
OPUNTIA
574

Early June 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.

ABOUT THE COVER

2024-05-31

photos by Dale Speirs

The lilacs are in bloom in Calgary. These were in the backyard of Chez Opuntia.

LILAC FESTIVAL 2024

2024-06-02

photos by Dale Speirs

[Previous reports were in OPUNTIAs #343, 380, 415, 444 and 550.]

Calgary is a great city for street and ethnic festivals. The season traditionally begins on the first Sunday in June with the Lilac Festival in the Mission district of central Calgary. The event is the biggest street festival of the season with 50,000 Cowtowners along 4 Street SW from 12 Avenue to 26 Avenue.

The street is lined with hundreds of food trucks and kiosks. Each of the side avenues and parks has music acts or other entertainment. The festival is held just before the rainy season begins and usually has sunny weather.

Thereafter follows a pause because June is the rainiest month of the year. Then Canada Day on July 1, and the Calgary Stampede rodeo for ten days in early July. The weekend after the Stampede the festivals kick into high gear, with two or three ethnic groups or street fairs every weekend until Labour Day.

And so to the Lilac Festival on 4 Street SW. There are no lilacs on 4 Street SW.

The shrubs grow up to 4 metres in diameter and are not suitable for streets.

Above: Immediately south of the Mission district are the Roxboro and Rideau districts, who tried a cute piece of piggy-backing.

Lots of music on the side avenues.

The Ukrainian dance troupe drew a very good crowd.

I met up with my brother Neil, who is a food truck junkie like myself. I'm wearing the cowboy hat and we are both enjoying smokies.

At the 12 Avenue SW end of the festival was Central Memorial Park, also part of the fun. The Carnegie Library is in the background.

Above: Good organization, putting a cold drinks kiosk next to a hot spices booth.

At near left: Made from real dogs?

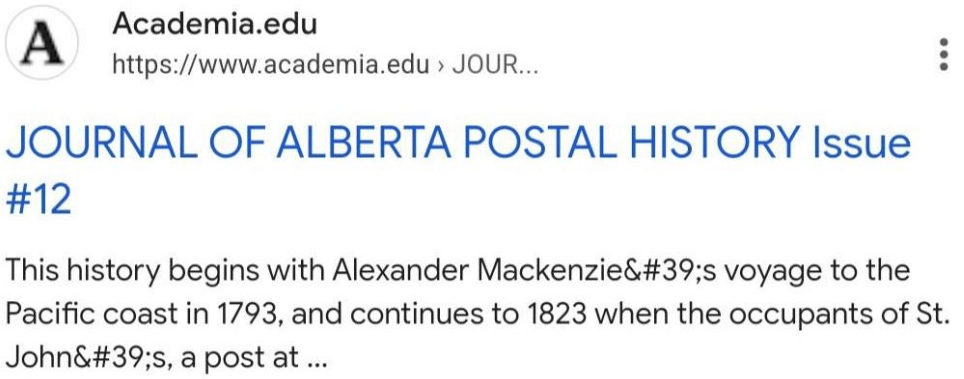
THE FUTURE IS FRIGHTENING
by Dale Speirs

Like most people, I occasionally Google my name or related items just to make certain there is no rubbish online about me. I'm not on any social media such as Facebook, X formerly Twitter, Instagram, Tik Tok, or whatever else is trending.

There are four other Dale Speirs names posting online, all from Glasgow, Scotland. That is not surprising since my father's ancestors came from a village just west of that city. Speirs is a common name in the west district. My Scottish counterparts seem to be okay. One is a young musician and the others are engineers or tradesmen.

I publish JOURNAL OF ALBERTA POSTAL HISTORY, now in its 33rd installment. I am writing the history of post offices in Alberta on a district by district basis. Issues are available as free pdfs from either Academia.edu (independent.academia.edu/DaleSpeirs) or the Postal History Society of Canada website (www.postalhistorycanada.net/php/StudyGroups/Alberta).

Now for the frightening part. Google has proudly announced that online searches will be conducted by their AI software. Unfortunately it has been producing garbage. I got the following results in May when I checked JAPH.



The text is gibberish, scraped from who knows where but not the summary of the actual JAPH #12, which was about whiskey fort post offices in southwestern Alberta. Alexander Mackenzie had nothing to do with southern Alberta post offices, nor have I ever written about him anywhere.

If you click on the actual pdf, you will get the correct issue. The problem is that users may be decide the issue wasn't for them based on the blurb and pass it by.

The next result was even worse. Again the text has nothing to do with JAPH #15, which was about railroad post offices in southern Alberta. Not only that, the province of Nova Scotia is at the opposite end of the continent.

I registered a complaint with Google via an automated form but have little confidence that any human will ever look at it.

Those in the philatelic community who have the URLs for JAPH will get the correct information. What bothers me is that outsiders who are interested will be led astray. Deepfakes are trouble enough already, but these diversionary tactics will be even worse.

All the publications I edit, whether philatelic or SFnal, are locked pdfs to prevent bots or IP thieves from scraping articles and passing them off as their own. They can of course download the entire pdf but as long as that stays intact then I have no concern. No doubt the advanced hackers can easily bust into a locked pdf but few if any would think it worth the trouble.

If you ever see a flammatory post on any social media purporting to come from Dale Speirs of Calgary, it is a fake. Do me a favour and let others know if such a thing should happen. I can't answer for my Scottish relatives.

My observation is that those involved in flaming, trolling, and deepfakes do not operate in the postal history part of the Internet, which seems peaceful. The flame wars seem to be gamers or Americans commenting on their politics.

COWTOWN FICTION
photos by Dale Speirs

While there have been genre stories using Calgary as a setting, they are relatively scarce. Most Cowtown novels I've seen are dull mainstream fiction about someone agonizing over their childhood or ancestry. I've found some science fiction stories which I mentioned in OPUNTIA #330, and mystery stories (issues #361 and 368).

Recently while browsing the shelves at the Calgary Public Library, I came across a series of chapbooks by P.D. Workman. These were mystery novellas about a Cree Metis named Margie Patenaude, who was a homicide detective with the Calgary Police Service. Her biggest problem was getting people to pronounce her surname properly (PAT-en-ode).

She found herself specializing in murder victims found in Calgary parks. The Patenaude books are loaded with lots of infodumps about Calgary which annoy Cowtowners like myself but which we can tolerate because the majority of readers know little about Calgary.

Pause for a digression. I worked 31 years for the City of Calgary Parks Dept, retiring in 2010. I began as a gardener, then Pest Control Foreman, then 15 years as a District Maintenance Foreman in various districts across the city. My final decade was Trouble Calls Supervisor, a city-wide position. When I came across these books, they naturally caught my attention.

OUT WITH THE SUNSET (2021) was the first novella in the series. The murder was a man stabbed to death in Fish Creek Provincial Park. But first another digression.

Calgary is Canada's answer to Los Angeles, with suburbs sprawling onto the prairies to the east and up into the Rocky Mountain foothills in the west. In doing so, the city swallowed numerous villages whole and surrounded provincial parks that at one time were out in the country.

Those parks, even though entirely inside the city now, are operated by the provincial Ministry of Environment. The city Parks Dept, and myself, never had anything to do with them.

Provincial law enforcement is contracted to the Royal Canadian Mounted Police. One would think provincial park crimes would be investigated by the RCMP, but the Patenaude stories have the CPS investigating in such parks. Fish Creek originally formed the southern boundary of Calgary but the suburbs long ago jumped over it and now extend far out on the prairies.

Besides the murder, Patenaude's other problem was a bratty teenage daughter she was trying to raise as a single mother. The investigation took place during the height of the COVID-19 pandemic. This hampered the sleuthing because video surveillance cameras showed most people in masks.

The dead man had cash on him, so the motive wasn't robbery. Back-tracking people on the cameras was drudgery but finally a suspect was traced to a house and identified. The murder was a misunderstanding between a teenager who had a hard life and a self-righteous victim.

Fish Creek just before it flows into the Bow River.

LONG CLIMB TO THE TOP (2021) had Margie Patenaude called out to Glenbow Provincial Park on the northwest corner of Calgary in the Bow River. The deceased was found quite a distance from the parking lot.

I could sympathize with the unhappiness of Patenaude and the police investigators about investigating the crime scene. Glenbow Park is in a steep valley and every direction you walk is uphill. I know this from personal experience, having hiked the length both upstream and downstream.

Unfortunately for forensics technicians, not everyone is murdered in a parking lot or a bungalow. The deceased was in a natural area only reachable on foot after a long hike.

The killer deliberately planted clues to taunt the police. He had washed out of police academy and was acting up, trying to show them he was superior to them.

A typical view of Glenbow Park.

DARK WATER UNDER THE BRIDGE (2021) was next in the series. Margie Patenaude was called out for a body in a city wetlands area called Ralph Klein Park. He was a mayor of Calgary and later Premier of Alberta.

The park is way down yonder on the southeast corner of Calgary. It is a municipal park opened in 2011, so I never had anything to do with it. Thus the infodumps were as helpful to me as to any outlander.

The killer had severe psychological problems. Patenaude almost joined the first victim in a running battle across the park but survived to another day and another case.

Following on in the series was IMMERSED IN THE VIEW (2021). Margie Patenaude was strolling in Valleyview Park, a slope on the left bank of the Bow River with an impressive view of the downtown skyline. Impressive in a different way was her finding a body on the river's edge.

From there events transpired. The victim was an aboriginal male who got on his friend's nerves by yammering too much about Reconciliation. He was accidently killed while being told to shut up.

This book will not be easily understood by non-Canadian readers. You had to be a Canadian on Canada Day 2021 to really understand the background. That day specifically, not just any other Canada Day, and during the initial stages of the Reconciliation Crisis.

SKIMMING OVER THE LAKE (2022) took Margie Patenaude to Elliston Park on the east-central edge of Calgary. This was formerly the Forest Lawn landfill site until it was topped off as an artificial mesa overlooking the surrounding flatlands. A large pond was created in the middle of the park.

The body was floating out in the middle of the pond, partially under a raft. Eventually the victim was identified as a pedophile who had been taken out by a vigilante using a radio-controlled toy boat.

HAZARD OF THE HILLS (2022) brought Margie Patenaude to Edworthy Park, where a woman was found dead at the base of a 70-metre cliff. The park is a cliff along the south bank of the Bow River in central Calgary, just west of the downtown core.

The transcontinental railroad squeezes along the riverbank. There is just enough room to allow footpaths on either side. The cliff is heavily forested because the trees are shaded, but at various points there are active landslide zones.

When I was a Parks foreman, I never dared to drive down the access road in winter. Getting down was easy but getting back up to the plateau has given many a driver the cold sweats. But I digress.

There were two culprits in the story. One was involved in a hit-and-run death years ago. The present-day murderer tried to cover up that incident by murdering a witness who threatened to blab.

Looking downstream on Bow River, with the Edworthy cliffs in the distance.

LET MARS DIVIDE ETERNITY IN TWAIN: PART 18
by Dale Speirs

[Parts 1 to 17 appeared in OPUNTIAs #310, 321, 328, 332, 337, 354, 357, 369, 372, 384, 401, 429, 437, 466, 495, 503, and 549. Reviews of the WAR OF THE WORLDS movies appeared in #289.]

First Contact.

A TRIP TO MARS was a 1918 Danish silent movie. The original title was HIMMELSKIBET, which translates as Heaven Ship. The film was based on a novel by Sophus Michaelis and adapted for the screen by Ole Olsen.

I watched a restored colourized version on YouTube. This was a full-length movie and among the earliest science fiction films to have a wide audience. Silent films were commonly marketed internationally because it was easy to translate the dialogue cards, as opposed to dubbing or subtitling talkies.

The plot was hackneyed even then, with a professor, his spaceship, the handsome hero, et al off to visit Mars. They found a utopian human (or humanoid) civilization with pyramidal temples and everyone dressed in togas. What is it with utopias where everyone dresses identically? If not togas, then silver jumpsuits. Oh, and the Martians were vegetarians. On a desert planet.

The Martian king's daughter fell in love with the handsome hero. Speeches were made about pacifism, which were more significant to the theatre audiences back then because World War One was still grinding away.

The movie wasn't so much about Mars as it was about pacifism and why can't we all get along? History since then and current events today demonstrate the futility of the pacifist movement.

"Radio V-Rays" by Jan Dirk (1925 March, WEIRD TALES, available as a free download from https://gutenberg.org) was about two college students back when radio was cutting edge science.

They were experimenting when they intercepted transmissions from a Martian leader. He was broadcasting to subordinates and told them to press their thought cones to their foreheads and he would teleport them. The students did so with their headsets and were sucked out to Mars. No one back on Earth knew what happened.

SHUDDERING CASTLE (1936) by Wilbur Fawley (pseudonym of Wilbur Finlay Fauley) is available as a free download from https://gutenberg.org

The narrator Livingston Royce came from old money. His brother Henry fitted up an astronomical observatory on the family's summer estate. Henry hoped to communicate with Martians by radio.

With their sister Jane, all three were in their 60s with no children. Their orphaned niece Patricia lived with them. Henry's assistant Serge Olinski and the butler Orkins completed the household.

Henry and Olinski established communication with Martians. A newspaper reporter named McGinity was snooping about trying to get an exclusive about the contact. Various other plot complications occurred, too numerous and convoluted to mention. A rival scientist LaRauche was among them.

Eventually a Martian arrived, crashing his spaceship on the Royce estate. It, or he, was humanoid and looked much like an apeman. Once the word got out, the mansion was besieged by the press and rubberneckers.

Mr. Zzyx, as the Martian was named, seemed more of a passenger than astronaut. Found inside the spacecraft was a manuscript with an extensive text, which kept translators busy. Eventually they broke the code and discovered that:

"*... the strange, geometric markings on the planet, as studied by astronomers on earth, are not a canal system, or even man-made. The lines, or bands, which some of our astronomers believed to be canals, constituting a system of irrigation, are really deep wide canyons, ten to twelve miles in width at the rim, and descending 2,000-3,000 feet below the sterile plateau-surface of the planet, with cultivated vegetation in the bottomlands.*"

"*The rims of these canyons are fortified with very high and very wide stone walls, a military defensive work, with watch-towers, designed as a protection for the white people who inhabit the canyons from attack by their ancient enemy, the ape-men, who swarm over the tropical regions in countless numbers.*"

(Pause for hollering from wokers and cancellers.)

"*The wind, it seems, blows eternally on Mars, kicking up a fearful dust from the reddish deserts, and making the planet a veritable dust bowl. I must give Schiaparelli credit, however, for his discovery of the canals, in 1877, for these canyons do really serve as water routes. Running through them are great aqueducts which tap the arctic and antarctic regions, into which the Martians pump water from the melting snow and ice caps.*"

"*As there are no seas on the planet, and very little rainfall, this water is stored in huge reservoirs, and used largely for irrigating the bottom-land of the canyons, thus rendering them extremely fertile. Around these reservoirs the white inhabitants cluster, not in cities, but in vast cliff-dwelling communities, the sides of the canyons being honeycombed with homes.*"

"*The wind-power of the planet is converted into electrical energy in immense funneled power-houses, just as we harness water-power on the earth. The current generated by this method is used to turn the wheels of industry, propel the passenger and freight trains which rumble through the tunnels in the cliffs, connecting the various communities, operate the elevators and escalators uniting the tiers of cliff homes with the fortifications at the rim and the bottom-lands, as well as supplying light and heat for all of the inhabitants.*"

The story got funnier as the text rolled along:

"*For instance, a specialized offspring is being produced on Mars to save the white race from extinction. Respiratory diseases and their frightening toll of lives, caused by the climatic extremes and the particles of sand in the air, have long been a national calamity.*"

"*For the begetting and production of the young, the healthiest and most beautiful women of the planet give themselves up to the State as a patriotic duty. Their mates are carefully selected for their mental and physical fitness.*"

McGinity spotted that the scroll was a fake when he held it to the light and saw an American paper manufacturers watermark. Taking Livingston into his confidence, the two men began investigating further. LaRauche, who had dropped out of the story at the beginning, reappeared. He had engineered a massive hoax to discredit Henry, his bitter enemy.

"The Waning Of The World" by W. Elwyn Backus was serialized in WEIRD TALES in four issues from November 1925 into 1926. Available from https://gutenberg.org as a free download.

Robert Sprague had completed an anti-gravity vessel powered by mythonite. (They didn't have unobtainium in those days.) Called 'Sphere' because of its shape, it was also equipped with a death ray. Professor Palmer and his laboratory assistant Henry G. Simms heard of Sphere and inveigled Sprague to use it as a spacecraft. Palmer was an astronomer obsessed with Mars, so the destination was thus determined.

Off Palmer and Sprague went in Chapter 8, joined as they discovered to their dismay, by a stowaway. He was a newspaper reporter Hugh Taggert. Other alarums ensued during the two-week voyage to Mars. Weightlessness caused a variety of problems which had to be explained. Zero-G was not an obvious concept to the readers of 1925. Navigating proved tricky but some jury-rigging got them to Mars.

They landed on Mars, carefully picking a spot far enough from the cities along the canals to avoid attack by nervous Martians. They were met by the inhabitants, who were humanoid. Their king put them up in palace rooms, after which the two sides commenced to learn each other's language.

Emperor Kharnov, as he was, revealed himself as a stern ruler. There was a fair maiden in distress, a beautiful princess to woo, and all the standard impedimenta of Martian civilizations. The alarums were predictable and culminated with the Earthlings fleeing home. They took with them some Martians, gold bullion, and diamonds. Big projects were begun because of them. As an example:

"*Construction of a huge device for flashing messages to Mars by means of reflection of the sun's rays was commenced in the Sahara Desert. A code furnished by the emperor was to be used. Though wireless had been considered, the enormous distance was judged to be too great to make that method of communication practicable, even with the most powerful apparatus then conceivable.*"

The handsome young hero wed the Martian princess. Here are the final paragraphs of the story.

"*More surprising, however, may have been the choice of these two young beings of the scene of their honeymoon. Not a tour of Europe, nor of the natural wonders of our own great country. They simply disappeared into the great Canadian wilderness."*

"There, if one could have followed them, they might have been discovered happily paddling a well-loaded canoe up a winding stream of still, friendly, wooded shores. Above, the clear blue sky rivaled the crystal transparency of the rippling stream. A hawk drifted across the ribbon of blue and was lost again beyond the maze of tall pines. Somewhere a woodpecker drummed stoutly upon a dead limb."

"Softly, easily, the slim craft rounded a bend to the even thrust of two pairs of vigorous, willing young arms. Like the hawk, it was soon lost to view, lost in a twilight wilderness of love and peace."

Speaking as someone who has traveled many times in the Canadian wilderness, I hope the young couple had plenty of insect repellent.

"When the Atoms Failed" by John W. Campbell Jr (1930 January, AMAZING STORIES, available as a free download from https://gutenberg.org) was the first story published by one of the major figures of magazine science fiction.

At the time he was a student at the Massachusetts Institute of Technology. The story was about Martian invaders and the superscience inventions used to defeat them. About half was infodumps, mostly cribbed from his classroom notes about the physics of his time.

The Martians were eventually defeated by disintegration rays and tractor beams, apparently powered by what is known as frame-dragging in relativistic physics. The scientist who invented the devices became the ruler of Earth. Benign, of course, as all wise scientists are.

WORLD WIDE PARTY ON JUNE 21

Founded by Benoit Girard (Québec) and Franz Miklis (Austria) in 1994, the World Wide Party is held on June 21st every year. 2024 will be the 31st year of the WWP. Mark your calendars now!

At 21h00 local time, everyone is invited to raise a glass and toast fellow members of zinedom around the world. It is important to have it exactly at 21h00 your time. The idea is to get a wave of fellowship circling the planet. Rescheduling it to a club meeting or more convenient time negates the idea of a wave of celebration by SF fans and zinesters circling the globe.

At 21h00, face to the east and salute those who have already celebrated. Then face north, then south, and toast those in your time zone who are celebrating as you do. Finally, face west and raise a glass to those who will celebrate WWP in the next hour.

Raise a glass, publish a one-shot zine, have a party, or do a mail art project for the WWP. Let me know how you celebrated the day.

CHECKMATE: PART 4
by Dale Speirs

[Parts 1 to 3 appeared in OPUNTIA #412, 473, and 544.]

Novels.

I don't read romance novels as a rule, mainly because they rely on idiot plots where the characters could have resolved their problems in the first chapter had they used a single iota of common sense. CHECK AND MATE (2023) by Ali Hazelwood was a romance involving two chess players, so I deigned to take it off the library shelf and read it.

The protagonist was Mallory Greenleaf, who lived in poverty while supporting her mother and sisters. She was a chess player on the side. The plot began moving when she defeated world champion Nolan Sawyer at a charity tournament.

That miffed him. The win got her on the championship trail for cash prizes to support her family. This being a romance novel, the real game was off the board. There were some politics and dastardly deeds in the chess world, to be sure.

The knives were out for Nolan in the tournament room but being a handsome chap he was more interested in groupies. Mallory tripped him up emotionally. As she remarked, "*I wish I had the prospect of exchanging more than gambits with him.*"

Their romance was a delight to the FIDE because the news media suddenly had something interesting to write about professional chess. Events worked out well, although the epilogue was a bit gluey. Then again, romances generally are.

Gimme That Old Time Radio.

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

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.

"The Midway Robberies" aired on 1949-01-02. An automatic chess player Ayjab Jr was the centre of attention. Jed Claymore was a midway owner who called in Blackstone for advice. Customers were being robbed and attendance was declining as a result.

The suspect was a gypsy fortune teller but she always had an alibi. She was a suspect because all of the victims had their palms read by her just before they were robbed.

As Blackstone and Rhoda talked to the gypsy, a shriek came from the other end of the midway. A woman's diamond bracelet had suddenly disappeared from her wrist, as if by magic. Next to the scene of the crime was Ayjab Jr. While others fretted, Blackstone engaged Ayjab Jr in a game of chess while Rhoda went for the police.

He later explained there was no such thing as an automaton capable of playing chess. There was always a man hidden inside the cabinet. Blackstone played the game to keep the thief inside the cabinet until police arrived.

Revival Radio.

"The Chess Master" aired on 1982-05-28 on the CBS RADIO MYSTERY THEATER, written by Murray Burnett. The narrator Charlie Williams was wandering aimlessly when in a skyscraper lobby he saw a man sitting at a chess board.

A bystander Ben Bradley hysterically warned Charlie not to play the game. The man at the board calmed Ben, who then left. Charlie said he wasn't a good player but sat down at the board anyway.

The man introduced himself as Lawrence Chessman, apologizing for his surname as just a coincidence. He suggested each of them put up a worthless personal item as stakes in the game.

Charlie had just been fired, so he offered his key to the executive washroom he wouldn't be using anymore. Chessman threw in some sort of trinket, not specified.

Chessman gave Charlie the white pieces. Both made Pawn to King 4 as their opening moves. The opening moves were identified by Chessman as the Muzio Gambit. Charlie won the game.

Chessman handed over his trinket but added a bizarre condition. Someday someone would approach Charlie and say: "*The Muzio Gambit is a very unsound opening*". At that point, Charlie must hand over the trinket immediately.

Charlie foolishly agreed. The next day a woman approached and said the phrase. She handed Charlie an envelope and walked away with the trinket. In the envelope were five new $1,000 bills.

Pause for digression. I question whether anyone, then or now, could deposit five $1,000 banknotes without the bank teller stepping on the silent alarm. What would Charlie do with those banknotes?

Charlie went back to Chessman with many questions. The latter was unhelpful and insisted they play a game while talking. The trinket was identified at this point as a coin. Time passed and complications and chess games occurred.

This episode was 43 minutes long, a 60-minute episode by network standards, less commercials. It could have been shortened to a half-hour episode, or 20 minutes playing time, and been much better paced.

Be that as it may, Chessman yanked Charlie around, including threatening his wife. The FBI suddenly appeared and arrested Chessman for espionage. He used the coin to transmit information to Soviet spies. This seemed like a complicated method of communication.

In the epilogue, reference was made to the Bobby Fischer-Boris Spassky world chess championship of 1972. The subtle suggestion was that maybe the tournament had something to do with Soviet espionage.

Seen at New Central Library in downtown Calgary on May 23.

I took these photos at the 2023 Calgary Stampede in the commercial exhibits building. I have no doubt that cowboys played chess back when. We did on our ranch.

SEEN IN THE LITERATURE

Stars.

Heintz, K.E., et al (2024) **Strong damped Lyman-a absorption in young star-forming galaxies at redshifts 9 to 11.** SCIENCE 384:doi.org/10.1126/science.adj0343

[Star and galaxy formation seems to have begun much sooner after the Big Bang than expected.]

Authors' abstract: *Primordial neutral atomic gas, mostly composed of hydrogen, is the raw material for star formation in galaxies. However, there are few direct constraints on the amount of neutral atomic hydrogen (H i) in galaxies at early cosmic times.*

We analyzed James Webb Space Telescope near-infrared spectroscopy of distant galaxies, at redshifts >8. From a sample of 12 galaxies, we identified three that show strong damped Lyman-a absorption due to H i in their local surroundings.

The galaxies are located at spectroscopic redshifts of 8.8, 10.2, and 11.4, corresponding to 400 to 600 million years after the Big Bang. They have H i column densities $>10^{22}$ cm^{-2}, which is an order of magnitude higher than expected for a fully neutral intergalactic medium, and constitute a gas-rich population of young star-forming galaxies.

Vasil, G.M., et al (2024) **The solar dynamo begins near the surface.** NATURE 629:doi.org/10.1038/s41586-024-07315-1 (available as a free pdf)

Authors' abstract: *The magnetic dynamo cycle of the Sun features a distinct pattern: a propagating region of sunspot emergence appears around 30° latitude and vanishes near the equator every 11 years. Moreover, longitudinal flows called torsional oscillations closely shadow sunspot migration, undoubtedly sharing a common cause.*

Contrary to theories suggesting deep origins of these phenomena, helioseismology pinpoints low-latitude torsional oscillations to the outer 5 to 10% of the Sun, the near-surface shear layer.

Within this zone, inwardly increasing differential rotation coupled with a poloidal magnetic field strongly implicates the magneto-rotational instability, prominent in accretion-disk theory and observed in laboratory experiments.

Together, these two facts prompt the general question: whether the solar dynamo is possibly a near-surface instability. Here we report strong affirmative evidence in stark contrast to traditional models focusing on the deeper tachocline.

Simple analytic estimates show that the near-surface magneto-rotational instability better explains the spatiotemporal scales of the torsional oscillations and inferred subsurface magnetic field amplitudes. State-of-the-art numerical simulations corroborate these estimates and reproduce hemispherical magnetic current helicity laws.

The dynamo resulting from a well-understood near-surface phenomenon improves prospects for accurate predictions of full magnetic cycles and space weather, affecting the electromagnetic infrastructure of Earth.

Planets.

Kuzuhara, M., et al (2024) Gliese 12 b: **A temperate Earth-sized planet at 12 pc ideal for atmospheric transmission spectroscopy.** ASTROPHYSICAL JOURNAL LETTERS 967:doi.org/10.3847/2041-8213/ad3642 (available as a free pdf)

Authors' abstract: *Recent discoveries of Earth-sized planets transiting nearby M dwarfs have made it possible to characterize the atmospheres of terrestrial planets via follow-up spectroscopic observations.*

However, the number of such planets receiving low insolation is still small, limiting our ability to understand the diversity of the atmospheric composition and climates of temperate terrestrial planets.

We report the discovery of an Earth-sized planet transiting the nearby (12 parsecs) inactive M3.0 dwarf Gliese 12 (TOI-6251) with an orbital period (Porb) of 12.76 days. The planet, Gliese 12 b, was initially identified as a candidate with an ambiguous Porb from TESS data.

Joint analysis of the light curves and RV measurements revealed that Gliese 12 b has a radius of 0.96 ± 0.05 Earth radius, a 3sigma mass upper limit of 3.9 Earth masses, and an equilibrium temperature of 315 ± 6 degrees Kelvin assuming zero albedo.

The transmission spectroscopy metric (TSM) value of Gliese 12 b is close to the TSM values of the TRAPPIST-1 planets, adding Gliese 12 b to the small list of potentially terrestrial, temperate planets amenable to atmospheric characterization with JWST.

Asteroids.

Levison, H.F., et al (2024) **A contact binary satellite of the asteroid (152830) Dinkinesh.** NATURE 629:doi.org/10.1038/s41586-024-07378-0 (available as a free pdf)

Authors' abstract: *Asteroids with diameters less than about 5 km have complex histories because they are small enough for radiative torques (that is, YORP, short for the Yarkovsky-O'Keefe-Radzievskii-Paddack effect) to be a notable factor in their evolution.*

(152830) Dinkinesh is a small asteroid orbiting the Sun near the inner edge of the main asteroid belt with a heliocentric semimajor axis of 2.19 AU; its S-type spectrum is typical of bodies in this part of the main belt.

Here we report observations by the Lucy spacecraft as it passed within 431 km of Dinkinesh. Lucy revealed Dinkinesh, which has an effective diameter of only 720 metres, to be unexpectedly complex.

Of particular note is the presence of a prominent longitudinal trough overlain by a substantial equatorial ridge and the discovery of the first confirmed contact binary satellite, now named (152830) Dinkinesh I Selam.

Selam consists of two near-equal-sized lobes with diameters of 210 metres and 230 metres. It orbits Dinkinesh at a distance of 3.1 km with an orbital period of about 52.7 hours and is tidally locked.

The dynamical state, angular momentum and geomorphologic observations of the system lead us to infer that the ridge and trough of Dinkinesh are probably

the result of mass failure resulting from spin-up by YORP followed by the partial reaccretion of the shed material. Selam probably accreted from material shed by this event.

[Image is from this paper. Dinkinesh is at left and the two halves of its satellite Salem are at right.]

Origin Of Life.

Jordan, S.F., et al (2024) **Prebiotic membrane structures mimic the morphology of alleged early traces of life on Earth.** COMMUNICATIONS EARTH AND ENVIRONMENT 5:doi.org/10.1038/s43247-024-01372-0 (available as a free pdf)

Authors' abstract: *Elucidating compositions of the first cell membranes requires experiments with molecules and chemical conditions representative of early Earth. The molecules used are described as 'prebiotically plausible', i.e., they could have formed through abiotic reactions before the emergence of biology.*

Similarly, the chemical properties of solutions in which these membranes are formed (e.g., pH, temperature, ionic strength) must represent early Earth environments.

Here, using confocal and transmission electron microscopy combined with population morphometry, we show that prebiotically plausible molecules, in solutions representative of Hadean submarine alkaline hydrothermal vents, form microstructures with substantial morphological diversity.

The microstructures hold the potential for use as analogues of prebiotic processes in the rock record. Additionally, many of the structures are morphologically similar to purported early microfossils, highlighting limitations of morphological interpretation in these studies. Detailed analyses of abiotic microstructures are essential for understanding the earliest life on Earth, and for interpretation of potential biosignatures from extra-terrestrial bodies.

There are many theories as to how life on Earth arose. Whether in hot springs on land or hydrothermal vents on the ocean floor, all these ideas require an energy source within a geological setting that can fuel chemical reactions. Over time these reactions increased in complexity from geochemistry to organic chemistry, eventually leading to biochemistry with the emergence of life.

The gradients within these settings could potentially drive chemical reactions producing organic molecules from inorganic reactants. These organic compounds then reacted together forming more complex molecules through increasingly advanced pathways, eventually becoming something like a metabolic pathway: a protometabolism.

Without boundaries, this protometabolism may not have been long lived. Products would have quickly become diluted, and reactions could have dissipated giving way to alternate reactions. Like the cell membranes found in all living organisms, some form of compartmentalisation would probably have been required.

The cell membranes of all extant living organisms are mainly composed of glycerol phosphate phospholipids. However, these phospholipid membranes are possibly too complex to have formed at the earliest stages of the emergence of life on Earth.

Instead, early compartments could have been supplied in the form of vesicles, membrane structures composed of single chain amphiphiles (SCAs) such as fatty acids, giving rise to the first protocells. It is likely that fatty acids, alcohols, and many other SCAs would have existed in almost any origin of life scenario, and the precursors of membrane-forming moleculesmay have been synthesised abiotically on the early Earth.

The list of prebiotically plausible organics is ever-growing due to results from both laboratory experiments and analysis of real samples. Prebiotic synthesis experiments have achieved the formation of carboxylic acids, amino acids, sugars, and nucleotides.

Paleobiology.

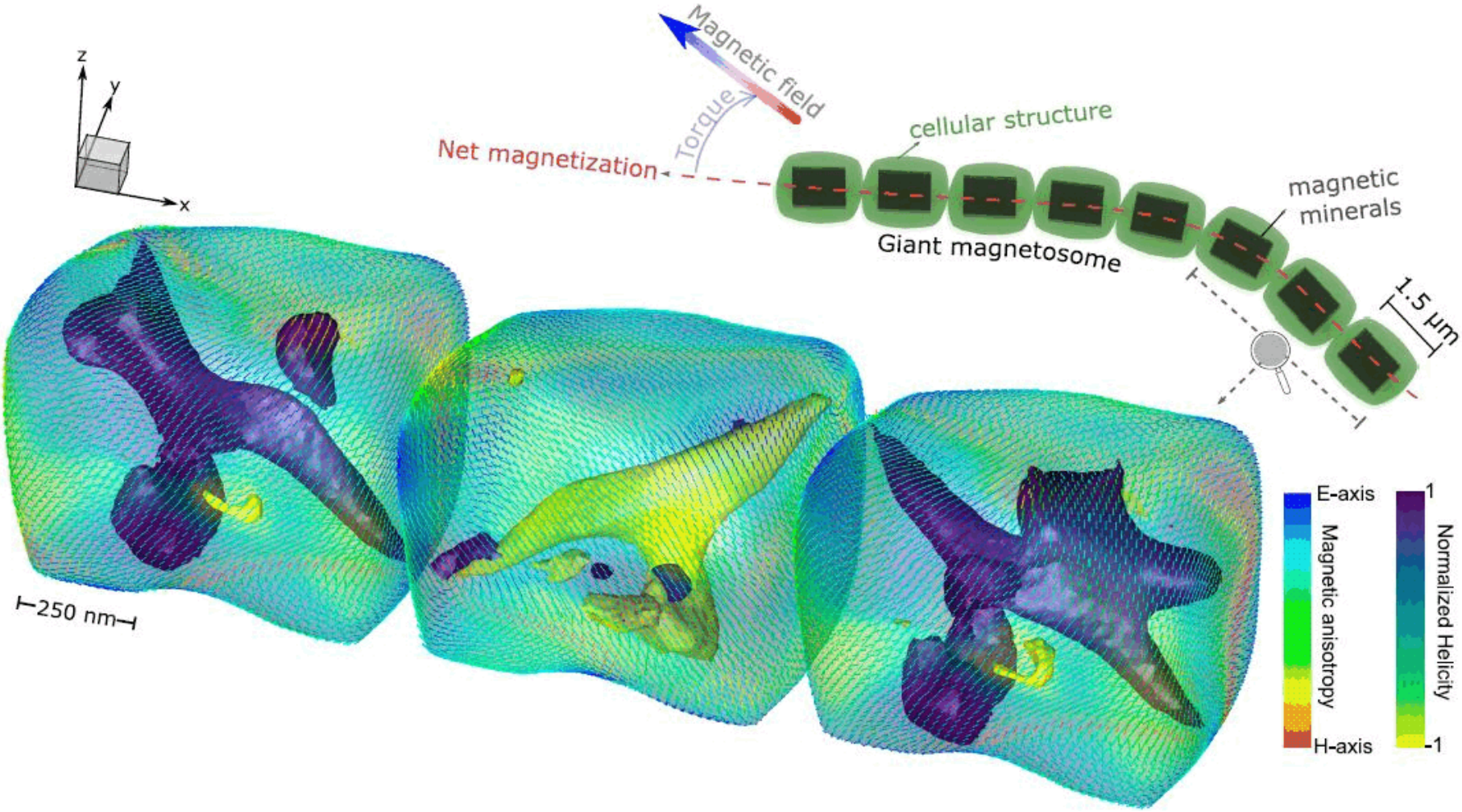
Bellon, U.D., et al (2024) **Primordial magnetotaxis in putative giant paleoproterozoic magnetofossils.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 121:doi.org/10.1073/pnas.2319148121 (available as a free pdf)

Authors' abstract: *Magnetotactic bacteria produce chains of nanoscopic iron minerals used for navigation, which can be preserved over geological timescales in the form of magnetofossils.*

Micrometer-sized magnetite crystals with unusual shapes suggesting a biologically controlled mineralization have been found in the geological record and termed giant magnetofossils.

The biological origin and function of giant magnetofossils remains unclear, due to the lack of modern analogues to giant magnetofossils. Using distinctive Ptychographic nanotomography data of Precambrian (1.88 gigayears ago) rocks, we recovered the morphology of micrometric cuboid grains of iron oxides embedded in an organic filamentous fossil to construct synthetic magnetosomes.
Their morphology is different from that of previously found giant magnetofossils, but their occurrence in filamentous microfossils and micromagnetic simulations support the hypothesis that they could have functioned as a navigation aid, akin to modern magnetosomes.

[Image is from this paper.]



Gutarra, S., et al (2024) **Ediacaran marine animal forests and the ventilation of the oceans.** CURRENT BIOLOGY 34:doi.org/10.1016/j.cub.2024.04.059 (available as a free pdf)

[The Ediacaran was the rise of large multicellular animals 565 megayears ago. It also marked the first time that life began physically disturbing habitats such as burrowing or deflecting ocean currents.]

Authors' abstract: *The rise of animals across the Ediacaran-Cambrian transitionmarked a step-change in the history of life, from a microbially dominated world to the complex macroscopic biosphere we see today.*

While the importance of bioturbation and swimming in altering the structure and function of Earth systems is well established, the influence of epifaunal animals on the hydrodynamics of marine environments is not well understood.

Of particular interest are the oldest marine animal forests, which comprise a diversity of sessile soft-bodied organisms dominated by the fractally branching rangeomorphs.

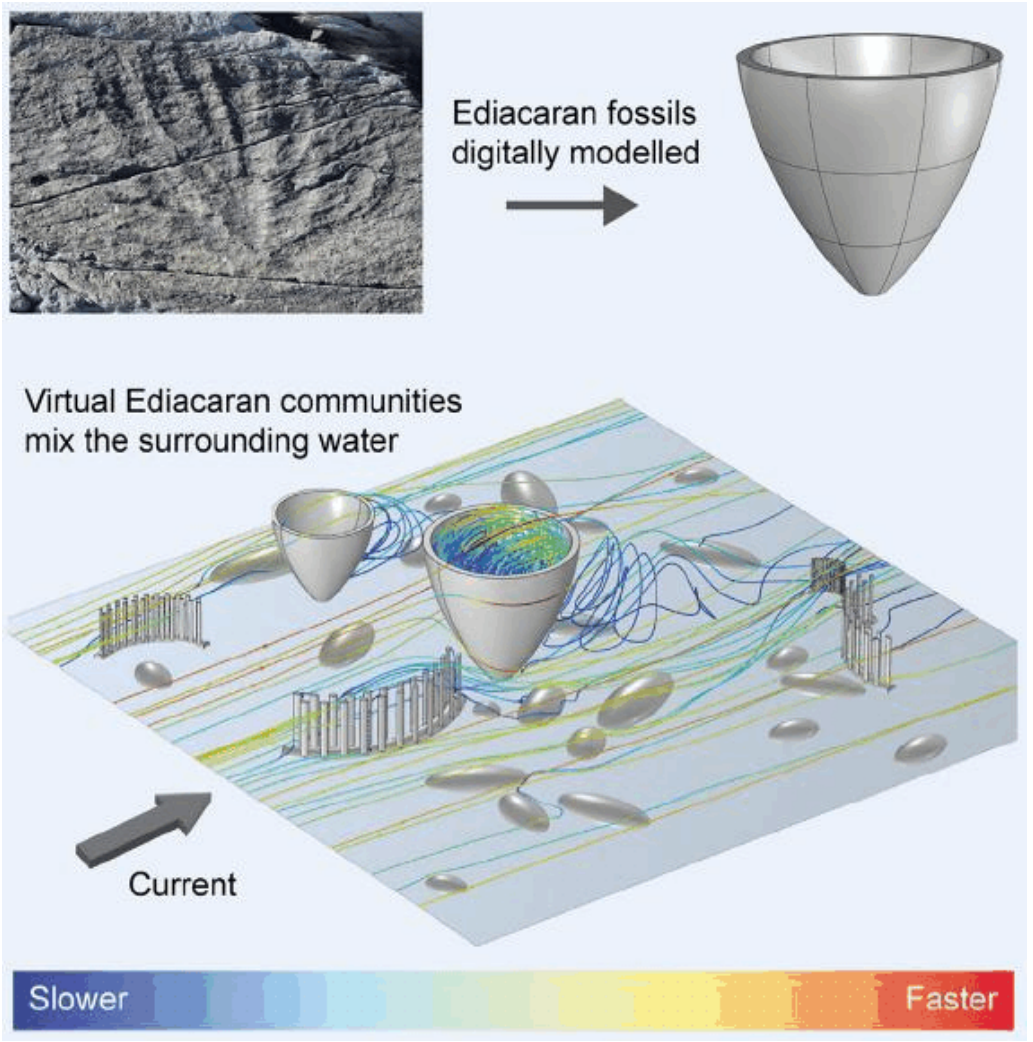
Typified by fossil assemblages from the Ediacaran of Mistaken Point, Newfoundland, these ancient communities might have played a pivotal role in structuring marine environments, similar tomodern ecosystems, but our understanding of how they impacted fluid flow in the water column is limited.

Here, we use ecological modeling and computational flow simulations to explore how Ediacaran marine animal forests influenced their surrounding environment. Our results reveal how organism morphology and community structure and composition combined to impact vertical mixing of the surrounding water.

We find that Mistaken Point communities were capable of generating high-mixing conditions, thereby likely promoting gas and nutrient transport within the canopy. This mixing could have served to enhance local-scale oxygen concentrations and redistribute resources like dissolved organic carbon.

Our work suggests that Ediacaran marine animal forests may have contributed to the ventilation of the oceans over 560 million years ago, well before the Cambrian explosion of animals.

[Image is from this paper.]



Zanella, A., et al (2024) **Trace fossils as mechanical discontinuities in shales, insight for the generation of bedding-parallel veins (BPV).** SCIENTIFIC REPORTS 14:doi.org/10.1038/s41598-024-63665-w (available as a free pdf)

[Fossils can alter sedimentary rocks because they create wedges that fracture the rocks horizontally.]

Authors' abstract: *Understanding shale petrophysical parameters is of interest due to its direct implications as cap rocks for CO2 or hydrogen storage, waste depositions, and as unconventional reservoirs.*

The generation and propagation of natural and induced fracture networks in such rocks is highly dependent on the mechanical behavior linked to several sedimentological parameters, as lithological discontinuities or bioturbation.

This study is focused on a different sedimentological parameter that consists of trace fossils and their implication on the generation of fluid-assisted fractures, called bedding-parallel veins.

In the Austral-Magallanes Basin, Southern Patagonia, Argentina, both geological features, Skolithos Ichnofacies (doomed pioneers trace fossils) and bedding-parallel veins, are numerous, especially at the top of the turbiditic bodies.

The trace fossils exhibit U-shaped vertically oriented burrows composed of clean sandstone, partially cemented by calcite, and a spreite in the central part with heterogenous laminated siltstone.

Bedding-parallel veins are composed of calcite fibers with some pyrite grains and bitumen. They are located on the top of the trace fossils along the lithological discontinuity between the turbiditic bodies and the impermeable shales.

On their surfaces, a radial pattern starts growing from the trace fossils. Moreover, the number of bedding-parallel veins is dependent on the bioturbation intensity.

With this study, we infer that trace fossils represent ichnological mechanical discontinuities (IMD) that have a key role in the generation and development of bedding-parallel veins. By correlation, we also suggest that these geological features must be thoroughly studied, especially regarding their potential for the development of induced fracturing networks.

Stiller, J., et al (2024) **Complexity of avian evolution revealed by family-level genomes.** NATURE 629:doi.org/10.1038/s41586-024-07323-1 (available as a free pdf)

Authors' abstract: *Despite tremendous efforts in the past decades, relationships among main avian lineages remain heavily debated without a clear resolution. Discrepancies have been attributed to diversity of species sampled, phylogenetic method and the choice of genomic regions.*

Here we address these issues by analysing the genomes of 363 bird species4 (218 taxonomic families, 92% of total). Using intergenic regions and coalescent methods, we present a well-supported tree but also a marked degree of discordance.

The tree confirms that Neoaves experienced rapid radiation at or near the Cretaceous-Palaeogene boundary. Sufficient loci rather than extensive taxon sampling were more effective in resolving difficult nodes.

Remaining recalcitrant nodes involve species that are a challenge to model due to either extreme DNA composition, variable substitution rates, incomplete lineage sorting or complex evolutionary events such as ancient hybridization.

Assessment of the effects of different genomic partitions showed high heterogeneity across the genome. We discovered sharp increases in effective population size, substitution rates and relative brain size following the Cretaceous-Palaeogene extinction event, supporting the hypothesis that emerging ecological opportunities catalysed the diversification of modern birds.

The resulting phylogenetic estimate offers fresh insights into the rapid radiation of modern birds and provides a taxon-rich backbone tree for future comparative studies.

Botany.

Wan, J.N., et al (2024) **The rise of baobab trees in Madagascar.** NATURE 629:doi.org/10.1038/s41586-024-07447-4 (available as a free pdf)

Authors' abstract: *The baobab trees (genus Adansonia) have attracted tremendous attention because of their striking shape and distinctive relationships with fauna. These spectacular trees have also influenced human culture, inspiring innumerable arts, folklore and traditions.*

Here we sequenced genomes of all eight extant baobab species and argue that Madagascar should be considered the centre of origin for the extant lineages, a key issue in their evolutionary history. Integrated genomic and ecological analyses revealed the reticulate evolution of baobabs, which eventually led to the species diversity seen today.

Past population dynamics of Malagasy baobabs may have been influenced by both interspecific competition and the geological history of the island, especially changes in local sea levels.

We propose that further attention should be paid to the conservation status of Malagasy baobabs, especially of Adansonia suarezensis and Adansonia grandidieri, and that intensive monitoring of populations of Adansonia za is required, given its propensity for negatively impacting the critically endangered Adansonia perrieri.

Environmental Science.

Pereira, A.G., et al (2024) **Two major extinction events in the evolutionary history of turtles: One caused by an asteroid, the other by hominins.** AMERICAN NATURALIST 203:doi.org/10.1086/729604

Authors' abstract: *Among animals, turtles (Testudinata) are one of few groups that have both a rich fossil record and sufficiently stable ecological and functional roles to enable meaningful comparisons between the end-Cretaceous mass extinction (~66 megayears ago) and the ongoing wave of extinctions.*

Here we analyze the fossil record of the entire turtle clade and identify two peaks in extinction rates over their evolutionary history. The first coincides with the Cretaceous-Paleogene transition, reflecting patterns previously reported for other taxa.

The second major extinction event started in the Pliocene and continues until now. This peak is detectable only for terrestrial turtles and started much earlier in Africa and Eurasia than elsewhere. On the basis of the timing, geography, and functional group of this extinction event, we postulate a link to co-occurring hominins rather than climate change as the cause.

These results lend further support to the view that negative biodiversity impacts were already incurred by our ancestors and related lineages and demonstrate the severity of this continued impact through human activities.

Hyeon, J.Y., et al (2024) **Genome analysis of *Streptococcus* spp. isolates from animals in pre-antibiotic era with respect to antibiotic susceptibility and virulence gene profiles.** VETERINARY RESEARCH 55:doi.org/10.1186/s13567-024-01302-0 (available as a free pdf)

Authors' abstract: *Lyophilized Streptococcus spp. isolates (n = 50) from animal samples submitted to the diagnostic laboratory at the University of Connecticut in the 1940s were revivified to investigate the genetic characteristics using whole-genome sequencing (WGS).*

WGS analysis revealed that none of Streptococcus spp. carried antibiotic resistance genes. However, tetracycline resistance was observed in four out of 15 S. dysgalactiae isolates and in one out of four S. equi subsp. zooepidemicus isolate.

This data highlights that antimicrobial resistance is pre-existed in nature before the use of antibiotics. The draft genome sequences of isolates from this study and 426 complete genome sequences of Streptococcus spp. downloaded from BV-BRC and NCBI GenBank database were analyzed for virulence gene profiles and phylogenetic relationships.

Different Streptococcus species demonstrated distinct virulence gene profiles, with no time-related variations observed. Phylogenetic analysis revealed high genetic diversity of Streptococcus spp. isolates from the 1940s, and no clear spatio-temporal clustering patterns were observed among Streptococcus spp. analyzed in this study.

Beinart, R.A., et al (2024) **Deep seafloor hydrothermal vent communities buried by volcanic ash from the 2022 Hunga eruption.** COMMUNICATIONS EARTH AND ENVIRONMENT 5:doi.org/10.1038/s43247-024-01411-w (available as a free pdf)

Authors' abstract: *Mass mortality of marine animals due to volcanic ash deposition is present in the fossil record but has rarely been documented in real time.*

Here, using remotely-operated vehicle video footage and analysis of ash collected at the seafloor, we describe the devastating effect of the record-breaking 2022 Hunga submarine volcanic eruption on endangered and vulnerable snail and mussel species that previously thrived at nearby deep-sea hydrothermal vents.

In contrast to grazing, scavenging, filter-feeding, and predatory vent taxa, we observed mass mortality, likely due to smothering during burial by thick ash deposits, of the foundation species, which rely on symbiotic chemosynthetic bacteria for the bulk of their nutrition.

This is important for our broad understanding of the natural disturbance of marine ecosystems by volcanic eruptions and for predicting the effects of anthropogenic disturbance, like deep-sea mining, on these unique seafloor habitats.

Rapid deposition of volcanic tephra following an eruption can cause mass mortality of animal communities, though, in the ocean, this has been observed only rarely, even in shallow habitats.

Fossilized aggregations of marine animals in volcaniclastic sediment and ash are exceptionally well preserved, providing historical evidence for the significance of these events and subsequent shifts in faunal community composition.

However, the paucity of modern observations of the effects of ash fall on marine communities means that we do not have the depth of understanding regarding ecosystem or organismal response, resilience, and succession after volcanic eruptions that we have for terrestrial ecosystems.

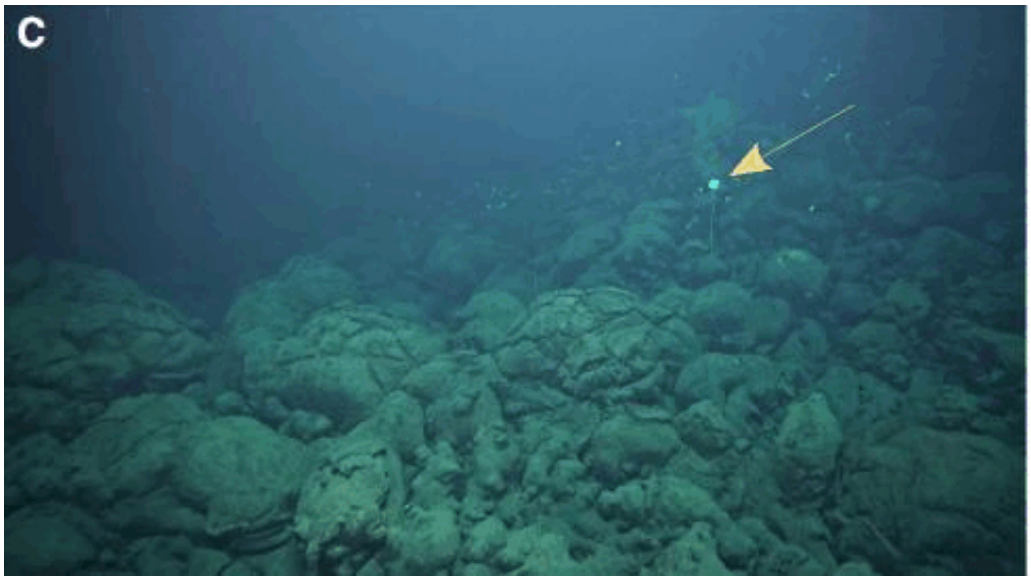
Eruptive activity at the Hunga volcano (previously called the Hunga Tonga Hunga Ha'apai volcano), Kingdom of Tonga, began on December 20, 2021, ending with a record-breaking explosive eruption that sent a plume of material as high as 58 km on January 15, 2022.

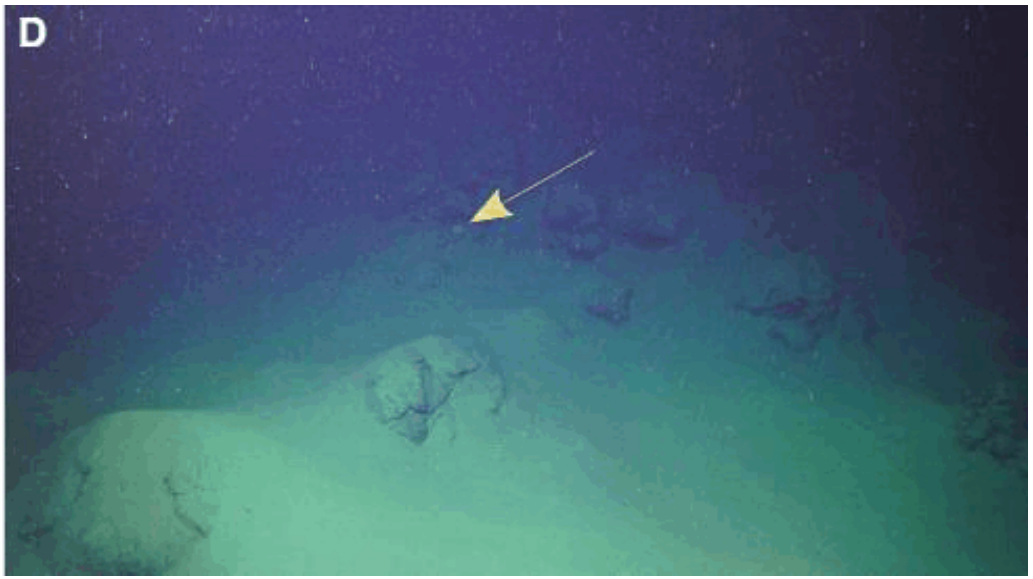
Additionally, up to 10 km3 of the seafloor was displaced from the caldera walls and flanks via submarine density currents during this eruptive period, with major impacts on the seafloor as far as 80 km from the caldera.

Approximately 3 months later (April 2022), we conducted a series of remotely operated vehicle dives at five active hydrothermal vent fields and one inactive field along the Eastern Lau Spreading Center-Valu Fa Ridge in the Lau back-arc basin. These ranged in distance from 83 to 222 km west of the Hunga caldera.

Our expedition provided a unique opportunity to explore the impact of volcanic activity on deep-sea marine ecosystems and to study community recovery and succession following a major volcanic event of unprecedented magnitude.

[Images on the next page are before and after the volcano erupted. The arrows point to a navigational marker that had been emplaced before the eruption by scientists previously studying the area, thus allowing an exact comparison of the ashfall.]





Riris, P., et al (2024) **Frequent disturbances enhanced the resilience of past human populations.** NATURE 629:doi.org/10.1038/s41586-024-07354-8 (available as a free pdf)

Authors' abstract: *To date, there have been no systematic global comparisons of humans' ability to absorb and recover from disturbances through time. Here we synthesized resilience across a broad sample of prehistoric population time-frequency data, spanning 30,000 years of human history.*

Cross-sectional and longitudinal analyses of population decline show that frequent disturbances enhance a population's capacity to resist and recover from later downturns.

Land-use patterns are important mediators of the strength of this positive association: farming and herding societies are more vulnerable but also more resilient overall.

The results show that important trade-offs exist when adopting new or alternative land-use strategies. Understanding the range of past responses of human societies to disturbances is a global priority across the social and natural sciences and will support the development of solutions to future crises. A well-known example is the shift to a narrow marine diet among the Greenland Norse that initially offset the short-term risk of crop failure yet heightened societal vulnerability to longer-term North Atlantic cooling.

Ottmann, D., et al (2024) **Impact of increased fishing on long-term sequestration of carbon by cephalopods.** CURRENT BIOLOGY 34:doi.org/10.1016/j.cub.2024.04.023

Authors' abstract: *Fish and other metazoans play a major role in long-term sequestration of carbon in the oceans through the biological carbon pump.*

Recent studies estimate that fish can release about 1,200 to 1,500 million metric tons of carbon per year (MtC year) in the oceans through feces production, respiration, and deadfalls, with mesopelagic fish playing a major role.

This carbon remains sequestered (stored) in the ocean for a period that largely depends on the depth at which it is released. Cephalopods (squid, octopus, and cuttlefish) have the potential to sequester carbon more effectively than fish

because they grow on average five times faster than fish and they die after reproducing at an early age (usually 1 to 2 years), after which their carcasses sink rapidly to the sea floor.

Deadfall of carcasses is particularly important for long-term sequestration because it rapidly transports carbon to depths where residence times are longest. We estimate that cephalopod carcasses transfer 11 to 22 MtC to the seafloor globally.

While cephalopods represent less than 5% of global fisheries catch, fishing extirpates about 0.36 MtC year of cephalopod carbon that could otherwise have sunk to the seafloor, about half as much as that of fishing large fish.

Zhang, J., et al (2024) **Rice's trajectory from wild to domesticated in East Asia.** SCIENCE 384:doi.org/10.1126/science.ade4487

Authors' abstract: *Rice (Oryza sativa) serves as a staple food for more than one-third of the global population. However, its journey from a wild gathered food to domestication remains enigmatic, sparking ongoing debates in the biological and anthropological fields.*

Here, we present evidence of rice phytoliths sampled from two archaeological sites in China, Shangshan and Hehuashan, near the lower reaches of the Yangtze River.

We demonstrate the growth of wild rice at least 100,000 years before present, its initial exploitation as a gathered resource at about 24,000 years before present, its predomestication cultivation at about 13,000 years before present, and eventually its domestication at about 11,000 years before present.

These developmental stages illuminate a protracted process of rice domestication in East Asia and extend the continuous records of cereal evolution beyond the Fertile Crescent.

Flouris, A.D., et al (2024) **Analysis of Greek prehistoric combat in full body armour based on physiological principles: A series of studies using thematic analysis, human experiments, and numerical simulations.** PLOS ONE 19:doi.org/10.1371/journal.pone.0301494 (available as a free pdf)

Authors' abstract: *One of the oldest complete suits of European armour was discovered in 1960 near the village of Dendra, in Southern Greece, but it remained unknown whether this armour was suitable for extended use in battle or was purely ceremonial.*

This had limited our understanding of the ancient Greek-Late Bronze Age warfare and its consequences that have underpinned the social transformations of prehistoric Europe and Eastern Mediterranean.

In a series of archeo-physiological studies, merging knowledge in archaeology, history, human physiology, and numerical simulation, we provide supporting evidence that the Mycenaean armour found at Dendra was entirely compatible with use in extended combat, and we provide a free software enabling simulation of Late Bronze Age warfare.

A group of special armed-forces personnel wearing a replica of the Dendra armour were able to complete an 11-hour simulated Late Bronze Age combat protocol that we developed from a series of studies based on the available evidence.

Numerical simulation of the thermal exchanges in Late Bronze Age warfare extended this conclusion across different environmental conditions and fighting intensities. Our results support the notion that the Mycenaeans had such a powerful impact in Eastern Mediterranean at least partly as a result of their armour technology.

Human Health.

Bland, D.M., et al (2024) ***Yersinia pestis*** **can infect the Pawlowsky glands of human body lice and be transmitted by louse bite.** PLOS BIOLOGY 22:doi.org/10.1371/journal.pbio.3002625 (available as a free pdf)

Authors' abstract: *Yersinia pestis, the causative agent of plague, is a highly lethal vector-borne pathogen responsible for killing large portions of Europe's*

population during the Black Death of the Middle Ages. In the wild, Y. pestis cycles between fleas and rodents; occasionally spilling over into humans bitten by infectious fleas. For this reason, fleas and the rats harboring them have been considered the main epidemiological drivers of previous plague pandemics.

Human ectoparasites, such as the body louse (Pediculus humanus humanus), have largely been discounted due to their reputation as inefficient vectors of plague bacilli.

Using a membrane feeder adapted strain of body lice, we show that the digestive tract of some body lice become chronically infected with Y. pestis at bacteremia as low as 1×10^5 CFU/ml, and these lice routinely defecate Y. pestis.

At higher bacteremia (about 1×10^7 CFU/ml), a subset of the lice develop an infection within the Pawlowsky glands (PGs), a pair of putative accessory salivary glands in the louse head. Lice that developed PG infection transmitted Y. pestis more consistently than those with bacteria only in the digestive tract.

These glands are thought to secrete lubricant onto the mouthparts, and we hypothesize that when infected, their secretions contaminate the mouthparts prior to feeding, resulting in bite-based transmission of Y. pestis.

The body louse's high level of susceptibility to infection by gram-negative bacteria and their potential to transmit plague bacilli by multiple mechanisms supports the hypothesis that they may have played a role in previous human plague pandemics and local outbreaks.

Tang, Q., et al (2024) **Solving the 250-year-old mystery of the origin and global spread of the German cockroach, *Blattella germanica*.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 121:doi.org/10.1073/pnas.2401185121 (available as a free pdf)

Authors' abstract: *The origin of the German cockroach, Blattella germanica, is enigmatic, in part because it is ubiquitous worldwide in human-built structures but absent from any natural habitats.*

The first historical records of this species are from ca. 250 years ago (ya) from central Europe (hence its name). However, recent research suggests that the center of diversity of the genus is Asian, where its closest relatives are found.

To solve this paradox, we sampled genome-wide markers of 281 cockroaches from 17 countries across six continents. We confirm that B. germanica evolved from the Asian cockroach Blattella asahinai approximately 2,100 years ago, probably by adapting to human settlements in India or Myanmar.

Our genomic analyses reconstructed two primary global spread routes, one older, westward route to the Middle East coinciding with various Islamic dynasties (~1,200 years ago), and another younger eastward route coinciding with the European colonial period (~390 years ago).

While Europe was not central to the early domestication and spread of the German cockroach, European advances in long-distance transportation and temperature-controlled housing were likely important for the more recent global spread, increasing chances of successful dispersal to and establishment in new regions.

The global genetic structure of German cockroaches further supports our model, as it generally aligns with geopolitical boundaries, suggesting regional bridgehead populations established following the advent of international commerce.

Chen, G., et al (2024) **Regular use of fish oil supplements and course of cardiovascular diseases: prospective cohort study.** BRITISH MEDICAL JOURNAL: MEDICINE 3:doi.org/10.1136/bmjmed-2022-000451 (available as a free pdf)

Authors' abstract: *Regular use of fish oil supplements might be a risk factor for atrial fibrillation and stroke among the general population but could be beneficial for progression of cardiovascular disease from atrial fibrillation to major adverse cardiovascular events, and from atrial fibrillation to death.*

In people with no known cardiovascular disease, regular use of fish oil supplements was associated with an increased relative risk of atrial fibrillation and stroke.

In people with known cardiovascular disease, the beneficial effects of fish oil supplements were seen on transitions from atrial fibrillation to major adverse cardiovascular events, atrial fibrillation to myocardial infarction, and heart failure to death.

Technology.

Baribi-Bartov, S., et al (2024) **Supersharers of fake news on Twitter.** SCIENCE 384:doi.org/10.1126/science.adl4435 (available as a free pdf)

Authors' abstract: *Governments may have the capacity to flood social media with fake news, but little is known about the use of flooding by ordinary voters. In this work, we identify 2,107 registered US voters who account for 80% of the fake news shared on Twitter during the 2020 US presidential election by an entire panel of 664,391 voters.*

We found that supersharers were important members of the network, reaching a sizable 5.2% of registered voters on the platform. Supersharers had a significant over-representation of women, older adults, and registered Republicans.

Supersharers' massive volume did not seem automated but was rather generated through manual and persistent retweeting. These findings highlight a vulnerability of social media for democracy, where a small group of people distort the political reality for many.

FREE STUFF ONLINE

I provide sources for the scientific pdfs and mp3s reviewed in this zine. Here is a summary of some good resources, all of which are free.

In particular, the "Seen In The Literature" column cites only peer-reviewed papers. For topics such as climate change or social media effects, more people should be reading these papers instead of blogs where commentators confuse their opinions as being facts.

For scientific papers for which free pdfs are available, the easiest method is to Google either the title of the paper or its digital object identifier, the phrase beginning with doi.org.

Many papers are behind a paywall, so unless you have access to a university library computer, you can only get the abstract. However, the abstract is often enough to understand the gist of the article.

Every scientific periodical has free email notifications of each new issue's table of contents. I subscribe to dozens of notification services, in case you were wondering how I manage to keep up with the literature.

For zines, www.efanzines.com provides current pdf zines as well as some older ones. A club called Fanac at www.fanac.org does the reverse; they provide thousands of old zines from the 1930s to date, with a few current zines. Both sites have a free email notification service you can subscribe to.

The Old Time Radio Researchers have thousands of old-time radio shows (1930s to 1950s) covering all the genres, such as comedy, science fiction, fantasy, and mystery. Visit www.otrr.org/OTRRLibrary.

They also publish a free bulletin OLD RADIO TIMES, available at www.otrr.org/?c=times, with an email notification service. Don't pay money for audio books and listen to a droning voice when you can listen for free to full-cast shows such as Jack Benny or Inner Sanctum from the OTRR.

For pulp fiction magazines from all genres, visit www.archive.org/details/pulpmagazinearchive?&sort=-downloads&page=2
Books in the public domain are free from https://gutenberg.org

AROUND CHEZ OPUNTIA
photos by Dale Speirs

Nanking cherries in full bloom on my boulevard on May 31.

Flickertail woodpeckers nesting in a boulevard tree directly across the street from Chez Opuntia.