

OPUNTIA 534



Autumn Equinox 2022

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

BOW RIVER VIEWS

2022-09-11

photos by Dale Speirs

I was down in south-central Calgary running some errands. Finishing up early, I decided to stop off at a nearby riverbank park along the Diamond Cove SE suburb. The pathway from which I took the photos runs along a cliff.

The cover photo is looking east-southeast. In the far distance is the Douglassdale suburb. I remember when it was rangeland back in the 1980s. However, both banks of the Bow River are preserved as natural parks. Spot the rafters.

The bridge downstream is a pedestrian bridge named after city councillor Sue Higgins, a feisty battleaxe who liked to call herself The Alderbroad, back when councillors were still called aldermen or alderwomen.

The photo on this page was taken looking upstream to the northeast. The hill on the horizon was an munitions dump during World War Two when the area was far out into the countryside.

The real estate developers never mentioned that to home buyers when all that land was developed from the 1990s onward. The hill is a park. That way, the worst that could happen is a dog walker's pet digs into an old artillery shell and both are eliminated from the gene pool.



TRANSIT FANNING IN CALGARY: PART 31

photos by Dale Speirs

[Parts 1 to 30 appeared in OPUNTIA's #256, 258, 260, 264, 269, 275, 283, 298, 302, 327, 333, 341, 348, 357, 359, 365, 369, 371, 392, 394, 396, 407, 412, 426, 435, 445, 462, 484, 508, and 524.]

Where Old Trains Go To Die.

At the west end of the downtown core on 10 Street SW at 8 Avenue, a decommissioned LRT train was converted into an art project this summer. I like to photograph trains and buses (yes, I am a trainspotter but do not own an anorak) but didn't have a photo of car #2002 when it was in service.

However, shown below is one of its siblings, to show what the train looked like when it was operational. These were the original style of train when Calgary's LRT system began operating in 1981. Few of them are left after forty years but occasionally I see one trundle by.

At right are views of the demise of #2002. Better than the scrap heap, one supposes. The train was used as an art workshop.



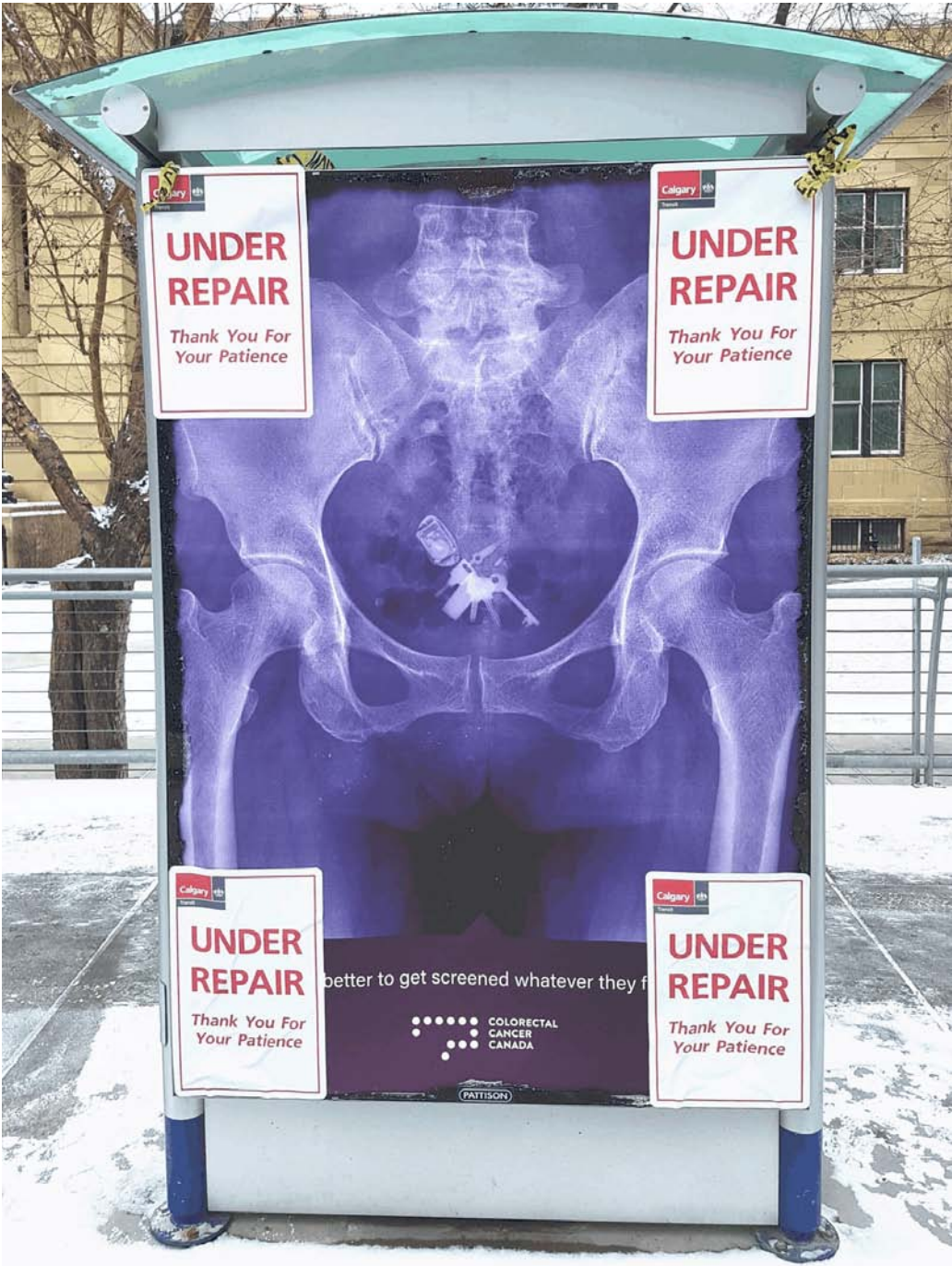
Below: This bus threw me when I first saw it because it had no Calgary Transit markings. Then I realized it was a decommissioned bus converted into a mobile grocery store. Seen downtown in the East Village, where all the trendy yuppies live in condo towers.



Bottom: Another one bites the dust. I saw the tow truck coming, so I managed to get my smartphone out in time to take a photo.



A fittingly vandalized sign at the 4th Street SW LRT platform. The glass on the other side of the sign had been smashed.



DBO ZPV SFBE UIJT NFFTBHF: QBSU 5
by Dale Speirs

[Parts 1 to 4 appeared in OPUNTIA's #335 409, 446, and 473.]

Gold Keys.

“The Gold Jug” by Leon Rutledge Whipple (1912 January, THE BLACK CAT, available as a free pdf from www.archive.org) was a cryptogram story based on Edgar Allan Poe’s “The Gold Bug”. Rich old uncle Justin Amyx left his fortune to his nephew Fred, the narrator.

Sometime later, while reading through one of Uncle Justin’s books, Fred found a slip of paper with Xs on it, apparently a cryptogram. With the assistance of his wife Cynthia, he puzzled out a message based on tiny pinpricks in different positions on different Xs.

Uncle Justin had been a great admirer of Poe, who besides his legacy as an author was well known as a pioneer of cryptography. Fred and Cynthia finally managed to break the code, which was based on the physical distance between the pinpricks.

They had to buy a micrometer divider for the task. The deciphered code led them out to the countryside where they found a stone jug hidden inside a monumental marker. Alas, it did not contain gold coins, only 60-year-old whiskey.

Puzzling Matters.

PRESUMED PUZZLED (2015) by Parnell Hall was the 16th novel in what is the silliest cozy series around. Cora Felton was a syndicated puzzle columnist, whose puzzles were ghosted by her niece Sherry Carter. The latter was in hiding from an abusive ex-husband, hence the arrangement.

They lived in Bakerhaven, Connecticut. The village not only had a ghastly murder rate that would shock a Chicago gang member, but whose perpetrators left crossword puzzles as taunts.

Cora’s current case, and the police of course, was the axe murder of Roger Martindale. His wife Paula was the suspect. The clues were Sudoku and

crossword puzzles left here, there, and everywhere. The puzzles were included in the text of the novel. The reader was invited to solve them and race Cora to the finish line.

After about 20 murders in this cozy series, at a guess, Cora was well known to police. No doubt the local officers wished they could transfer to a quieter jurisdiction such as Chicago. A second murder put Cora in jail for that charge.

Unusually for a cozy, a considerable amount of text was devoted to the court proceedings. The trial made Perry Mason look like he was in traffic court. Puzzles and perjury appeared in equal proportions. Eventually Cora was acquitted. She had been set up by the murderer and his cohort with a fake Sudoku.

A similar cozy series has been done by Shelley Freydon't about Katie McDonald of Granville, New Hampshire. The first novel was THE SUDOKU MURDER (2007). In that formerly peaceful village, her childhood mentor Professor P.T. Avondale operated the Avondale Puzzle Museum.

Kate (or Katie; her name kept changing) had returned to her village from the big city. Partly she wanted to escape a failed romance, partly to escape her boring job at the Institute of Theoretical Mathematics, and partly because Avondale wrote her a letter asking for help.

There had been financial fraud with the museum accounts. Avondale departed this world shortly after re-uniting with Kate. There was a knife in his back and a sudoku puzzle on his desk. She became the prime suspect of the Deppity Dawgs and the murderer's next target.

Her main clue was the blood-splattered sudoku, partially completed but partially blotted out by the professor's blood. The puzzle was illustrated in Chapter 15 for the reader to attempt solving it before Kate did. She figured out the sudoku wasn't an actual puzzle.

Avondale must have been talking to the murderer and known he was going to die, so he wrote a numerical code in the squares. The giveaway was the numeral zero in one of the squares, which sudoku puzzles never use.

After first accusing the wrong person, Kate met up with the murderer. The museum had a hedge maze out in the back yard, to which she fled to evade him.

Once the shooting and shouting were over, she settled in as the new museum curator.

Next in the series was SUDDEN DEATH SUDOKU (2008), set six months later. The museum, and by extension the village, were hosting the First Annual P.T. Avondale Sudoku Challenge. A boost for the museum and the tourist economy.

As the competition began, a blizzard moved in. Inside though, things were hot. The competitors were deadly serious divas. One of them was dead, period, his body found in a snowbank. Kate McDonald was now established as the village Miss Marple. She was assisted by the Granny Activist Brigade, as they called themselves, a group of old biddies with entirely too much time on their hands.

The village was isolated by the storm. The sudoku tournament continued, as did the alarums. The excitement concluded with a car chase on a highway coated with black ice.

There were two murderers, with two motives and two victims, which had messed up both the police and Miss Marple, pardon me, Kate. The MacGuffin was an electronic wristwatch that could be used to play sudoku. Really? At least two computer programmers thought the device and its software were worth killing for.

SERIAL KILLER SUDOKU (2009) was the third novel in the series. The second page touched an essential point:

“Kate tried to wrap her mind around the idea of another homicide in this small New Hampshire town that hadn't seen a murder in ten years, that is, until she returned last fall. Since then ... she didn't want to think about it.”

The Miss Marple effect was in full bloom. Kate McDonald had the police station on her speed dial. And yes, she was the one who found the body. The village was already alarmed about a serial killer.

Someone sent threatening sudoku puzzles to Kate, if a sudoku can be called threatening, via anonymized emails. Assorted back stories came to naught, as did the killer when he tried to trap Kate and kill her. Miss Marples always survive to the next book. It's a rule.

The murderer was acting out on a mixture of ambition and resentment of the past. His identity was a twist, although an experienced mystery reader would have him on the short list of suspects.

Gimme That 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. (These and other old-time radio shows are available as free mp3s from www.otrr.org/OTRRLibrary.)

“The Baconian Cipher” was written by Denis Green and Anthony Boucher, and aired on 1946-05-27. Francois Lavie was a French detective visiting Holmes at 221B Baker Street. Watson was married at the time and busy with his practice, but dropped by occasionally when he could spare the time.

The three men got to talking and decided to peruse the personal classified ads column in a newspaper for anything interesting. They found an ad inviting those interested cryptography to communicate with Box XQL696 at the newspaper. The words of the ad were set in strange combinations of upper and lower case letters.

The Baconian bilateral cipher, as Holmes lectured the others, used such upper and lower cases in groups of five letters. (It can also be a two-letter or two-number pattern such as aabab or 10011.) Each group of five signified a letter, so UULLU might be the letter H in the secret message.

Holmes decoded the message as a distress call from Penge. Off the three men went. As they arrived, gunshots were heard. A neighbour mowing his lawn was unperturbed, so Holmes deduced someone was target practicing.

The doorbell was rung, and answered by the niece of the advertiser. Holmes explained they saw the ad and she invited them inside. It was her who had been target shooting. She took them up to see her paralyzed Uncle John.

John was sitting in a wheelchair. He complained that Holmes was late and his brother Mycroft had been faster with a telegram a few hours earlier. The gist of the problem was that Uncle John was one of those who believed Shakespeare’s plays were written by Francis Bacon. He wanted Holmes to prove the point.

Holmes declined the offer. The three men departed. Out on the driveway, Holmes remarked that Uncle John was an imposter who had fresh garden loam on his boots. The real uncle was probably already dead.

The real uncle had smuggled out the ad message without his captors knowing. However, Mycroft’s telegram exposed him. Guessing that Sherlock would be next, the gang had one of their own pose as the uncle.

The three snooped about. Nothing in the garden, so the body must still be in the house. Bluffing their way in, they forced the issue. The gang were relatives trying to hijack the estate. Fortunately the real uncle was still alive, drugged into submission. The miscreants were hauled off to Scotland Yard.

The epilogue was a visit to Watson by Gregory Hood to plug his forthcoming radio series THE CASEBOOK OF GREGORY HOOD. Watson assured everyone that he would be back in the autumn after taking a trip to England.

He wasn’t, as the Sherlock Holmes series moved to another network during the summer, and the Gregory Hood series got on steady that autumn.

Factual.

The Gutenberg Project (www.gutenberg.org) is a gold mine of free downloads of public domain books and magazines. You don’t have to be a gold bug to decode the site; just use keywords in the search engine.

Crossword puzzles date back to ancient word squares, but the modern type we use today was originated in 1913 by Arthur Wynne. By the 1920s, crosswords had become an international fad.

This brings me to THE CROSS WORD PUZZLE BOOK (1924) by Prosper Buranell, F. Gregory Hartswick, and Margaret Petherbridge. This apparently was the first collection of crosswords published.

Project Gutenberg has a daily update of newly uploaded books, and I spotted this one. You can download the book and print out pages of puzzles from the first decade of crosswords. Fun for all.

WHISTLING PAST THE GRAVEYARD

by Dale Speirs

THE WHISTLER was an old-time radio anthology series that aired from 1942 to 1955. It was not a mystery show. Both the narrator and the protagonist explained everything to the listener as a perfect crime was plotted and carried out. The criminal would gloat after the crime and get in a few bwah-ha!-ha!s.

After the final commercial, the epilogue would reveal some detail the criminal overlooked that tripped him up. It was for the listener to keep track of the little details and discard the red herrings, then predict what the twist ending would be.

“Justice” was written by J. Donald Wilson and aired on 1943-06-12. An elderly farmer John Henderson had a son Matthew and a young second wife Marta. The two men squabbled about the farm. Matthew resented Marta trying to boss him around.

The war was on and help difficult to find. A previous hired hand Henry Jacobs had been wounded in action. After recovering, he returned to the farm. He helped out and also helped himself to Marta. Matthew lurked about, resentful about everything.

He told Marta to vamoose or else he would tell his father about her relationship with Jacobs. That set off a chain reaction as everyone went on the defensive. John’s will said half the farm would go to Marta and the other half to Matthew. John died, assisted by poison. The sheriff arrived the next day. The doctor had refused to sign the death certificate after arsenic was found during the autopsy.

Matthew and Marta blamed each other. Matthew was convicted and sent up for life. Marta inherited the entire farm (murderers can’t inherit), then married Henry. He wanted to sell the farm and leave. She didn’t.

Henry had always been suspicious about John’s death. He blamed Marta and then poisoned her. She admitted her guilt verbally to him as she died. In anticipation of a double-cross, she had also written a letter admitting the murder and put it in her safe deposit box.

In her dying words, she told Henry he would get a big surprise. He did when the letter was read by the executor.

“Bullet Proof” was written by Kenneth Harvey and aired on 1946-08-05. Howard and Andrea Martine were discussing divorce. He didn’t want to separate because her departure would ruin his financial corporation.

They settled on mutual blackmail but hers was more advantageous. She had a lover but her friends supported the corporation and could withdraw their funds if she asked them. Howard requested a week before divorce proceedings began.

The delay gave him time to plan. He asked an underworld friend to alter a 45 handgun to fire 22-calibre bullets. He shot Andrea dead with the trick gun, then staged a fake jewel robbery to make her death seem plausible.

The investigating detective was named William Conrad, played by a rising young actor named William Conrad. Yes, the big guy, although at the time he was physically fit, not at all how television viewers would remember him. He was suspicious because burglars normally don’t use 22s.

The gunsmith Sam showed up, asking \$100,000 for his silence. Howard offered him the supposed stolen jewels as payment. Sam also took the special handgun. A short time later he returned, angry because the jewels were hot and he couldn’t fence them.

Howard got the gun back from Sam in a struggle, then pointed it at Sam. “*You haven’t the guts*” were Sam’s last words before Howard killed him. After the final commercial, came the twist. As Howard tried to haul away the body, Conrad arrived. Howard confessed all but much too soon.

Sam had changed the gun back to a 45 because he didn’t want to be caught with a murder weapon. If Howard had stayed silent, he could have pleaded self defense with an unrelated gun.

“Blind Impulse” was written by Sherman Marks and aired on 1946-12-02. Strangely, it was performed before a live audience, whose occasional applause was disconcerting.

Steve Consella was playing the field with his ex-wife Millie and his current girlfriend Carol Crandall. The latter wanted him but he was only interested in her inheritance. Her father Simon wasn’t well and the legacy was expected soon.

Steve's plan was to marry Carol, wait a while, then file for a divorce. They lived in California and he was counting on the community property law to get half of the estate. Carol wasn't stupid but Steve was a handsome bloke.

At that point, the story broke for a Meisterbrau beer commercial. Back at the honeymoon, the news came that the old man had made a miraculous recovery and was good for another twenty years. To celebrate, Carol, Steve, and Simon took a vacation trip to the Grand Canyon.

Simon argued Steve into taking a horse ride down the cliffs of the Grand Canyon. Steve seized the opportunity and whipped Simon's horse, sending him over the cliff. Afterwards, Carol told Steve she saw him do it but was stymied because a wife cannot testify against her husband.

Following on, there was advice to mellow out with Meisterbrau beer. Once the final commercial passed, Millie arrived. The conversation was tense.

The twist was Millie's news that she had just learned her divorce from Steve wasn't valid and they were still married. That meant Carol wasn't legally Steve's wife and could now testify she saw him murder her father.

"Wedding Gift" was written by David Clark and Merrick Stone, and aired on 1947-12-10. Christine was to marry John Grey the next day. Her dressmaker sent a replacement seamstress, her rival Marion Lance, whose parents' marriage was broken up by Christine.

Lance dug into Christine with full psychological warfare. The latter had much to be guilty about, having clawed her way up as a career woman over bodies and shattered lives.

On the honeymoon drive, Christine learned her husband had a sister he never told her about before. They did have a rushed courtship. The car gave trouble, so they stopped at a garage. At a roadside restaurant she met Edgar, an ex-boyfriend. He began dredging up old times and not in a nice way. Like Marion, he mentioned someone named Nora.

The journey resumed albeit still with car trouble. They arrived at a remote cabin where John's sister resided. He wanted to get the car fixed so left her at the cabin. She went inside and discovered Marion and Edgar at home.

Christine was in fear of her life. She managed to make a phone call to John for help. Back in the living room, the conversation returned to Nora, another rival who had been badly burned in a fire set by Christine. The fear was crystallized when Marion and Edgar told Christine she would not live the night.

Just then, John returned. But first, the final commercial before the twist. He knew all about Christine's past, and left her to her fate. Nora was his sister.

"Tough Guy" was written by Bob Cossin and Slick Goodin and aired on 1948-04-28. Larry Sands was a Pacific Airways pilot visiting a South American town. He had been there during the Revolution of 1938. The townsfolk thought he was there to supervise construction of an updated airport. When he checked into a hotel, he found a photo of himself in his room. The manager denied any knowledge. Sands said he was leaving immediately.

After the first commercial, the episode flashed back to 1938 when Sands had been hired as a mercenary pilot, flying out of that town. He had never been in combat and learned the hard way. Sands put on a front as a tough guy.

The Blue Grotto cantina was the social centre for the pilots. Taracita was a refugee from the war looking for her parents in between serving drinks. She collected photos of the pilots for a shrine and prayed for them. Someone was murdering the pilots one by one in the village, using photos to identify them in the streets.

The commandant Antonio blamed the revolutionaries. An air raid by them on the airport demolished a dozen government fighter planes. The revolutionaries had been informed about the airfield's defenses. Antonio suspected Taracita as a spy and shot her, saying she had been supplying the photos to the revolutionaries.

The twist came after the final commercial. Back in the present, ie 1948, Antonio arrived at the hotel. He had ten years to think about things. Sands been the spy, who set up Taracita to take the blame. Revenge is a dish best served cold. Antonio shot Sands dead the same way he had shot Taracita.

"Lady From The Sea" was written by Esther McCoy and aired on 1948-07-29. Myra Cartwright was a Hollywood star whose blood ran cold when she read a newspaper article about the demolition of an old café called Lady From The Sea, a ship converted into a restaurant.

Long ago, as a young actress, she had an affair with veteran actor Craig Douglas, who owned the café as a sideline. His wife Norma demanded a divorce with ruinous terms, basically everything he had, including the café. The three met and the final settlement was a knife through Norma's heart from Myra.

Craig said he would dispose of Norma and the knife. The knife had been a presentation letter-opener to Myra and had her name engraved on the blade. Craig was caught, signed a confession that he killed her, and was sentenced to 15 years on a 2nd-degree murder charge. The knife was never found and Craig wouldn't say where it was hidden.

Myra went on to fame and fortune in the movies. When Craig was paroled after 10 years, he was disappointed to find her no longer in love with him. He told her he had hidden in the café both the knife and a note explaining Myra's part in the murder. He then went off and committed suicide by drowning. His body was never found.

The Lady From The Sea was auctioned off. Myra eventually realized the knife was hidden in the figurehead. She climbed up on the railing and tried to retrieve the knife but slipped into the water and drowned. The police found only Craig's note in the figurehead, which explained the knife had been thrown into the harbour long ago.

"Enough Rope" was written by James Sussex and aired on 1948-08-11. Margaret Forbes had been strangled by a serial killer. The odd thing was that a rope had been used rather than silk stockings as in the other murders.

Her husband Martin learned the police caught the killer but they were still looking for details. The killer said he hadn't done all the murders for which he was blamed. That made Martin nervous because he had killed Margaret and tried to make the murder look like part of the others. He hadn't known the killer used a different M.O.

The police and neighbour Harvey Brant (who lost his wife Clara to the killer) kept barging into his house. Then his mistress Adele arrived. Martin became a nervous wreck trying to keep everyone off the scent. Harvey in particular just wouldn't let go. Martin felt trapped.

Harvey kept digging, apparently trying to blackmail Martin. Not directly but \$10,000 to buy his gun collection, hardly worth \$100. Harvey departed this

world from high-velocity lead poisoning. He pushed too hard. What Martin didn't know was that police had suspected Harvey of killing his wife. They kept a close watch on his house, saw Martin go in, heard the gunshot, and saw him leave. Two murder cases solved with one shot.

"All Damage Covered" was written by Robert S. Brody and aired on 1949-01-30. Maxine Kendall was a nightclub singer who was tired of her crippled husband Charlie. She fancied nightclub manager Jim McCord but he had his scruples.

Charlie squabbled with her and wouldn't consider a divorce. She therefore began plotting his demise, preferably by an accidental fire. He did have a bad habit of falling asleep while smoking. Her alibi was elaborately plotted. Lots of details, of which the listener knew one would trip her up after the final commercial. The fire killed Charlie and everyone accepted the blaze was accidental.

The guilty flee when no one pursues, and confess when no one asked. McCord dumped Maxine on suspicion, and she thought she was being tailed by a detective. Her panic brought her to a bad end.

"Murder At Twin Pines" aired on 1949-04-10, no writer credited. Sheriff Tilson was dragging the lake at the Twin Pines for the body of Margo Reed. She had gone missing after shots were heard in the night. Victoria Crane and her sister Meg lived in the village. Newspaper publisher Ben Drisco, who was courting Meg, had known Reed. In fact, Reed was his ex-wife.

Victoria had a guilty conscience because Reed had some sort of past connection with her. She contrived a frame-up against Drisco but it failed. The truth then came out, to the listener only, about how the Crane sisters inherited their wealth. Victoria had assisted her rich uncle to his demise.

Reed was suspicious and a potential blackmailer. When she appeared in the village, Victoria panicked. Eddie Faro was Drisco's assistant on the paper. Victoria tried to tilt suspicion to Drisco via the suggestible Faro. She kept scheming, each time more elaborately.

Victoria tried to sweeten the pot by planting the murder gun in Drisco's house. The sheriff caught her doing so. Oh what a tangled web.

LONG MAY SHE REIGN, BUT WHAT ABOUT THE STAMPS?
by Dale Speirs

When Canada Post announced its 2002 stamp programme, there was initially indignation from monarchists because nothing was shown of a Queen Elizabeth II definitive. However, a follow-up indicated that there would be a stamp to mark the 50th anniversary of the accession of the Queen to the throne in 1952.

It was not the first time there was a squawk about a lack of QEII stamps. Starting in 1977, during the Pierre Trudeau era, monarchists were kept in a continuous uproar by what appeared to them to be unjust neglect of the Queen.

The 1977 Commemorative.

On February 4, 1977, the subject of a QEII commemorative for her 25th anniversary on the throne was brought up in the Canadian House of Commons by W.G. Dinsdale, member for Brandon-Souris [1].



During Question Period he asked the Postmaster General J.-J. Blais about the stamp, but prefaced his question with a sly dig at the Post Office:

“I congratulate him for issuing a commemorative stamp honouring the Queen and also for the ceremony which was held this morning at which the Minister upheld the reputation of the Post Office by arriving slightly late.”

After a pause for “*Some hon. Members: Oh, oh!*”, Dinsdale went on to ask: “*In view of the high denominational value of the stamp and the popularity of the monarch, is the Postmaster General planning to use this stamp to retire the deficit of the Post Office?*”

The PMG was quite unperturbed and calmly replied: “*Well, Mr. Speaker, that would be desirable, and I appreciate the remarks of the hon. gentleman. I would like to add that if there was a slight delay, it had nothing at all to do with the Post Office. I was relying on the Ministry of Transport to bring me there.*”

“However, with reference to the high value of the stamp, we felt that a 25-cent issue would coincide with Her Majesty’s twenty-fifth anniversary very well. I would like to indicate also that the silver foil which was used in that stamp was not the result of any melting of silver coins left over from the coin program, in case the hon. gentleman might ask.”

The Storm Arrives.

That was but the prelude to a greater storm, for several weeks later, on April 25, former Prime Minister John Diefenbaker (Progressive Conservative) raised a question about why the recently issued 12-cent definitive stamps depicted the Parliament buildings instead of the Queen.

He was reacting to a Canadian Press report which had appeared in the newspapers two days earlier announcing the lack of a QEII stamp, and which quoted Post Office spokesman John Blenkiron as saying he could give no reason for the change [2].

This was waving a red flag in the faces of unreconstructed monarchists such as Diefenbaker, who unsuccessfully sought a motion “... *in condemnation of the government of its latest step in the surreptitious downgrading of the Monarchy by replacing the Queen’s head from the 12-cent stamp, this being the first time in history that the definitive stamp does not bear the Monarch’s likeness.*” [3].

After this motion failed, another opposition member, Donald Munro, took up the challenge. PMG Blais told him the whole thing was based on an erroneous report by the Canadian Press agency, and that there would be both Parliament and QEII 12-cent definitives [4].

In response to a supplemental question by Munro, Blais defended the two types of definitives, saying that: “ ... *we are not the only country which issues more than one definitive stamp of main denomination.*”

At this point, Diefenbaker jumped back into the argument [5]: “*Mr. Speaker, I listened to the alibi of the Minister with some interest. Did he not read that one of his officials was asked why the change? Did he not read that the official said “I cannot understand why it was made.” The stamp was shown with the Queen entirely removed and when he was asked why it was done he said “I don’t know why they did it. ... “.*

Blais repeated that the postal official had been misquoted. At this point the debate veered off into the Prime Minister’s well-known antipathy to the monarchy, and Diefenbaker dropped the stamp issue in favour of Trudeau-bashing.

Has Anyone Seen The Queen?

The topic of the QEII stamp re-surfaced on December 19, 1978, and not surprisingly, Diefenbaker was the one who revived it [6]. This time he went directly after Pierre Trudeau: “*I have said on a number of occasions that this government is endeavouring to downgrade the monarchy. I need only point to what the Prime Minister said. He said he had no more use for the Queen than he had for snowshoeing or skiing.*”

After a bit of did not-did too between Diefenbaker and Trudeau, interspersed with frequent “*Some hon. Members: Oh, oh!*”, Diefenbaker finally got down to his point: “*On this very date, neither in the House of Commons post office nor in the Senate post office can one purchase any stamps with the Queen’s head thereon. Why is that? I asked specifically for them and I was told there were none. Was that coincidence?*”

This brings to mind a rather interesting mental picture of Diefenbaker downstairs at the post office, looming over the counter (he was a tall man) and spluttering at some hapless postal clerk, who probably wished she had phoned in sick that day. One can imagine heads turning in the post office lobby as Diefenbaker boomed out loudly and indignantly at the lack of QEII stamps.

The Postmaster General, Gilles Lamontagne, calmed Diefenbaker down in the House by promising to personally see to it that the stamps were put into stock

by the next day. “*That is fine.*”, Diefenbaker said, and subsided back into his seat, as the House then went on to consider the Alaska pipeline.

(When you read through HANSARD, you will notice that the members jump randomly from one item to the next, and apparently have the attention span of a fungus gnat. The importance of a subject was not correlated with the amount of time spent discussing it in the House.)

You Shall Hear Of Rumours.

The next philatelic outburst in the Commons began on October 30, 1981, when opposition backbencher D.M. Collenette queried Prime Minister Pierre Trudeau about rumours that in 1982 there would be no postage stamp with the Queen’s portrait [7]. (Diefenbaker died in 1979.)

Again, the whole thing was touched off by an inaccurate report in the newspapers. Trudeau used the opportunity to get in a few ironic digs at the Tories about the monarchy, but after the usual to-and-fro subsided, he confirmed unequivocally that there would be a QEII definitive in the forthcoming year.

The matter reappeared a week later on November 3, when backbencher Bud Bradley looked further ahead to the future and asked the Minister Responsible for Canada Post (there no longer being a Postmaster General) about 1983 and subsequent years [8].

Andre Ouellet, the Minister, pointed out that stamp programmes were not decided that far ahead, and added: “*I think somebody, somewhere, is really trying to create a problem that does not exist.*”

Where Is She?

The 36-cent QEII definitive was a short-lived one, and its delay in appearing raised concerns among monarchists. Backbencher Reginald Stackhouse asked on May 29, 1987, about where it was [9].

In between a question about a shortage of dairy herdsmen and another about Via Rail maintenance shops, he put the question: “*Mr. Speaker, is Canada Post going republican? When the new 36-cent stamps were issued in April many were disappointed to discover that there was none bearing the Queen’s portrait.*

This stamp was promised twice for dates in May but still has not appeared. Many Toronto customers have been told by post office workers there that it might never be issued.”

“If this were an isolated incident it might be accepted as only an inconvenience. However, it impresses many from experience that it is a part of a pattern. It is a serious grievance to all Canadians who esteem the Queen as Canada’s head of state.”

Stackhouse came back to the matter on August 31, since the 36-cent stamps had still not yet appeared [10]. Harvie Andre, the Minister Responsible explained that: *“Apparently there have been some production problems with the supplier of those stamps. I was hoping they were working on a stamp with my picture on it but this is apparently not the case.”*

“Some. hon. members: Oh, oh!”

“Mr. Andre: I am told that on October 1 there should be 15 million such stamps available for Canadian consumers.”



That stamp finally did appear on October 1, but only had a brief life, as the postal rate was shortly thereafter raised to 37 cents.

Genuinely-used non-philatelic covers with this stamp in correct time of use will therefore be rare.

Canada Post moved faster with the 37 cent QEII definitive, which was available on December 30, 1987.

Keeping The Queen In Stock.

In subsequent years, the complaints about QEII stamps were of post offices not keeping them in stock for customers. Backbencher Cyril Keeper complained to the Commons on July 7, 1988, that his constituents couldn’t find the stamps in Winnipeg post offices [11].

Later in the day, Harvie Andrie responded to the question by reporting that Station A had 10,000 in stock. Evidently someone had made telephone calls from Ottawa to Winnipeg in order to advise the Minister.

Ten years later, the situation did not appear to have changed much. John Aimers, the Chairman of the Monarchist League of Canada, was testifying before a Senate committee and mentioned in passing a conspiracy theory popular among monarchists [12].

He said: *“Some years ago, Canada Post decided to allow an option vis-a-vis the purpose of definitive postage stamps. It offered the Canadian flag as an option to the definitive bearing the portrait of Her Majesty.”*

“I should add that a loyal, constitutionally-minded Crown corporation might never have forced Canadians to make that choice. By squirreling away the Queen stamps into the bottom of obscure drawers and by making the flag stamps easily available in a variety of formats, the option very nearly became the rule.”

Canada Post denied this was the case and said that flag stamp booklets outsold QEII booklets by a four to one margin. It had therefore discontinued the Queen booklets but would still be selling those stamps in sheet form [13].

Notwithstanding this, a fuss about the Queen stamps in Ottawa postal outlets prompted Canada Post officials to tour all 61 outlets to enforce stocking of the stamps [14].

One monarchist pointed out that people had to ask for the stamps, which, if in stock at all, were usually in a back room. He then pointed out that if despite this handicap the Queen stamps still sold one for every four of the touted flag stamps, then there must still be a demand for Queen stamps [15].

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12] Aimers, John (1998-06-17) Examination of Bill S-15. PROCEEDINGS OF THE STANDING SENATE COMMITTEE ON LEGAL AND CONSTITUTIONAL AFFAIRS 1st Session, 36th Parliament 29:27

13] Robertson, Ian (1998-06-23) Booklets drop Queen. CANADIAN STAMP NEWS 23(3):1

14] Rogers, D. (1998-06-03) Stamping out dissent. OTTAWA CITIZEN, page B8

15] Taylor, John (1998-06-02) Must be a big demand for Queen stamps despite unfair marketing. OTTAWA CITIZEN, page A16

ME AND THE QUEEN

photo by Dale Speirs

In 1978, I was in my final year at the University of Alberta, reading for a BSc in Horticulture. The city of Edmonton was hosting the Commonwealth Games that year, and Queen Elizabeth II came to open the event and then tour northern Alberta.

Twass a beautiful sunny day and I had nothing else to do, so I went to the City Hall plaza to see the arrival of the Queen. I got lucky. Where I stood, there were only three or four lines of spectators.

I am a tall man, so I stood at the back. As the Queen went by, I lifted my camera up at arm's length and held the shutter down, getting one very nice photo out of the batch. On the far side was Prince Phillip, back to the camera, between the two Mounties.



Covers.

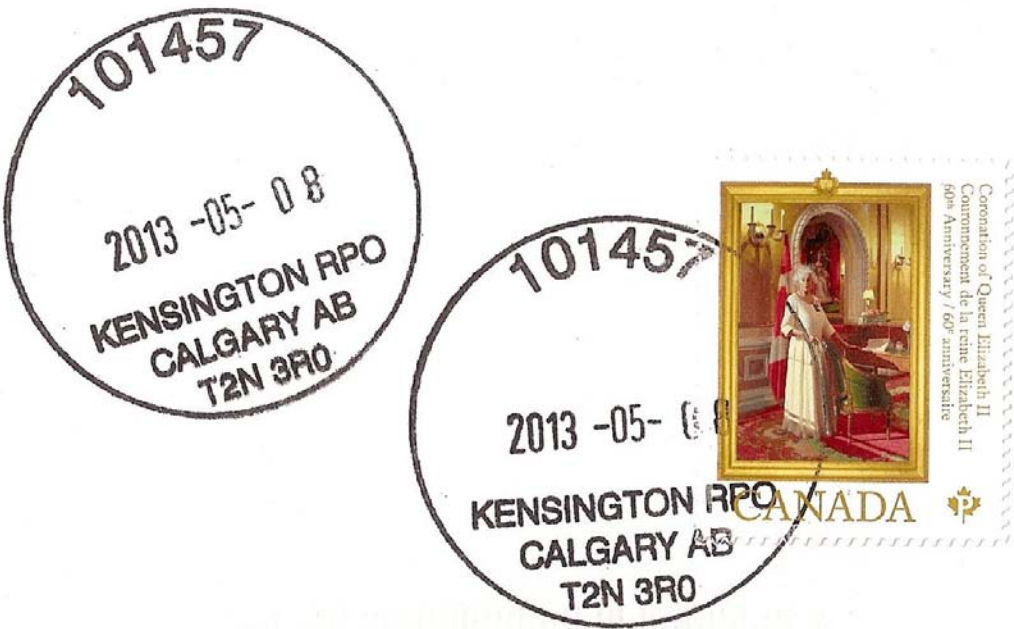
In philatelic parlance, a cover is the combination of an envelope, postmark, and stamp. Many collectors, myself included, like to produce covers for first day of issue stamps or events. I only produce them for a few events such as the Stampede rodeo, flower stamps (I worked 31 years as a professional horticulturist), and, upon occasion, for royal events.

Elizabeth became Queen the instant her father died in 1952, but the Coronation ceremony wasn't held until the following year. Canada Post issued a stamp on 2013-01-14 commemorating 60 years of her reign. For the first day of issue, I prepared covers with two stamps on them.

One was cancelled at the Britannia retail postal outlet in southwest Calgary. I then drove up to the Royal Oak district in northwest Calgary and got a second cancel. There was a personal significance to the Royal Oak cancel, as the suburb was once the Speirs dairy farm.

My grandparents lost their homestead in southern Saskatchewan in the Dirty Thirties as the land dried up and blew away. They migrated to the rural area where Royal Oak now is and began life anew. They retired in the 1950s and two of their sons, my uncles Arnold and Bob took over.

At that time the farm was far into the countryside but by the 1980s the city had expanded and they sold out. Arnold bought a grain farm near Olds and Bob a cattle ranch near Sundre, both well north of Calgary. Oaks are not native in Alberta, although one species will grow in domestication. No one of royal blood ever went anywhere near the land.



Later that year, Canada Post issued a second stamp for the Queen's anniversary. I took some first day covers to a retail postal outlet on Kensington Road NW in central Calgary. The name was appropriate, given that one of her palaces is named Kensington.

In 2013, OPUNTIA was still published only as a print edition, and those writing letters of comment sent them by real mail. Lloyd Penney has long been the most faithful loccer of my zine, nowadays by email. In 2013 and early 2014, his letters were franked by Picture Postage stamps depicting his mother-in-law Gabrielle Klein-Robert dressed as the Queen.



Although the covers had bar codes they were not postmarked. Picture Postage was personalized postage stamps which Canada Post offered until this year, the final date being August 31 for orders.

Customers could go online, load their image onto a stamp template, and order copies.

Jumping ahead to 2015-09-09, I prepared event covers postmarked on the day Queen Elizabeth II became the longest reigning monarch in British history. She surpassed Queen Victoria's record.

2015-09-09
Queen Elizabeth II becomes the longest reigning British monarch.

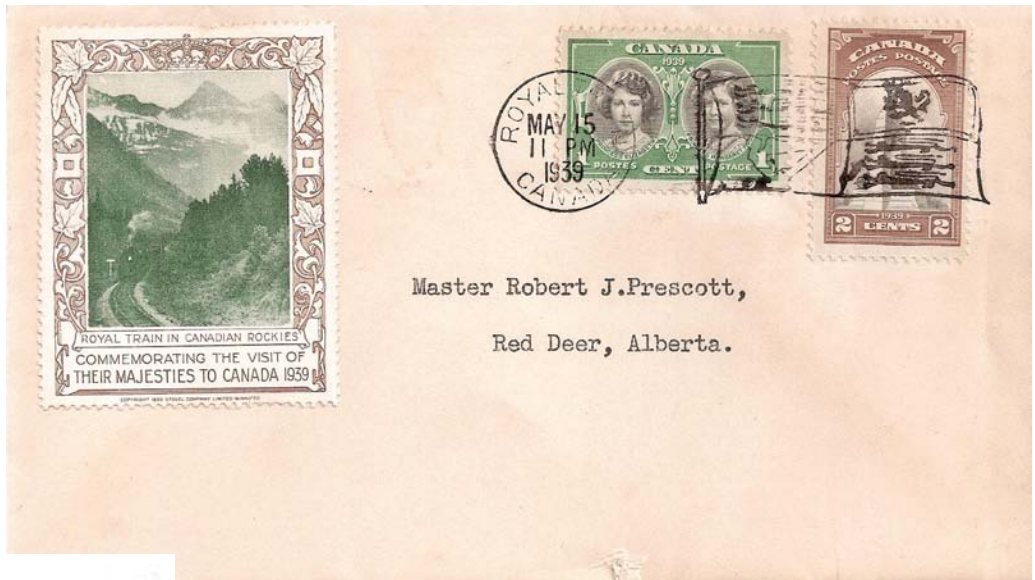


1978 Royal Tour, Commonwealth Games, Edmonton, Alberta



The cover at bottom left was made using my 1978 photo of her. I only have a black-and-white printer.

Elizabeth appeared on Canadian stamps as early as 1939. That year her parents went on tour across Canada. The Royal Train had its own post office and collectors sent in covers to be cancelled, such as the example below. The green stamp shows Elizabeth and her sister Margaret. The former was 13 years old at the time. They stayed at home and did not accompany their parents.

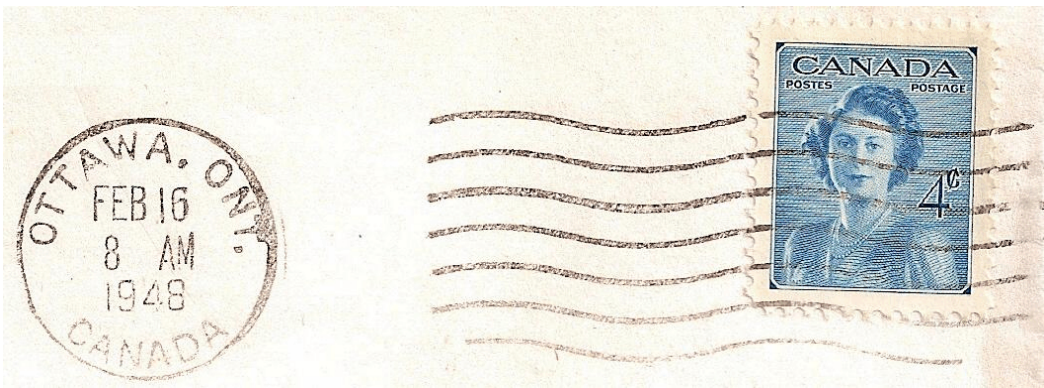


The Royal Navy ship that brought King George VI and Queen Consort Elizabeth was late arriving. The official reason was fog in the Gulf of St Lawrence.

The real reason, not revealed until after the war, was that the ship was carrying a substantial portion of Britain's gold reserves. The gold was secretly transferred to a Royal Canadian Navy ship, then brought to Montreal where the gold was stored for the duration.

If Britain fell to the Germans, a government in exile was to be established in Canada, and the gold used to back its currency.

The postmark below was a first day for a stamp issued in honour of Princess Elizabeth as she then still was. She was a newlywed and the Heir Presumptive.



I bought a box of covers sent from Cote D'Ivoire to Finland (my mother was Finnish). Interestingly the former had issued in 1981 a stamp for Chuck and Di's wedding, although it was doubtful any citizens cared.

However the stamps were legitimately used for postage, as the three graphically-cropped covers shown below left will attest.

Charles was depicted on several stamps issued by Britain. The stamps below show him as the Prince of Wales with his two wives, the second of whom is now Queen Consort Camilla.



LETTERS TO THE EDITOR

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

FROM: Lloyd Penney
Etobicoke, Ontario

2022-09-10

OPUNTIA #531: [re: Calgary street festivals] Street festivals are starting up for the fall here, too. We are trying to find a good show to get a table at, and there is a lot of choice.

[I’ve gone to quite a few street festivals this summer, although I haven’t reported on most of them to avoid being repetitive. They’re much the same throughout Calgary but nonetheless fun and a good reason to get out of the house.]

There are new start-up conventions, but there’s nothing wrong with craft shows in church basements. There are food truck festivals around, but we don’t go; it’s gotten so expensive to eat at anything like that.

[In Calgary, a hamburger, fries, and pop are now \$12 minimum at any fast food outlet or food truck.]

My last letter: [re: prairie gardening] I have been reading that the Toronto Parks Dept. has been encouraging people to keep part of their front lawns, or at least the verge between sidewalks and the road edge, for wild flowers. They are desperately needed for bees and other insects.

[I worked 31 years in park maintenance for the City of Calgary. After oil prices collapsed in 1982, the Parks Dept. stopped mowing freeway boulevards and park slopes due to budget cuts. That had the inadvertent effect of naturalizing large areas.]

Besides the three shows I mentioned here, we also went to a steampunk festival in Coldwater, Ontario, and sales were stellar there, too. We plan more shows in the fall.

OPUNTIA 532: I had wondered about what I might get out of When Words Collide’s online version, but I just didn’t have the time to test it out. Perhaps the next time.

[Unlikely there will be a next time, as 2023 will be a live event.]

I am finding lots of people to talk to on the Toronto SF&F page on Discord, so now to see what else I can do with it.

[re: disappearing print publications] There’s a lot of empty newsboxes, or newsboxes that have been taken away. Local entertainment newspapers have been taken away, and university papers are mostly gone, too.

Well, it’s a lot easier to keep the subways cleaner. There are websites, but it’s tough to keep track of all the websites you need to be on, or all the websites that provide vital news for the community.

OPUNTIA #533: [re: review of COSPLAY: A HISTORY] I would really like to have a look at that book by Andrew Liptak. We’ve had our own costumes over the years, and we did win some major prizes a long time ago, but it would have been neat to be included in this book.

Cosplayers have needed an area where great photos could be publicized, and YouTube has always been a good place, although social media sites are best for still photos.

With the summer nearly done, we have had some great shows to vend at this summer, and the fall may also have some great shows. We have some venues in mind, and with some luck, we will do great again. I have been keeping busy with fanzines and with editorial work, and it continues to look good.

whimsyandcolour.com

The heat of Summer
Still reigns,
The rewards of harvest
Grace our tables,
Night has grown,
Day has less,

Children's voices
Speak of school,
And things to do
Next weekend.
Our amazing world
Reaches yet again,
Another cosmic waypoint.

"Seasonal
Greetings!"

©2022 Theo Nelson



To:

Date -

May Autumn be beautiful

and weird.

Handwritten signature



SEEN IN THE LITERATURE

Astronomy.

Neuhauser, R., et al (2022) **Colour evolution of Betelgeuse and Antares over two millennia, derived from historical records, as a new constraint on mass and age.** MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY 516:doi.org/10.1093/mnras/stac1969 (available as a free pdf)

Authors' abstract: *After core hydrogen burning, massive stars evolve from blue-white dwarfs to red supergiants by expanding, brightening, and cooling within few millennia.*

We discuss a previously neglected constraint on mass, age, and evolutionary state of Betelgeuse and Antares, namely their observed colour evolution over historical times.

We place all 236 stars bright enough for their colour to be discerned by the unaided eye ($V=3.3$ mag) on the colour-magnitude-diagram (CMD), and focus on those in the Hertzsprung gap. We study pre-telescopic records on star colour with historically critical methods to find stars that have evolved noticeably in colour within the last millennia.

Our main result is that Betelgeuse was recorded with a colour significantly different (non-red) than today (red, $B-V = 1.78 \pm 0.05$ mag).

Hyginus (Rome) and Sima Qian (China) independently report it two millennia ago as appearing like Saturn ($B-V = 1.09 \pm 0.16$ mag) in colour and 'yellow' (quantifiable as $B-V = 0.95 \pm 0.35$ mag), respectively (together, 5.1 s different from today).

The colour change of Betelgeuse is a new, tight constraint for single-star theoretical evolutionary models (or merger models). It is most likely located less than one millennium past the bottom of the red giant branch, before which rapid colour evolution is expected.

Evolutionary tracks from MIST consistent with both its colour evolution and its location on the CMD suggest a mass of $\sim 14 M_{\odot}$ at ~ 14 Myr. The (roughly) constant colour of Antares for the last three millennia also constrains its mass and age. Wezen was reported white historically, but is now yellow.

Planets.

Wisdom, J., et al (2022) **Loss of a satellite could explain Saturn's obliquity and young rings.** SCIENCE 377:doi.org/10.1126/science.abn1234

Authors' abstract: *The origin of Saturn's $\sim 26.7^{\circ}$ obliquity and ~ 100 -million-year-old rings is unknown. The observed rapid outward migration of Saturn's largest satellite, Titan, could have raised Saturn's obliquity through a spin-orbit precession resonance with Neptune.*

We use Cassini data to refine estimates of Saturn's moment of inertia, finding that it is just outside the range required for the resonance. We propose that Saturn previously had an additional satellite, which we name Chrysalis, that caused Saturn's obliquity to increase through the Neptune resonance.

Destabilization of Chrysalis's orbit ~ 100 million years ago can then explain the proximity of the system to the resonance and the formation of the rings through a grazing encounter with Saturn.

Staya, S., et al (2022) **Moon packing around an Earth-mass planet.** MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY 516:doi.org/10.1093/mnras/stac2172

Authors' abstract: *All four giant planets in the Solar system host systems of multiple moons, whereas the terrestrial planets only host up to two moons. The Earth can capture small asteroids as temporary satellites, which begs the question as to how many moons could stably orbit the Earth, or an Earth-mass exoplanet.*

We perform a series of N-body simulations of closely spaced equal-mass moons in nested orbits around an Earth-mass planet orbiting a Sun-like star. The innermost moon begins near the host planet's Roche radius, and the system is packed until the outermost moon begins near the stability limit for single moons.

The initial spacing of the moons follows an iterative scheme commonly used for studies of compact planetary systems around single stars. For the three-moon system, we generate maps to calculate periodic and chaotic regions and to identify the destabilizing mean motion resonances.

Our calculations show that the maximum number of moons depends on the assumed masses of the satellites (Ceres-, Pluto-, and Luna-mass) that could maintain stable orbits in a tightly packed environment.

Through our N-body simulations, we find stable configurations for up to 7 ± 1 Ceres-mass, 4 ± 1 Pluto-mass, and 3 ± 1 Luna-mass moons. However, outward tidal migration will likely play a substantial role in the number of moons on stable orbits over the 10 gigayear stellar lifetime of a Sun-like star.

The Origin Of Life.

Wogan, N.F., et al (2022) **Rapid timescale for an oxic transition during the Great Oxidation Event and the instability of low atmospheric O₂.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 119:doi.org/10.1073/pnas.2205618119 (available as a free pdf)

Authors’ abstract: *The Great Oxidation Event (GOE), arguably the most important event to occur on Earth since the origin of life, marks the time when an oxygen-rich atmosphere first appeared. However, it is not known whether the change was abrupt and permanent or fitful and drawn out over tens or hundreds of millions of years.*

Here, we developed a one-dimensional time-dependent photochemical model to resolve time-dependent behavior of the chemically unstable transitional atmosphere as it responded to changes in biogenic forcing.

When forced with step-wise changes in biogenic fluxes, transitions between anoxic and oxic atmospheres take between only 10^2 and 10^5 years. Results also suggest that O₂ between $\sim 10^{-8}$ and $\sim 10^{-4}$ mixing ratio is unstable to plausible atmospheric perturbations.

For example, when atmospheres with these O₂ concentrations experience fractional variations in the surface CH₄ flux comparable to those caused by modern Milankovich cycling, oxygen fluctuates between anoxic ($\sim 10^{-8}$) and oxic ($\sim 10^{-4}$) mixing ratios.

Overall, our simulations are consistent with possible geologic evidence of unstable atmospheric O₂, after initial oxygenation, which could occasionally collapse from changes in biospheric or volcanic fluxes.

Additionally, modeling favors mid-Proterozoic O₂ exceeding 10^{-4} to 10^{-3} mixing ratio; otherwise, O₂ would periodically fall below 10^{-7} mixing ratio, which would be inconsistent with post-GOE absence of sulfur isotope mass-independent fractionation.

Abundant atmospheric O₂ at 21% by volume is the most distinctive and consequential feature of Earth’s atmosphere. Produced by cyanobacteria, algae, and plants, O₂ is a clear sign of our biosphere that is detectable across interstellar space by telescopic spectroscopy.

Oxygen permits aerobic respiration, the only known metabolism with sufficient energy yield to sustain complex animal life. However, for about the first half of Earth’s 4.5-billion-year-old history, the atmosphere had negligible O₂. This changed ~ 2.4 billion years ago.

The timing of the Great Oxidation Event and the magnitude of atmospheric O₂ concentrations before and after the GOE can be constrained by the geologic record of sulfur isotopes in combination with photochemical models.

Archean and earliest Proterozoic sedimentary minerals contain sulfur isotopes with characteristic mass-independent fractionation which abruptly disappears 2.4 billion years ago.

Paleobiology.

Greif, M., et al (2022) **Extreme abundance of ammonoids in mass accumulations from the Late Devonian of the Moroccan Anti-Atlas.** ACTA PALAEONTOLOGICA POLONICA 67:doi.org/10.4202/app.00935.2021 (available as a free pdf)

Authors’ abstract: *The eastern Anti-Atlas is renowned for its highly fossiliferous outcrops of Devonian rocks. Ammonoids occur in rock-forming numbers at many localities in the Tafilalt and Maïder.*

This study addresses the questions of how many ammonoids are preserved within a standardized area as well as over the whole Tafilalt and Maïder basins, and how these mass occurrences formed.

Five samples from the Tafilalt and Maïder were analysed. The ammonoids contained therein were prepared, measured and counted as a base for estimates of the orders of magnitude of the total number of preserved ammonoids and their biomass within the respective Famennian strata in the eastern Anti-Atlas.

Two samples were stratigraphically assigned to the lower Famennian, two samples to the middle Famennian and one sample to the upper Famennian. For these samples, estimates for a standardized area of 1 km² and a layer thickness of 100 mm lie between 19.9×10⁹ and 1.25×10¹⁰ ammonoids.



The estimated numbers for the whole study area with a retro-deformed size of 15,512.5 km² and a sediment thickness of 100 mm, ranges from 30.9×10¹³ to 19.4×10¹⁴ ammonoids and a annual accumulation of 15.4×10⁹ to 97.1×10⁹ ammonoid conchs. This corresponds to a annual total palaeo-biomass that ranges from 25,954 tonnes to 47,058 tonnes within the whole study area and from 1.67 t to 3.03 tonnes within an area of 1 km².

Based on these results and size-distribution in the samples, the ecological role of the small and highly abundant, subspherical ammonoids from the early and middle Famennian is discussed and reproductive rates are estimated.

With ca. 230 eggs produced by an adult female, cheiloceratids and small maeneceratids from the early Famennian deposits are at the lower end of ammonoid reproductive rates.

These accumulations of conchs can be caused by processes like sudden mass mortality or sedimentary processes such as transport, condensation and sorting. The presence of all ontogenetic stages in the samples supports the explanation of mass mortalities, but with some reservation.

[Image is from this paper.]

Khramov, A.V., et al (2022) **Possible long-proboscid insect pollinators from the Early Permian of Russia.** CURRENT BIOLOGY 32:doi.org/10.1016/j.cub.2022.06.085

[Gymnosperms are cone-bearing plants such as cycads and conifers. Angiosperms are flowering plants.]

Authors' abstract: *Insect pollination is one of the hallmarks of flowering plants. Bees, moths, flies, and some other pollinators evolved elongate siphonate mouthparts for sucking concealed nectar and occasionally other liquids.*

However, it is clear from the fossil record that insects with similar adaptations appeared long before the mid-Cretaceous radiation of angiosperms. These insects most probably used their proboscis to reach pollination drops and other sugary fluids that were hidden in the cones of extinct gymnosperms, pollinating them in the process.

The vast majority of these gymnosperm-associated long-proboscid insects have been reported from the Middle Jurassic to the Early Cretaceous, i.e., the time interval that immediately predated the advent of flowering plants.

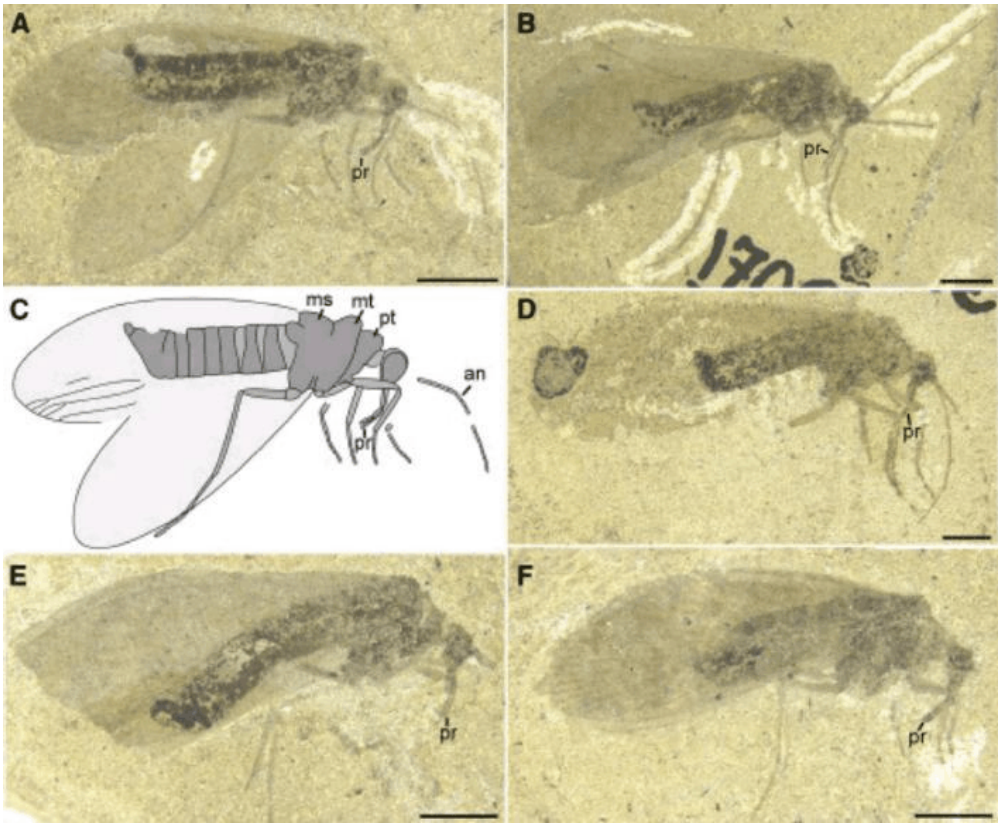
By contrast, the Paleozoic stage of the co-evolution between long-proboscid insect pollinators and plants has remained poorly understood. Here, we report a putative pollination mutualism involving long-proboscid holometabolous

insects (*Panorpida: Protomeropidae*) from the Early Permian of Russia (ca. 283 to 273 megayears ago).

Their elongate mouthparts have very similar morphology to those of some present-day nectarivorous *Coleoptera* and *Hymenoptera* and probably served to imbibe micropylar secretions from the semi-closed ovulate organs of the gymnosperms of a peltaspermalean affinity that have been found in the same locality.

This is the earliest record of insects with siphonate-like mouthparts, which could indicate that the complex interactions between pollinators and gymnosperms predate the first flowering plants by over 100 megayears ago.

[Images are from this paper. The proboscids are indicated by ‘pr’.]



Smith, R.M.H., and P.A. Viglietti (2022) **Taphonomy of drought afflicted tetrapods in the Early Triassic Karoo Basin, South Africa.** PALAEOGEOGRAPHY, PALAEOCLIMATOLOGY, PALAEOECOLOGY 604:doi.org/10.1016/j.palaeo.2022.111207

Authors’ abstract: *The sedimentology and taphonomy of in-situ fossils from earliest Triassic strata (Induan) in the southern Karoo Basin of South Africa is presented as evidence for episodes of drought-induced mass death of the resident tetrapods.*

Abundant skeletons are preserved in a 2 metre-thick tabular silty sandstone capping a multi-storeyed low-sinuosity channel sandstone interpreted as a wide shallow channel that became progressively abandoned, with more ephemeral flow regime than in the underlying channels and subjected to intermittent flows of low-density sediment-laden floodwaters.

*Stratigraphic and planimetric distribution of 170 in-situ tetrapod fossils shows several clusters of up to eight closely-spaced articulated *Lystrosaurus* skeletons preserved in prone and spread-eagled body position. These are interpreted as drought-stricken carcasses that collapsed and died of starvation in and alongside dried-up water sources.*

*Two of the specimens display an unusual micritic envelope with a distinctive pustular texture interpreted as permineralised mummified skin indicative of rapid desiccation after death. Bonebeds of disarticulated bones of multiple juvenile *Lystrosaurus* occur in shallow depressions within the rubified mudstones.*

Layering of different skeletal elements suggests some hydraulic sorting but the initial aggregation was likely a behavioural response to drought.

*Osteohistology of spread-eagled *Lystrosaurus* (*L. declivis* and *L. murrayi* species) skeletons show that they represent early juvenile stage which is in accordance with previous findings that throughout Pangaea Early Triassic *Lystrosaurus* died relatively young due to environmental stressors.*

Our results support the hyperthermal hypothesis that ~252 Mya increased continental aridity, already a consequence of the coalescence of Pangaea, was critically intensified by volcanogenic greenhouse gasses from the Siberian traps.

We propose that in the aftermath of the End-Permian mass extinction event, a succession of climatic drying episodes orchestrated a series of fully-functioning terrestrial ecosystems that were markedly different to those of the pre-extinction, and likely had a profound and lasting influence on the evolution of tetrapods.

[Images are from this paper.]



Cabreira, S.F., et al (2022) **Diphyodont tooth replacement of *Brasilodon*: A Late Triassic eucynodont that challenges the time of origin of mammals.** JOURNAL OF ANATOMY 241:doi.org/10.1111/joa.13756

Authors' abstract: *Two sets of teeth (diphyodonty) characterise extant mammals but not reptiles, as they generate many replacement sets (polyphyodonty). The transition in long-extinct species from many sets to only two has to date only been reported in Jurassic eucynodonts.*

Specimens of the Late Triassic brasilodontid eucynodont *Brasilodon* have provided anatomical and histological data from three lower jaws of different growth stages. These reveal ordered and timed replacement of deciduous by adult teeth.

Therefore, this diphyodont dentition, as contemporary of the oldest known dinosaurs, shows that *Brasilodon* falls within a range of wide variations of typically mammalian, diphyodont dental patterns.

Importantly, these three lower jaws represent distinct ontogenetic stages that reveal classic features for timed control of replacement, by the generation of only one replacement set of teeth.

This data shows that the primary premolars reveal a temporal replacement pattern, importantly from directly below each tooth, by controlled regulation of tooth resorption and regeneration.

The complexity of the adult prismatic enamel structure with a conspicuous intra-structural Schmelzmuster array suggests that, as in the case of extant mammals, this extinct species would have probably sustained higher metabolic rates than reptiles.

Furthermore, in modern mammals, diphyodonty and prismatic enamel are inextricably linked, anatomically and physiologically, to a set of other traits including placentation, endothermy, fur, lactation and even parental care.



Our analysis of the osteodental anatomy of Brasilodon pushes back the origin of diphyodonty and consequently, its related biological traits to the Norian (225.42 ± 0.37 megayears ago), and around 25 myr after the End-Permian mass extinction event.

[Image shows life reconstruction of *Brasilodon*.]

Green, T., et al (2022) **Continental flood basalts drive Phanerozoic extinctions.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 119:doi.org/10.1073/pnas.2120441119

Authors' abstract: *Refinements of the geological timescale driven by the increasing precision and accuracy of radiometric dating have revealed an apparent correlation between large igneous provinces (LIPs) and intervals of Phanerozoic faunal turnover that has been much discussed at a qualitative level.*

However, the extent to which such correlations are likely to occur by chance has yet to be quantitatively tested, and other kill mechanisms have been suggested for many mass extinctions.

Here, we show that the degree of temporal correlation between continental LIPs and faunal turnover in the Phanerozoic is unlikely to occur by chance, suggesting a causal relationship linking extinctions and continental flood basalts. The relationship is stronger for LIPs with higher estimated eruptive rates and for stage boundaries with higher extinction magnitudes.

This suggests LIP magma degassing as a primary kill mechanism for mass extinctions and other intervals of faunal turnover, which may be related to CO₂, SO₂CO₂, SO₂, Cl, and F release. Our results suggest continental LIPs as a major, direct driver of extinctions throughout the Phanerozoic.

Dinosaurs.

Griffin, C.T., et al (2022) **Africa's oldest dinosaurs reveal early suppression of dinosaur distribution.** NATURE 609:313-319

Authors' abstract: *The vertebrate lineages that would shape Mesozoic and Cenozoic terrestrial ecosystems originated across Triassic Pangaea. By the*

Late Triassic (Carnian stage, ~235 million years ago), cosmopolitan 'disaster faunas' had given way to highly endemic assemblages on the supercontinent.

Testing the tempo and mode of the establishment of this endemism is challenging. There were few geographic barriers to dispersal across Pangaea during the Late Triassic. Instead, palaeolatitudinal climate belts, and not continental boundaries, are proposed to have controlled distribution.

During this time of high endemism, dinosaurs began to disperse and thus offer an opportunity to test the timing and drivers of this biogeographic pattern. Increased sampling can test this prediction.

If dinosaurs initially dispersed under palaeolatitudinal-driven endemism, then an assemblage similar to those of South America and India, including the earliest dinosaurs, should be present in Carnian deposits in south-central Africa.

*Here we report a new Carnian assemblage from Zimbabwe that includes Africa's oldest definitive dinosaurs, including a nearly complete skeleton of the sauropodomorph *Mbiresaurus raathi* gen. et sp. nov.*

This assemblage resembles other dinosaur-bearing Carnian assemblages, suggesting that a similar vertebrate fauna ranged high-latitude austral Pangaea.

The distribution of the first dinosaurs is correlated with palaeolatitude-linked climatic barriers, and dinosaurian dispersal to the rest of the supercontinent was delayed until these barriers relaxed, suggesting that climatic controls influenced the initial composition of the terrestrial faunas that persist to this day.

Nudds, J.R., et al (2022) **Gastroliths and *Deinonychus* teeth associated with a skeleton of *Tenontosaurus* from the Cloverly Formation (Lower Cretaceous), Montana, USA.** CRETACEOUS RESEARCH 140:doi.org/10.1016/j.cretres.2022.105327 (available as a free pdf)

Authors' abstract: *Tenontosaurus tilletti was an abundant ornithischian dinosaur from the Lower Cretaceous of North America, commonly regarded as a 'basal' iguanodontian.*

Here, we describe a remarkably well-preserved specimen, comprising a near-complete skeleton and skull, from the Cloverly Formation, Montana, USA, currently housed at the University of Manchester Museum, UK.

*Found alongside the specimen were alleged gastroliths, cycad seeds, and teeth of the contemporaneous dromaeosaur *Deinonychus antirrhopus*, all of which were buried in an alleged ash.*

We assess the credibility of these claims, using X-ray CT scanning and X-ray fluorescence (XRF) respectively, and show that the ‘seeds’ are non-organic mineral concretions, and that the ‘ash’ is actually a lime mud with a silica content of approximately 7%.

*We confirm the identification of the gastroliths and the *Deinonychus* teeth, providing further evidence to support the long-standing assertion, originally made by John Ostrom in 1970, that *Tenontosaurus* was a common food item for *Deinonychus*.*

Microbiology.

Hayward, A., and C. Gilbert (2022) **Transposable elements.** CURRENT BIOLOGY 32:R904-R909 (available as a free pdf)

[Genomes are the sum of genes in an organism, the total expression of heredity.]

Authors’ extracts: Transposable elements are a near ubiquitous feature of eukaryotic genomes, and they often comprise a substantial proportion of total genomic content. Active transposable elements play no inherent role in host biology, instead operating as genomic parasites.

Although the costs associated with inducing a host to synthesise an individual transposable element are nearly neutral, if transposition occurs into an essential host gene or regulatory region, insertional mutagenesis can be highly deleterious or even fatal to the host.

Transposable elements are also directly associated with several human diseases, including muscular dystrophy, haemophilia, and several forms of cancer.

Given the costs outlined above, host genomes have evolved strategies to control transposable element activity. These include epigenetic mechanisms that alter chromatin conformation to reduce transposable element expression, and targeted degradation of transcripts. Consequently, after an initial period of proliferation, the activity of a given transposable element tends to decline or halt altogether.

*A major discovery of the genomic era has been that genome size varies greatly among species, and that this is partially explained by substantial variation in transposable-element content, for example: maize 84%, pig 40%, *Drosophila* 20%, chicken 10%, and brewer’s yeast 3%.*

In humans, transposable elements account for approximately two-thirds of our 3.2 Gb genome, dwarfing the 1 to 2% encoding our genes. Transposable elements gradually accumulate mutations at the same background mutation rate as the rest of the genome. As a result, many transposable element sequences are ‘genomic fossils’ that can no longer mobilise.

Numerous examples exist where transposable elements have played significant roles during vertebrate evolution. For example, the domestication of recombination activating genes from transposase genes was an important step in the evolution of adaptive immunity in jawed vertebrates.

A transposable element insertion even appears to have provided the genetic mechanism by which apes lost their tails! Specifically, insertion of a short interspersed nuclear element transposable element into an intron of the brachyury gene in the ancestor of hominoids is implicated in causing alternative splicing and tail loss.

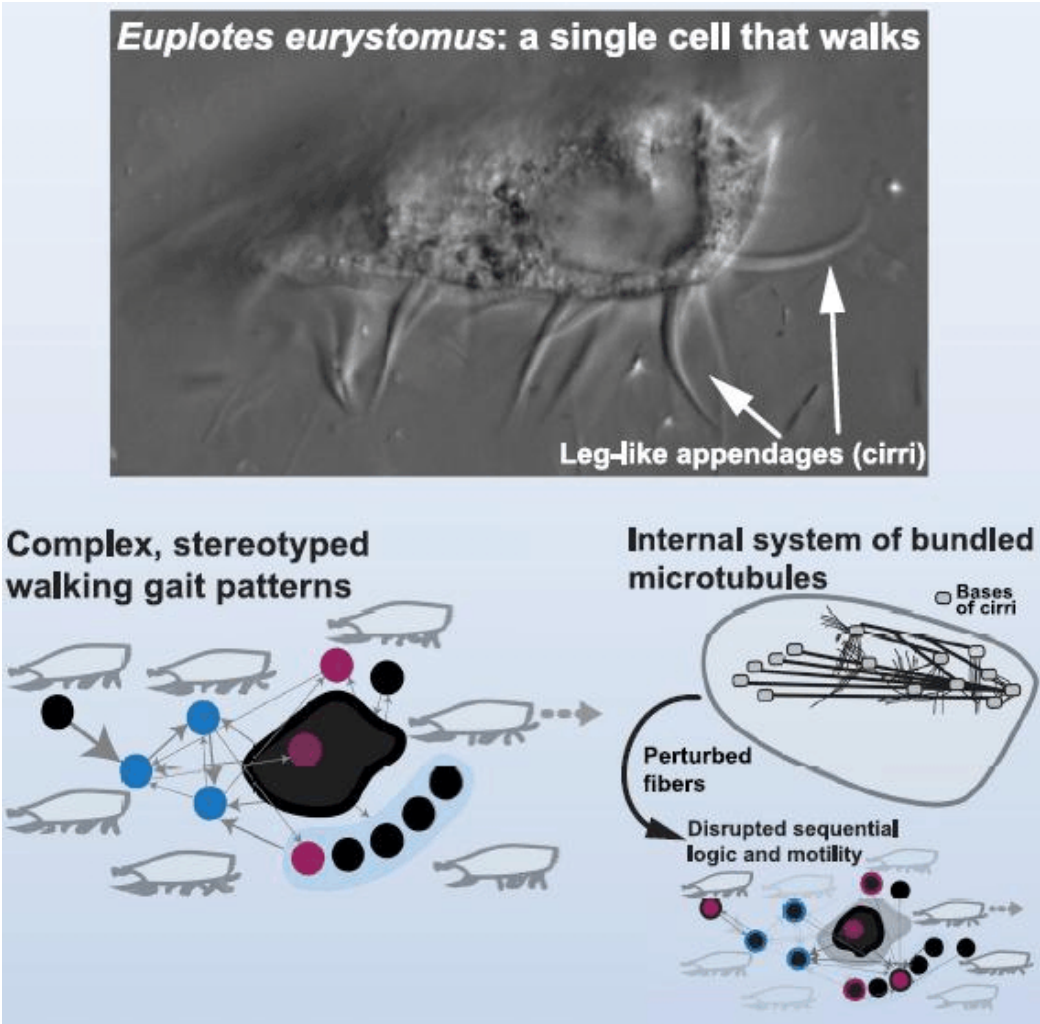
Coupled with strong selection for resistance, stress-induced increases in transposable-element activity may potentially provide an engine for evolution, whereby beneficial mutations arise and spread through a population.

Transposable elements do not share a single evolutionary origin. Moreover, the distinction between viruses and transposable elements is blurred in several cases, complicating attempts to elucidate their respective histories. Viruses are often defined as infectious particles (virions) that replicate within the living cells of organisms. Meanwhile, transposable elements are considered mobile genetic elements that are not infectious and are restricted to individual host cells.

Larson, B.T., et al (2022) **A unicellular walker controlled by a microtubule based finite-state machine.** CURRENT BIOLOGY 32:doi.org/10.1016/j.cub.2022.07.034 (available as a free pdf)

Authors’ abstract: *Here, we demonstrate finite-state machine-like processing embodied in cells using the walking behavior of Euplotes eurystomus, a ciliate that walks across surfaces using fourteen motile appendages (cirri).*

We found that cellular walking entails regulated transitions among a discrete set of gait states. The set of observed transitions decomposes into a small group of high-probability, temporally irreversible transitions and a large group of low-probability, time-symmetric transitions, thus revealing stereotypy in the sequential patterns of state transitions.



Simulations and experiments suggest that the sequential logic of the gait is functionally important. Taken together, these findings implicate a finite-state-machine-like process.

Cirri are connected by microtubule bundles (fibers), and we found that the dynamics of cirri involved in different state transitions are associated with the structure of the fiber system.

Perturbative experiments revealed that the fibers mediate gait coordination, suggesting a mechanical basis of gait control.

[Images are from this paper.]

Zoology.

Kornder, N.A., et al (2022) **Sponges sneeze mucus to shed particulate waste from their seawater inlet pores.** CURRENT BIOLOGY 32:doi.org/10.1016/j.cub.2022.07.017 (available as a free pdf)

Authors’ abstract: *Sponges, among the oldest extant multicellular organisms on Earth, play a key role in the cycling of nutrients in many aquatic ecosystems. They need to employ strategies to prevent clogging of their internal filter system by solid wastes, but self-cleaning mechanisms are largely unknown.*

It is commonly assumed that sponges remove solid waste with the outflowing water through distinct outflow openings (oscula). Here, we present time-lapse video footage and analyses of sponge waste revealing a completely different mechanism of particle removal in the Caribbean tube sponge Aplysina archeri.

This sponge actively moves particle-trapping mucus against the direction of its internal water flow and ejects it into the surrounding water from its seawater inlet pores (ostia) through periodic surface contractions that have been described earlier as “sneezing.”

Visually, it appears as if the sponge is continuously streaming mucus-embedded particles and sneezes to shed this particulate waste, resulting in a notable flux of detritus that is actively consumed by sponge-associated fauna.

The new data are used to estimate production of detritus for this abundant sponge on Caribbean coral reefs. Last, we discuss why waste removal from the sponge inhalant pores may be a common feature among sponges and compare the process in sponges to equivalent mechanisms of mucus transport in other animals, including humans.

Schultheiss, P., et al (2022) **The abundance, biomass, and distribution of ants on Earth.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 119:doi.org/10.1073/pnas.2201550119

Authors' abstract: *Our analysis is based on 489 studies, spanning all continents, major biomes, and habitats. We conservatively estimate total abundance of ground-dwelling ants at over 3×10^{15} and estimate the number of all ants on Earth to be almost 20×10^{15} individuals.*

The latter corresponds to a biomass of ~12 megatons of dry carbon. This exceeds the combined biomass of wild birds and mammals and is equivalent to ~20% of human biomass.

Abundances of ground-dwelling ants are strongly concentrated in tropical and subtropical regions but vary substantially across habitats. The density of leaf-litter ants is highest in forests, while the numbers of actively ground-foraging ants are highest in arid regions.

Ballard, J.W.O., et al (2022) **Eye contact and sociability data suggests that Australian dingoes were never domesticated.** CURRENT ZOOLOGY 68:doi.org/10.1093/cz/zoab024 (available as a free pdf)

Authors' abstract: *Dogs were the first animal to become domesticated by humans, and they represent a classic model system for unraveling the processes of domestication. We compare Australian dingo eye contact and socialization with Basenji and German Shepherd dog (GSD) breeds.*

Australian dingoes arrived in Australia 5,000 to 8,000 BP, and there is debate whether they were domesticated before their arrival. The Basenji represents a primitive breed that diverged from the remaining breeds early in the domestication process, while GSDs are a breed dog selected from existing domestic dogs in the late 1800s.

We conducted a 4-phase study with unfamiliar and familiar investigators either sitting passively or actively calling each canid. We found 75% of dingoes made eye contact in each phase. In contrast, 86% of Basenjis and 96% of GSDs made eye contact. Dingoes also exhibited shorter eye-gaze duration than breed dogs and did not respond to their name being called actively.

Sociability, quantified as a canid coming within 1 metre of the experimenter, was lowest for dingoes and highest for GSDs. For sociability duration, dingoes spent less time within 1 metre of the experimenter than either breed dog.

When compared with previous studies, these data show that the dingo is behaviorally intermediate between wild wolves and Basenji dogs and suggest that it was not domesticated before it arrived in Australia. However, it remains possible that the accumulation of mutations since colonization has obscured historical behaviors, and dingoes now exist in a feralized retamed cycle.

Todd, E.T., et al (2022) **The genomic history and global expansion of domestic donkeys.** SCIENCE 377:doi.org/10.1126/science.abo3503

Authors' abstract: *Donkeys have been important to humans for thousands of years, being the primary source of work and transport for many cultures. Unlike horses, little was known about the origin and domestication of donkeys.*

We sequenced the genomes of modern and ancient donkeys and found evidence of an eastern African origin over 7,000 years ago, with subsequent isolation and divergence of lineages in Africa and Eurasia.

We also reveal the imprint of desertification on divergence among groups and specifics about donkey breeding and husbandry, including selection for large size and the practice of inbreeding.

Donkeys transformed human history as essential beasts of burden for long-distance movement, especially across semi-arid and upland environments. They remain insufficiently studied despite globally expanding and providing key support to low- to middle-income communities.

To elucidate their domestication history, we constructed a comprehensive genome panel of 207 modern and 31 ancient donkeys, as well as 15 wild equids.

We found a strong phylogeographic structure in modern donkeys that supports a single domestication in Africa ~5000 BCE, followed by further expansions in this continent and Eurasia and ultimately returning to Africa.

We uncover a previously unknown genetic lineage in the Levant ~200 BCE, which contributed increasing ancestry toward Asia. Donkey management involved inbreeding and the production of giant bloodlines at a time when mules were essential to the Roman economy and military.

Klump, B.C., et al (2022) **Is bin-opening in cockatoos leading to an innovation arms race with humans?** CURRENT BIOLOGY 32:/doi.org/10.1016/j.cub.2022.08.008 (available as a free pdf)

Authors’ extract: Here, we report a potential case in wild, urban-living, sulphur-crested cockatoos (Cacatua galerita; henceforth cockatoos), where the socially-learnt behaviour of opening and raiding of household bins by cockatoos is met with increasingly effective and socially-learnt bin protection measures by human residents.

Cockatoos in Sydney have begun to open suburban rubbish bins, with knowledge spreading to form local traditions. In accessing food, cockatoos spread garbage onto the street, putting them in conflict with people.

Protecting bins from cockatoos is challenging as the lid needs to still open when the bin is tipped over into the garbage truck, yet local human residents have innovated various solutions to protect their bins from attack.

Our data were best described by 13 distinct clusters, which we further assigned to levels based on the stage and degree of alteration to the bin.

These ranged from level 2, no functional alteration to the bin (e.g. a rubber snake), level 3, unfixed object to prevent lifting (e.g. rock), level 4, object to prevent flipping (e.g. shoes in hinge), to level 5, fixed alteration to prevent opening (e.g. an attached weight; representing the greatest investment).

Variation in the efficacy of these levels on preventing bin-opening was then verified with personal observations. We observed that ‘no functional alteration’ and ‘low efficacy’ devices (e.g. rocks) could be solved by cockatoos, while we have not yet observed cockatoos opening bins protected at level 4 or 5.

[Images are from this paper and show the different levels of cockatoo defences.]



Wu, Y., et al (2022) **Ambush predation and the origin of euprimates.** SCIENCE ADVANCES 8:doi.org/10.1126/sciadv.abn6248 (available as a free pdf)

Authors’ abstract: *Primates of modern aspect (euprimates) are characterized by a suite of characteristics (e.g., convergent orbits, grasping hands and feet, reduced claws, and leaping), but the selective pressures responsible for the evolution of these euprimate characteristics have long remained controversial.*

Here, we used a molecular phyloecological approach to determine the diet of the common ancestor of living primates (CALP), and the results showed that the CALP had increased carnivory.

Given the carnivory of the CALP, along with the general observation that orbital convergence is largely restricted to ambush predators, our study suggests that the euprimate characteristics could have been more specifically adapted for ambush predation.

In particular, our behavior experiment further shows that nonclaw climbing can significantly reduce noises, which could benefit the ancestral euprimates’ stalking to ambush their prey in trees. Therefore, our study suggests that the distinctive euprimate characteristics may have evolved as their specialized adaptation for ambush predation in arboreal environments.

Ecology.

Sánchez de Miguel, A., et al (2022) **Environmental risks from artificial nighttime lighting widespread and increasing across Europe.** SCIENCE ADVANCES 8:doi.org/10.1126/sciadv.abl6891 (available as a free pdf)

Authors’ abstract: *The nighttime environment of much of Earth is being changed rapidly by the introduction of artificial lighting.*

While data on spatial and temporal variation in the intensity of artificial lighting have been available at a regional and global scale, data on variation in its spectral composition have only been collected for a few locations, preventing variation in associated environmental and human health risks from being mapped.

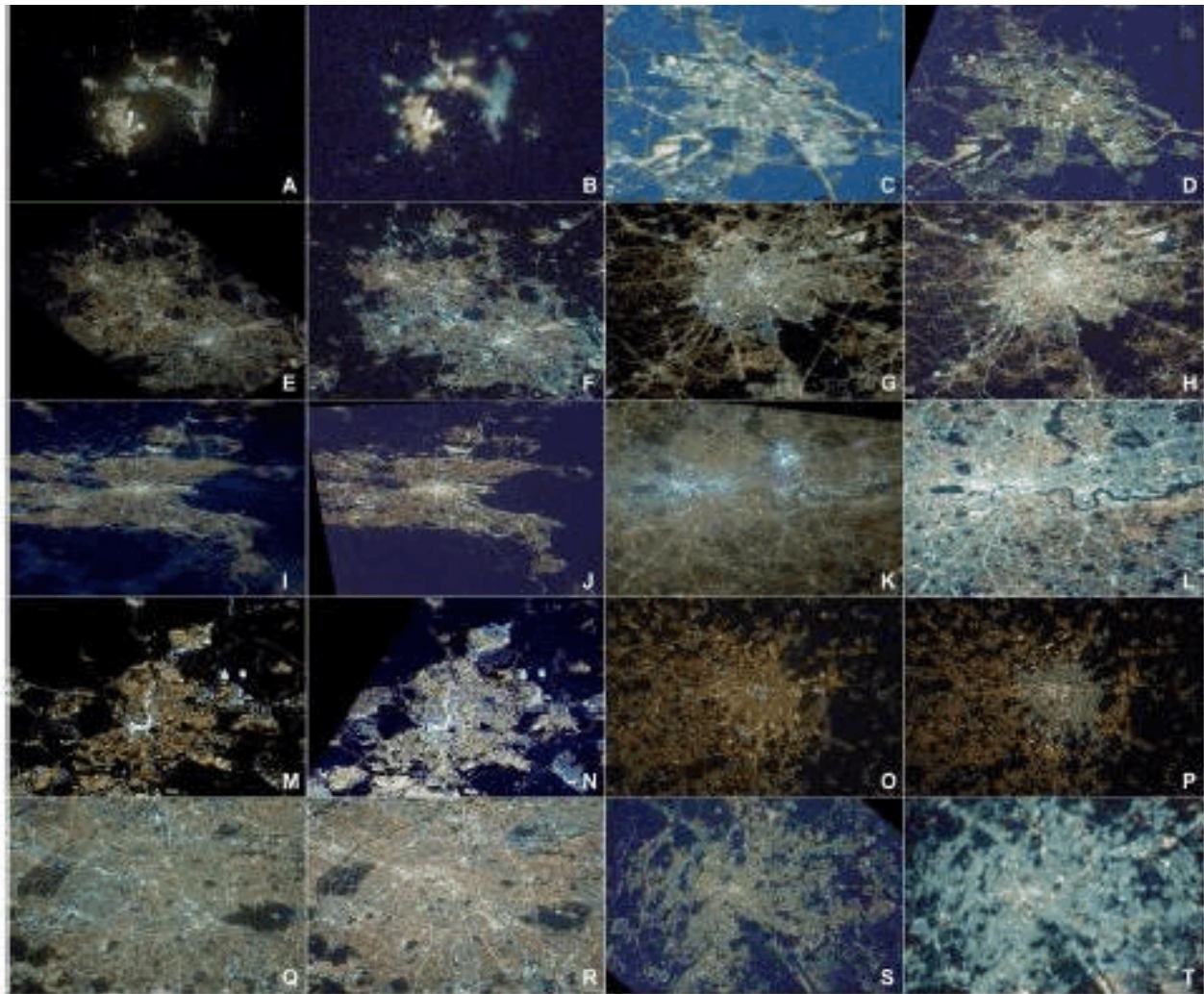


Fig. 4. Changes in different European cities at night. Comparison of Images obtained from the ISS for Gibraltar/Algeciras in (A) 2012 and (B) 2020, Amsterdam in (C) 2012 and (D) 2016, Birmingham in (E) 2013 and (F) 2020, Brussels in (G) 2013 and (H) 2019, Dublin in (I) 2012 and (J) 2014, London in (K) 2012 and (L) 2020, Madrid in (M) 2012 and (N) 2017, Milan in (O) 2012 and (P) 2015, Paris in (Q) 2012 and (R) 2020, and Rome in (S) 2012 and (T) 2020. Images (see data file S2) have been color-calibrated following (49), except those for Milan, which were processed by the International Astronomical Union.

Here, we use imagery obtained using digital cameras by astronauts on the International Space Station to map variation in the spectral composition of lighting across Europe for 2012-2013 and 2014-2020.

These show a regionally widespread spectral shift, from that associated principally with high-pressure sodium lighting to that associated with broad white light-emitting diodes and with greater blue emissions. Reexpressing the color maps in terms of spectral indicators of environmental pressures, we find that this trend is widely increasing the risk of harmful effects to ecosystems.

The change in both B/G and G/R ratios of artificial nighttime light emissions between 2012-2013 and 2014-2020 drives biological responses.

In addition, the influence of changes in the spectral composition was determined specifically for

- (i) melatonin suppression, using relationships established between the MSI and the B/G and G/R ratios;*
- (ii) visibility of stars, using relationships established between the SLI and the B/G and G/R ratios; and*
- (iii) the relative phototactic response of moths and total phototactic response of moths.*

[Images are from this paper.]

Osowski, A.R., and S.T. Szedlmayer (2022) **Red snapper (*Lutjanus campechanus*) abundance on oil and gas platforms based on mark–recapture methods in the northern Gulf of Mexico.** CANADIAN JOURNAL OF FISHERIES AND AQUATIC SCIENCES 79:doi.org/10.1139/cjfas-2021-0227

*Authors’ abstract: Oil and gas platforms provide reef habitat for many fish species on continental shelves. Red snapper (*Lutjanus campechanus*) are an important component of these communities in the Gulf of Mexico, but abundance estimates are difficult to obtain. Hydroacoustic and visual-video surveys have been applied in previous abundance estimates, but such methods have difficulties.*

To improve abundance and fishing mortality (F) estimates, mark–recapture methods were applied to red snapper at 22 platforms in the northern Gulf of

Mexico from February 2017 through May 2020. Estimates were adjusted for emigration, tagging mortality, natural mortality, fisher nonreporting, and tag retention.

Mean \pm SE abundance·platform⁻¹ (563 \pm 107, range = 109 to 1407) and F (0.36, range = 0 to 1.25·platform⁻¹) were not significantly affected by year, location, depth, or distance-from-shore.

Based on an estimated 904 platforms, there were 508,952 (900,845 kg) red snapper on platforms. This indicated that red snapper on platforms accounted for only 1.2% of the 2016 Gulf of Mexico red snapper biomass. Thus, required removal of platforms will not significantly affect the red snapper stock in this area.

Human Prehistory.

Pinson, A., et al (2022) **Human TKTL1 implies greater neurogenesis in frontal neocortex of modern humans than Neanderthals.** SCIENCE 377:doi.org/10.1126/science.abl6422

Authors’ abstract: Neanderthal brains were similar in size to those of modern humans. We sought to investigate potential differences in neurogenesis during neocortex development. Modern human transketolaselike 1 (TKTL1) differs from Neanderthal TKTL1 by a lysine-to-arginine amino acid substitution.

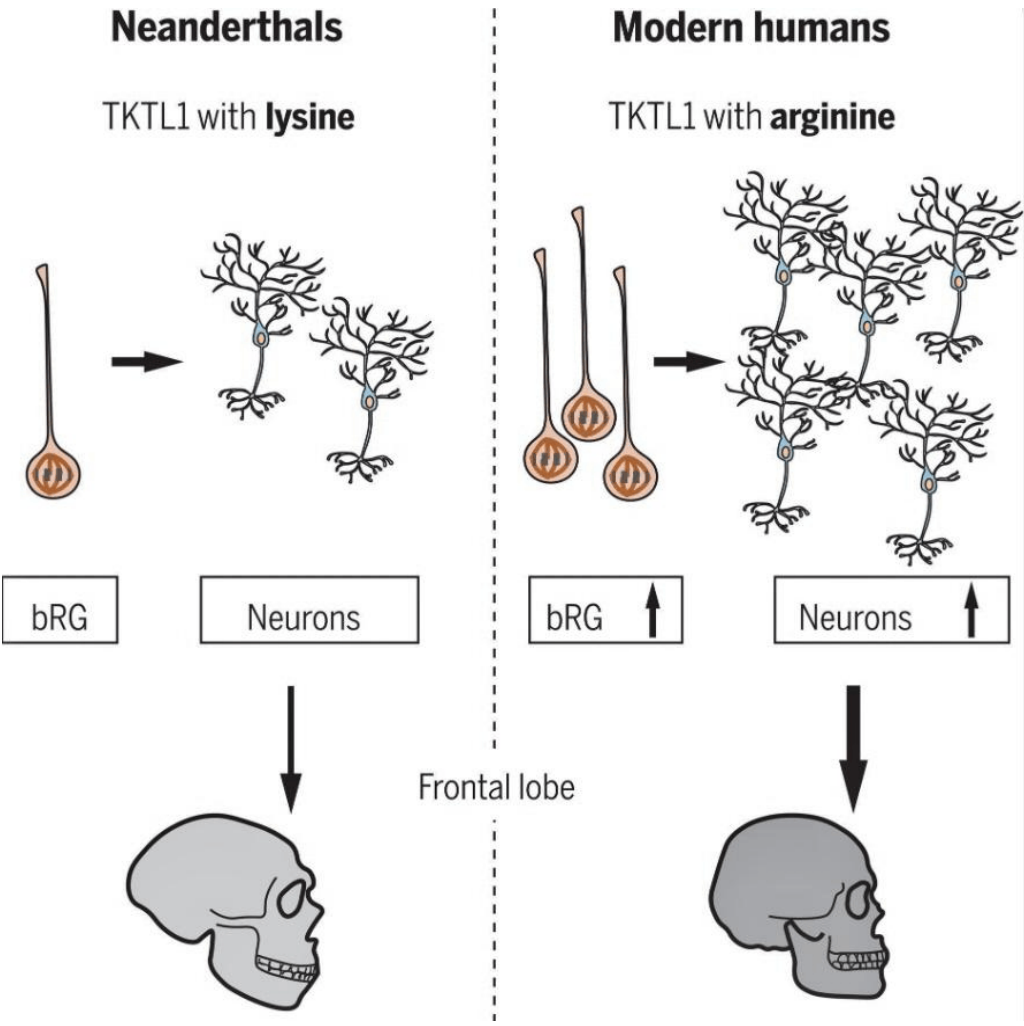
Using overexpression in developing mouse and ferret neocortex, knockout in fetal human neocortical tissue, and genome-edited cerebral organoids, we found that the modern human variant, hTKTL1, but not the Neanderthal variant, increases the abundance of basal radial glia (bRG) but not that of intermediate progenitors (bIPs).

bRG generate more neocortical neurons than bIPs. The hTKTL1 effect requires the pentose phosphate pathway and fatty acid synthesis. Inhibition of these metabolic pathways reduces bRG abundance in fetal human neocortical tissue.

Our data suggest that neocortical neurogenesis in modern humans differs from that in Neanderthals. The single lysine-to-arginine substitution in modern human TKTL1 leads to greater bRG numbers than in Neanderthals.

These bRG in turn generate more neocortical neurons in modern humans. Because *TKTL1* expression in fetal human neocortex is particularly high in the developing frontal lobe, these findings imply that the frontal lobe of modern humans contains more neurons than that of Neanderthals.

[Image is from this paper.]



Sheisha, H., et al (2022) Nile waterscapes facilitated the construction of the Giza pyramids during the 3rd millennium B.C. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 119:doi.org/10.1073/pnas.2202530119

Authors' abstract: *The pyramids of Giza constitute one of the world's most iconic cultural landscapes and have fascinated humanity for thousands of years. Indeed, the Great Pyramid of Giza (Khufu Pyramid) was one of the Seven Wonders of the Ancient World.*

It is now accepted that ancient Egyptian engineers exploited a former channel of the Nile to transport building materials and provisions to the Giza plateau. However, there is a paucity of environmental evidence regarding when, where, and how these ancient landscapes evolved.

New palaeoecological analyses have helped to reconstruct an 8,000-year fluvial history of the Nile in this area, showing that the former waterscapes and higher river levels around 4,500 years ago facilitated the construction of the Giza Pyramid Complex.

The pyramids of Giza originally overlooked a now defunct arm of the Nile. This fluvial channel, the Khufu branch, enabled navigation to the Pyramid Harbor complex but its precise environmental history is unclear.

To fill this knowledge gap, we use pollen-derived vegetation patterns to reconstruct 8,000 years of fluvial variations on the Giza floodplain.

After a high-stand level concomitant with the African Humid Period, our results show that Giza's waterscapes responded to a gradual insolation-driven aridification of East Africa, with the lowest Nile levels recorded at the end of the Dynastic Period.

The Khufu branch remained at a high-water level (~40% of its Holocene maximum) during the reigns of Khufu, Khafre, and Menkaure, facilitating the transportation of construction materials to the Giza Pyramid Complex.

Modern Humans.

Brojakowska, A., et al (2022) **Retrospective analysis of somatic mutations and clonal hematopoiesis in astronauts.** COMMUNICATIONS BIOLOGY 5:doi.org/10.1038/s42003-022-03777-z (available as a free pdf)

Authors’ abstract: *With planned deep space and commercial spaceflights, gaps remain to address health risks in astronauts. Multiple studies have shown associations between clonal expansion of hematopoietic cells with hematopoietic malignancies and cardiometabolic disease.*

This expansion of clones in the absence of overt hematopoietic disorders is termed clonal hematopoiesis (CH) of indeterminate potential (CHIP).

Using deep, error-corrected, targeted DNA sequencing we assayed for somatic mutations in CH-driver genes in peripheral blood mononuclear cells isolated from de-identified blood samples collected from 14 astronauts who flew Shuttle missions between 1998 to 2001.

We identified 34 nonsynonymous mutations of relatively low variant allele fraction in 17 CH-driver genes, with the most prevalent mutations in TP53 and DNMT3A.

The presence of these small clones in the blood of relatively young astronaut cohort warrants further retrospective and prospective investigation of their clinical relevance and potential application in monitoring astronaut’s health.

Clancy, C., et al (2022) **Resilience and the role of equids in humanitarian crises.** DISASTERS 46:doi.org/10.1111/disa.12501 (available as a free pdf)

Authors’ abstract: *In times of crisis, working equids can play a pivotal role in supporting vulnerable people in lower-middle income countries. However, their contributions are rarely acknowledged in academic research, media reporting, international policy, and development initiatives.*

Working equids are a key part of the social fabric of many lower middle income countries. They provide some of the poorest and most marginalised people in the world with an essential source of income and support, the same groups that are vulnerable to shocks and disturbances, with limited capacity to respond.

Working equids can play a critical part in supporting the resilience and recovery of communities that undergo the impacts of humanitarian crises. They can ferry goods and supplies, support rebuilding efforts, and offer a means of transport for people within or without affected areas. They can also help to maintain a sense of cultural identity and community cohesion during times of upheaval.

In the context of disasters, working equids can assist their owners in resuming work, restoring income and productivity. As such, working equids can reduce community vulnerability to the impacts of disasters and emergencies by generating social and economic stability, which is essential for long-term sustainable development.

Qiana, J., et al (2022) **Daytime eating prevents mood vulnerability in night work.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 119:

Authors’ abstract: *Shift workers have a 25% to 40% higher risk of depression and anxiety partly due to a misalignment between the central circadian clock and daily environmental/behavioral cycles that may negatively affect mood and emotional well-being. Hence, evidence based circadian interventions are required to prevent mood vulnerability in shift work settings.*

We used a stringently controlled 14-day circadian paradigm to assess mood vulnerability during simulated night work with either daytime and nighttime or daytime only eating as compared with simulated day work (baseline).

Simulated night work with daytime and nighttime eating increased depression-like mood levels by 26.2% and anxiety-like mood levels by 16.1% compared to baseline, whereas this did not occur with simulated night work in the daytime-only eating group.

Importantly, a larger degree of internal circadian misalignment was robustly associated with more depression-like and anxiety-like mood levels during simulated night work.

These findings offer a proof-of-concept demonstration of an evidence-based meal timing intervention that may prevent mood vulnerability in shift work settings.

Technology.

Ostermeijer, F., et al (2022) **Automobiles and urban density.** JOURNAL OF ECONOMIC GEOGRAPHY 22:doi.org/10.1093/jeg/lbab047 (available as a free pdf)

Authors’ abstract: *In this paper, we investigate the long-run impact of car ownership on urban population density, based on a sample of 232 city observations in 57 countries.*

Using the presence of a domestic car manufacturer in 1920 as a source of exogenous variation, our IV estimates indicate that car ownership substantially reduces density.

A one-standard deviation increase in car ownership rates causes a reduction in population density of around 35%. For employment density, we find almost identical results.

This result has important implications for vehicle taxation, car ownership growth in developing countries, and new transport technologies such as automated vehicles.

Bojarski, P.A., et al (2022) **Topic selectivity and adaptivity promote spreading of short messages.** SCIENTIFIC REPORTS 12:doi.org/10.1038/s41598-022-19719-y (available as a free pdf)

Authors’ abstract: *Why is the Twitter, with its extremely length-limited messages so popular? Our work shows that short messages focused on a single topic may have an inherent advantage in spreading through social networks, which may explain the popularity of a service featuring only short messages.*

We introduce a new explanatory model for information propagation through social networks that includes selectivity of message consumption depending on their content, competition for user’s attention between messages and message content adaptivity through user-introduced changes.

Our agent-based simulations indicate that the model displays inherent power-law distribution of number of shares for different messages and that the popular messages are very short.

The adaptivity of messages increases the popularity of already popular messages, provided the users are neither too selective nor too accommodating.

The distribution of message variants popularity also follows a power-law found in real information cascades. The observed behavior is robust against model parameter changes and differences of network topology.

Zahoora, U., et al (2022) **Ransomware detection using deep learning based unsupervised feature extraction and a cost sensitive Pareto Ensemble classifier.** SCIENTIFIC REPORTS 12:doi.org/10.1038/s41598-022-19443-7 (available as a free pdf)

Authors’ abstract: *Ransomware attacks pose a serious threat to Internet resources due to their far-reaching effects. It’s Zero-day variants are even more hazardous, as less is known about them.*

In this regard, when used for ransomware attack detection, conventional machine learning approaches may become data dependent, insensitive to error cost, and thus may not tackle zero-day ransomware attacks.

Zero-day ransomware have normally unseen underlying data distribution. This paper presents a Cost-Sensitive Pareto Ensemble strategy, CSPE-R to detect novel Ransomware attacks.

Initially, the proposed framework exploits the unsupervised deep Contractive Auto Encoder (CAE) to transform the underlying varying feature space to a more uniform and core semantic feature space.

To learn the robust features, the proposed CSPE-R ensemble technique explores different semantic spaces at various levels of detail. Heterogeneous base estimators are then trained over these extracted subspaces to find the core relevance between the various families of the ransomware attacks.

Then, a novel Pareto Ensemble-based estimator selection strategy is implemented to achieve a cost-sensitive compromise between false positives and false negatives.

Finally, the decision of selected estimators are aggregated to improve the detection against unknown ransomware attacks. The experimental results show

that the proposed CSPE-R framework performs well against zero-day ransomware attacks.

Ransomware is a specific extortion attack that exploits cryptography to hijack a victim's computer and consequently mandate ransom payment for disinfecting the infected resource.

Nowadays, due to monetary benefits, these kinds of extorting attacks have been emerging very rapidly and causing high financial losses to individuals and organizations.

The first ransomware attack, known as Acquired Immunodeficiency Syndrome (AIDS) or Trojan-PC Cyborg, was reported in 1989. It spread through twenty thousand septic floppy disk drives dispersed to the AIDS conference accomplices.

It stays silently in the system and triggers after 90 times the system's reboot. Upon activation, it either encrypts the files or hides the directories. At that time, due to less connectivity, it did not proliferate on a large scale.

Later, ransomware intruded cyber resources utilizing different forged applications. These fraudulent applications grab users by falsely notifying them that the user's critical data is breached and demand ransom for data recovery. In the year 2015, the Federal Bureau of Investigation (FBI) reported an US\$18,000,000 loss due to ransomware attacks.

One of the latest cyber-attacks in May 2017, conceded via WannaCry malware, shows that ransomware has established over the years and does not use the conventional propagation methods anymore. According to one of Kaspersky's reports, 62 novel ransomware families were detected at the beginning of year 2016.

In 2016, an 11% increase in ransomware attacks was observed as compared 2015. Organizations and individuals practice different types of detection systems against these attacks. However, the financial benefits are motivating attackers to escalate the production of new variants to evade the security of the existing systems.

Although zero-day vulnerabilities are exploited in a variety of attacks, but when combined with ransomware, it can be more devastating. Zero-day attacks are

increasing very rapidly with an increase in the applications. According to cybersecurity ventures, increase in zero-day attacks observed in 2015 is one attack per week, which may increase to one attack per day in 2023.

FREE STUFF ONLINE

You will have noticed that I provide sources for the 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. Most 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.

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 bulletin OLD RADIO TIMES, available at www.otrr.org/?c=times, with a free 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.

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