman. They shared their problems, both of which required deductions and detections.

The experienced reader will have little difficulty guessing they were a young Holmes and an elderly C. Auguste Dupin. There were, however, a few neat misleading clues.

"The Adventure Of The Booby-Trapped Boots" by Jeffrey A. Lockwood was a standard plot about a man wishing to speed up his inheritance from his older brother.

The reader will easily guess the means and opportunity halfway through the story. By then, the younger brother had distilled a large amount of pure nicotine from tobacco leaves. His brother had died with brown stains on his feet. The title supplied the clinching evidence.

"The Sign Of The Three" by Larry Lefkowitz was a trifle. Holmes was asked to investigate a note signed with the letter W, sent to a Jewish woman. After several wrong tracks, he deduced the initial was the Hebrew letter 'shin', which looks somewhat like a W. From there he found the writer, Jewish of course.

"Mycroft Holmes And The Black Heart Of London" by J.G. Grimmer took place during the Great Hiatus, when everyone thought Sherlock was dead. Watson was summoned by Mycroft to help catch a mysterious murderer who proved to be the Invisible Man. Once they realized his ability, they caught him by tossing sacks of flour to make him visible.

One of the victims was the wife of Dr Fu Manchu. He managed to kidnap the Invisible Man away from the authorities. In the epilogue, Fu Manchu slowly tortured him to death. A rather unusual twist for a crossover story.

"The Last Colonel Moran" by Rafe McGregor was about an attempt to Sebastian Moran to ruin Holmes by accusing him of being the Whitechapel killer.

Moran approached a former Scotland Yard detective and tried to convince him. They visited Holmes in his retirement in Sussex keeping bees but he ran them off. Moran later admitted that Professor Moriarty had been Jack the Ripper.

"The Problem At The Musée Du Louvre" by Gary Lovisi took Holmes and Watson to Paris to help recover the stolen Mona Lisa painting. Holmes identified the thief but didn't hand him over to the police. Instead, he burgled the thief's apartment, took back the painting, and substituted a copy.

"One Medium, Well Done" by Frank Emerson took Holmes and Watson to the USA. Oliver Wendall Holmes Jr had summoned his distant cousin to help expose a medium at a séance.

The first half of the story was the set-up and an account of the event. Afterwards, the two Holmes and Watson adjourned elsewhere for the great detective's extended infodump on the clever means by which the fraud was carried out.

As in previous issues, a canon story was reprinted, this time "The Final Problem". A waste of space since the canon stories have never been out of print and are readily available. Those pages could have been used for an extra pastiche.

Pastiches: Novels.

THE GENTLEMAN BURGLAR (2024) by Sam Siciliano took Sherlock Holmes and his cousin Henri Vernier into the hire of Frederic Chameric, the Baron de Creuse. He hired them to search for the lost treasure of the kings of France.

They were competing against others, including the notorious Arsene Lupin. Many puzzles and coded messages later, they wound up in Normandy, where the Baron had a sea base. He had invested his fortune in a newfangled submersile called the Nautilus, in honour of Jules Verne's famous story.

After giving Holmes and Vernier a grand tour of the submersile, course was set for a lighthouse on the Isle of Wight, where the clues led to the treasure. Along the way the Baron boasted that having spent his wealth on the submersile he would regain it many times over with the treasure and blackmailing navies.

The Nautilus was equipped with torpedoes and would be the forerunner of a fleet of submersiles with which to conquer Europe and make the Baron a new king of France. Several twists occurred at the lighthouse.

The Baron and his ship went down while departing and were erased from history. Holmes and Vernier remained at the lighthouse to detect another day.

Pastiches: Old-Time Radio.

Sherlock Holmes was very successful on radio. He aired on several networks with several sets of actors from 1930 to 1956, encompassing the entire lifespan of old-time radio. Basil Rathbone and Nigel Bruce had a long run, but others played the parts before and after. Available as free downloads from the Old Time Radio Researchers at www.otrr.org/OTRRLibrary

"The Adventure Of Maltree Abbey" aired on 1947-03-31 and was written by Denis Green and Anthony Boucher. The client was Miss Sybil Carter, whose brother Harold was the 24th Earl of Maltree.

The family was impoverished, as the rural aristocracy so often was. A rich cousin Jonathan Devers from South Africa offered to bail out Maltree on condition of marriage to Sybil and the exile of Harold.

There was an old family legend that if a certain piece of ancient music was played in the chapel next to a statue of the Venerable Bede, the Maltree estate would be saved. Holmes recalled the Musgrave ritual.

Sybil invited Holmes to help under the pretext of playing the music on his violin. At the manor, they found Devers was a rude boor. Harold was only slightly better behaved, conducting himself in a high-handed aristocratic manner. Both were nasty to the groom Wilson, who kept lurking about.

The music was played by Sybil on a piano in the drawing room but nothing happened. Holmes tried again later that night in the chapel, having translated the musical notes into a coded message about the statue.

The code corresponded to part of statue which, when pressed, opened a secret passage to a hidden chamber. Someone had anticipated them and grabbed whatever the treasure was, possibly an ancient codex.

The chase was on. Devers, carrying the codex in a Gladstone bag, almost succeeded in sinking the book into the manor pond. Wilson, lurking about as always, had swapped the codex with rocks and saved the estate.

The codex was in the handwriting of the Venerable Bede, worth a fortune. Wilson was Inspector Athelney Jones of Scotland Yard in disguise. Devers was off to Her Majesty's Prison and the Maltrees were saved.

"The Remarkable Affair Of The Pointless Robbery" aired on 1947-05-05, and was written by Denis Green and Anthony Boucher. The story was set in 1913 after Holmes had retired to the Sussex Downs to raise bees.

Watson came down to visit. As they were having breakfast, the local rector Mr Kenmore arrived. During the night burglars had broken into the rectory and ransacked the place, yet apparently stole nothing.

Holmes and Watson visited the rectory but no clues were evident. Once the business was over, Kenmore's daughter Alice asked if she could photograph them. She had a new camera and was enthusiastically photographing everything in sight.

After snapping the duo, she mentioned she had used the last shot on the roll and would take the film into the village for developing at Doworthy's shop. Watson mentioned they were heading that direction and offered to take the roll, which offer Alice accepted.

The next night the rectory was burglarized again. Alice was attacked and struck unconscious. As Watson tended to her, the village constable arrived and informed Holmes that Doworthy had been murdered in his quarters.

Holmes surmised what the listener already suspected, that the roll of film was the MacGuffin. Fortunately Watson had forgotten to drop off the film and still had the roll in his pocket. The two men took a train into London to be developed by Scotland Yard.

One of the photos showed two men in the background of a beach scene, one of whom was Professor Moriarty. A quick trip to the Foreign Ministry revealed the other man was the German spy Von Schalien.

Thence homeward. A trap was set by mentioning the photos to the village postmistress. It is a truism, then and now, that village post offices are the centre of gossip. Kenmore told her that while Alice's camera had been stolen, fortunately the film was still in the rectory.

The rest of the plot was predictable. Holmes and Watson lay in wait and trapped Moriarty. They took him as a hostage to rendezvous with Von Schalien at a beach where he was to be picked up by a German submarine.

They caught Von Schalien and secret papers, but Moriarty got away for a future episode. Holmes then quoted the canon phrase "*There's an east wind coming*" to end the episode.

"The Cradle That Rocked Itself" was written by Edith Meiser and aired on 1947-11-30. Sherlock Holmes and Dr Watson were vacationing in Cornwall. The village vicar Roundhead called on them.

A local family, on the land for centuries, had an ancient cradle that was said to rock by itself when death was imminent. An old governess had been hustled into a nursing home. As they put her away, she screamed imprecations that her ghost would return to rock the cradle.

Members of the household began to suffer illness, all of whom were in the line of succession. The cradle began rocking. Holmes and Watson visited the manor house, perched on a cliff. Tribulations ensued.

As the listener will suspect, it was a family member trying to gain the estate. The reason was a peculiar British legality called entailing an estate. This method specified who could inherit and prevented the estate from being divided among several heirs.

A cousin frozen out by the entail attempted to bend the line of succession to him. After Holmes accused him, he ran from the mansion and took a dive off the cliff. Good thing the manor wasn't in southern Saskatchewan.

SEEN IN THE LITERATURE

Physics.

Skvarla, Jiri (2024) **Einstein-Perrin dilemma on the Brownian motion (Avogadro's number) resolved?** ARCHIVE FOR HISTORY OF EXACT SCIENCES 78:doi.org/10.1007/s00407-024-00337-1 (available as a free pdf)

Author's abstract: *The general recognition of the existence of atoms and molecules occurred only at the beginning of the twentieth century.*

Many researchers contributed to this, but the ultimate proof of the molecular nature of matter that convinced even the last sceptics was the confirmation of Albert Einstein's statistical-fluctuation theory of Brownian motion, a part of his comprehension of interdisciplinary atomism, by Jean Perrin's experiments on colloidal gamboge particles.

Einstein noticed a difference between the values of Avogadro's constant derived from Perrin's experiments and Planck's calculation from black-body radiation.

Einstein assumed the incorrectly evaluated size of the gamboge spherules to be a culprit of the difference and asked Perrin to check the assumption with additional experiments and using the viscosity formula introduced in his own dissertation.

The result was a discrepancy that neither Einstein nor Perrin settled any further.

In this communication, based on the survey of developments in colloid and polymer science and their comparison with relevant experiments, an explanation of the dilemma is given that now, after more than a century, proves Einstein correct. The comparison was de facto possible during his lifetime.

Astronomy.

Baker, W.M., et al (2024) **A core in a star-forming disc as evidence of inside-out growth in the early Universe.** NATURE ASTRONOMY 8:doi.org/10.1038/s41550-0-024-02384-8 (available as a free pdf)

Authors' abstract: *Here we report the finding of the morphologically mature galaxy JADES-GS+53.18343-27.79097, which existed within the first 700 million years of the Universe's history.*

This star-forming galaxy with a stellar mass of 400 million solar masses consists of three components: a highly compact core with a half-light radius of less than 100 parsecs, an actively star-forming disc with a radius of about 400 parsecs and a star-forming clump, all of which show distinctive star-formation histories.

The central stellar mass density of this galaxy is within a factor of 2 of the most massive present-day ellipticals, while being globally 1,000 times less massive. The radial profile of the specific star-formation rate is rising towards the outskirts.

This evidence suggests a detection of the inside-out growth of a galaxy as a proto-bulge and a star-forming disc in the epoch of reionization.

Galaxies in the local Universe show a range of morphologies, from younger disc-dominated spiral galaxies to older bulge-dominated ellipticals, and are typically classified by the Hubble sequence.

The growth of local star-forming galaxies has been observed on spatially resolved scales, confirming that in general galaxies grow inside-out.

However, there is a diverse range of specific star-formation rate profiles in the local universe with some galaxies undergoing inside-out growth, while others grow outside-in, probably corresponding to different growth phases.

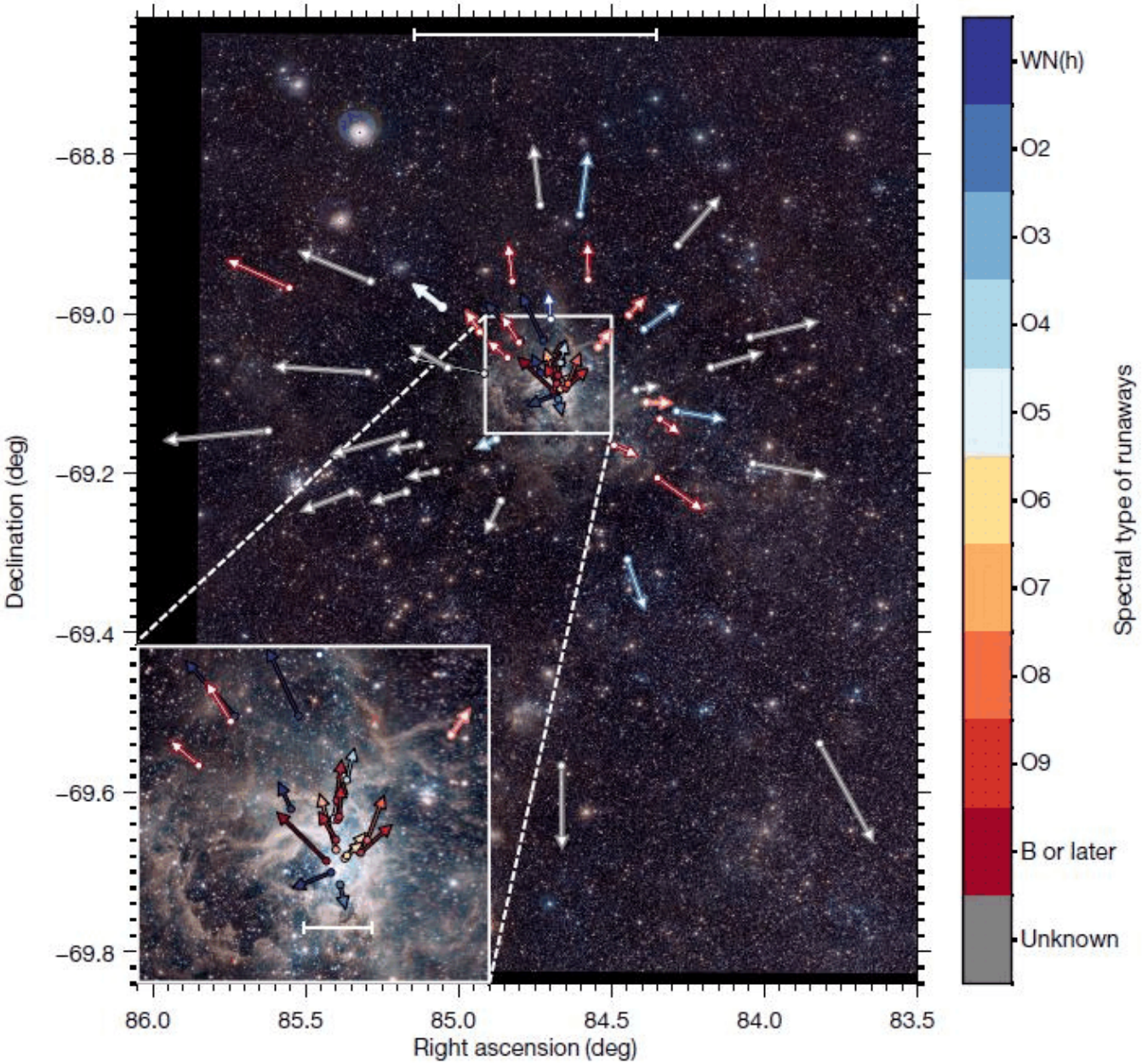
Most of the mass of local galaxies is found to have formed during the redshift range $1 < z < 3$, around the period of 'cosmic noon', the peak of the cosmic star-formation rate density in the Universe.

Stoop, M., et al (2024) **Two waves of massive stars running away from the young cluster R136.** NATURE 634:doi.org/10.1038/s41586-024-08013-8 (available as a free pdf)

Authors' abstract: *Massive stars are predominantly born in stellar associations or clusters. Their radiation fields, stellar winds and supernovae strongly impact their local environment.*

In the first few million years of a cluster's life, massive stars are dynamically ejected and run away from the cluster at high speed. However, the production rate of dynamically ejected runaways is poorly constrained.

Here we report on a sample of 55 massive runaway stars ejected from the young cluster R136 in the Large Magellanic Cloud. An astrometric analysis of Gaia data reveals two channels of dynamically ejected runaways.



The first channel ejects massive stars in all directions and is consistent with dynamical interactions during and after the birth of R136. The second channel launches stars in a preferred direction and may be related to a cluster interaction.

We found that 23 to 33% of the most luminous stars initially born in R136 are runaways. Model predictions have significantly underestimated the dynamical escape fraction of massive stars.

Consequently, their role in shaping and heating the interstellar and galactic media and their role in driving galactic outflows are far more important than previously thought.

The Large Magellanic Cloud (LMC), a satellite galaxy of the Milky Way, hosts the Tarantula nebula (30 Doradus), a region containing more than a thousand massive stars that formed in several bursts of star formation in the past several tens of megayears.

The most recent star-formation episode in this region gave birth to the dense cluster core Radcliffe 136 (R136). Using the astrometric information in Gaia Data Release 3 (DR3), we identified stars consistent with running away from R136.

We required them to have a transverse velocity significantly larger than 27.6 km per second and to have been ejected up to 3 megayears ago, although R136 is probably younger. This yielded 55 early-type runaways, which is an increase of the number of known runaways from the cluster core by an order of magnitude.

We determined their dynamic trace-back age (kinematic age), which indicates how long ago they were ejected from R136, and cross-matched them with the literature to obtain their stellar parameters.

The spectral type of almost all the classified runaways ranges from early-type B to early-type O. There are also WN(h)-type stars. The corresponding masses are in the range of approximately 5 up to 140 solar masses.

The runaways are moving in different directions and have reached (projected) distances of approximately 3 to 460 parsecs from R136. This implies that about half of them have left the 30 Dor region and that their ionizing radiation fields, supersonic stellar winds and, eventually, powerful supernovae are affecting relatively tenuous areas in or outside the LMC.

[Images are from this paper.]

Planets.

Edwards, G.H., et al (2024) **An early giant planet instability recorded in asteroidal meteorites.** NATURE ASTRONOMY 8:doi.org/10.1038/s41550-024-02340-6 (available as a free pdf)

Authors' abstract: *Giant planet migration appears widespread among planetary systems in our Galaxy. However, the timescales of this process, which reflect the underlying dynamical mechanisms, are not well constrained, even within the Solar System.*

As planetary migration scatters smaller bodies onto intersecting orbits, it would have resulted in an epoch of enhanced bombardment in the Solar System's asteroid belt.

Here, to accurately and precisely quantify the timescales of migration, we interrogate thermochronologic data from asteroidal meteorites, which record the thermal imprint of energetic collisions. We present a database of ^{40}K–^{40}Ar system ages from chondrite meteorites and evaluate it with an asteroid-scale thermal code coupled to a Markov chain Monte Carlo inversion.

Simulations require bombardment to reproduce the observed age distribution and identify a bombardment event beginning 11.3 Myr after the Sun formed (50% credible interval). Our results associate a giant planet instability in our Solar System with the dissipation of the gaseous protoplanetary disk.

Planetary migrations seem to be commonplace in our Galaxy. The proximity of 'hot Jupiters' to their host stars results from inward migration from more distant planetary birth radii. Planets in the TRAPPIST-1 system also probably migrated inwards from larger radii where they inherited their volatile inventories.

Distributions of both exoplanet eccentricity and orbital spacing in multi-planet systems are most readily explained by histories of dynamical instability and orbital reorganization.

Several lines of evidence indicate that the Solar System's giant planets underwent at least one episode of migration. The admixture of material from the inner and outer Solar System among main belt asteroids and asteroidal meteorites requires dynamical mixing of protoplanetary reservoirs.

The orbital architecture of giant planets and the Kuiper Belt as well as the low masses of Mars and the asteroid belt could not have formed in situ and require a history of dynamical excitation.

Consequently, giant planet migration (GPM) established the long-term (>4 billion years) physical and chemical structure of the Solar System and perhaps promoted terrestrial habitability by supplying volatile-rich material from the outer Solar System to the early Earth. As a corollary, we expect migrations to similarly imprint these characteristics in exoplanetary systems.

While dynamical models of GPM vary widely in their assumptions and details, the overarching mechanisms that drive GPM fall into one of two categories: dynamical instability triggered by interplanetary gravitational interactions or inward migration triggered by tidal interactions with a surrounding gaseous disk, also known as 'type II' migration.

Simon, A.A., et al (2024) **A detailed study of Jupiter's Great Red Spot over a 90-day oscillation cycle.** PLANETARY SCIENCE JOURNAL 5:doi.org/10.3847/PSJ/ad71d1 (available as a free pdf)

Authors' abstract: *Jupiter's Great Red Spot (GRS) is known to exhibit oscillations in its westward drift with a 90-day period. The GRS was observed with the Hubble Space Telescope on eight dates over a single oscillation cycle in 2023 December to 2024 March to search for correlations in its physical characteristics over that time.*

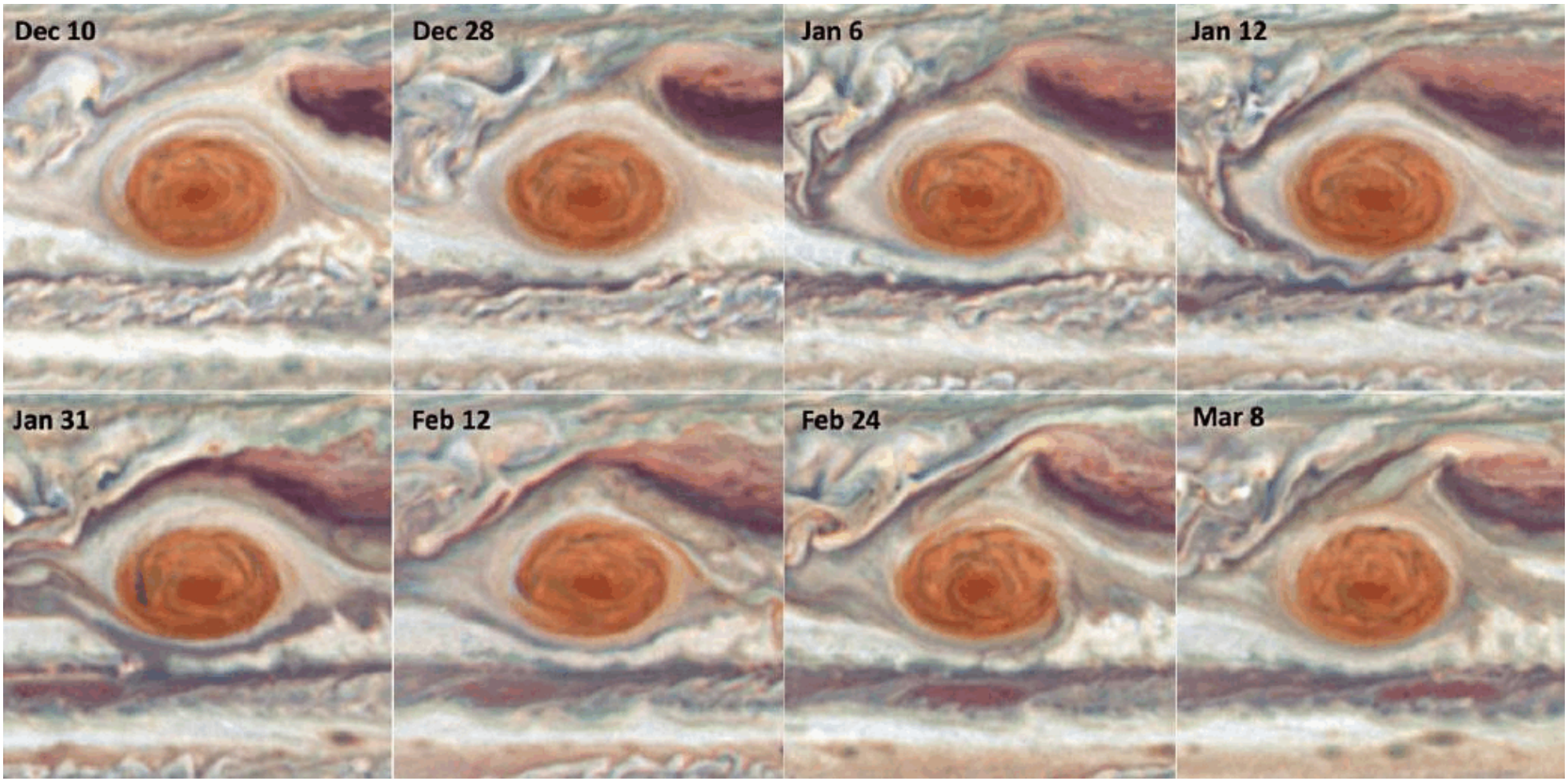
Measured longitudinal positions are consistent with a 90-day oscillation in drift, but no corresponding oscillation is found in latitude. We find that the GRS size and shape also oscillate with a 90-day period, having a larger width and aspect ratio when it is at its slowest absolute drift (minimum date-to-date longitude change).

The GRS's UV and methane gas absorption-band brightness variations over this cycle were small, but the core exhibited a small increase in UV brightness in phase with the width oscillation; it is brightest when the GRS is largest. The high-velocity red collar also exhibited color changes, but out of phase with the other oscillations.

Maximum interior velocities over the cycle were about 20 metres per second larger than minimum velocities, slightly larger than the mean uncertainty of 13 metres per second, but velocity variability did not follow a simple sinusoidal pattern as did other parameters such as longitude width or drift.

Relative vorticity values were compared with aspect ratios and show that the GRS does not currently follow the Kida relation.

[Images are from this paper.]



Wang, L., and J. Huang (2024) **Hypothesis of an ancient northern ocean on Mars and insights from the Zhurong rover.** NATURE ASTRONOMY 8:doi.org/10.1038/s41550-024-02343-3

Authors' abstract: *Various landforms suggest the past presence of liquid water on the surface of Mars. The putative coastal landforms, outflow channels and the hemisphere-wide Vastitas Borealis Formation sediments indicate that the northern lowlands may have housed an ancient ocean.*

Challenges to this hypothesis are from topography analysis, mineral formation environment and climate modelling. Determining whether there was a northern ocean on Mars is crucial for understanding its climate history, geological processes and potential for ancient life, and for guiding future explorations.

Recently, China's Zhurong rover has identified marine sedimentary structures and multiple subsurface sedimentary layers. The unique in situ perspective of the Zhurong rover, along with previous orbital observations, provides strong support for an episodic northern ocean during the early Hesperian and early Amazonian (about 3.6 to 2.5 billion years ago).

The ground truth from future sample-return missions, such as China's Tianwen-3 or the Mars sample-return programmes by NASA, ESA and other agencies, will be required for a more unambiguous confirmation.

Wu, Y., et al (2024) **A 650-Myr history of Earth's axial precession frequency and the evolution of the Earth-Moon system derived from cyclostratigraphy.** SCIENCE ADVANCES 10:doi.org/10.1126/sciadv.ado2412 (available as a free pdf)

Authors' abstract: *The preservation of Milankovitch cycles in the stratigraphic record provides independent geological information to study our ancient solar system and can be leveraged to constrain existing theoretical models.*

Here, we identify 34 high-quality cyclostratigraphic records spanning the past 650 million years and use them to infer the evolution of the Earth-Moon system through a Bayesian inversion method. We reconstruct the time evolution of Earth's axial precession frequency, lunar distance, length of day, and the periods of obliquity and climatic precession cycles.

The results indicate an interval of high tidal energy dissipation in the Earth-Moon system at ~300 to 200 million years ago, and are broadly consistent with an independently calculated tidal evolution model.

Our results provide an improved determination of the past periods of obliquity and climatic precession for astrochronology applications and yield important constraints on the history of tidal energy dissipation during the Phanerozoic Eon.

Quasiperiodic variations in the shape of Earth's orbit and in the orientation of its rotation axis influence the distribution of incoming solar radiation reaching the surface of Earth, leading to climate changes that can be recorded in sedimentary sequences.

This linkage between the geological record and astronomical cycles (orbital eccentricity, obliquity, and climatic precession) greatly improves the ability to construct geological timescales and date ancient Earth System events and also provides a way to choose alternative astronomical solutions and to constrain the frequencies of astronomical cycles in deep time.

In particular, the history of Earth's axial precession frequency (k), which determines Earth's obliquity and climatic precession periods, is highly uncertain and has been the focus of past studies.

Here, we analyze 34 high-quality cyclostratigraphic records with a Bayesian inversion method that quantitatively links astronomical theory with geologic observation (13) to estimate Earth's axial precession frequency (k) over the past 650 million years (Myr) and, in doing so, also provide a new assessment of Earth-Moon history.

The connection between axial precession and Earth-Moon history is through the effect of tidal friction, which dissipates energy and acts to slow Earth's rotation while accelerating the Moon and moving it to a higher orbit.

The decreasing spin rate and increasing lunar distance reduce the total torques exerted by the Sun and the Moon on Earth's equatorial bulge and thus reduce the rate at which Earth's rotational axis precesses. Therefore, determination of the axial precession frequency k from cyclostratigraphic records allows estimation of the Earth-Moon distance and Earth's spin rate through geologic time.

Other Earth-Moon history proxies such as tidal rhythmites and bioarchives such as stromatolites require interpretation that is often ambiguous due to difficulties relating daily or tidal laminations to lunar or annual cycles, and to questions about completeness of the record on such short timescales.

In contrast, cyclostratigraphic sequences provide the most reliable estimates of the time evolution of k because they are commonly found in the geological record, sedimentation rates can be constrained by independent radioisotopic or stratigraphic evidence, and stratigraphic completeness on the relevant timescale of evaluation is common.

Asteroids.

Marsset, M., et al (2024) **The Massalia asteroid family as the origin of ordinary L chondrites.** NATURE 634:doi.org/10.1038/s41586-024-08007-6 (available as a free pdf)

Authors' abstract: *Studies of micrometeorites in mid-Ordovician limestones and impact craters on Earth indicate that our planet witnessed a massive infall of ordinary L chondrite material about 466 million years ago that may have been at the origin of an Ordovician ice age and major turnover in biodiversity.*

The breakup of a large asteroid in the main belt is the likely cause of this massive infall. Currently, material originating from this breakup still dominates meteorite falls (>20% of all falls).

Here we provide spectroscopic observations and dynamical evidence that the Massalia collisional family is the only plausible source of this catastrophic event and the most abundant class of meteorites falling on Earth today.

This family of asteroids is suitably located in the inner belt, at low-inclination orbits, which corresponds to the observed distribution of L-chondrite-like near-Earth objects and interplanetary dust concentrated at 1.4°.

Ordinary L chondrites are believed to be derived from a single-parent asteroid. Nearly half of these L chondrites are heavily shocked and degassed, with $^{40}Ar/^{39}Ar$ radiometric ages near 470 million years (My). This suggests that an L-chondrite-like asteroid suffered a supersonic impact about 470 My ago, which ejected a substantial amount of material.

Studies of fossil meteorites found in a 466-My-old Ordovician strata in a limestone quarry in Sweden supported these findings and further showed that the measured abundance of fossil L chondrites implies a rate of meteoritic bombardment one to three orders of magnitude higher than at present, with L chondrites representing =99% of all falls just after the impact.

To explain the slow cooling rates of L chondrites, the parent body had to be larger than 100 km in diameter.

All this implies that the impact at the origin of the L chondrite shower on Earth 466 My ago must have led to the formation of a prominent asteroid family in the main belt, still visible today as a cluster in the space of proper orbital elements (semi-major axis, eccentricity and inclination).

Broz, M., et al (2024) **Young asteroid families as the primary source of meteorites.** NATURE 634:doi.org/10.1038/s41586-024-08006-7 (available as a free pdf)

Authors' abstract: *As of today, only approximately 6% of meteorite falls have been firmly linked to their sources (Moon, Mars or asteroid Vesta).*

Here we show that approximately 70% of meteorites originate from three recent break-ups of diameter > 30 km asteroids that occurred 5.8, 7.6, and less than about 40 Myr ago.

These break-ups, including the well-known Karin family, took place in the prominent yet old Koronis and Massalia families and are at the origin of the dominance of H and L ordinary chondrites among meteorite falls.

These young families are distinguished among all main belt asteroids by having a uniquely high abundance of small fragments. Their size-frequency distribution remained steep for a few tens of millions of years, exceeding temporarily the production of metre-sized fragments by the largest old asteroid families (for example, Flora and Vesta).

Supporting evidence includes the existence of associated dust bands, the cosmic-ray exposure ages of H-chondrite meteorites, and the distribution of the pre-atmospheric orbits of meteorites.

According to both dynamical models and observational surveys, most meteorites are thought to have their origin in the main asteroid belt. Collisions between millions of asteroids generate fragments, which drift through the Yarkovsky thermal effect, until they approach mean-motion or secular resonances.

Planets then strongly perturb their eccentricities to the point where their orbits become Earth-crossing.

Notably, meteorite falls are dominated by two groups only (H and L chondrites), which account for approximately 70% of all falls. These are followed at a significantly lower proportion by LL chondrites (8%) and HEDs (6%).

In contrast, kilometre-sized asteroids in the main belt and near-Earth objects (NEOs) typically have a different composition, with LL-like bodies being as abundant as H- or L-like bodies.

Specifically, the Flora (LL) and Vesta (HED) families have the most kilometre-sized asteroids among all H-, L-, LL- and HED-like families. Consequently, neither prominent asteroid families nor the background population are probably significant sources of the meteorite flux.

Instead, a few recent stochastic collisional events may be the main source of the meteorite flux, as suggested by the cosmic-ray exposure (CRE) ages. About 40% of all H chondrites have young CRE ages in the 5 to 8 Myr range, indicating a recent break-up of an H-chondrite-like body.

Nicholson, U., et al (2024) **3D anatomy of the Cretaceous-Paleogene age Nadir Crater.** COMMUNICATIONS EARTH AND ENVIRONMENT 5:doi.org/10.1038/s43247-024-01700-4 (available as a free pdf)

[Was there more than one asteroid impact that killed off the dinosaurs?]

Authors' abstract: *The Nadir Crater offshore West Africa is a recently proposed near K-Pg impact structure identified on 2D seismic.*

Here we present 3D seismic data that image this crater in exceptional detail, unique for any such structure, which demonstrates beyond reasonable doubt that the crater-forming mechanism was a hypervelocity impact.

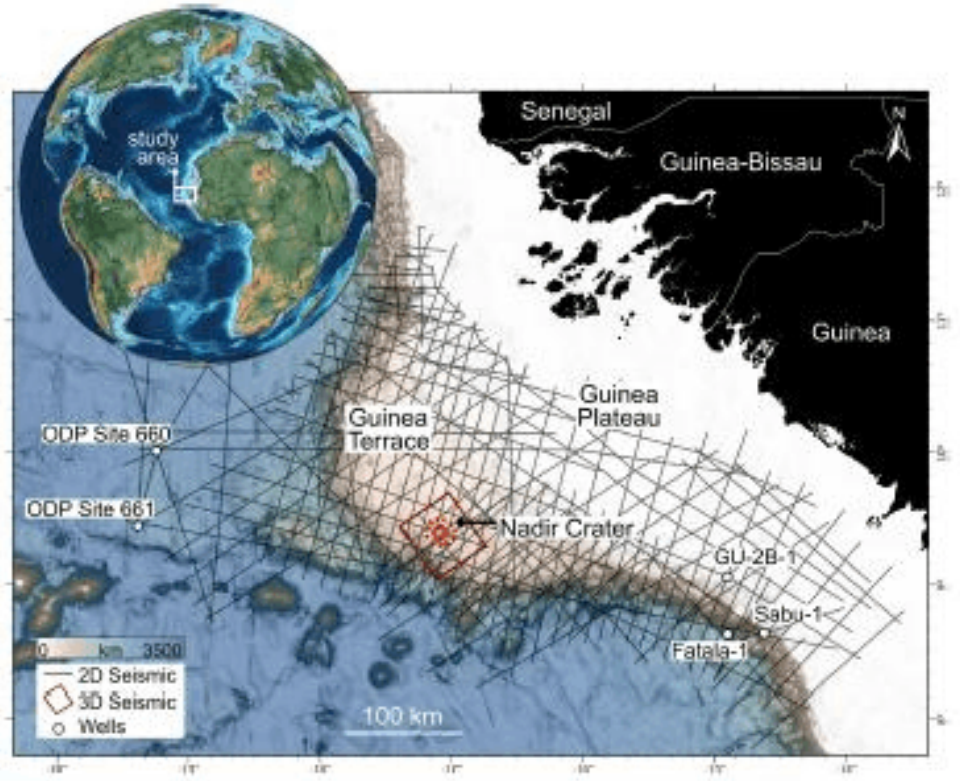
Seismic mapping reveals a near-circular crater rim of 9.2 km and an outer brim of ~23 km diameter defined by concentric normal faults. An extended damage zone is evident across the region, well beyond the perceived limit of subsurface deformation for impact craters, except in a 'sheltered zone' to the east.

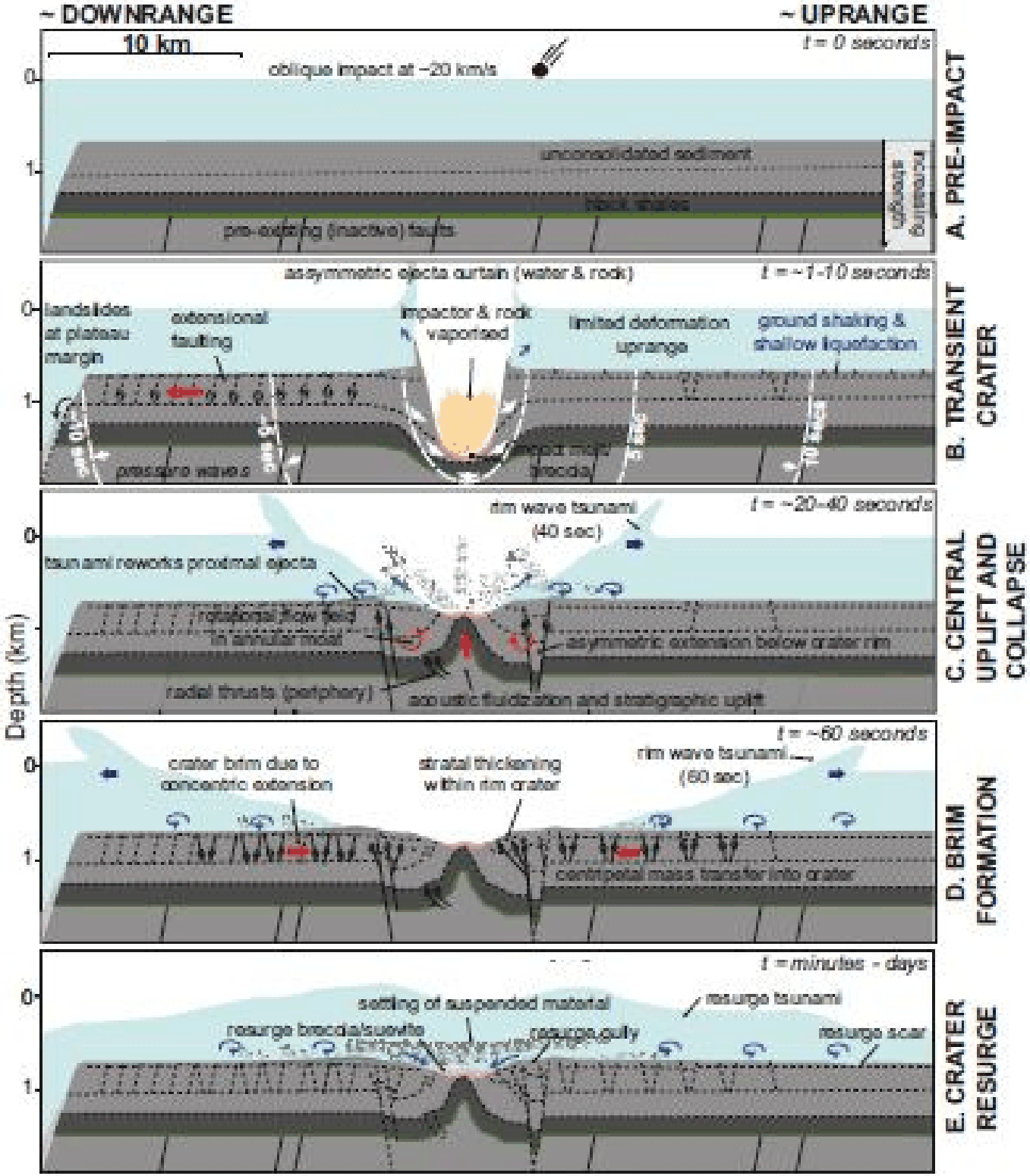
The paleo-seabed shows evidence for widespread liquefaction because of seismic shaking, and scars and gullies formed by tsunami wave propagation and resurge.

Deformation within the ~425 metres high stratigraphic uplift and annular moat allows us to reconstruct the evolution of the crater, with radial thrusts at the periphery of the uplift suggesting a low-angle impact from the east.

Structural relationships are used to reconstruct the deformation processes during the crater modification stage, with the central uplift forming first, followed by centripetal flow of surrounding sediments into the evacuated crater floor in the seconds to minutes after impact.

[Images on this and next page are from this paper.]




~ DOWNRANGE
~ UPRANGE
10 km
t = 0 seconds
oblique impact at ~20 km/s
unconsolidated sediment
rock strata
pre-existing (inactive) faults
A. PRE-IMPACT
asymmetric ejecta curtain (water & rock)
t = ~1-10 seconds
landslides at plateau margin
extensional faulting
impactor & rock vaporized
limited deformation uprange
ground shaking & shallow liquefaction
pressure waves
B. TRANSIENT CRATER
rim wave tsunami (40 sec)
t = ~20-40 seconds
tsunami reworks proximal ejecta
rotational flow field in annular moat
asymmetric extension below crater rim
radial thrusts (periphery)
acoustic fluidization and stratigraphic uplift
C. CENTRAL UPLIFT AND COLLAPSE
Depth (km)
t = ~60 seconds
crater brim due to concentric extension
stratal thickening within rim crater
rim wave tsunami (60 sec)
centripetal mass transfer into crater
D. BRIM FORMATION
t = minutes - days
settling of suspended material
resurge tsunami
resurge breccia/suevite
resurge gully
resurge scar
E. CRATER RESURGE

Alien Biology.

Shen, J., et al (2024) **Follow the serpentine as a comprehensive diagnostic for extraterrestrial habitability.** NATURE ASTRONOMY 8:doi.org/10.1038/s41550-024-02373-x

Authors' abstract: *One of the main goals of most ongoing and future space exploration missions is to search for habitable conditions and potential signs of extraterrestrial life on Solar System bodies.*

Space agencies have usually implemented this by 'following' a specific diagnostic that has an important role in life, with 'following the water' being the most famous, but by no means the only indication.

However, the use of only one life-essential element has limitations. Here we propose to follow the serpentine as a way to integrate multiple aspects of habitable conditions as we know them, given that the presence of serpentine implies a water supply, organic molecules, bioavailable essential elements, energy sources, greenhouse gases and preservable environments.

Serpentine minerals are associated with the complex process called serpentinization, a subtype of water-rock interactions. Serpentinization and its products are therefore likely to provide insights into where to find potential life-inhabited niches on celestial bodies such as Mars and icy moons.

Origin Of Life.

Luo, A., et al (2024) **Large igneous provinces played a major role in oceanic oxygenation events during the mid-Proterozoic.** COMMUNICATIONS EARTH AND ENVIRONMENT 5:doi.org/10.1038/s43247-024-01780-2 (available as a free pdf)

[Earth did not steadily develop an oxygen atmosphere. There were many sudden and major fluctuations in oxygen content.]

Authors' abstract: *Low atmospheric oxygen levels during the mid-Proterozoic were occasionally interrupted by transient high oxygen levels. The cause of mid-Proterozoic ocean redox variability remains unclear.*

Here we investigate mercury chemostratigraphy across the Jixian section of North China Craton through two oxygenation intervals. Abnormal spikes in mercury concentration and excursions of mercury isotopes are observed in the Dahongyu and Hongshuizhuang formations, which occur just below the two oxygenation intervals, respectively.

These mercury anomalies suggest that the two oxygenation events were preceded by subaerial volcanism. Furthermore, the two oxygenation intervals show increased nutrient concentrations and negative shifts in mercury isotopes, indicating that enhanced weathering and terrestrial nutrient influx occurred during oxygenation intervals.

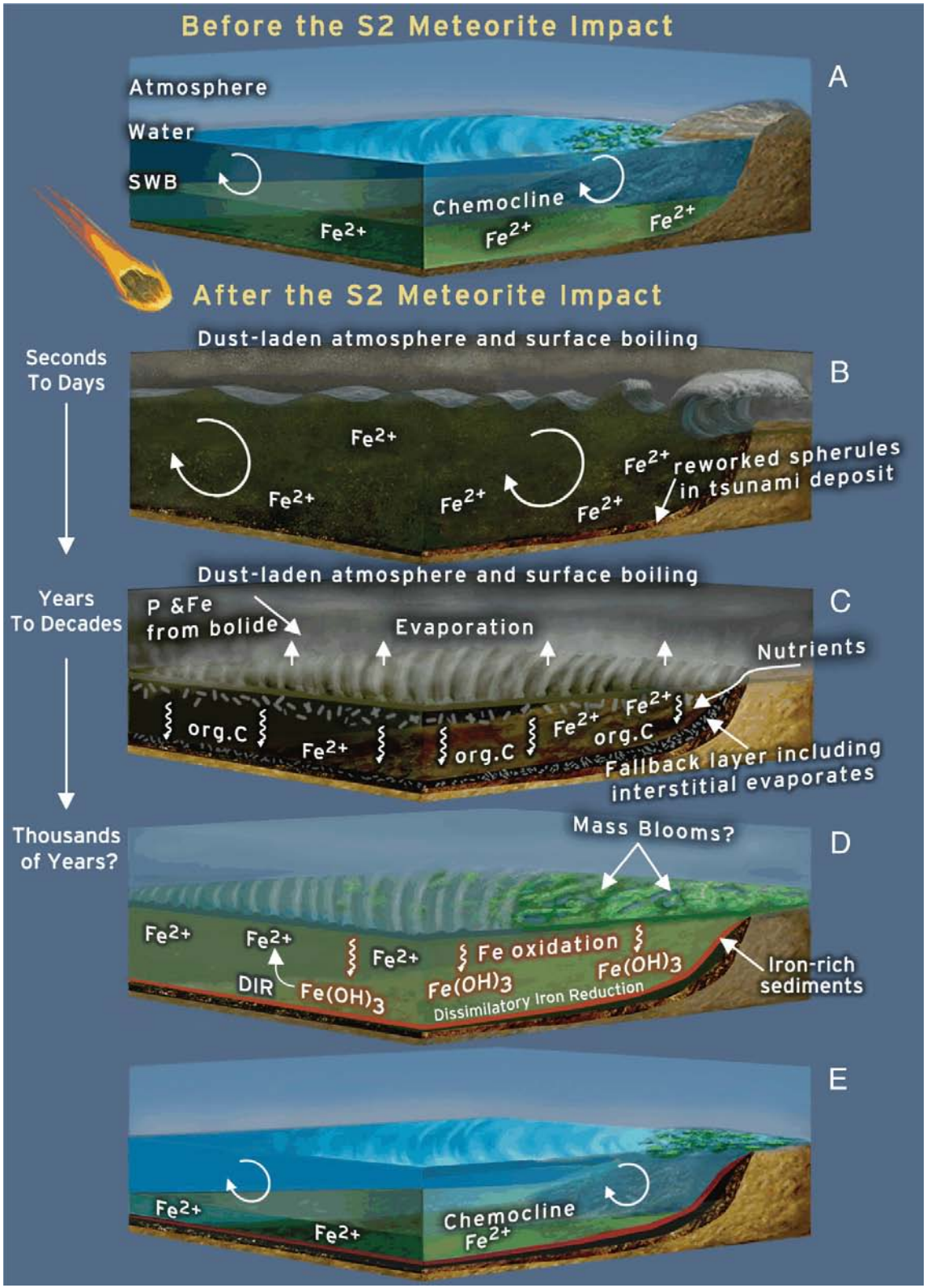
We infer that in the breakup setting of the Columbia supercontinent, large igneous province volcanism and its efficient low-latitude weathering could rapidly increase terrestrial nutrient influx into the ocean, promoting oceanic productivity and a pulsed rise in oxygen levels.

The mid-Proterozoic interval (1.8 to 0.8 billion years ago (Ga)) has long been recognized as a phase of environmental and biological stasis. Geochemical studies have suggested a generally low atmosphere oxygen partial pressure (pO_2) during the mid-Proterozoic, perhaps <0.1% present atmospheric level (PAL).

However, growing evidence supports that the redox state of the mid-Proterozoic was likely dynamic, with several intervals of high oxygen levels that punctuated overall low background levels. The earliest evidence comes from geochemical records of redox-sensitive trace metals (Mo, U, V) in the ca. 1.4 Ga Xiamaling Formation on the North China Craton.

Drabon, N., et al (2024) **Effect of a giant meteorite impact on Paleoarchean surface environments and life.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 121:doi.org/10.1073/pnas.2408721121 (available as a free pdf)

Authors' abstract: *Large meteorite impacts must have strongly affected the habitability of the early Earth. Rocks of the Archean Eon record at least 16 major impact events, involving bolides larger than 10 km in diameter. These impacts probably had severe, albeit temporary, consequences for surface environments. However, their effect on early life is not well understood.*



Here, we analyze the sedimentology, petrography, and carbon isotope geochemistry of sedimentary rocks across the S2 impact event (37 to 58 km carbonaceous chondrite) forming part of the 3.26 gigayears Fig Tree Group, South Africa, to evaluate its environmental effects and biological consequences.

The impact initiated
1) a giant tsunami that mixed Fe^{2+}-rich deep waters into the Fe^{2+}-poor shallow waters and washed debris into coastal areas,
2) heating that caused partial evaporation of surface ocean waters and likely a short-term increase in weathering and erosion on land, and
3) injection of P from vaporization of the S2 bolide.

Strata immediately above the S2 impact event contain abundant siderites, which are associated with organic matter and exhibit light and variable $d^{13}C_{carb}$ values.

This is consistent with microbial iron cycling in the wake of the impact event. Thus, the S2 impact likely had regional, if not global, positive and negative effects on life.

The tsunami, atmospheric heating, and darkness would likely have decimated phototrophic microbes in the shallow water column.

However, the biosphere likely recovered rapidly, and, in the medium term, the increase in nutrients and iron likely facilitated microbial blooms, especially of iron-cycling microbes.

[Images are from this paper.]

McGeoch, J.E.M. 92024) **Fossil and present-day stromatolite ooids contain a meteoritic polymer of glycine and iron.** INTERNATIONAL JOURNAL OF ASTROBIOLOGY 23:doi.org/10.1017/S1473550424000168 (available as a free pdf)

[Stromatolites were the first type of multicellular life. They were sheets of algal mats that built up into columns. When the first multicellular animals evolved, they almost completely wiped out stromatolites. However there are a few rare localities where stromatolites still survive, such as the hypersaline waters of Shark Bay, Australia.]

[Ooids are tiny grains of calcium carbonate secreted by stromatolites.]

[Meteorite falls were much more abundant 3 gigayears ago than today. They might have actually fertilized the waters of Earth.]

Authors' abstract: *Hemoglycin, a space polymer of glycine and iron, has been identified in the carbonaceous chondritic meteorites Allende, Acfer 086, Kaba, Sutter's Mill and Orgueil.*

Its core form has a mass of 1494 Da and is basically an antiparallel pair of polyglycine strands linked at each end by an iron atom. The polymer forms two- and three- dimensional lattices with an inter-vertex distance of 4.9 nm.

Here the extraction technique for meteorites is applied to a 2.1 gigayear old fossil stromatolite to reveal the presence of hemoglycin by mass spectrometry. Intact ooids from a recent (3,000 years ago) stromatolite exhibited the same visible hemoglycin fluorescence in response to x-rays as an intact crystal from the Orgueil meteorite.

X-ray analysis confirmed the existence in ooids of an internal three-dimensional lattice of 4.9 nm inter-vertex spacing, matching the spacing of lattices in meteoritic crystals. FTIR measurements of acid treated ooid and a Sutter's Mill meteoritic crystal both show the presence, via the splitting of the Amide I band, of an extended anti-parallel beta sheet structure.

It seems probable that the copious in-fall of carbonaceous meteoritic material, from Archaean times onward, has left traces of hemoglycin in sedimentary carbonates and potentially has influenced ooid formation.

Paleobiology.

Eberle, J., et al (2024) **A new Late Cretaceous metatherian from the Williams Fork Formation, Colorado.** PLOS ONE 19:doi.org/10.1371/journal.pone.0310948 (available as a free pdf)

[Metatherians are marsupials plus a few extinct related groups. They just barely survived the asteroid impact and were mostly displaced by placental mammals. Before the asteroid, metatherians were the dominant form of mammals.]

Authors' abstract: *Heleocola piceanus, a new, relatively large metatherian from Upper Cretaceous ('Edmontonian') strata of the Williams Fork Formation in northwestern Colorado is described, based on a recently discovered jaw fragment (MWC 9744), in addition to three isolated teeth initially referred by other studies to Aquiladelphis incus and Glasbius piceanus.*

Based upon its molar morphology, specifically the low inflated cusps, low height differential between the trigonid and talonid, and near-bunodont morphology, H. piceanus is interpreted as an omnivore with a plant-dominated diet.

Xu, C., et al (2024) **Enhanced flight performance and adaptive evolution of Mesozoic giant cicadas.** SCIENCE ADVANCES 10:doi.org/10.1126/sciadv.adr2201 (available as a free pdf)

Authors' abstract: *Insects have evolved diverse ecological flight behaviors and adaptations that played a key role in their large-scale evolutionary patterns. However, the evolution of their flight performance is poorly understood because reconstructing flight abilities of extinct insects is highly challenging.*

Here, we propose an integrated approach to reveal the evolution of flight performance of Palaeontinidae (giant cicadas), a Mesozoic arboreal insect clade with large bodies and wings.

Our analyses unveil a faunal turnover from early to late Palaeontinidae during the latest Jurassic-earliest Cretaceous, accompanied by a morphological adaptive shift and remarkable improvement in flight abilities including increased flight speed and enhanced maneuverability.

The adaptive aerodynamic evolution of Palaeontinidae may have been stimulated by the rise of early birds, supporting the hypothesis of an aerial evolutionary arms race (Air Race) between Palaeontinidae and birds.

Our results provide a potential example of predator-induced morphological and behavioral macroevolution and contribute to our understanding of how powered flight has shaped animal evolution.

[Images on this and next page are from this paper.]

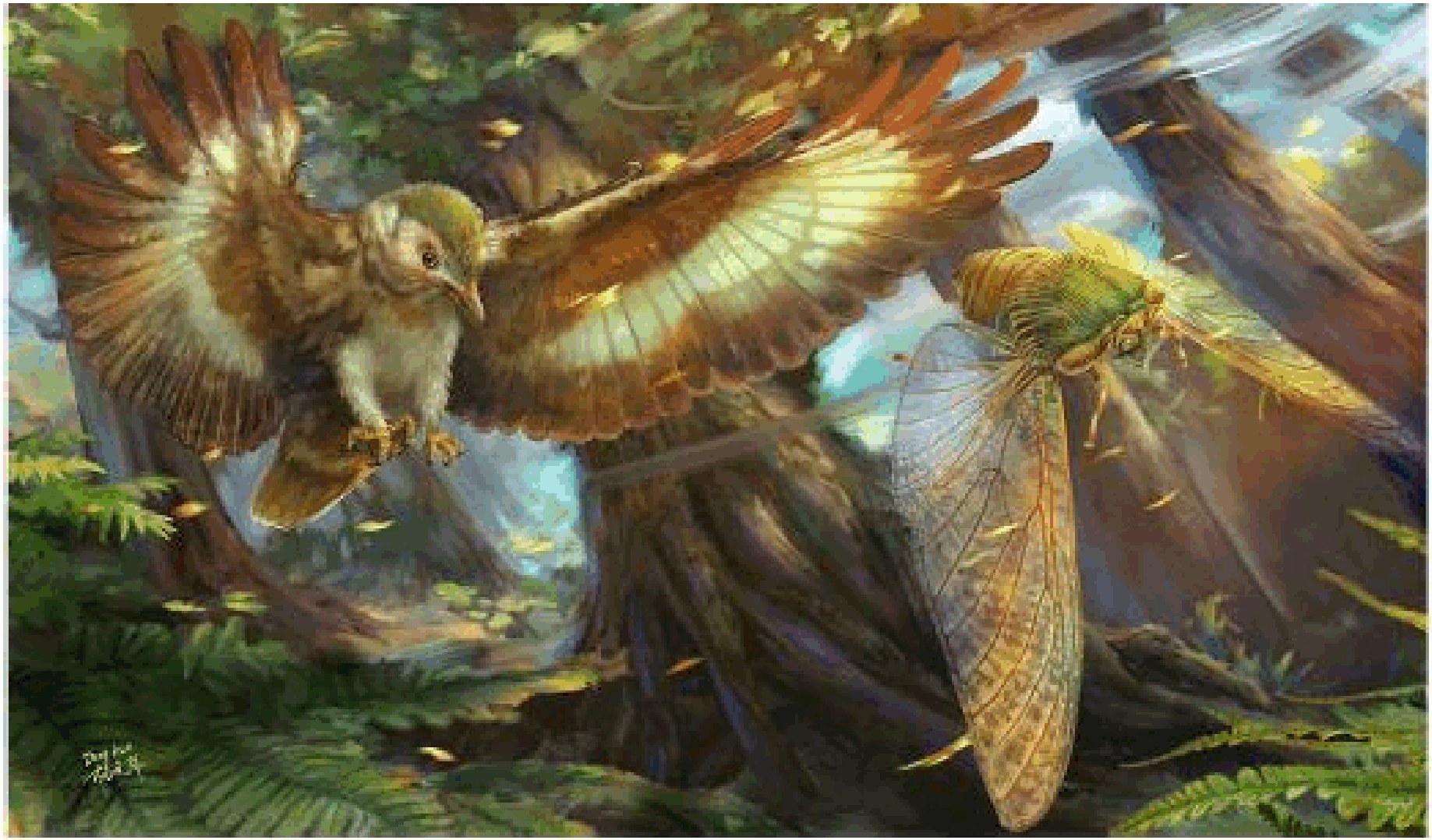


Fig. 5. Ecological restoration of predator-prey interaction (chasing flights) between early birds (*Longipteryx chaoyangensis*) and late Palaeontinidae (*B. fortunatus*) in the Early Cretaceous. Artistic reconstruction by D. Yang.

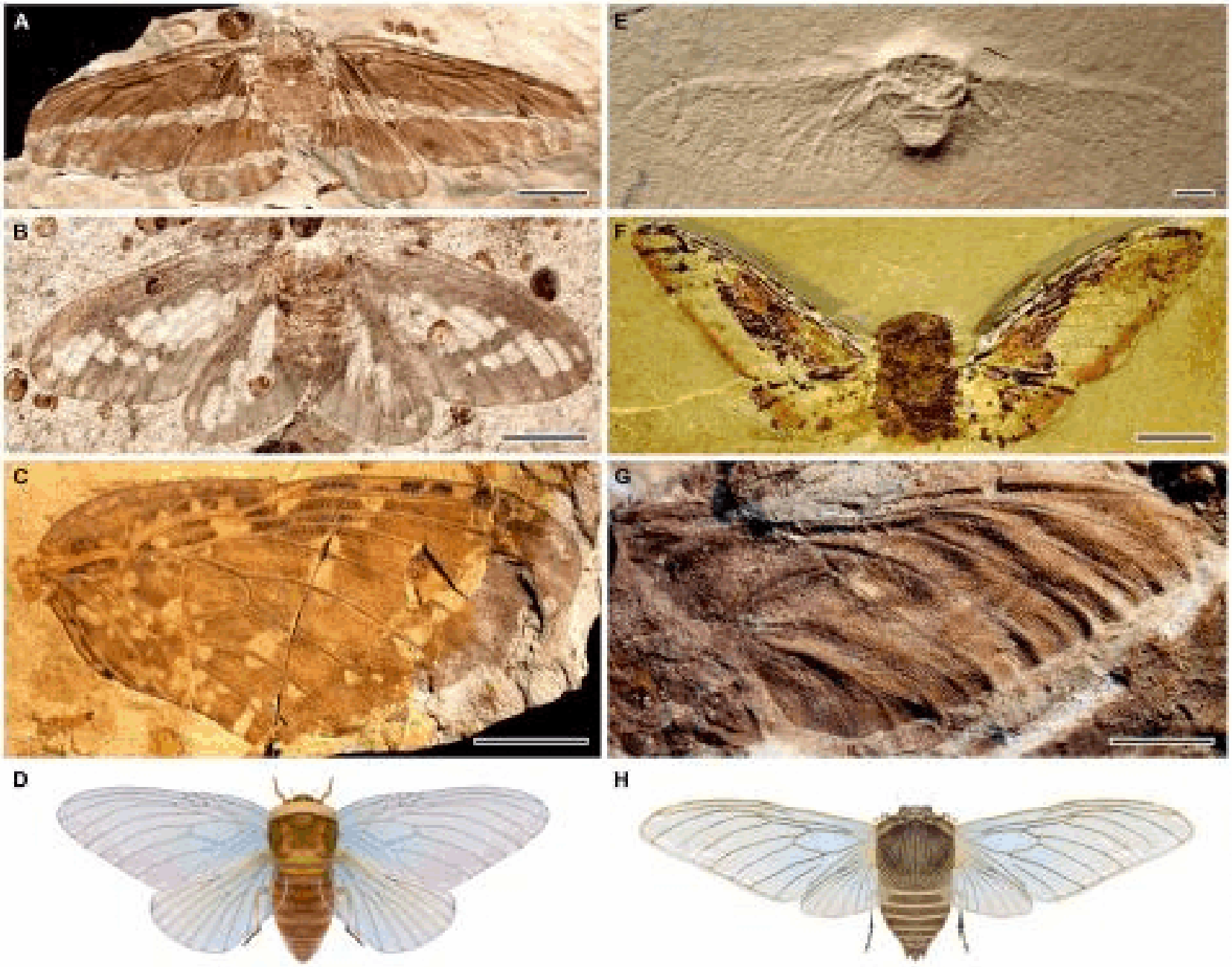


Fig. 1. Representatives of Palaeontinidae. Early Palaeontinidae (**A** to **D**) and late Palaeontinidae (**E** to **H**). (A) *Palaeontinodes reshuitangensis*, from the Middle Jurassic Daohugou Konservat-Lagerstätte, China (NIGP156791). (B) *Sinoviaococcus fangi*, from the Middle Jurassic Daohugou Konservat-Lagerstätte, China (NIGP150277). (C) *Martynovococcus punctulosus*, from the Middle Jurassic Daohugou Konservat-Lagerstätte, China (NIGP147878a). (D) Reconstruction of early Palaeontinidae based on *M. punctulosus*. (E) *Eocicada microcephala*, from the Upper Jurassic Limestone of Solnhofen, Germany (a well-preserved specimen deposited at the Museum Bergér). (F) *Boreococcus fortunatus*, from the Lower Cretaceous Crato Formation, Brazil (SMNS 65546). (G) *Nerdococcus browsei*, from the Lower Cretaceous Weald Clay Formation, England (BMB 014927). (H) Reconstruction of late Palaeontinidae based on *B. fortunatus*. Scale bars, 10 mm.

Botany.

Sun, P.F., et al (2024) **An acidophilic fungus promotes prey digestion in a carnivorous plant.** NATURE MICROBIOLOGY 9:doi.org/10.1038/s41564-024-01766-y (available as a free pdf)

Authors' abstract: *Leaves of the carnivorous sundew plants (Drosera spp.) secrete mucilage that hosts microorganisms, but whether this microbiota contributes to prey digestion is unclear.*

We identified the acidophilic fungus Acrodontium crateriforme as the dominant species in the mucilage microbial communities, thriving in multiple sundew species across the global range. The fungus grows and sporulates on sundew glands as its preferred acidic environment, and its presence in traps increased the prey digestion process.

A. crateriforme has a reduced genome similar to other symbiotic fungi. During A. crateriforme-Drosera spatulata coexistence and digestion of prey insects, transcriptomes revealed significant gene co-option in both partners.

Holobiont expression patterns during prey digestion further revealed synergistic effects in several gene families including fungal aspartic and sedolisin peptidases, facilitating prey digestion in leaves, as well as nutrient assimilation and jasmonate signalling pathway expression.

This study establishes that botanical carnivory is defined by adaptations involving microbial partners and interspecies interactions. Botanical carnivory has evolved independently at least 11 times in the plant kingdom, each group showcasing distinct molecular adaptations to attract, trap and digest insects.

Zoology.

de Flamingh, A., et al (2024) **Compacted hair in broken teeth reveals dietary prey of historic lions.** CURRENT BIOLOGY 34:doi.org/10.1016/j.cub.2024.09.029 (available as a free pdf)

Authors' abstract: *With recent advances, nuclear genome data for phylogenomic analyses can now be sequenced from minuscule quantities of DNA and from specimens that are more than a million years old.*

DNA analysis from hair is a well-established approach widely used in forensic science and wildlife conservation. Hair samples can be effectively decontaminated and can be used to identify the mammalian species from which the hair was shed.

We aimed to use advances optimized for degraded DNA to systematically identify dietary prey species from hair compacted in the teeth of two Tsavo lions that lived during the 1890s in Kenya.

Analysis of hair DNA identified giraffe, human, oryx, waterbuck, wildebeest, and zebra as prey and also identified hair that originated from lion.

DNA preservation allowed for analyses of complete mitogenome profiles of zebra, giraffe, and lion. Giraffe mitogenomes are phylogeographically partitioned, and we found that the lions ate at least two individuals that belong to a subspecies of Masai giraffe (Giraffa tippelskirchi tippelskirchi) typically found in southeast Kenya.

The lion mitogenome from a hair sample was identical to the Tsavo lion endogenous mitogenome and most closely matched other East African lions from Kenya and Tanzania.

The Tsavo lions are known to have preyed on humans. Hair 4 DNA matched the human mitogenome and showed characteristic deamination patterns typical of ancient/historical degraded DNA.

Now that we have confirmed human remains in this project, we refrain from using this information to predict ancestry and linked ethnicities of the person to whom this hair belonged.

First, the data analysis only traces one of many ancestral lines (direct maternal line) of this person. Second, even though haplogroup K has been identified in human groups of East Africa, sampling in Africa is sparse, and most studies of this region tend to target Indigenous communities to better understand ancient demographic events and miss mtDNA variation from more recent colonial movements.

Third, there may be descendants still in the region today, and to practice responsible science, we are using community-based methods to extend the human aspects of the project.

Pongracz, Peter (2024) **Cats are (almost) liquid!: Cats selectively rely on body size awareness when negotiating short openings.** iSCIENCE (not to be confused with SCIENCE) 27:doi.org/10.1016/j.isci.2024.110799 (available as a free pdf)

Author's abstract: *Various animal species can make a priori decisions about the passability of openings, based on their own size knowledge. So far no one has tested the ability for self-representation in cats.*

We hypothesized that cats may rely on their size awareness when they have to negotiate small openings.

Companion cats (N = 30) were tested with incrementally decreasing sized openings, which were either the same height, or the same width.

Cats approached and entered even the narrowest openings, but they slowed down before reaching, and while passing through the shortest ones.

Because of their specific anatomical features and cautious locomotory strategy, cats readily opt for the trial-and-error method to negotiate narrow apertures, but they seemingly rely on their body-size representing capacity in the case of uncomfortably short openings.

[Images are from this paper.]

Yao, A., et al (2024) **Passive dispersal potential of medaka eggs by attaching to waterbirds.** SCIENCE OF NATURE 111:doi.org/10.1007/s00114-024-01935-3 (available as a free pdf)

Authors' abstract: *Colonization of new habitats is a key event in forming current distributions in organisms. It has been speculated that freshwater fish eggs can be dispersed passively by attaching to or egestion from waterbirds that arrive in wetland habitats.*

Recent research showed that some freshwater fish eggs could be excreted alive from birds and then successfully hatch, but scientific evidence of bird-mediated fish dispersal is still limited to endozoochory (internal transport through a bird's digestive tract).

Here, we experimentally suggest the dispersal potential in another way or epizoochory (external dispersal by attaching to waterbirds), using medaka Oryzias latipes, which spawns on aquatic plants.

Our field experiment showed that waterbirds could carry artificial aquatic plants among waterbodies. Medaka eggs attached to aquatic plants could survive in the air for up to 18 hours with a median lethal period of 16.3 hours. Those two findings raise the possibility of the epizoochory of medaka in nature.

Although connecting waterbodies by geographic events (i.e., stream captures, sea-level changes) and disasters (floods) also cause such dispersal, it has long been speculated worldwide that freshwater fish eggs are dispersed by attaching to (epizoochory or ectozoochory) or egestion from (endozoochory) waterbirds.

It is well documented that waterbirds disperse aquatic plants, zooplankton, and various invertebrates both by epizoochory and endozoochory.

However, there is only three reported cases of empirical evidence of endozoochory in freshwater fishes and no scientific evidence of epizoochory.

In this study, we focused on the southern medaka Oryzias latipes (hereafter medaka) as a case study. Medaka is a small freshwater fish living in shallow waterbodies in Japan except Hokkaido Island.

This species lays eggs on various substrates, such as submerged aquatic plants. The picture book Flying Medaka in the Sky ("Soratobu medaka" in Japanese) reported that shoals of medaka were found in a shallow concrete pool that was used to wash trucks.

The writer proposed waterbirds such as night herons (Nycticorax nycticorax) carried medaka eggs from a nearby stream because he thought that only birds could reach both the concrete pool and the creek, and he was convinced that such waterbirds carried eggs attached to aquatic plants tangled on their feet.

Environmental Sciences.

Xu, G., et al (2024) **Jet stream controls on European climate and agriculture since 1300 CE.** NATURE 634:doi.org/10.1038/s41586-024-07985-x (available as a free pdf)

Authors' abstract: *The jet stream is an important dynamic driver of climate variability in the Northern Hemisphere mid-latitudes.*

Modern variability in the position of summer jet stream latitude in the North Atlantic-European sector (EU JSL) promotes dipole patterns in air pressure, temperature, precipitation and drought between northwestern and southeastern Europe.

EU JSL variability and its impacts on regional climatic extremes and societal events are poorly understood, particularly before anthropogenic warming.

Based on three temperature-sensitive European tree-ring records, we develop a reconstruction of interannual summer EU JSL variability over the period 1300 to 2004 CE and compare it to independent historical documented climatic and societal records, such as grape harvest, grain prices, plagues and human mortality.

Here we show contrasting summer climate extremes associated with EU JSL variability back to 1300 CE as well as biophysical, economic and human demographic impacts, including wildfires and epidemics.

Under anthropogenic climate change, the Northern Hemisphere subpolar jet stream is projected by most models to weakly shift poleward and to show enhanced sinuosity.

A wavier jet stream can result in more persistent and extreme jet stream anomalies that strongly affect mid-latitude weather patterns.

An amplified meridional configuration of the jet stream and the resulting jet stream latitudinal extremes can cause more intense and frequent extreme weather events, including increased persistence of summer heatwaves, droughts, floods and wildfires that can exacerbate and compound anthropogenically driven climate extremes.

Intensified upper-level wind speed and vertical wind shear under climate change may also contribute to more severe climate extremes and quasi-resonance in the jet stream system can result in hemispheric-scale synchronization of climate extremes.

With this multitude of drivers, many types of climate extreme are projected to increase in frequency, duration and intensity under anthropogenic warming and their interactions are projected to lead to compounding hazards and risks.

During recent decades, the number of climate extremes affecting the Northern Hemisphere mid-latitudes has increased and the associated societal impacts have intensified in high-risk regions.

Beaulieu, C., et al (2024) **A recent surge in global warming is not detectable yet.** COMMUNICATIONS EARTH AND ENVIRONMENT 5:doi.org/10.1038/s43247-024-01711-1 (available as a free pdf)

Authors' abstract: *The global mean surface temperature is widely studied to monitor climate change. A current debate centers around whether there has been a recent (post-1970s) surge/acceleration in the warming rate.*

Here we investigate whether an acceleration in the warming rate is detectable from a statistical perspective. We use changepoint models, which are statistical techniques specifically designed for identifying structural changes in time series.

Four global mean surface temperature records over 1850 to 2023 are scrutinized within. Our results show limited evidence for a warming surge; in most surface temperature time series, no change in the warming rate beyond the 1970s is detected despite the breaking record temperatures observed in 2023. As such, we estimate the minimum changes in the warming trend required for a surge to be detectable. Across all datasets, an increase of at least 55% is needed for a warming surge to be detectable at the present time.

Goosse, H., et al (2024) **A drop in Antarctic sea ice extent at the end of the 1970s.** COMMUNICATIONS EARTH AND ENVIRONMENT 5:doi.org/10.1038/s43247-024-01793-x (available as a free pdf)

Authors' abstract: *After a period of relative stability, the Antarctic sea ice extent has abruptly decreased in 2016 and has remained low since then.*

Both atmospheric and oceanic processes likely contributed to this drop but many questions remain regarding the underlying dynamics and it is unknown if this drop is unprecedented.

Here we produce a new multi-variate spatial reconstruction covering 1958 to 2023 and show that a similar drop in sea ice extent occurred at the end of the 1970s, albeit with a smaller magnitude.

Both drops show similar spatial patterns, with a higher sea ice loss in the East Antarctic sector than in the West Antarctic sector where the variability is strongly modulated by wind-driven changes. The ocean integrates the atmospheric forcing and provides memory that amplifies the magnitude of both drops.

Since 1979, corresponding to the onset of continuous estimates derived from satellite observations, the Antarctic sea ice extent has first slightly increased, reaching its highest annual mean value in 2014 before a dramatic decrease in 2016, leading to a record low in 2023.

These recent changes are so large that it has been suggested that sea ice has now shifted to a new regime compared to the period covering the late 20th century and the beginning of the 21st century.

Several studies have demonstrated the role of changes in atmospheric circulation in driving the recent sea ice loss but different origins have been identified for the different minima.

Furthermore, the transition from a positive to negative trend in sea ice extent in 2016 does not correspond to any observed shifts in the dominant modes of atmospheric variability influencing the Antarctic sea ice, such as the Southern Annular Mode, the Zonal wave mode 3 or El Niño Southern Oscillation.

Romero, A., et al (2024) **How African ungulates respond to tourist vehicles in Kruger National Park.** AFRICAN JOURNAL OF ECOLOGY 62:doi.org/10.1111/aje.13335 (available as a free pdf)

Authors' abstract: *Managers of protected areas need to balance how they use or preserve their resources, especially regarding 'road ecology'. This study focuses on Kruger National Park's (KNP) common ungulates' response to tourist vehicles.*

We answered the following questions for impala, zebra, giraffe, blue wildebeest, greater kudu and steenbok: What mediates animal flight and flight distance from a vehicle? How much of KNP is affected by roads? Are ungulates using or avoiding roads?

We sampled 55.9% of KNP's tourist roads, where we approached animals and determined whether and how far they fled. We georeferenced sightings and estimated the amount of land area along KNP's tourist roads where animals would be expected to flee from vehicles.

Of 517 animal sightings, Impala were sighted most (263) and steenbok least (32). Impala had the highest flight propensity (42.6%) and wildebeest lowest (13%). Steenbok were found closest to the road (22.13 m) and wildebeest furthest (77.6 m). Impala had the closest tolerance distance (16.63 m), with zebra furthest (44.74 m).

Impala fled the least distance (9.93 metres) and zebra fled furthest (24.52 metres). Binary logistic regressions (BLRs) showed that all species fled more consistently when closer to the road.

The amount of KNP affected by animal flight based on BLRs was largest for zebra (2.32% of the park) and smallest for kudu (0.84%).

Impala used the first 10 metres of the roadside more than expected and 10 to 20 metres from the road less. KNP's ungulates are habituated to vehicles since flight propensity was low, distribution analysis showed no-road avoidance, flight distance was short, and animals > 50 metres from the road generally do not flee.

Given the amount of KNP that is already affected by vehicle traffic, as tourism increases, the land solely devoted to wildlife will necessarily decrease.

Human Prehistory.

Yilmaz, F., et al (2024) **Reconstruction of the human amylase locus reveals ancient duplications seeding modern-day variation.** SCIENCE 386:doi.org/10.1126/science.adn0609

[Amylase is one of the most important genes in humans because it breaks down starch or complex sugars into simpler energy-giving sugars that cells need for their functions.]

Authors' abstract: *Previous studies suggested that the copy number of the human salivary amylase gene, AMY1, correlates with starch-rich diets. However, evolutionary analyses are hampered by the absence of accurate, sequence-resolved haplotype variation maps.*

We identified 30 structurally distinct haplotypes at nucleotide resolution among 98 present-day humans, revealing that the coding sequences of AMY1 copies are evolving under negative selection.

Genomic analyses of these haplotypes in archaic hominins and ancient human genomes suggest that a common three-copy haplotype, dating as far back as 800 thousand years ago, has seeded rapidly evolving rearrangements through recurrent non-allelic homologous recombination.

Additionally, haplotypes with more than three AMY1 copies have significantly increased in frequency among European farmers over the past 4,000 years, potentially as an adaptive response to increased starch digestion.

Frachetti, M.D., et al (2024) **Large-scale medieval urbanism traced by -UAV-lidar in highland Central Asia.** NATURE 634:doi.org/10.1038/s41586-024-08086-5 (availabe as a free pdf)

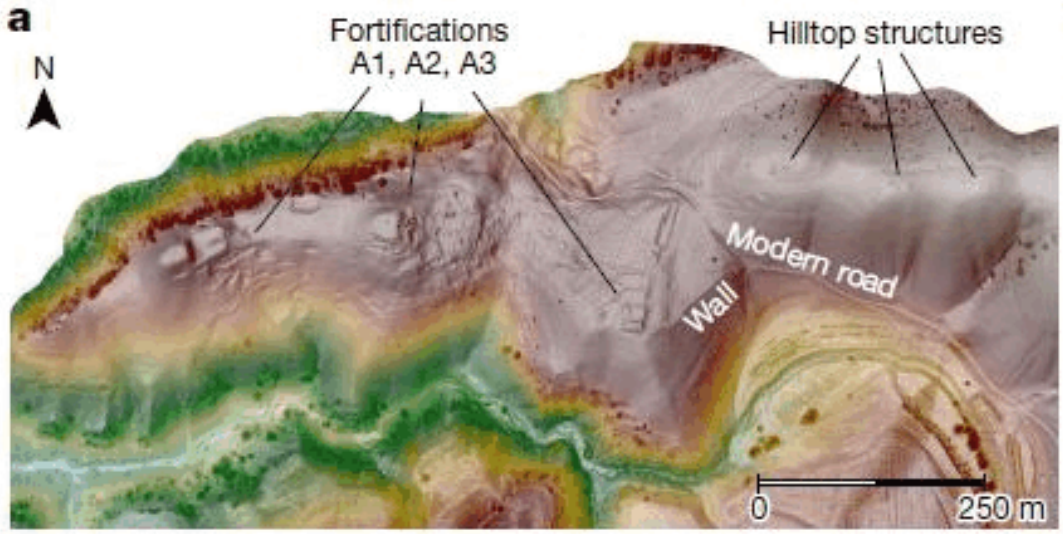
Authors' abstract: *Here we present the results of uncrewed aerial vehicle-lidar surveys in Central Asia, conducted at two recently discovered archaeological sites in southeastern Uzbekistan: Tashbulak and Tugunbulak.*

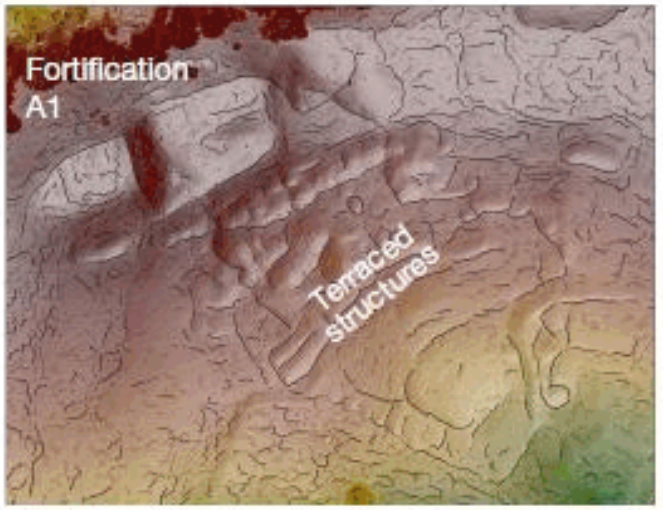
Situated at around 2,000 to 2,200 metres above sea level, these sites illustrate a newly documented geography of large, high-altitude urban centres positioned along the mountainous crossroads of Asia's medieval Silk Routes (6th to 11th century CE (Common Era).

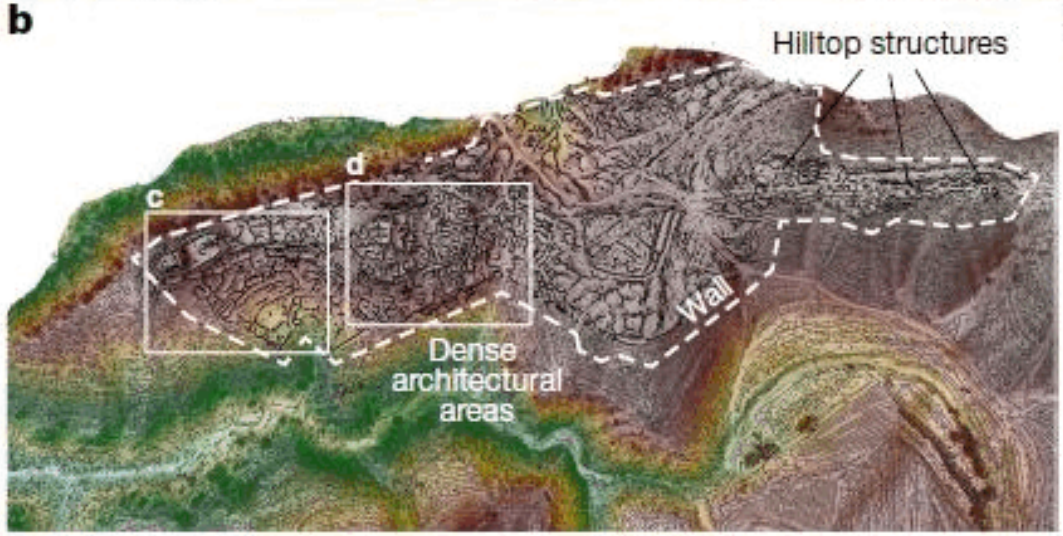
Although hidden by centuries of surface processes, our pairing of very-high-resolution surface modelling with semiautomated feature detection produces a detailed plan of monumental fortifications and architecture spanning 120 ha at Tugunbulak, thereby demonstrating one of the largest highland urban constellations in premodern Central Asia.

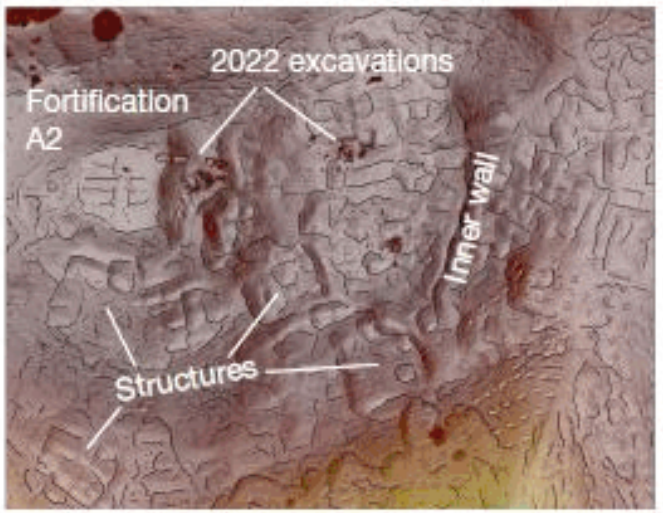
Documentation of extensive urban infrastructure and technological production among medieval communities in Central Asia's mountains, a crucial nexus for Silk Road trade networks, provides a new perspective on the participation of highland populations in the economic, political and social formation of medieval Eurasia.

[Images are from this paper.]









Human Health.

Nieft, U., et al (2024) **Increasing handgrip strength via post-hypnotic suggestions with lasting effects.** SCIENTIFIC REPORTS 14:doi.org/10.1038/s41598-024-73117-0 (available as a free pdf)

Authors' abstract: *In our study, we suggested participants to feel strong during hypnosis and tested if that affected their handgrip strength.*

Handgrip strength is measured via a hand dynamometer and indicates muscle strength and participants' general medical condition. In addition, we obtained subjective ratings of strength via a visual analogue scale.

We developed a hypnosis intervention to increase strength and tied the feeling of strength to a post-hypnotic power anchor. Participants could activate this power anchor afterwards to feel strong again.

We also had a randomized control group that read Arnold Schwarzenegger's autobiography instead of hypnosis. We tested the effect of the post-hypnotic power anchor on two experimental sessions separated by one week.

Our data show that participants in the hypnosis group felt significantly stronger when they activated their post-hypnotic power anchor compared to their own baseline, both in the first and second experimental session.

In addition, participants in the hypnosis group showed a significant increase in objective handgrip strength compared to their own baseline one week after the hypnosis session.

We conclude that our hypnosis intervention primarily improved strength perception and secondary objective handgrip strength. Our intervention can help patients to improve their medical condition and athletes to improve their sport performance.

Ahmadi, M.N., et al (2024) **Device-measured stationary behaviour and cardiovascular and orthostatic circulatory disease incidence.** INTERNATIONAL JOURNAL OF EPIDEMIOLOGY 53:doi.org/10.1093/ije/dyae136 (available as a free pdf)

[Standing all day isn't any healthier than sitting.]

Authors' abstract: *Previous studies have indicated that standing may be beneficially associated with surrogate metabolic markers, whereas more time spent sitting has an adverse association.*

Studies assessing the dose-response associations of standing, sitting and composite stationary behaviour time with cardiovascular disease (CVD) and orthostatic circulatory disease are scarce and show an unclear picture.

We used accelerometer data from 83 013 adults (mean age ± standard deviation ¼61.3±7.8; female¼55.6%) from the UK Biobank to assess daily time spent sitting and standing. Major CVD was defined as coronary heart disease, heart failure and stroke.

Orthostatic circulatory disease was defined as orthostatic hypotension, varicose vein, chronic venous insufficiency and venous ulcers. To estimate the dose-response hazard ratios (HR) we used Cox proportional hazards regression models and restricted cubic splines. The Fine-Gray subdistribution method was used to account for competing risks.

During 6.9 years of follow-up, 6,829 CVD and 2,042 orthostatic circulatory disease events occurred. When stationary time exceeded 12 hours/day, orthostatic circulatory disease risk was higher by an average HR of 0.22 per hour.

Every additional hour above 10 hours/day of sitting was associated with a 0.26 higher risk. Standing more than 2 hours/day was associated with an 0.11 higher risk for every additional 30 minutes/day.

For major CVD, when stationary time exceeded 12 hours/day, risk was higher by an average of 0.13 per hour. Sitting time was associated with a 0.15 higher risk per extra hour. Time spent standing was not associated with major CVD risk.

Time spent standing was not associated with CVD risk but was associated with higher orthostatic circulatory disease risk. Time spent sitting above 10 hours/day was associated with both higher orthostatic circulatory disease and major CVD risk.

The deleterious associations of overall stationary time were primarily driven by sitting. Collectively, our findings indicate increasing standing time as a prescription may not lower major CVD risk and may lead to higher orthostatic circulatory disease risk.

Modern Humans.

Michel-Mata, S., et al (2024) **The evolution of private reputations in information-abundant landscapes.** NATURE 634:doi.org/10.1038/s41586-024-07977-x (available as a free pdf)

Authors' abstract: *Reputations are critical to human societies, as individuals are treated differently based on their social standing.*

For instance, those who garner a good reputation by helping others are more likely to be rewarded by third parties. Achieving widespread cooperation in this way requires that reputations accurately reflect behaviour6 and that individuals agree about each other's standings.

With few exceptions, theoretical work has assumed that information is limited, which hinders consensus unless there are mechanisms to enforce agreement, such as empathy, gossip, or public institutions.

Such mechanisms face challenges in a world where empathy, effective communication and institutional trust are compromised. However, information about others is now abundant and readily available, particularly through social media.

Here we demonstrate that assigning private reputations by aggregating several observations of an individual can accurately capture behaviour, foster emergent agreement without enforcement mechanisms and maintain cooperation, provided individuals exhibit some tolerance for bad actions.

This finding holds for both first- and second-order norms of judgement and is robust even when norms vary within a population. When the aggregation rule itself can evolve, selection indeed favours the use of several observations and tolerant judgements.

Nonetheless, even when information is freely accessible, individuals do not typically evolve to use all of it. This method of assessing reputations, 'look twice, forgive once', in a nutshell, is simple enough to have arisen early in human culture and powerful enough to persist as a fundamental component of social heuristics.

The theory of indirect reciprocity helps explain how cooperation can arise when individuals lack a shared history of social interactions. Without personal experience, we often decide how to interact with someone based on our information about their past interactions with others.

In the simplest model, everyone engages in pairwise interactions through a one-shot donation game (a simplified prisoner's dilemma) between a potential donor and a recipient. The donor can either cooperate, paying a cost to provide a benefit to the recipient, or defect, incurring no cost and generating no benefit.

Donors can act unconditionally by always cooperating or always defecting, or they can condition their behaviour on the recipient's reputation (discriminate), donating only if they perceive the recipient to have good social standing.

The donor's action may result in the donor gaining a good reputation in the eyes of a third party, so that the donor may expect to receive donations from the third party, hence the term indirect reciprocity.