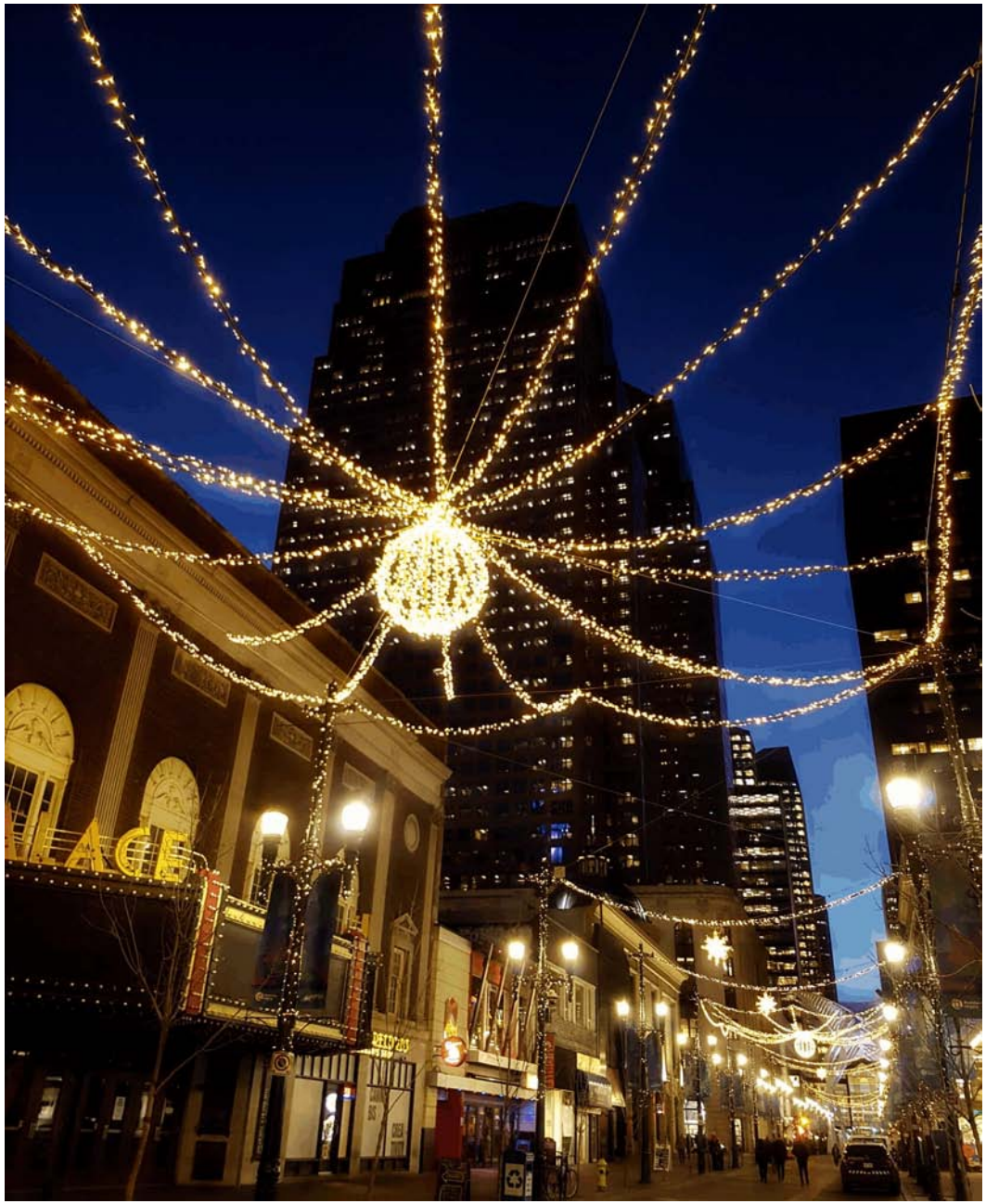
OPUNTIA 514

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.

AROUND COWTOWN

photos by Dale Speirs

Some neighbourhood Christmas lights. At the time I took these photos, we had a chinook, so the ground was bare. Since then we have had a steady pattern of light snowfalls (2 to 4 cm) with daytime temperatures about -10ºC and overnight lows around -20. All told, a mild winter so far. In Calgary there is a 50/50 chance of a brown Christmas since records were first kept in 1881. (Calgary was founded in 1975.)



Above: Seen in my neighbourhood.
At right: Stephen Avenue pedestrian mall in the downtown core.

Brookfield Place
7 Avenue SW in
the downtown.

CURRENT EVENTS: PART 30
by Dale Speirs

[Parts 1 to 29 appeared in OPUNTIAs #474, 475, 479, 480, 483, 484, 488 to 503, and 507 to 513.]

Trying To Get Back To Normal.

Alberta provincial law mandates masks and QR-code vaccine certificates. The Calgary Philatelic Society is trying to move away from Zoom meetings to live meetings but the latter are on and off because the province keeps changing the rules. Pre-pandemic the CPS had a monthly general meeting on first Wednesdays and a stamp auction on third Wednesdays, both at the Kerby Centre downtown.

I took these photos at our November 17 auction. Below: CPS members view some of the 245 auction lots. At right: Kerby Centre employee (on left) scans the QR code on a CPS member's smartphone. No vaccination? No entry.

As of December 19, Canada had 1,874,786 cases of COVID-19, with 30,040 deaths. 76.5% of the population was vaccinated, out of a population of 38,000,000.

Seen In The COVID-19 Literature.

Li, J., et al (2021) **The emergence, genomic diversity, and global spread of SARS-CoV-2.** NATURE 600:doi.org/10.1038/s41586-021-04188-6 (available as a free pdf)

Authors' abstract: *Since the first cases of COVID-19 were documented in Wuhan, China in 2019, the world has witnessed a devastating global pandemic, with more than 238 million cases, nearly 5 million fatalities and the daily number of people infected increasing rapidly.*

Here we describe the currently available data on the emergence of the SARS-CoV-2 virus, the causative agent of COVID-19, outline the early viral spread in Wuhan and its transmission patterns in China and across the rest of the world, and highlight how genomic surveillance, together with other data such as those on human mobility, has helped to trace the spread and genetic variation of the virus and has also comprised a key element for the control of the pandemic.

We pay particular attention to characterizing and describing the international spread of the major variants of concern of SARS-CoV-2 that were first identified in late 2020 and demonstrate that virus evolution has entered a new phase.

More broadly, we highlight our currently limited understanding of coronavirus diversity in nature, the rapid spread of the virus and its variants in such an increasingly connected world, the reduced protection of vaccines, and the urgent need for coordinated global surveillance using genomic techniques.

On 31 December 2019, the Wuhan Municipal Health Commission reported an outbreak of pneumonia on its official website. Subsequently, scientists reported the discovery of a previously undescribed coronavirus obtained from samples of the respiratory system of some of these patients.

This virus differed from all known coronaviruses including severe acute respiratory syndrome (SARS) coronavirus (SARS-CoV) and Middle East respiratory syndrome (MERS) coronavirus (MERS-CoV).

The World Health Organization (WHO) named the disease coronavirus disease 2019 (COVID-19) and the International Committee on Taxonomy of Viruses named this new infectious agent SARS-CoV-2; the seventh coronavirus that can infect humans. SARS-CoV-2 rapidly spread through the globally, producing several variants of concern (VOCs) and developing into a major and devastating pandemic.

Many of the early cases of COVID-19 in Wuhan, China, were associated with the Huanan Seafood Market, which, because of the presence of wildlife at the market, was considered an obvious candidate for the location of the initial zoonotic (that is, cross-species transmission) event.

However, none of the animals from the market (including rabbits, snakes, stray cats, badgers and bamboo rats) tested positive for SARS-CoV-2, and viral genome sequences of environmental samples from the market were not considered to occupy basal positions on the viral phylogeny (although the position of the rooting on the tree is uncertain).

In addition, some of the early cases of COVID-19 in Wuhan were not epidemiologically linked to the market, and some were linked to other markets. Therefore, although it has not been resolved fully, the current evidence suggests that the Huanan Seafood Market could be the location of an early 'superspreading' event.

From the earliest genomic comparisons, it was clear that SARS-CoV-2 had a genomic organization similar to SARS-CoV. The spike proteins of both viruses have similar three-dimensional structures, suggesting that these viruses might use the same cell surface receptor-human angiotensin-converting enzyme 2(ACE2). This was soon confirmed in vitro and using structural biology.

However, SARS-CoV-2 differs from SARS-CoV in two fundamental ways. First, there are six amino acid positions in the receptor-binding domain (RBD) of the spike protein that mediate the attachment of the SARS-CoV and SARS-CoV-2 spike proteins to the human ACE2 receptor.

However, amino acids at five of the six positions differed between SARS-CoV and SARS-CoV-2. Notably, such differences caused SARS-CoV-2 to have a higher binding avidity to the human ACE2 receptor, and may have contributed to the higher transmissibility of SARS-CoV-2 compared with SARS-CoV.

Davis, J.T., et al (2021) **Cryptic transmission of SARS-CoV-2 and the first COVID-19 wave.** NATURE 600:doi.org/10.1038/s41586-021-04130-w (available as a free pdf)

Authors' abstract: *Considerable uncertainty surrounds the timeline of introductions and onsets of local transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) globally.*

Although a limited number of SARS-CoV-2 introductions were reported in January and February 2020, the narrowness of the initial testing criteria, combined with a slow growth in testing capacity and porous travel screening, left many countries vulnerable to unmitigated, cryptic transmission.

Here we use a global metapopulation epidemic model to provide a mechanistic understanding of the early dispersal of infections and the temporal windows of the introduction of SARS-CoV-2 and onset of local transmission in Europe and the USA.

We find that community transmission of SARS-CoV-2 was likely to have been present in several areas of Europe and the USA by January 2020, and estimate that by early March, only 1 to 4 in 100 SARS-CoV-2 infections were detected by surveillance systems.

The modelling results highlight international travel as the key driver of the introduction of SARS-CoV-2, with possible introductions and transmission events as early as December 2019 to January 2020.

We find a heterogeneous geographic distribution of cumulative infection attack rates by 4 July 2020, ranging from 0.78% to 15.2% across US states and 0.19% to 13.2% in European countries.

A few weeks after the initial announcement of a cluster of atypical pneumonia cases in Wuhan, China, the first confirmed cases of coronavirus disease 2019 (COVID-19) in the USA and Europe were detected (on 21 January 2020 in WA, USA and on 24 January 2020 in France).

Although many more states and countries began to report initial introductions in the following weeks, only a few cases were detected daily during this time period, and most countries adopted a testing policy that targeted symptomatic individuals with a travel history linked to China.

Several reports suggest that the introduction of SARS-CoV-2 occurred earlier than initially recognized, raising questions about the effectiveness of the initial testing policies and travel-related restrictions, as well as the extent to which the SARS-CoV-2 virus spread through cryptic transmission in January and February 2020.

Brülhart, M., et al (2021) **Mental health concerns during the COVID-19 pandemic as revealed by helpline calls**. NATURE 600:doi.org/10.1038/s41586-021-04099-6 (available as a free pdf)

Authors' abstract: *Mental health is an important component of public health, especially in times of crisis. However, monitoring public mental health is difficult because data are often patchy and low-frequency.*

Here we complement established approaches by using data from helplines, which offer a real-time measure of 'revealed' distress and mental health concerns across a range of topics.

We collected data on 8 million calls from 19 countries, focusing on the COVID-19 crisis. Call volumes peaked six weeks after the initial outbreak, at 35% above pre-pandemic levels.

The increase was driven mainly by fear (including fear of infection), loneliness and, later in the pandemic, concerns about physical health. Relationship issues, economic problems, violence and suicidal ideation, however, were less prevalent than before the pandemic.

This pattern was apparent both during the first wave and during subsequent COVID-19 waves. Issues linked directly to the pandemic therefore seem to have replaced rather than exacerbated underlying anxieties. Conditional on infection rates, suicide-related calls increased when containment policies became more stringent and decreased when income support was extended.

This implies that financial relief can allay the distress triggered by lockdown measures and illustrates the insights that can be gleaned from the statistical analysis of helpline data.

The state of population mental health is difficult to measure. This could lead policymakers to neglect mental health issues relative to aspects that can be

measured more easily, especially during fast-moving crisis situations. We propose using helpline data as a source of real-time information on the state of public mental health. Helpline data have two main advantages.

First, helpline calls can be considered as a manifestation of revealed distress and mental health concerns. Callers incur the mental and time cost of reaching out without having been prompted to do so. Therefore, helpline calls resemble clinical data by offering a measure of mental health that is unaffected by researchers' study design and framing.

Second, information about helpline calls is recorded digitally with daily frequency and covers a wide range of conversation topics. Telephone helplines are well-established institutions for mental health protection and suicide prevention in many countries, and they offer support immediately, anonymously, cheaply and accessibly.

Some helplines specialize in particular issues such as suicide, children or violence against women. Suicide helplines, for example, have been shown to reduce suicide rates, and call volumes of suicide prevention helplines have been shown to relate to the incidence of actual suicides.

Using this approach in relation to the COVID-19 crisis, we documented the growth and composition of helpline calls as well as their pandemic-related determinants. Helplines take on particular relevance in a pandemic, when face-to-face contacts carry infection risks and may even be impossible owing to stay-at-home orders.

We collected data from 23 helplines in 14 European countries, the USA, China, Hong Kong, Israel and Lebanon. The total dataset covers 8 million individual calls made between 2019 and early 2021.

The panel structure of the data enables us to exploit differences in the timing of local infection waves and policy measures to isolate their separate effects on helpline calls.

This is a first-order issue for policymakers, as interventions designed to contain infections might also affect mental health by exacerbating unemployment, financial stress, loneliness, relationship problems and pre-existing mental vulnerabilities. These are, in turn, well-recognized risk factors for suicide.

We consider the analysis of helpline calls as a complement, and not a substitute, for established approaches. Mental health surveys and suicide statistics are highly informative, but they tend to be low frequency and available with a lag.

Higher-frequency monitoring has been performed in the context of the COVID-19 pandemic on the basis of online searches as recorded by Google Trends, by tracking visits to emergency departments, and by monitoring calls to the police for help with domestic disputes.

Munro, A.P.S., et al (2021) **Safety and immunogenicity of seven COVID-19 vaccines as a third dose (booster) following two doses of ChAdOx1 nCov-19 or BNT162b2 in the UK (COV-BOOST): a blinded, multicentre, randomised, controlled, phase 2 trial.** THE LANCET 398:doi.org/10.1016/S0140-6736(21)02717-3 (available as a free pdf)

Authors' extracts: *Few data exist on the comparative safety and immunogenicity of different COVID-19 vaccines given as a third (booster) dose.*

To generate data to optimise selection of booster vaccines, we investigated the reactogenicity and immunogenicity of seven different COVID-19 vaccines as a third dose after two doses of ChAdOx1 nCov-19 (Oxford–AstraZeneca; hereafter referred to as ChAd) or BNT162b2 (Pfizer–BioNtech, hearafter referred to as BNT).

The analysis shows there was good correlation seen for all vaccines between the pseudoneutralising assay NT50 against the wild-type and delta variants at days 0 and 28.

Vaccines that produce antibodies against wild-type appear to neutralise delta effectively in vitro to a consistent, but slightly lesser degree, confirming the current public health strategy of using wild-type vaccines to control the currently predominant delta epidemic. Future analysis will investigate the in vitro killing against alpha and beta variants.

Findings from this trial demonstrate that the immunogenicity of homologous or heterologous third dose boost with all tested vaccines was superior to control regardless of which vaccine had been received in the initial course, apart from VLA [Valneva vaccine], which did not achieve predefined criteria for minimum clinically important difference following BNT/BNT.

Lucas, C., et al (2021) **Impact of circulating SARS-CoV-2 variants on mRNA vaccine-induced immunity**. NATURE 600:doi.org/10.1038/s41586-021-04085-y (available as a free pdf)

Authors' abstract: *The emergence of SARS-CoV-2 variants with mutations in major neutralizing antibody-binding sites can affect humoral immunity induced by infection or vaccination. Here we analysed the development of anti-SARS-CoV-2 antibody and T cell responses in individuals who were previously infected (recovered) or uninfected (naive) and received mRNA vaccines to SARS-CoV-2.*

While individuals who were previously infected sustained higher antibody titres than individuals who were uninfected post-vaccination, the latter reached comparable levels of neutralization responses to the ancestral strain after the second vaccine dose.

T cell activation markers measured upon spike or nucleocapsid peptide in vitro stimulation showed a progressive increase after vaccination. Comprehensive analysis of plasma neutralization using 16 authentic isolates of distinct locally circulating SARS-CoV-2 variants revealed a range of reduction in the neutralization capacity associated with specific mutations in the spike gene.

Lineages with E484K and N501Y/T (for example, B.1.351 and P.1) had the greatest reduction, followed by lineages with L452R (for example, B.1.617.2).

While both groups retained neutralization capacity against all variants, plasma from individuals who were previously infected and vaccinated displayed overall better neutralization capacity than plasma from individuals who were uninfected and also received two vaccine doses, pointing to vaccine boosters as a relevant future strategy to alleviate the effect of emerging variants on antibody neutralizing activity.

The ongoing evolution and emergence of SARS-CoV-2 variants raise concerns about the effectiveness of monoclonal antibody therapies and vaccines. The mRNA-based vaccines Pfizer-BioNTech BNT162b2 and Moderna mRNA-1273 encode a stabilized full-length SARS-CoV-2 spike ectodomain derived from the Wuhan-Hu-1 genetic sequence and elicit potent neutralizing antibodies (NAbs).

However, emerging SARS-CoV-2 variants with mutations in the spike gene, especially in NAb-binding sites, have been associated with increased transmissibility as well as neutralization resistance to monoclonal antibodies, convalescent plasma and sera from vaccinated individuals.

Chu, J., et all (2021) **Religious identity cues increase vaccination intentions and trust in medical experts among American Christians**. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 118:doi.org/10.1073/pnas.2106481118 (available as a free pdf)

Authors' abstract: *Containing the COVID-19 pandemic in the United States requires mobilizing a large majority of the mass public to vaccinate, but many Americans are hesitant or opposed to vaccination.*

A significant predictor of vaccine attitudes in the United States is religiosity, with more-religious individuals expressing more distrust in science and being less likely to get vaccinated.

Here, we test whether explicit cues of common religious identity can help medical experts build trust and increase vaccination intentions. In a preregistered survey experiment conducted with a sample of unvaccinated American Christians (n = 1,765), we presented participants with a vaccine endorsement from a prominent medical expert (NIH Director Francis Collins) and a short essay about doctors' and scientists' endorsement of the vaccines.

In the common religious identity condition, these materials also highlighted the religious identity of Collins and many medical experts. Unvaccinated Christians in the common identity condition expressed higher trust in medical experts, greater intentions to vaccinate, and greater intentions to promote vaccination to friends and family than those who did not see the common identity cue.

These effects were moderated by religiosity, with the strongest effects observed among the most religious participants, and statistically mediated by heightened perceptions of shared values with the medical expert endorsing the vaccine.

These findings demonstrate the efficacy of common identity cues for promoting vaccination in a vaccine-hesitant subpopulation. More generally, the results illustrate how trust in science can be built through the invocation of common group identities, even identities often assumed to be in tension with science.

Dey, T., et al (2021) **Counterfactual time series analysis of short-term change in air pollution following the COVID-19 state of emergency in the United States.** SCIENTIFIC REPORTS 11:doi.org/10.1038/s41598-021-02776-0 (available as a free pdf)

Authors' abstract: *Lockdown measures implemented in response to the COVID-19 pandemic produced sudden behavioral changes. We implement counterfactual time series analysis based on seasonal autoregressive integrated moving average models (SARIMA), to examine the extent of air pollution reduction attained following state-level emergency declarations.*

We also investigate whether these reductions occurred everywhere in the US, and the local factors (geography, population density, and sources of emission) that drove them.

Following state-level emergency declarations, we found evidence of a statistically significant decrease in nitrogen dioxide (NO2) levels in 34 of the 36 states and in fine particulate matter (PM2.5) levels in 16 of the 48 states that were investigated.

The lockdown produced a decrease of up to 3.4 μg/m3 in PM2.5 (observed in California) with range (- 2.3, 3.4) and up to 11.6 ppb in NO2 (observed in Nevada) with range (- 0.6, 11.6).

The state of emergency was declared at different dates for different states, therefore the period "before" the state of emergency in our analysis ranged from 8 to 10 weeks and the corresponding "after" period ranged from 8 to 6 weeks.

These changes in PM2.5 and NO2 represent a substantial fraction of the annual mean National Ambient Air Quality Standards (NAAQS) of 12 μg/m3 and 53 ppb, respectively.

As expected, we also found evidence that states with a higher percentage of mobile source emissions (obtained from 2014) experienced a greater decline in NO2 levels after the lockdown.

Although the socioeconomic restrictions are not sustainable, our results provide a benchmark to estimate the extent of achievable air pollution reductions. Identification of factors contributing to pollutant reduction can help guide state-level policies to sustainably reduce air pollution.

Kanaya, Y., et al (2021) **Dominance of the residential sector in Chinese black carbon emissions as identified from downwind atmospheric observations during the COVID-19 pandemic.** SCIENTIFIC REPORTS 11:doi.org/10.1038/s41598-021-02518-2 (available as a free pdf)

Authors' abstract: *Emissions of black carbon (BC) particles from anthropogenic and natural sources contribute to climate change and human health impacts. Therefore, they need to be accurately quantified to develop an effective mitigation strategy.*

Although the spread of the emission flux estimates for China have recently narrowed under the constraints of atmospheric observations, consensus has not been reached regarding the dominant emission sector.

Here, we quantified the contribution of the residential sector, as 64% (44 to 82%) in 2019, using the response of the observed atmospheric concentration in the outflowing air during Feb-Mar 2020, with the prevalence of the COVID-19 pandemic and restricted human activities over China.

In detail, the BC emission fluxes, estimated after removing effects from meteorological variability, dropped only slightly (-18%) during Feb-Mar 2020 from the levels in the previous year for selected air masses of Chinese origin, suggesting the contributions from the transport and industry sectors (36%) were smaller than the rest from the residential sector (64%).

Carbon monoxide (CO) behaved differently, with larger emission reductions (-35%) in the period Feb-Mar 2020, suggesting dominance of non-residential (i.e., transport and industry) sectors, which contributed 70% (48 to 100%) emission during 2019.

Philately.

Some recent COVID-19 stamps I've acquired. Images not to same scale or actual size.

Canada Post offers a personalized stamp programme known as Picture Postage. Individuals can supply images and have their own stamps produced within a standard frame. These mask stamps were created by K.P. Lepold, a philatelist in Kelowna, British Columbia.

The 2020 Women's World Hockey Championship was to have taken place in Truro and Halifax, Nova Scotia. It was postponed to 2021 and played in Calgary without an audience. Lepold created these items with Picture Postage.

CHRISTMAS MAIL ART OF BETTY SPEIRS (1931 to 2002)
by Dale Speirs

My mother Betty was a mail artist who traded covers with other members of the Art Cover Exchange (still going, visit www.artcoverexchange.org). Depending on the size of the group, she would make 10 to 20 covers of a design, keeping back one for herself.

Since I was the only stamp collector in the younger generation, she left her collection for me. I sorted out the thematic covers by topic. See OPUNTIA #511 for her Halloween covers. Here are some of her Christmas covers.

Covers not to same scale or actual size.

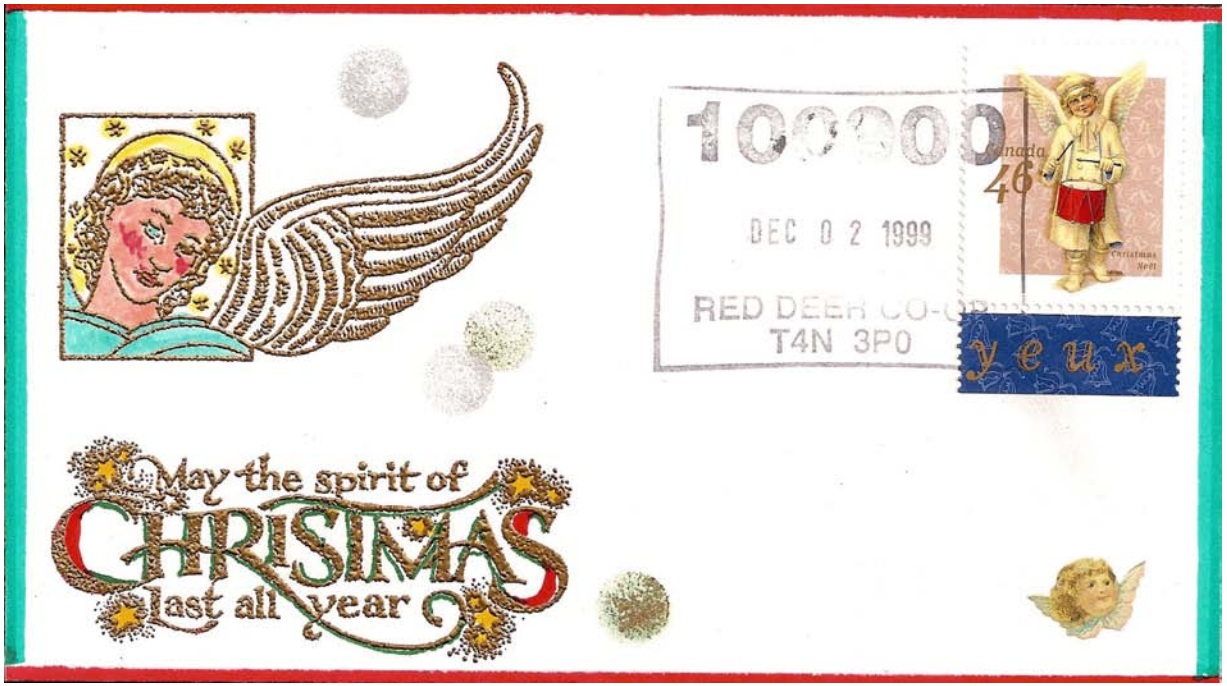

"We Three Kings of Orient are..."
THE LUNG ASSOCIATION
L'ASSOCIATION PULMONAIRE
CANADA 1994
43
Canada
CHRISTMAS • NOËL
WHITE-TAILED DEER
CANADIAN WILDLIFE FEDERATION
PROTECT OUR WILDLIFE
Holiday Greetings
Seasons Greetings
ACE 287
Betty Speirs
4535 Moore Cres.
Red Deer, Alt.
T4N 2M1


CANADA '97
THE LUNG ASSOCIATION
L'ASSOCIATION PULMONAIRE
CANADA '97
THE LUNG ASSOCIATION
L'ASSOCIATION PULMONAIRE
Detail of Our Lady of the Rosary, designed by Guido Nincheri
for the Holy Rosary Cathedral, Vancouver, British Columbia, ca. 1940.
Detail de Our Lady of the Rosary, vitrail réalisé par Guido Nincheri
pour la cathédrale Holy Rosary, à Vancouver, en Colombie-Britannique, v. 1940
Christmas
Noël
45
CANADA
DEC 05 1997
RED DEER CO-OP
T4N 3P0
DEC 05 1997
RED DEER CO-OP
T4N 3P0
Merry Christmas
~1997~
ACE # 287

Some years Betty sent away for the special postmarks used by the post office on Christmas Island, Nova Scotia.

Betty Speirs
4535 Moore Cres.
Red Deer, Alta. T4N 2M1

T4N 2M1



Betty's final Christmas cover before her death.

CHRISTMAS FICTION: PART 5
by Dale Speirs

[Parts 1 to 4 appeared in OPUNTIAs #430, 431, 463, and 490.]

A Very Maudlin Christmas To You.

DARK FANTASY was an old-time radio anthology series with 31 episodes aired from 1941 to 1942. It is available as free mp3s from www.archive.org.

Unusual for the times, it was a national show on the NBC network aired out of Oklahoma City. All the episodes were written by Scott Bishop. They were a mixture of science fiction, fantasy, weird, and twist mysteries.

"The House Of Bread" aired on 1941-12-26. Note the date of the airing and keep it in mind. The episode portentously began with the narrator solemnly intoning "*I am the dweller in the House of Bread*". Fortunately I had just eaten a pizza. On an empty stomach I might have hit pause and gone into the kitchen to fix myself a sandwich.

The narrator then identified himself the scriptwriter Scott Bishop. He said that one evening he was sitting at his typewriter, trying to think of a plot. He fell asleep in his chair and began dreaming.

He was standing on a mountain top that overlooked the world. With him was an old philosopher who struck up a conversation. They discussed the old saws such as "What is truth?" and Bishop's search for the meaning of life. The philosopher identified himself as Word, which prompted a couple of minutes of dialogue about names.

Word told him the answers of life would be found in the House of Bread, then abruptly faded from view. Bishop cried out for instructions on how to find it, but there was only soft organ music. He abandoned his life and took to the road with his wife Sonya.

They drove from California to New York City, then took a ship to Europe. Their trip went from England to France to Spain to North Africa. No mention of war, so the story must have been set in the future.

Many meanders, much padding, and frequent organ segues later, they arrived in Jerusalem on December 21. They saw a bright star and followed it. No lodging was available as they traveled but eventually they found a small inn for shelter.

None other than Word greeted them. Bishop and Word traded quotes with each other from the Book of Genesis and the nativity scenes in the Gospels. Bishop got religion and eventually learned that Bethlehem translated into English as House of Bread.

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.

"The Double Cross" was a 1942 tearjerker written by J. Donald Wilson. The episode began on Christmas Eve, although it didn't actually air until December 27. Joe Blake was a young man who lived with his brother-in-law Steve, who had been married to Joe's sister.

She died two years previously and left an infant son Timmy, now 4 years old. Steve was an NYPD police detective who couldn't care for his son, so Joe looked after the boy and the apartment. Joe had fallen in with the wrong crowd and almost wound up in reform school but for Steve's intercession.

The police suspected Joe in a department store heist that afternoon. He worked mornings there and his past record made him a suspect. On flimsy evidence, Joe was sent up for two years, and Steve was dishonourably discharged.

After his release, Joe met Della Kenton, who got him a job as a secretary with her father John. Just before another Christmas, Joe managed to locate Steve and Timmy in a slum apartment. To increase the maudlin level, Timmy couldn't walk anymore and needed an expensive operation. Steve was an angry alcoholic.

Gangsters inserted themselves into the plot to vex Joe and framed him for a robbery at the Kenton mansion. Once the maximum amount of pathos had been milked from the script, Joe was vindicated. Steve got his job back. Everyone had a merry Christmas, except the bad guys.

A Very Murderous Christmas To You.

"Delayed Christmas Present" aired on 1948-12-26, written by Edward Bloodworth. This episode of THE WHISTLER was set in Panama City on December 26. A local nightclub Pete's Cantina understandably had no business. Four hostesses, including Mary Winslow, sat about idly. They all wondered what had gone wrong in their lives that they had to work Christmas in a foreign nightclub.

Winslow was hiding from a past and masquerading as Candy Porter, a blues singer. An American customer named Fontaine arrived and chatted with Winslow qua Porter. He said he had come after her and named her real name. The orchestra broke into a crescendo.

The announcer broke in to wish everyone a Merry Christmas on behalf of the sponsor Signal Oil. After the episode resumed, Winslow didn't sound merry. She thought Fontaine was a police detective and tried to bluff her way out.

Then was an extended flashback to Christmas Eve a year prior. She had sung at a private party, after which a man named Joe Clark had approached her. He said he could get her into nightclubs as a singer.

He wined and dined her, but when he was too persistent she suddenly remembered her fiancé Dr Frank Wilson MD. Nonetheless she drove home with Clark in her car late at night. He said he had a headache and asked her to stop at a drugstore so he could buy some aspirin.

Jumping out of the car, he told her to keep the motor running. If that wasn't an ominous foreboding, nothing was. Seconds later, gunshots resounded from within the drugstore.

Clark came running back to the car with the loot from the cash register and forced her to drive. He had shot the clerk dead. He blackmailed her by telling her she drove the getaway car and would fry with him if caught.

She ran, and kept running for the next year. Clark found her and demanded she marry him because wives can't testify against husbands. She managed to escape and kept running. And so back to the present, with Fontaine.

He was sympathetic. The first surprise twist was that Clark had been killed in a gunfight with the police. The second twist was that Fontaine wasn't a police officer but a private investigator working for her fiancé Wilson. All was forgiven, a delayed Christmas present for her.

CASEY, CRIME PHOTOGRAPHER aired on radio from 1943 to 1955. The title varied several times but is generally remembered by this variation. The series was based on novels by George Harmon Coxe. The hero was Casey, first name never given, who was a newspaper photographer for the MORNING EXPRESS. He was accompanied by reporter and girlfriend Ann Williams.

"Christmas Shopping" was written by Alonzo Deen Cole and aired on 1946-12-19. Casey and Ann Williams were struggling through the crowds in a department store. Casey spotted Fingers Fogerty working the crowd.

The pickpocket dipped a fat man but disappeared in the crush. Casey, self righteous, accosted the fat man and told him what happened. The man denied his wallet was missing.

From there to the Blue Note café, where Casey drowned his sorrows. He insisted he had seen Fogerty do the snatch. Ethelbert the bartender depressed him further by telling him that while he had been shopping, the police had arrested a kidnapper and murderer. Casey had missed the big story of the day.

The $50,000 ransom for the kidnapping had been paid with recorded banknotes. An astute bartender checked the serial number on the currency offered by a customer. The bill was hot and the police were called. Equally astute listeners will guess that Fogerty was passing the cash, and had another $500 on him from the ransom.

Casey told the story to the police. He convinced them that the fat man used Fogerty to test how hot the bills were. Speaking of hot, the episode broke for a commercial from the Anchor Hocking glassware company. For last-minute shoppers looking for a gift, why not buy Fire King ovenware?

While the announcer was burbling, Casey and Williams were paging through the mug files, with no success. The next day Casey thought of something, which was indeed a logical and fair clue, so the reporters tracked down a contractor named Nick Pensa.

They found him, short and skinny, which left them up a tree, a Christmas tree. However, they eventually did encounter the fat man, uncle Gus Pensa. He was not friendly and took them away at gunpoint. At the Pensa residence, he slugged both of them unconscious.

Pause for consideration. In all the hundreds of old-time radio shows I have listened to, this was the first one where the heroine was slugged unconscious. Male detectives were usually rendered hors de combat once every episode, but women were treated more respectfully.

I'm surprised the network censor let this pass. Women were frequently shot or stabbed to death if they were supporting characters such as gun molls or scorned lovers. Heroines were threatened, frequently kidnapped, or left to die in elaborate James Bond villain style traps, but they always escaped.

Nick and Gus put Casey and Williams inside their garage, bound and gagged them, and prepared to give them the carbon monoxide treatment. They escaped of course, since there were hundreds of episodes left in the series.

The Pensas would walk to the electric chair. Fogerty was wanted on so many unrelated charges that he would serve hard time until 1999. Ethelbert put up a big Christmas tree in the Blue Note. Anchor Hocking proudly boasted it was a great name in glass. Merry Christmas everyone!

A Cozy Christmas To You.

A CUP OF HOLIDAY FEAR (2019) by Ellie Alexander (pseudonym of Katherine Dyer-Seeley) was the tenth novel in the Bakeshop Mysteries cozy series. The protagonist was Juliet Capshaw of Ashland, Oregon, who operated the Torte bakery and did some Marpleing on the side.

The Festival of Light was about to kick off the Christmas season. The bakery was doing good business in chocolate Yule logs, gingerbread cookies, and rum fruitcake. They had their staff party at the Winchester Inn, who put on the Dickens Feast.

Six courses in the meal, including Yorkshire pudding and roast goose. The jolliness couldn't last and of course it didn't. The hotel had just changed hands and the new owner was nasty. She got a steak knife in the chest not long after announcing the hotel would be bulldozed for a new development.

Capshaw's sleuthing revealed there had been financial fiddling under the old management. Her investigating had to be worked around the bakery's busy season. Cookies, strudels, peppermint sticks, eggnog fudge, if it was fattening then it was selling out in the Christmas rush.

After assorted alarums, the culprit was identified, an embezzler under the old management who feared the new management discovering the shortages in the wine cellar. Given that a single bottle was $100 or more, the thefts were not petty.

Other people didn't have much of a Christmas, but the Capshaws had a good celebration. The recipes appendix attested to that, with Chicken Cordon Bleu Crescent Pie, Cranberry Ginger Christmas Cake, Ode To The Bard Latte (finely diced pine needles and gold dust), and Hot Buttered Rum.

HOLLYBERRY HOMICIDE (2020) by Sharon Farrow (pseudonym of Sharon Pisacreta) was the fifth novel in a cozy series about Marlee Jacob of Oriole Point, Michigan. She was the proprietor of The Berry Basket, which specialized in fresh fruit, jams and jellies, wine, and trinkets.

The novel opened with the decease of 95-year-old Everett Hostetter, who was about to play Jacob Marley in the village's annual production of A CHRISTMAS CAROL. He was a cranky old man in real life, so the role was no stretch for him. Since he subsidized the Green Willow Players, the troupe put up with him.

The Hollyberry Festival was nigh. Their social interactions were just as vicious as the dramatic group. Jacob had a foot in both camps, acting in the play and having a booth in the festival. In spite of herself, she found herself investigating Hostetter's past and an ever-widening circle of people associated with him.

A belated discovery was made that Hostetter didn't keel over from old age but had eaten poisoned cookies. Autopsies are not normally done on 90-somethings who apparently died peacefully. The leftover cookies were fed to a squirrel, which promptly died, thus the revelation.

The alarums were set off amongst detectives, both police and amateur. Hostetter died a wealthy man, so attention turned to his will, which had gone missing. There were suspicious accidents on the stage and in the village square, and another death.

Jacob was hindered by rehearsing, her store, and her festival booth. Hot strawberry cocoa was a runaway bestseller at her booth. The motive was bad blood in the Hostetter family, and eventually a greedy heir was found out.

And so to the recipes. Holly berries and leaves are poisonous, so the Hollyberry Cluster Cookies used cinnamon candies as a substitute. Strawberry-Glazed Donut Holes also simulated holly berries. For the more adventurous, there was the Cranberry White-Chocolate Pistachio Bark.

CHRISTMAS CUPCAKE MURDER (2020) was by Joanne Fluke (pseudonym of Joanne Fischmann), who has a lengthy series about Hannah Swensen of Lake Eden, Minnesota. She operated the Cookie Jar bakery and could find a corpse faster than any bloodhound.

Swensen had Marpled in so many murders that the long-time reader of this series will wonder why the local police didn't just hire her as an auxiliary constable.

This was a flashback novel, set before Hannah Swensen got into top gear as an amateur sleuth. She and her sisters were making preparations for the holiday season. Recipes were scattered through the novel, beginning with German Chocolate Cupcakes.

The action picked up in Chapter 4 when the women found a man almost frozen to death. Someone had struck him with a blunt instrument and left him for dead. Lots of sleuthing and as many recipes, any two of which will exceed the daily recommended intake of calories for adults.

The afflicted man regained his memory with help from Swensen and friends, who did a lot of Googling for each fragment he recalled. He had been downed by a rival in love with the same woman and who wanted his fiancee.

Lots of cupcake recipes, most of which had the word 'chocolate' in them. Setting those aside, there were also Strawberry Cupcakes, Golden Raisin Rum Cupcakes, Sugar Plum Cookies, and Blue Apple Pie, to name but a few.

THE GIFT OF THE MAGPIE (2020) by Donna Andrews was the 28th novel in a cozy series about Meg Langslow, an animal lover and Miss Marple resident in Caerphilly, Virginia. Twas the season and the Helping Hands committee was decluttering Harvey the Hoarder's house. His surname was Dunlop, which didn't matter much since he didn't survive the book.

Meanwhile, Langslow's grandfather was trying to find his pet magpies, who had flown the coop and not figuratively. The two tracks of sleuthing plus Christmas preparations kept Langslow busy. There were the usual family melodramas, not to mention Dunlop's contested will.

The house decluttering became a search for evidence. The magpies helpfully picked up a few pieces, as they are attracted to shiny objects. Lots of suspects were smoked out.

The twist was that Dunlop had survived the attack on him. The police kept him under wraps as a John Doe at the hospital for fear the culprit would attempt to finish the job. The conclusion was obvious, as greedy heirs were going to spend Christmas in jail.

MRS MORRIS AND THE GHOST OF CHRISTMAS PAST (2020) by Traci Wilton (pseudonym of Patrice Wilton and Traci Hall) was the third novel in a cozy series about Charlene Morris of Salem, Massachusetts. She operated a bed-and-breakfast which had a resident ghost named Dr Jack Strathmore. Only she could see and hear him.

Her parents Brenda and Michael were staying at her inn for the Christmas holidays. Charlene and Jack were not enamored of Brenda, who was an annoying old biddy. The family, sans ghost, went out to a Christmas charity auction at a restaurant owned by David Baldwin. The party was over when he was killed in a supposed accident.

He had just won $10 million in a lottery. Fat lot of good that did him. He had been squabbling with his trophy wife Tori, who didn't like his reckless spending. Additional supporting suspects were his sullen teenaged son from a previous marriage, and a disputatious business partner.

Charlene was busy. She had other guests for the bed-and-breakfast over the holidays. She also kept busy Marpleing, dealing with her parents, and handling all the melodrama.

Winter Solstice was nigh, a bigger deal in Salem than most places, with lots of Wiccans in town. Jack was not easy to handle, but ghosts seldom are.

An idiot plot coupon finished up the novel, where in the fine tradition of Miss Marples everywhere, Charlene went alone to meet the killer in a remote parking lot, without telling anyone where she was going. The murderer had been embezzling money from the charity. Since the series will continue, Charlene defied the laws of natural selection and survived.

VARNISHED WITHOUT A TRACE (2020) by Misty Simon was the fifth novel in a cozie series about Tallie Graver, who lived in an unnamed town somewhere in central Pennsylvania. She operated a cleaning business when not Marpleing on the side. Her family owned a funeral parlour, which certainly came in handy.

Twas Christmas Eve and what better way to celebrate than by going to a bingo with her mother and visiting grandmother. The three women did not get along with each other, so the spirit of the season was definitely missing.

Twas even worse for Ronda Hogart, another nasty biddy at the bingo, who didn't survive past Chapter 1. Somebody brained her with a can of varnish. Graver found the body as per usual. "*It was becoming like a habit, and one that Police Chief Burton was not going to be happy about.*"

Hogart's husband went missing Christmas morning and he thereby became a suspect. Graver's reputation was such that the villagers expected her to wrap up the case before New Year's Day. The police were doubly annoyed, firstly that they had to work on Christmas Day and because Graver was on the loose again.

She had other problems. Her family were upset because she wouldn't join them in the funeral business. I don't understand why they would complain, given how much extra business she had sent their way in the previous novels. She preferred to run her own business.

The Graver family turkey dinner was not a Norman Rockwell moment. Once the screaming died away, there was time for the next murder victim. As Burton said: "*There is too much going on for how small and quaint we're supposed to be.*" Truer words were never spoken.

The finale was at gunpoint and also counterpoint. Like the Graver dispute about who would take over the family business, Hogart had similar problems with her store. The successor she picked wasn't approved by another family member, and the events had flowed from there.

May Your Days Be Merry And Sweet.

HAVE YOURSELF A FUDGY LITTLE CHRISTMAS (2020) by Nancy Coco (pseudonym of Nancy J. Parra) was the eighth novel in a food cozy series about Allie McMurphy of Mackinac Island, Michigan.

Her fudge shop and home were being renovated, so she was staying in the rooming house of Frances Devaney. She had the use of the kitchen to crank out batches of fudge to keep her cash flow operating.

The victim, and there was one, was Kayla Cramdon, whom McMurphy found in a snowbank. Much digging around ensued, not just in the snow, and assorted melodramas were uncovered. The culprit came out of nowhere in the denouement.

Cramdon had been a claim jumper trying to get in on the family fortune of a recently deceased millionaire. The family fought back, and successfully dealt with the interloper, at least until McMurphy barged into the case.

Instead of an appendix, the recipes were scattered in between the chapters. Fudge recipes included Sugar Cookie, Chocolate Sugar, Ginger Cookie, Eggnog, Hot Cocoa, Red Velvet, and White Chocolate Fruitcake flavours. If you are diabetic, you should read this book while wearing a surgical mask and wearing latex gloves.

A Very Victorian Christmas.

MRS JEFFRIES AND THE YULETIDE WEDDINGS (2009) by Emily Brightwell (pseudonym of Cheryl Arguile) was the 27th book in a series set in Victorian London about a housekeeper for Inspector Gerald Witherspoon.

Mrs Jeffries and other staff lived in his mansion (he had an independent income) and did their sleuthing anonymously, feeding him information and making him think he was the great detective.

Christmas was nearing, and the house was busier than ever. Besides the usual festivities, Betsy the maid and Smythe the coachman were about to be married, so the staff were aflutter with preparations. All was not so well in the outside world, for spinster Agatha Moran got a knife in her chest on the second page.

Witherspoon was assigned the case. Investigations in those days had to deal with the self-righteousness of the ruling classes, who were not inclined to cooperate. The murder had occurred while the upper crust were enjoying their Christmas parties.

Servants will talk below stairs, which was the advantage Mrs Jeffries had over her boss. The murderer killed Moran because she was about to reveal his sordid past, which would ruin him. That's all there was to it.

The marriage went as planned. The feast included Battenberg cakes with black currant cream (I had to look that one up on Google; it's like no other cake I've ever seen). Champagne to wash everything down.

MRS JEFFRIES AND THE THREE WISE WOMEN (2017) was another Victorian Christmas. The murder of Christopher Gilhaney happened at a Guy Fawkes Night party on November 5. The investigation went nowhere until Mrs Jeffries and three of her friends decided to speed up the case.

The newspapers gave the police a hard time about their failure to progress, so the case file was dumped in Witherspoon's lap. He was supposed to be on Christmas leave, but a policeman's lot is not a happy one.

As Wiggins the footman asked (you'll have to imagine his Cockney accent): "*Why do people keep killin' each other during the 'olidays? If they had any decency, they'd wait til after the New Year to do their evil deeds.*"

Gilhaney had quite the mysterious past, and his employer had quite a past to hide. The murderer, however, wanted his past quite covered up. That wasn't likely because Gilhaney had been brought in to audit the company books beginning November 6.

The four wise women, as the total added up to notwithstanding the title, dredged up information. Their sources were the kind of people who only entered a manor house through the trades entrance. The case was solved in time for Christmas dinner.

SAVE THE DATE!

The flatlanders are bidding for a Worldcon in 2067 as detailed below in their press release. I will be 112 years old in 2067, so probably won't be attending. Saskatoon is a university city on the South Saskatchewan River. The name is from Cree, and refers to a popular bush fruit native to western Canada. Saskatoon jam and pies are found in supermarkets across the prairies.

The province of Saskatchewan is like North Dakota, only not as exciting. That name could have been worse. The actual Cree word is 'Kisiskatchewanisipi', meaning "swift flowing river".

The bid's url is:
https://saskatoonin2067.blogspot.com/2021/12/saskatoon-in-2067-worldcon-bid-progress.html?m=1

Saskatoon In 2067 WorldCon Bid Progress Report (2021-12-09)

Welcome to the 2021 progress report for Saskatoon in 2067, currently styled "A Long Way Off". Progress has been smooth, if nonexistent, on getting things in place for our filing, anticipated by the Worldcon Business meeting of 2062 at the latest.

We are making early preparations for a restaurant guide for the event, but have little luck identifying restaurateurs willing to commit to deals, menus, locations, or existing, in 2067.

We are currently seeking a co-chair, preferably who will be under the age of 80 for the con, so born after 1987. There are a couple of candidates at the moment, but so far the youngest interested party is Juka Halme, who will be 100 at the time of the con.

Programming: Current head of programming is Gloria Lucia Albasi of New York who will likely also require an assistant under 80 at the time.

Dates Confirmed: Our team have voted to file for a con running from Tuesday, August 30, through Monday, September 5. 2067 will also mark Canada's bicentennial, so we anticipate having lots of extra-con activities for savvy travelers who choose to extend their stay beyond the window of the con itself.

Guests of Honour: Our goal is to have as the trinary-author-guests-of-honour the uploaded consciousnesses of William Gibson, Neal Stephenson, and Bruce Sterling, however we haven't had any luck yet finding out which agency will be representing those AIs in forty-six years.

If you have any ins with agencies which are currently representing the uploaded consciousness of these or any other likely candidates, please consider passing on our contact info and asking them to get in touch.

No Venue Selected: We're fairly confident that our venue-of-choice doesn't exist yet, so negotiations on that front are at a stand-still.

Memberships And Volunteer Opportunities: Pre-pre-pre supporting memberships are available for a commitment of one hour of talking up Saskatoon-in-2067 at other fan events of your choice and will be converted to a sustaining membership if the bid is successful. We have no bank account, so please do not send money of any kind unless you want me to blow it on frivolities.

Please send membership requests and volunteer offers to:
Saskatoon in 2067 Worldcon Bid
c/o Kent Pollard
1222 Junor Avenue
Saskatoon, Saskatchewan S7L 7K1

or saskatoonin2067@gmail.com

The Smallest Print: This is Progress Report Report 2021 of the bid to bring The World Science Fiction Society's convention for 2067 to Saskatoon, Saskatchewan, Canada. This is not an official publication of the World Science Fiction Society and does not represent their views or interests.

MEANWHILE, BACK AT THE WORLDCON

In the meantime, and more seriously, Winnipeg, in the adjacent province of Manitoba was bidding for the 2023 Worldcon. The url is www.winnipegin2023.ca

They were swamped by the Chinese bid from Chengdu. The site selection voting was done at the Worldcon in Washington, D.C., on the weekend of December 15 to 19. Chengdu won by 2,006 votes to 807 votes for Winnipeg.

Indications were that the Chinese vote was broad-based from a large group of fans across China. I enjoyed how the wokers tied themselves into knots over the result. They condemned China's poor record for human rights and in turn were condemned as racists upset by their loss of control over the results.

The Worldcon committee had turfed its original Guest of Honour because the cancel culture crowd blamed her for something her employer did. Now the politically correct are in a quandary, for no matter what they say or do about Chengdu, they will come off as a crowd of sore losers.

Philately has three or four international conventions per year, scattered around the world. They are sanctioned by the Federation Internationale de Philatelie. The tradition is that no nation will host an international stamp exhibition more than once every ten years. Some countries, such as Canada, may go 25 years due to lack of support by the post office to pay the huge costs.

Average attendance at an international stamp show is 100,000. Asian countries regularly top 200,000 visitors. Because of postponed shows carried forward from 2020 and 2021, the year 2022 will have more internationals than usual. Britain, United Arab Emirates, Indonesia, South Africa, Canada, Hungary, Switzerland, and Czechia will be hosting internationals. The first four countries have conventions that were postponed by the pandemic.

Germany has been sanctioned for a 2023 international, and the USA will have a show in Boston in 2026. The last American international was in New York City in 2016 with 100,000 attendees.

Many countries time their internationals with a significant date. The American conventions are held in years ending in 6, that is, multiples of 1776. Canada is less consistent. The Canadian post office began operating in 1851, so some internationals are multiples of that date, or, as seems to be the recent trend, years ending in 7 or 2, as multiples of 1867.

Britain invented the postage stamp in 1840, so their internationals were in years ending in 0, excepting of course, the 2020 convention, which was postponed to 2022.

I told you all that because many science fiction fans are under the impression that their Worldcon is a big show. Someone once pointed out that when the Worldcon was held in Las Vegas, it wasn't even the biggest convention in town that weekend. Chengdu will undoubtedly hit six figures in attendance.

It will do science fiction fandom good to become more international. For the last ten or fifteen years, the American SJWs, wokers, and cancellers had a stranglehold on the Hugos and Worldcons. They will soon be getting a lesson that their political correctness does not hold sway elsewhere.

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: David Redd 2021-11-24
Haverfordwest, England

OPUNTIA 512: [Re: cozies] I never realized there was such an extensive subgenre of cosy cookery crime.

[Like websites and fanzines, there is probably a cozy series for any hobby or small business you can think of. Food cozies do present one hazard, that of gaining weight. Never read a food cozy on an empty stomach.]

Science abstracts good. Memorial photographs [of the Field of Crosses] moving. Good of you to end with the free stuff summary. Thanks for putting it all up there.

FROM: Lloyd Penney 2021-12-08
Etobicoke, Ontario

[Lloyd also sent a Christmas card, received via real mail on December 14.]

OPUNTIA #511: Halloween has become a nothing event for us, even if we do have some good costumes to wear. We did see some Halloween decorations here and there.

As expected, there were no knocks at our door, and that was just as well, for we had nothing to hand out. It used to be that our building would ask for donations of goodies to hand out to the kids who would come to the building front door downstairs, but current management is too busy renovating a few suites to do anything else. It's mostly apartment buildings in our area, anyway.

[Trick-or-treating is a custom that only developed in the early 1950s. Even before the pandemic it was dying out in my neighbourhood, and I was not surprised that no one came by. I always buy a bag of Rockets candy just in case, and end up eating it myself. Not a hardship, mind you.]

There used to be a number of costume shops in Toronto, but most of the all-year shops are gone, and the specialty Spirit of Halloween shops that crop up, usually at the beginning of September, are fewer in number. According to what I see in the stores, the day after Halloween is Christmas, marketing-wise. Everything goes from black and orange to red and green.

Our municipal elections will be coming up soon, and our current mayor, John Tory, is not sure if he plans to run for a third term. Maybe we could entice [former Calgary mayor] Naheed Nenshi here?

[Re: found cannabis packages with revenue stamps} Most of the castoffs I see on the ground these days are vaping bits, not cannabis bits.

COVID-19: We have our QR codes, but are rarely checked. I've worked a few local shows here recently where I used a scanner to find COVID-19 status, but for the most part, I have had my QR code checked three times at most.

[It's hit or miss in Calgary. When I eat in fast-food outlets, most of the clerks scan my QR code but some never ask.]

OPUNTIA #512: In the 23 years we have lived at this address, we've wanted to go to our local Remembrance Day services. However, it is held in different locations most years, and we never find out where it was until after.

[I just Google for the Calgary sites. For 2021, the ceremonies did not allow audiences but did stream or broadcast. Calgary has dozens of ceremonies across the city and each year I attended a different one. Hopefully I'll have a report of a live ceremony in 2022.]

In Etobicoke, there is a daily newspaper which all houses get for free. They will NOT deliver to condos or apartment buildings, thereby ignoring close to 2/3 of the population of Etobicoke. I have had choice words with them, and letters to them are ignored. They do have a website, but much of the information you look for in the paper is not on the web. Sometimes, the website is not updated for some time.

[I'm not even sure if the CALGARY HERALD still has a print version, although they do have an active website. The CALGARY SUN still publishes a thin tabloid, mostly sports news, given away in fast-food outlets.]

OPUNTIA #513: There is so much interesting and inspiring artwork all over Toronto, but there are still a few old codgers, some of them in local government, who look at this art as graffiti and vandalism, even if you paint up your property yourself.

[No old codgers in Calgary City Hall. In fact, it is official policy of the City to encourage painted garbage bins and utility boxes, and back-alley wall murals to reduce graffiti.]

More and more, there is news about the COVID-19 Omicron variant. Our scientists say that if something isn't done to increase the masking, social distancing and vaccination in Ontario, we will have to deal with 3,000 to 4,000 cases a day. Seeing how many people think that vaccination mandates interferes with their liberties and freedoms, I do expect to see those high numbers soon.

[From what I read, Omicron is not that dangerous to vaccinated people. What we really need is a variant that will sweep across the country in a week or so and kill off the unvaccinated adults, thereby eliminating the problems with anti-vaxxers and anti-maskers. There would finally be herd immunity.]

I Also Heard From: Garth Spencer (Christmas card received December 15)

FROM: Theo Nelson
Calgary, Alberta

2021-12-21 [Theo's quarterly mail art postcard.]

tnelson@lexx.com

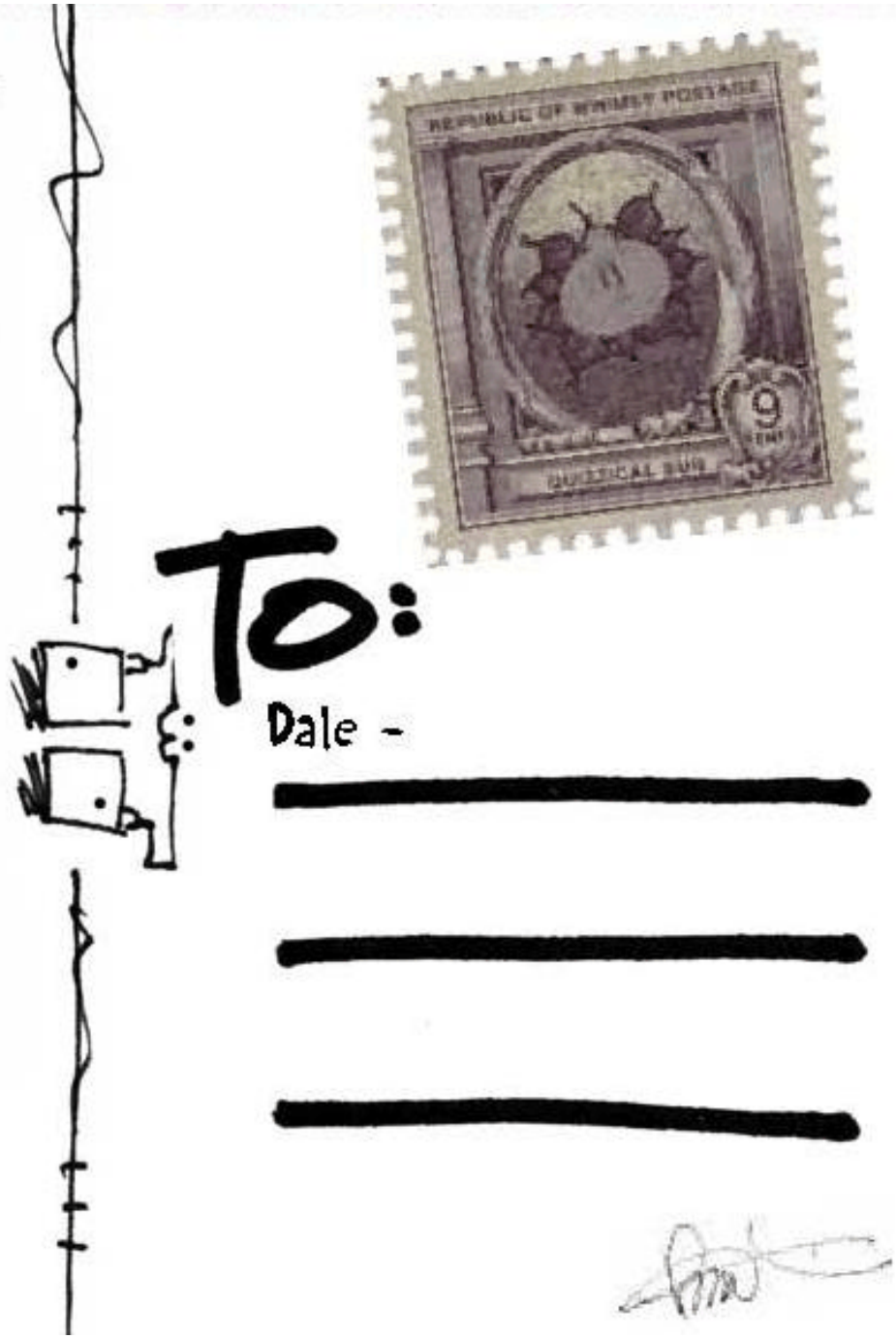
In northern climes,
White is the norm,
But the spectrum whole
Still resides
In Winter's grip.

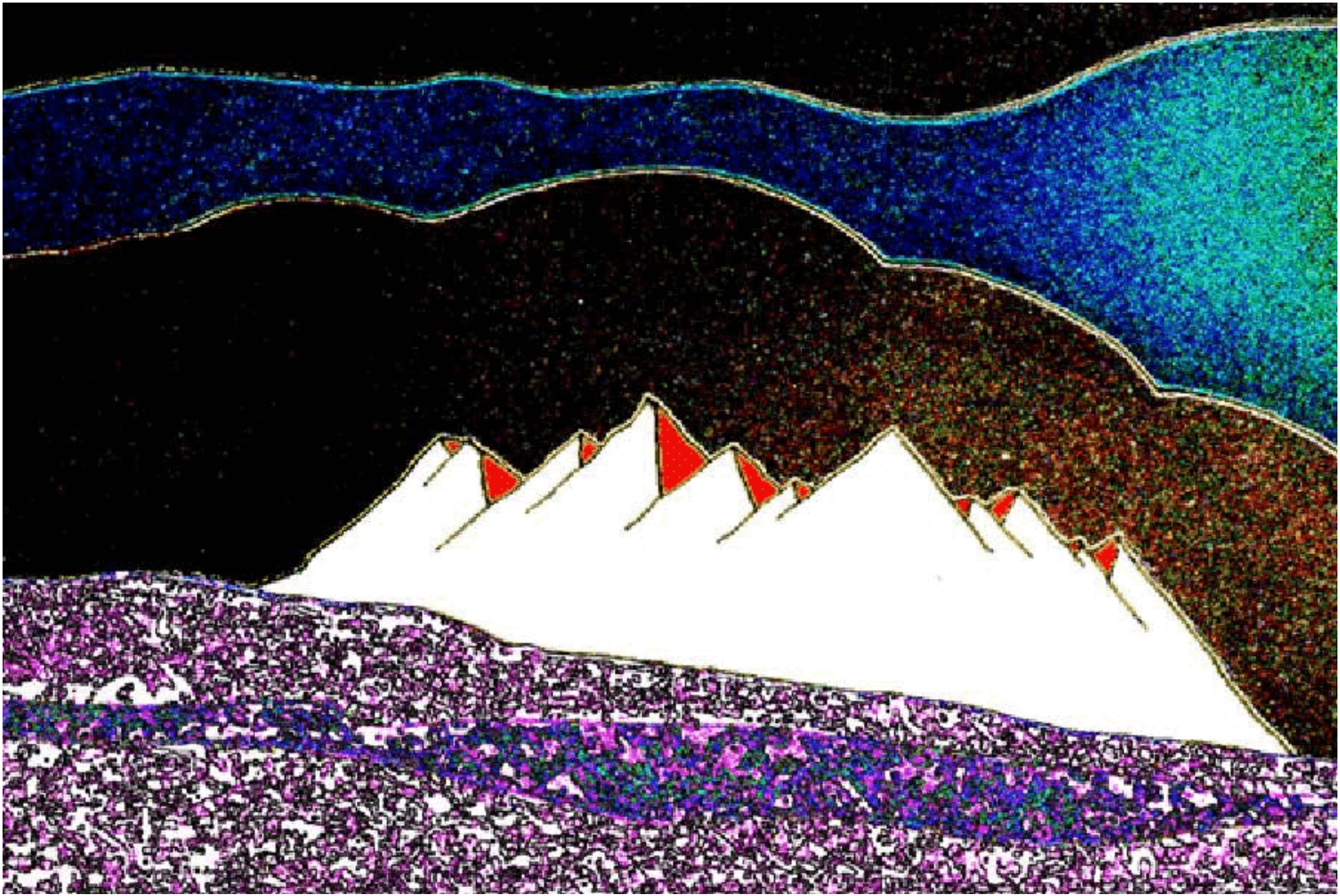
Poking through the snow,
Or filling the sky,
In day and night,
The forests and fields
Showing greens and browns.

The Winter Solstice
Marks the change,
We huddle in our shelters
And wait for the colours
To cover the land once again.

"Seasonal Greetings!"

©2021 Theo Nelson





SEEN IN THE LITERATURE

Palaeobiology.

McMahon, W.J., et al (2021) **Enigma variations: characteristics and likely origin of the problematic surface texture *Arumberia*, as recognized from an exceptional bedding plane exposure and the global record.** GEOLOGICAL MAGAZINE 159:doi.org/10.1017/S0016756821000777 (available as a free pdf)

Authors' abstract: *Arumberia is an enigmatic sedimentary surface texture that consists of parallel, sub-parallel or radiating ridges and grooves, most commonly reported from upper Neoproterozoic-lower Palaeozoic strata.*

It has variably been interpreted as the impression of a small metazoan, a 'vendobiont', a physical sedimentary structure formed on a substrate with or without a microbial mat covering, or a non-actualistic microbial community.

In this paper we contribute new insights into the origin of Arumberia, resulting from the discovery of the largest contiguous bedding plane occurrence of the texture reported to date: a 300 m2 surface in the lower Cambrian Port Lazo Formation of Brittany, NW France. We compare the characteristic features of Arumberia at this locality with 38 other global records, revealing four defining characteristics:

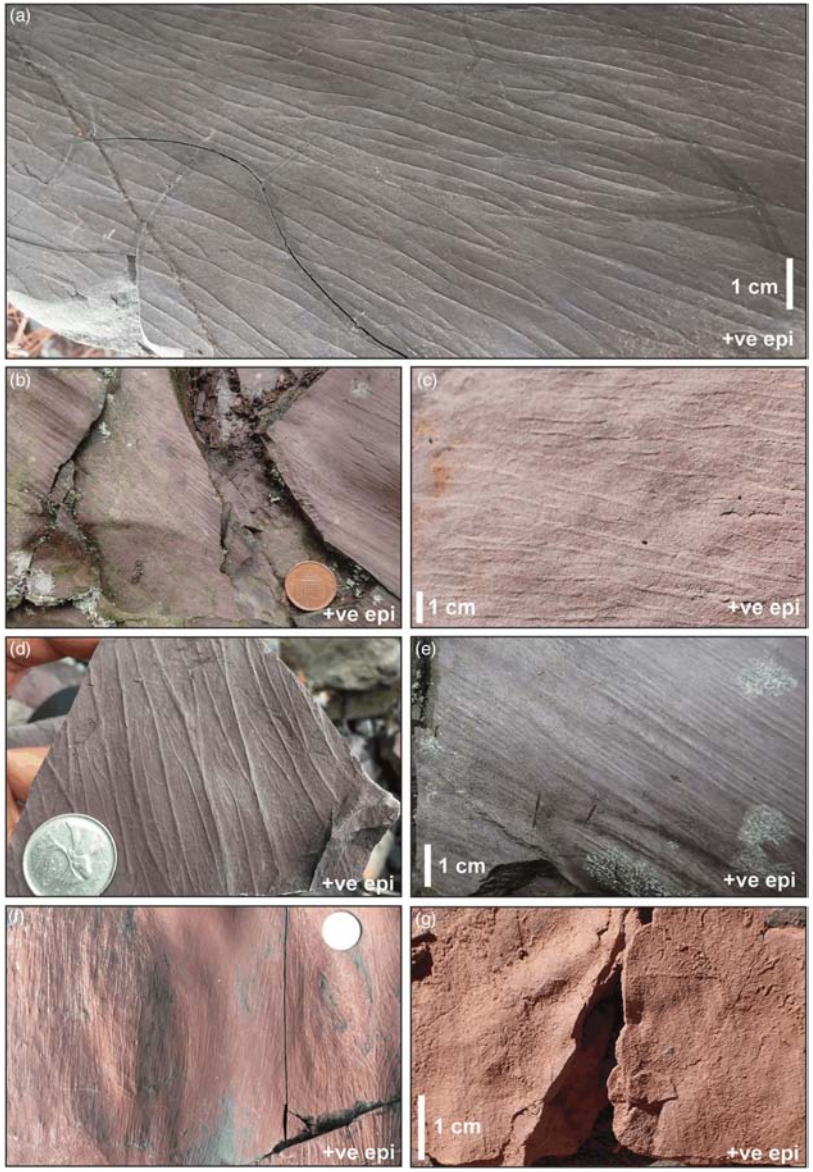
(1) the three-dimensional (3D) morphology of exposed Arumberia lines (either positive relief 'ridges' or negative relief 'grooves') records fully preserved cords within clay laminae;
(2) lines may transition laterally into reticulated patterns;
(3) characteristic parallel and sub-parallel Arumberia lines can become modified by desiccation on emergent substrates prior to interment; and
(4) Arumberia are streamlined with palaeoflow in successions showing evidence of unidirectional currents, but are organized parallel to ripple crests where strata were sculpted by oscillatory flows.

These characteristics indicate that Arumberia records a 3D entity, distinct in material properties from its host sediment, which occurred in very shallow water settings where it was prone to passive reorganization in moving water, and desiccation when water drained.

A literature survey of all known Arumberia occurrences reveals that the most reliable examples of the form are stratigraphically restricted to a 40 megayear interval straddling the Ediacaran-Cambrian boundary (560 to 520 Ma).

Together these characteristics suggest that Arumberia records the remains of extinct, sessile filamentous organisms (microbial or algal?) that occupied very shallow water and emergent environments across the globe at the dawn of the Phanerozoic eon.

[Images are from this paper.]



Dogantzis, K.A., et al (2021) **Thrice out of Asia and the adaptive radiation of the western honey bee.** SCIENCE ADVANCES 7:doi.org/10.1126/sciadv.abj2151 (available as a free pdf)

Authors' abstract: *The origin of the western honey bee Apis mellifera has been intensely debated. Addressing this knowledge gap is essential for understanding the evolution and genetics of one of the world's most important pollinators.*

By analyzing 251 genomes from 18 native subspecies, we found support for an Asian origin of honey bees with at least three expansions leading to African and European lineages.

The adaptive radiation of honey bees involved selection on a few genomic hotspots. We found 145 genes with independent signatures of selection across all bee lineages, and these genes were highly associated with worker traits.

Our results indicate that a core set of genes associated with worker and colony traits facilitated the adaptive radiation of honey bees across their vast distribution.

Giovanardi, S., et al (2021) **Giant Oligocene fossil penguin from the North Island of New Zealand** JOURNAL OF VERTEBRATE PALEONTOLOGY 41:doi.org/10.1080/02724634.2021.1953047

Authors' abstract: *Penguins (Sphenisciformes) have arguably the most complete and continuous fossil record of any avian clade, offering an ever-improving understanding of penguin phylogeny, biogeography, and the evolution of wing-propelled diving. Yet, our knowledge of the precise body proportions of stem-group penguins remains poor due to a dearth of articulated specimens.*

Here, we describe Kairuku waewaeroa sp. nov., a new giant penguin species from the Glen Massey Formation (Whaingaroan stage, 34.6–27.3 Ma). The holotype skeleton, discovered in Kawhia Harbour, North Island, New Zealand, is one of the most complete skeletons of a giant penguin yet uncovered.

Our phylogenetic analysis recovers a clade uniting the New Zealand endemics Kairuku waewaeroa, Kairuku waitaki, and Kairuku grebneffi, which is supported by synapomorphies including a stout femoral shaft and tibiotarsi with a distinctly convex medial condyle.

Kairuku waewaeroa is unique among stem penguins in having elongate tibiotarsi, revealing a new long-legged stem penguin body plan. The discovery of Kairuku waewaeroa contributes yet another penguin species to an Oligocene avifauna for Zealandia that is replete with giant birds.

[Image is from Wikipedia.]

De La Garza, R.G., et al (2021) **A fossil sea turtle (Reptilia, Pan-Cheloniidae) with preserved soft tissues from the Eocene Fur Formation of Denmark.** JOURNAL OF VERTEBRATE PALEONTOLOGY 41:doi.org/10.1080/02724634.2021.1938590 (available as a free pdf)

Authors' abstract: *A new hard-shelled sea turtle (Pan-Cheloniidae) with vestigial soft tissues from the lower Eocene (Ypresian) Fur Formation of Denmark is described and illustrated.*

The fossil (DK 807) comprises a partial, yet fully articulated carapace (estimated original length ~50 cm) where the individual bones mostly are preserved in three dimensions, together with an intact sacrum, a consecutive series of articulated caudal vertebrae, a complete pelvic girdle, and both hind limbs.

Primitive characters in the pelvis and limbs, along with free ribs that contact the posterior peripherals suggest affinity with the extinct pan-cheloniid Eochelone; however, because of the incomplete nature of the fossil, DK 807 is kept in open nomenclature. Associated with the skeletal elements are soft-tissue residues that include remnant epidermal scutes and a nearly complete outline of a rear paddle.

The flipper-shaped halo likely represents traces of skin preserved as a dark bedding-parallel film. Its wrinkled and striated surface texture attests to an originally scaleless configuration comparable to the soft integument of living adult dermochelyid (leatherback) turtles, and unlike that of extant cheloniids.

Scratches, scars and indentations on the bony carapace likely represent incompletely healed bite marks inflicted by a crocodylian or another large-sized seagoing tetrapod.

Dinosaurs.

Navarro-Lorbés, R., et al (2021) **Fast-running theropods tracks from the Early Cretaceous of La Rioja, Spain.** SCIENTIFIC REPORTS 11:doi.org/10.1038/s41598-021-02557-9 (available as a free pdf)

Authors' abstract: *Two trackways belonging to fast-running theropods from the Lower Cretaceous Enciso Group of Igea (La Rioja) are presented here and compared with other fast-running theropod trackways published to date.*

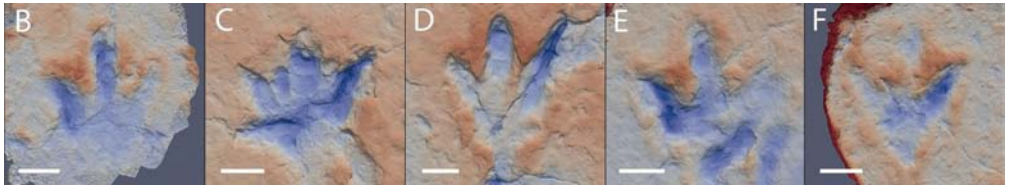
The Lower Cretaceous Iberian fossil record and some features present in these footprints and trackways suggest a basal tetanuran, probably a carcharodontosaurid or spinosaurid, as a plausible trackmaker.

Speed analysis shows that these trackways, with speed ranges of 6.5 to 10.3 and 8.8 to 12.4 metres per second, testify to some of the top speeds ever calculated for theropod tracks, shedding light on the question of dinosaur biodynamics and how these animals moved.

In the Early Cretaceous of Spain, a theropod trackway of six consecutive footprints with pace lengths of more than two metres preserved in a trampled surface was found at La Torre 6B, for which has been inferred high speeds of more than 10 metres per second

Speirs: I checked Google and the current world record for a human to run 100 metres is 9.58 seconds, about the same speed this dinosaur was running.

[Images are from this paper.]



Richards, T.M., et al (2021) **A new species of crested pterosaur (Pterodactyloidea, Anhangueridae) from the Lower Cretaceous (Upper Albian) of Richmond, North West Queensland, Australia.** JOURNAL OF VERTEBRATE PALEONTOLOGY 41:doi.org/10.1080/02724634.2021.1946068

Author'' abstract: *Pterosaur fossils from Australia are exceptionally rare. Since the discovery of the continent's first pterosaur some 40 years ago, fewer than 20 specimens have been described. The Lower Cretaceous (upper Albian) Toolebuc Formation of North West Queensland is the most productive horizon for Australian pterosaurs.*

Herein, we describe a new species of pterosaur, Thapunngaka shawi gen. et sp. nov., from the Toolebuc Formation, near Richmond, North West Queensland. The specimen (KKF494) comprises the rostral portion of a crested mandible and represents the largest pterosaur yet described from Australia.

The new species presents features that indicate an affinity with Anhangueridae, which is consistent with their reported cosmopolitan distribution during this period. Thapunngaka shawi can be distinguished from other anhanguerids through the possession of a mandible with a smooth dorsal surface medially and uniquely sized alveoli that are positioned laterally along the jaw.

Phylogenetic analysis reveals a close relationship among all Australian anhanguerids and points to an endemic Australian radiation within Anhangueridae. Thapunngaka shawi has the largest mandibular crest of any anhanguerian worldwide, and provides further evidence for the existence of an

increasingly diverse range of large crested pterosaurs in the Australian part of eastern Gondwana during the Cretaceous.

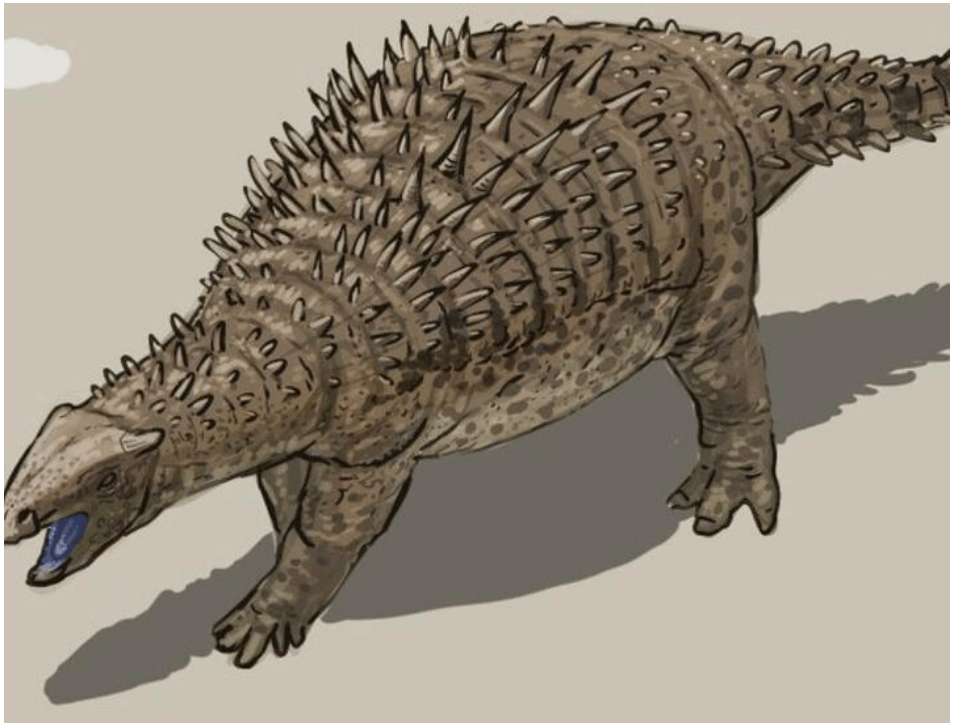
[Image is from Wikipedia.]

Maidment, S.V.R., et al (2021) **Bizarre dermal armour suggests the first African ankylosaur.** NATURE ECOLOGY AND EVOLUTION 5:1576-1581

Authors' abstract: *Ankylosauria is a diverse clade of armoured dinosaurs whose members were important constituents of many Cretaceous faunas. Phylogenetic analyses imply that the clade diverged from its sister taxon, Stegosauria, during the late Early Jurassic, but the fossil records of both clades are sparse until the Late Jurassic (~150 million years ago).*

Moreover, Ankylosauria is almost entirely restricted to former Laurasian continents, with only a single valid Gondwanan taxon. Spicomellus afer gen. et sp. nov. appears to represent the earliest-known ankylosaur and the first to be named from Africa, from the Middle Jurassic (Bathonian-Callovian) of Morocco, filling an important gap in dinosaur evolution.

The specimen consists of a rib with spiked dermal armour fused to its dorsal surface, an unprecedented morphology among extinct and extant vertebrates. The specimen reveals an unrealized morphological diversity of armoured dinosaurs during their early evolution, and implies the presence of an important but undiscovered Gondwanan fossil record.



Soto-Acuña, S., et al (2021) **Bizarre tail weaponry in a transitional ankylosaur from subantarctic Chile.** NATURE 600:259-263

Authors' abstract: *Armoured dinosaurs are well known for their evolution of specialized tail weapons, paired tail spikes in stegosaurs and heavy tail clubs in advanced ankylosaurs. Armoured dinosaurs from southern Gondwana are rare and enigmatic, but probably include the earliest branches of Ankylosauria.*

Here we describe a mostly complete, semi-articulated skeleton of a small (approximately 2 m) armoured dinosaur from the late Cretaceous period of Magallanes in southernmost Chile, a region that is biogeographically related to West Antarctica.

Stegouros elengassen gen. et sp. nov. evolved a large tail weapon unlike any dinosaur: a flat, frond-like structure formed by seven pairs of laterally projecting osteoderms encasing the distal half of the tail. Stegouros shows ankylosaurian cranial characters, but a largely ancestral postcranial skeleton, with some stegosaur-like characters.

Phylogenetic analyses placed Stegouros in Ankylosauria; specifically, it is related to Kunbarrasaurus from Australia and Antarctopelta from Antarctica, forming a clade of Gondwanan ankylosaurs that split earliest from all other ankylosaurs.

The large osteoderms and specialized tail vertebrae in Antarctopelta suggest that it had a tail weapon similar to Stegouros. We propose a new clade, the Parankylosauria, to include the first ancestor of Stegouros, but not Ankylosaurus, and all descendants of that ancestor.

Chiarenza, A.A., et al (2021) **An Italian dinosaur Lagerstätte reveals the tempo and mode of hadrosauriform body size evolution.** SCIENTIFIC REPORTS 11:doi.org/10.1038/s41598-021-02490-x (available as a free pdf)

[The "island rule" mentioned in this paper is a basic rule of ecology which states that an isolated island will evolve miniature species of whatever vertebrates were there before the island was cut off from surrounding areas. Hadrosaurs were giant bipedal herbivores.]

Authors' abstract: *During the latest Cretaceous, the European Archipelago was characterized by highly fragmented landmasses hosting putative dwarfed, insular dinosaurs, claimed as fossil evidence of the "island rule".*

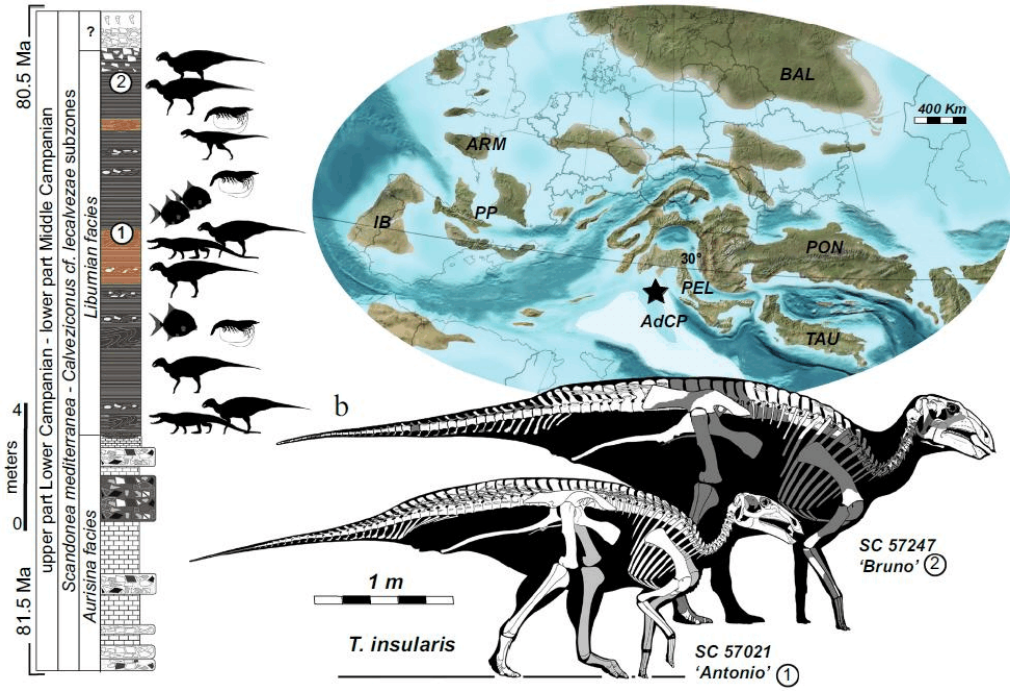
The Villaggio del Pescatore quarry (north-eastern Italy) stands as the most informative locality within the palaeo-Mediterranean region and represents the first, multi-individual Konservat-Lagerstätte type dinosaur-bearing locality in Italy.

The site is here critically re-evaluated as early Campanian in age, thus preceding the final fragmentation stages of the European Archipelago, including all other European localities preserving hypothesized dwarfed taxa.

New skeletal remains allowed osteohistological analyses on the hadrosauroid Tethyshadros insularis indicating subadult features in the type specimen whereas a second, herein newly described, larger individual is likely somatically mature.

A phylogenetic comparative framework places the body-size of T. insularis in range with other non-hadrosaurid Eurasian hadrosauroids, rejecting any significant evolutionary trend towards miniaturisation in this clade, confuting its 'pygmy' status, and providing unmatched data to infer environmentally-driven body-size trends in Mesozoic dinosaurs.

[Image on next page is from this paper.]



Kring, D.A., and W. Bach (2021) **Hydrogen production from alteration of Chicxulub crater impact breccias: Potential energy source for a subsurface microbial ecosystem.** ASTROBIOLOGY 21:doi.org/10.1089/ast.2021.0045

[Chicxulub was the asteroid impact that ended the age of dinosaurs.]

Authors' abstract: *A sulfate-reducing population of thermophiles grew in porous, permeable niches within glass-bearing impact breccias of the Chicxulub impact crater. The microbial community grew in an impact generated hydrothermal system that vented on the seafloor several hundred meters beneath the sea surface.*

Potential electron donors for that metabolism are hydrocarbons, although a strong C-isotope signature of that source does not exist.

Model calculations explored here suggest that alteration of glass within the impact breccias may have produced H2 in sufficient quantities for population growth as the hydrothermal system cooled through thermophilic temperatures, although it is sensitive to the oxidation state of iron in the melt rock prior to hydrothermal alteration and the secondary mineral assemblage.

At high water-to-rock ratios and temperatures below 45˚C, H2 yields are insufficient to maintain a population of hydrogenotrophic sulfate-reducing bacteria, but yields double with a higher proportion of ferrous iron between 45 and 65˚C.

The most reduced rocks (i.e., highest proportion of ferrous iron) that are allowed to form andradite, which is observed in core samples, produce copious amounts of H2 in the temperature window for thermophiles and hyperthermophiles.

Mixtures of melt rock and carbonate, which is observed in breccia matrices, produce somewhat less H2, and the onset of massive H2 production is shifted to higher temperatures (i.e., lower W/R).

DePalma, R.A., et al (2021) **Seasonal calibration of the end-Cretaceous Chicxulub impact event.** SCIENTIFIC REPORTS 11:doi.org/10.1038/s41598-021-03232-9 (available as a free pdf)

Authors' abstract: *The end-Cretaceous Chicxulub impact triggered Earth's last mass-extinction, extinguishing ~75% of species diversity and facilitating a global ecological shift to mammal-dominated biomes.*

Temporal details of the impact event on a fine scale (hour-to-day), important to understanding the early trajectory of mass-extinction, have largely eluded previous studies.

This study employs histological and histo-isotopic analyses of fossil fish that were coeval with a unique impact-triggered mass-death assemblage from the Cretaceous-Paleogene (KPg) boundary in North Dakota (USA).

Patterns of growth history, including periodicity of ?18O and ?13C and growth band morphology, plus corroborating data from fish ontogeny and seasonal insect behavior, reveal that the impact occurred during boreal spring/summer, shortly after the spawning season for fish and most continental taxa.

The severity and taxonomic symmetry of response to global natural hazards are influenced by the season during which they occur, suggesting that post-impact perturbations could have exerted a selective force that was exacerbated by seasonal timing.

The Chicxulub impact is widely regarded as the primary driver for the Cretaceous-Paleogene (KPg) mass extinction and launched multiple long-term, planet-wide impacts for life on Earth. A globally distributed iridium-rich clay at the KPg boundary, constituting the re-accretion of impact fallout, was one of the first indicators of a massive extra-terrestrial impact.

Impact-triggered tsunami deposits have been reported in nearshore-marine and continental shelf deposits around the Gulf of Mexico and the Caribbean, < 1000 km from the Chicxulub crater and evidence of seismically induced surges ~ 3,000 km from the crater were recently documented at the Tanis (North Dakota, USA) KPg mass-death assemblage.

Extreme, long-term global climatic shifts including a prolonged multi-year dark post-impact winter, resulting from infusion of CO2 and SO2 admixed with soot and atmospheric dust are considered the primary agents of critical terrestrial and marine ecological collapse.

Impact-related environmental perturbations ultimately resulted in Earth's last known mass-extinction event. The damaging effect of the multiple resulting causal triggers of extinction can vary depending on the time of year, therefore identifying the season for the Chicxulub impact event may be a crucial key to assessing the initial biotic stresses and also better help resolve their global effects.

Ecology.

Karp, A.T., et al (2021) **Global response of fire activity to late Quaternary grazer extinctions.** SCIENCE 374:doi.org/10.1126/science.abj1580

[The Quaternary is the ice ages plus our own times.]

Authors' abstract: *Grassland herbivores are known to play a role in limiting wildfires by consuming potentially flammable material. We present evidence that that herbivore-fire interactions affected fire on a global scale in the past.*

We compared the severity of late Quaternary continent-level megaherbivore extinctions with changes in paleofire activity calculated from sedimentary charcoal data from grassy biomes.

The extent of extinctions varied between continents, and this pattern was reflected in the changes in fire activity. Fire frequency increased most where the megaherbivore extinctions were greatest (South America) and least where few extinctions occurred (Africa). This loss of large-bodied grazers in the Quaternary drastically altered global fire regimes.

Fire activity varies substantially at global scales because of the influence of climate, but at broad spatiotemporal scales, the possible effects of herbivory on fire activity are unknown.

Here, we used late Quaternary large-bodied herbivore extinctions as a global exclusion experiment to examine the responses of grassy ecosystem paleofire activity (through charcoal proxies) to continental differences in extinction severity.

Grassy ecosystem fire activity increased in response to herbivore extinction, with larger increases on continents that suffered the largest losses of grazers; browser declines had no such effect.

These shifts suggest that herbivory can have Earth system-scale effects on fire and that herbivore impacts should be explicitly considered when predicting changes in past and future global fire activity.

Wang, Y., et al (2021) **Late Quaternary dynamics of Arctic biota from ancient environmental genomics.** NATURE 600:doi.org/10.1038/s41586-021-04016-x (available as a free pdf)

Authors' abstract: *During the last glacial-interglacial cycle, Arctic biotas experienced substantial climatic changes, yet the nature, extent and rate of their responses are not fully understood.*

Here we report a large-scale environmental DNA metagenomic study of ancient plant and mammal communities, analysing 535 permafrost and lake sediment samples from across the Arctic spanning the past 50,000 years.

Furthermore, we present 1,541 contemporary plant genome assemblies that were generated as reference sequences. Our study provides several insights into the long-term dynamics of the Arctic biota at the circumpolar and regional scales. Our key findings include:

(1) a relatively homogeneous steppe-tundra flora dominated the Arctic during the Last Glacial Maximum, followed by regional divergence of vegetation during the Holocene epoch;
(2) certain grazing animals consistently co-occurred in space and time;
(3) humans appear to have been a minor factor in driving animal distributions;
(4) higher effective precipitation, as well as an increase in the proportion of wetland plants, show negative effects on animal diversity;
(5) the persistence of the steppe-tundra vegetation in northern Siberia enabled the late survival of several now-extinct megafauna species, including the woolly mammoth until 3.9 ± 0.2 thousand years ago (ka) and the woolly rhinoceros until 9.8 ± 0.2 ka; and
(6) phylogenetic analysis of mammoth environmental DNA reveals a previously unsampled mitochondrial lineage.

Climate changes are amplified at high latitudes and have pronounced effects on Arctic ecosystems. Their effects on Arctic plant and animal communities, as well as the human populations who are dependent on them, would have been especially pronounced during the extremely cold and arid Last Glacial Maximum (LGM) (26.5 to 19 ka) and later during the rapid warming that preceded the Holocene.

Skeletal remains show that several megafaunal species, including woolly mammoth (Mammuthus primigenius), woolly rhinoceros (Coelodonta antiquitatis), steppe bison (Bison priscus) and horse (Equus spp.), were abundant in the Arctic during the Pleistocene epoch, but are thought to have become regionally or globally extinct by the onset of the Holocene.

However, the precise timing of megafaunal extinctions, and whether and to what extent some of these taxa survived into the Holocene, is uncertain. Similarly, the contribution of various abiotic and biotic drivers to the extinction process of different taxa remains an open question.

Waters, M.N., et al (2021) **Harmful algal blooms and cyanotoxins in Lake Amatitlan, Guatemala, coincided with ancient Maya occupation in the watershed.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 118:doi.org/10.1073/pnas.2109919118 (available as a free pdf)

Authors' abstract: *Human-induced deforestation and soil erosion were environmental stressors for the ancient Maya of Mesoamerica. Furthermore, intense, periodic droughts during the Terminal Classic Period, ca. Common Era 830 to 950, have been documented from lake sediment cores and speleothems.*

Today, lakes worldwide that are surrounded by dense human settlement and intense riparian land use often develop algae/cyanobacteria blooms that can compromise water quality by depleting oxygen and producing toxins. Such environmental impacts have rarely been explored in the context of ancient Maya settlement.

We measured nutrients, biomarkers for cyanobacteria, and the cyanotoxin microcystin in a sediment core from Lake Amatitlan, highland Guatemala, which spans the last ~2,100 years. The lake is currently hypereutrophic and characterized by high cyanotoxin concentrations from persistent blooms of the cyanobacterium Microcystis aeruginosa.

Our paleolimnological data show that harmful cyanobacteria blooms and cyanotoxin production occurred during periods of ancient Maya occupation.

Highest prehistoric concentrations of cyanotoxins in the sediment coincided with alterations of the water system in the Maya city of Kaminaljuyu, and changes in nutrient stoichiometry and maximum cyanobacteria abundance were coeval with times of greatest ancient human populations in the watershed.

These prehistoric episodes of cyanobacteria proliferation and cyanotoxin production rivaled modern conditions in the lake, with respect to both bloom magnitude and toxicity. This suggests that pre-Columbian Maya occupation of the Lake Amatitlan watershed negatively impacted water potability.

Prehistoric cultural eutrophication indicates that human-driven nutrient enrichment of water bodies is not an exclusively modern phenomenon and may well have been a stressor for the ancient Maya.

Zoology.

Mailho-Fontana, P.L., et al (2021) **Skin and poison glands in toads (Rhinella) and their role in defence and water balance.** ACTA ZOOLOGICA 103:112-128 (available as a free pdf)

Authors' abstract: *Toads are considered poisonous animals since they have a passive mode of defence relying on cutaneous poison glands, differently from venomous animals who can inject venom in predators/aggressors or prey. Toads of Rhinella marina group are generally large and have a broad distribution in South America, inhabiting a wide range of environments.*

In this paper, we studied the toads Rhinella icterica from the Atlantic rainforest, and Rhinella jimi from the Brazilian Semiarid Caatinga, analysing aspects of natural history and comparing their skin morphology, the presence of macroglands, their resistance to water loss and rates of water uptake.

In periods of extreme drought, R. jimi uses rock cracks as refuges, exposing only the head and regions of accumulation of poison glands. The skin of R. jimi showed higher number of poison glands with hydrophilic content than R. icterica.

R. jimi also had a thicker skin, which can be related to its superior resistance to water loss. It also showed high rates of rehydration in association with a peculiar behaviour using the limbs to spread water onto highly glandular skin areas, suggesting that poison glands may also act in water balance in addition to chemical defence.

Marek, P.E., et al (2021) **The first true millipede: 1306 legs long.** SCIENTIFIC REPORTS 11:doi.org/10.1038/s41598-021-02447-0 (available as a free pdf)

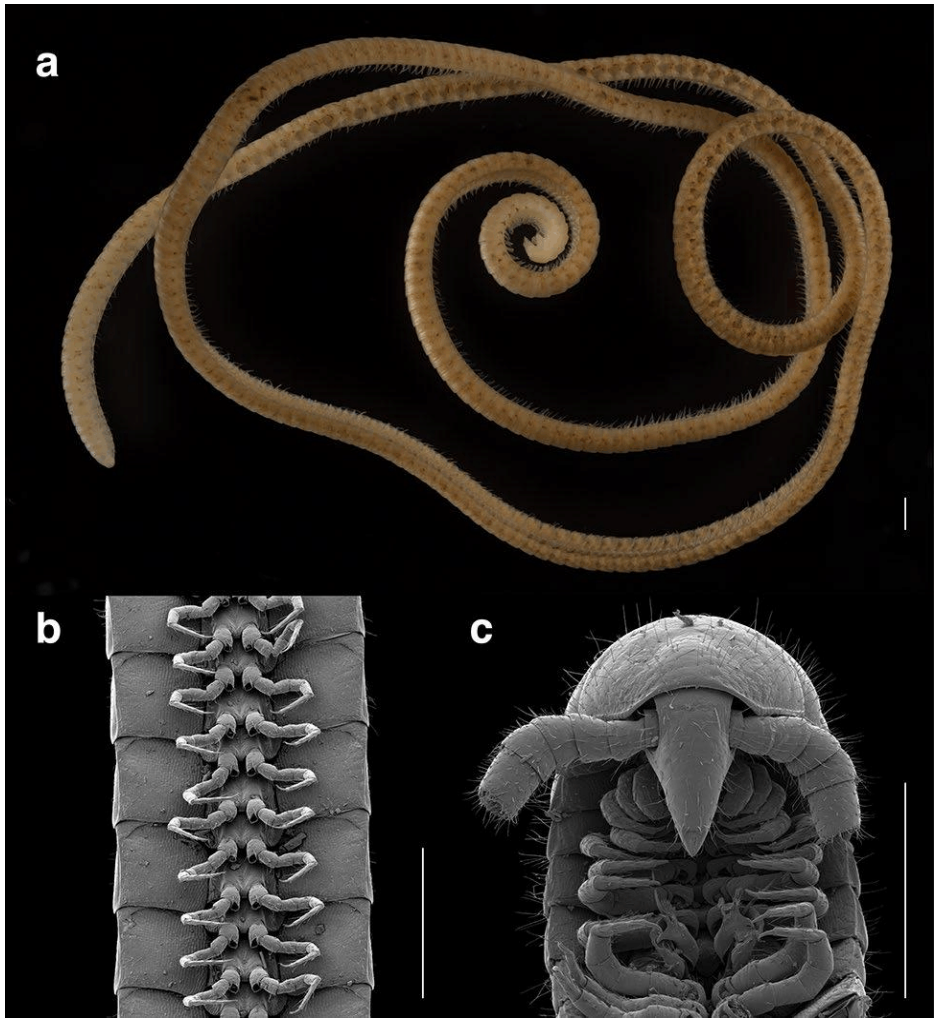
Authors'' abstract: *The name "millipede" translates to a thousand feet (from mille "thousand" and pes "foot"). However, no millipede has ever been described with more than 750 legs. We discovered a new record-setting species of millipede with 1,306 legs, Eumillipes persephone, from Western Australia.*

This diminutive animal (0.95 mm wide, 95.7 mm long) has 330 segments, a cone-shaped head with enormous antennae, and a beak for feeding. A distant relative of the previous record holder, Illacme plenipes from California, it belongs to a different order, the Polyzoniida.

Discovered 60 metres below ground in a drill hole created for mineral exploration, E. persephone possesses troglomorphic features; it lacks eyes and pigmentation, and it has a greatly elongated body, features that stand in stark contrast to its closest surface-dwelling relatives in Australia and all other members of its order.

Discovered in the resource-rich Goldfields-Esperance region and threatened by encroaching surface mining, documentation of this species and conservation of its habitat are of critical importance.

[Image is from this paper.]



Social Media.

[As we all know, social media isn't. There are lots of scientific studies trying to find out why. I am not on Facebook, Twitter, Instagram, Tik Tok, and all the other soul-destroying media.]

Macy, M.W., et al (2021) **Polarization and tipping points.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 118:doi.org/10.1073/pnas.2102144118 (available as a free pdf)

Authors' abstract: *Our study was motivated by a highly disturbing puzzle. Confronted with a deadly global pandemic that threatened not only massive loss of life but also the collapse of our medical system and economy, why were we unable to put partisan divisions aside and unite in a common cause, similar to the national mobilization in the Great Depression and the Second World War?*

We used a computational model to search for an answer in the phase transitions of political polarization. The model reveals asymmetric hysteresis trajectories with tipping points that are hard to predict and that make polarization extremely difficult to reverse once the level exceeds a critical value.

Research has documented increasing partisan division and extremist positions that are more pronounced among political elites than among voters. Attention has now begun to focus on how polarization might be attenuated.

We use a general model of opinion change to see if the self-reinforcing dynamics of influence and homophily may be characterized by tipping points that make reversibility problematic.

The model applies to a legislative body or other small, densely connected organization, but does not assume country-specific institutional arrangements that would obscure the identification of fundamental regularities in the phase transitions.

Agents in the model have initially random locations in a multidimensional issue space consisting of membership in one of two equal-sized parties and positions on 10 issues.

Agents then update their issue positions by moving closer to nearby neighbors and farther from those with whom they disagree, depending on the agents' tolerance of disagreement and strength of party identification compared to their ideological commitment to the issues.

We conducted computational experiments in which we manipulated agents' tolerance for disagreement and strength of party identification. Importantly, we also introduced exogenous shocks corresponding to events that create a shared interest against a common threat (e.g., a global pandemic).

Phase diagrams of political polarization reveal difficult-to-predict transitions that can be irreversible due to asymmetric hysteresis trajectories. We conclude that future empirical research needs to pay much closer attention to the identification of tipping points and the effectiveness of possible countermeasures.

Waller, I., and A. Anderson (2021) **Quantifying social organization and political polarization in online platforms.** NATURE 600;264-268

Authors' abstract: *Mass selection into groups of like-minded individuals may be fragmenting and polarizing online society, particularly with respect to partisan differences.*

However, our ability to measure the social makeup of online communities and in turn, to understand the social organization of online platforms, is limited by the pseudonymous, unstructured and large-scale nature of digital discussion.

Here we develop a neural-embedding methodology to quantify the positioning of online communities along social dimensions by leveraging large-scale patterns of aggregate behaviour. Applying our methodology to 5.1 billion comments made in 10,000 communities over 14 years on Reddit, we measure how the macroscale community structure is organized with respect to age, gender and US political partisanship.

Examining political content, we find that Reddit underwent a significant polarization event around the 2016 US presidential election. Contrary to conventional wisdom, however, individual-level polarization is rare; the system-level shift in 2016 was disproportionately driven by the arrival of new users.

Political polarization on Reddit is unrelated to previous activity on the platform and is instead temporally aligned with external events. We also observe a stark ideological asymmetry, with the sharp increase in polarization in 2016 being entirely attributable to changes in right-wing activity.

This methodology is broadly applicable to the study of online interaction, and our findings have implications for the design of online platforms, understanding the social contexts of online behaviour, and quantifying the dynamics and mechanisms of online polarization.

Santos, F.P., et al (2021) **Link recommendation algorithms and dynamics of polarization in online social networks.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 118:doi.org/10.1073/pnas.2102141118 (available as a free pdf)

Authors' abstract: *Polarization is rising while political debates are moving to online social platforms. In such settings, algorithms are used to recommend new connections to users, through so-called link recommendation algorithms. Users are often recommended based on structural similarity (e.g., nodes sharing many neighbors are similar).*

We show that preferentially establishing links with structurally similar nodes potentiates opinion polarization by stimulating network topologies with well defined communities (even in the absence of opinion-based rewiring).

When networks are composed of nodes that react differently to out-group contacts, either converging or polarizing, connecting structurally dissimilar nodes enhances moderate opinions.

The level of antagonism between political groups has risen in the past years. Supporters of a given party increasingly dislike members of the opposing group and avoid intergroup interactions, leading to homophilic social networks.

While new connections offline are driven largely by human decisions, new connections on online social platforms are intermediated by link recommendation algorithms, e.g., "People you may know" or "Whom to follow" suggestions.

The long-term impacts of link recommendation in polarization are unclear, particularly as exposure to opposing viewpoints has a dual effect. Connections with out-group members can lead to opinion convergence and prevent group polarization or further separate opinions.

Here, we provide a complex adaptive systems perspective on the effects of link recommendation algorithms. While several models justify polarization through rewiring based on opinion similarity, here we explain it through rewiring grounded in structural similarity—defined as similarity based on network properties.

We observe that preferentially establishing links with structurally similar nodes (i.e., sharing many neighbors) results in network topologies that are amenable to opinion polarization. Hence, polarization occurs not because of a desire to shield oneself from disagreeable attitudes but, instead, due to the creation of inadvertent echo chambers.

When networks are composed of nodes that react differently to out-group contacts, either converging or polarizing, we find that connecting structurally dissimilar nodes moderates opinions.

Tokita, C.K., et al (2021) **Polarized information ecosystems can reorganize social networks via information cascades.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 118:doi.org/10.1073/pnas.2102147118 (available as a free pdf)

Authors' abstract: *Many argue that partisan media coverage creates political polarization by pushing people's opinions to extremes, but evidence is mixed. We instead propose that partisan media coverage can cause polarization by altering people's social connections and reorganizing social networks along political lines.*

Using computational modeling and social media data, we explore how people may adjust their social ties to avoid the sharing behavior of friends who might be engaging with news from non-preferred information sources.

Our model suggests that polarization is driven to a large extent by unfollowing, which can gradually, and inadvertently, produce homogeneous online networks, known to reduce exposure to challenging information and encourage

outgroup hostility. In this way, institutional polarization can reverberate through the networked mass public.

Individuals follow pro-attitudinal information sources but are more likely to first hear and react to news shared by their social ties and only later evaluate these reactions by direct reference to the coverage of their preferred source. Reactions to news spread through the network via a complex contagion.

Following a cascade, individuals who determine that their participation was driven by a subjectively "unimportant" story adjust their social ties to avoid being misled in the future. In our model, this dynamic leads social networks to politically sort when news outlets differentially report on the same topic, even when individuals do not know others' political identities.

Observational follow network data collected on Twitter support this prediction: We find that individuals in more polarized information ecosystems lose cross-ideology social ties at a rate that is higher than predicted by chance.

Importantly, our model reveals that these emergent polarized networks are less efficient at diffusing information. Individuals avoid what they believe to be "unimportant" news at the expense of missing out on subjectively "important" news far more frequently. This suggests that "echo chambers", to the extent that they exist, may not echo so much as silence.

Perrings, C., et al (2021) **National polarization and international agreements.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 118:doi.org/10.1073/pnas.2102145118 (available as a free pdf)

Authors' abstract: *Why are so many postwar experiments in international governance now being challenged? We consider how polarization of political parties and stakeholders on the issues addressed by international environment agreements affects commitment to those agreements. We also consider how changes in national obligations under agreements affect polarization.*

We show that while there is good cause to think that party polarization is associated with reduced support for international agreements, stakeholder engagement that penalizes parties adopting positions too distant from their own has an important moderating affect.

The network of international environmental agreements (IEAs) has been characterized as a complex adaptive system (CAS) in which the uncoordinated responses of nation states to changes in the conditions addressed by particular agreements may generate seemingly coordinated patterns of behavior at the level of the system.

Unfortunately, since the rules governing national responses are ill understood, it is not currently possible to implement a CAS approach. Polarization of both political parties and the electorate has been implicated in a secular decline in national commitment to some IEAs, but the causal mechanisms are not clear.

In this paper, we explore the impact of polarization on the rules underpinning national responses. We identify the degree to which responsibility for national decisions is shared across political parties and calculate the electoral cost of party positions as national obligations under an agreement change.

We find that polarization typically affects the degree but not the direction of national responses. Whether national commitment to IEAs strengthens or weakens as national obligations increase depends more on the change in national obligations than on polarization per se.

Where the rules governing national responses are conditioned by the current political environment, so are the dynamic consequences both for the agreement itself and for the network to which it belongs. Any CAS analysis requires an understanding of such conditioning effects on the rules governing national responses.

Stewart, A.J., et al (2021) **Inequality, identity, and partisanship: How redistribution can stem the tide of mass polarization.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 118:doi.org/10.1073/pnas.2102140118 (available as a free pdf)

Authors' abstract: *Populist movements have begun to challenge mainstream political parties, disrupt established norms, and engage in violence against democratic institutions. The movements are fueled by significant support from ordinary citizens who have become increasingly politically polarized.*

We show that risk-averse attitudes toward other identity groups can transform into affective polarization between supporters of different political parties,

through a process of cultural evolution. The economic factors that drive risk aversion can also magnify the effects of unequal wealth, creating a dangerous feedback loop between polarization and inequality.

However, redistribution via public goods that reduces inequality can both prevent the onset of political polarization and make it easier for coordinated efforts to reverse entrenched polarized attitudes.

The form of political polarization where citizens develop strongly negative attitudes toward out-party members and policies has become increasingly prominent across many democracies. Economic hardship and social inequality, as well as intergroup and racial conflict, have been identified as important contributing factors to this phenomenon known as "affective polarization."

Research shows that partisan animosities are exacerbated when these interests and identities become aligned with existing party cleavages. In this paper, we use a model of cultural evolution to study how these forces combine to generate and maintain affective political polarization.

We show that economic events can drive both affective polarization and the sorting of group identities along party lines, which, in turn, can magnify the effects of underlying inequality between those groups.

But, on a more optimistic note, we show that sufficiently high levels of wealth redistribution through the provision of public goods can counteract this feedback and limit the rise of polarization. We test some of our key theoretical predictions using survey data on intergroup polarization, sorting of racial groups, and affective polarization in the United States over the past 50 years.

ZINE LISTINGS

[I only list zines I receive from the Papernet. If the zine is posted on www.efanzines.com or www.fanac.org, then I don't mention it since you can read it directly.]

FOR THE CLERISY #91 (The Usual from Brant Kresovich, Box 404, Getzville, New York 14068) Review zine focusing on older books. This issue also looks at the actresses of the Perry Mason television series.