OPUNTIA 403


LIVE DINOSAUR
HANDLE WITH CARE
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HANDLE WITH CARE
UNLEASHED
DOG BOWL

Late January 2018

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.

DINOSAURS IN COWTOWN

photos by Dale Speirs

I took the cover photo at the 2017 Calgary Stampede rodeo. I never did find out what it was about. There was no dinosaur event listed in the show catalogue, and the only act nearby was a dog racing event for kiddies.

Alberta is the richest source of Late Cretaceous fossils in the world, mostly along the Red Deer River badlands and down along the Montana border in the Milk River exposures. The Royal Tyrrell Museum of Palaeontology in Drumheller is the world's largest fossil museum, and the second biggest attraction for international tourists in Alberta after the Rocky Mountains.

The bedrock around Calgary is mostly Palaeocene, just after the extinction of the dinosaurs. Occasional fossil skeletons have been found within city limits of fish or mammals but nothing with the glamour of the big toothy carnosaurs.

Drumheller is a two-hour drive east-northeast of Calgary, and Dinosaur Provincial Park is two hours due east. Tourists fly into Calgary, take tour buses east to the badlands, come back to Calgary overnight, and then on the next day take buses westbound into the mountains, or vice versa.

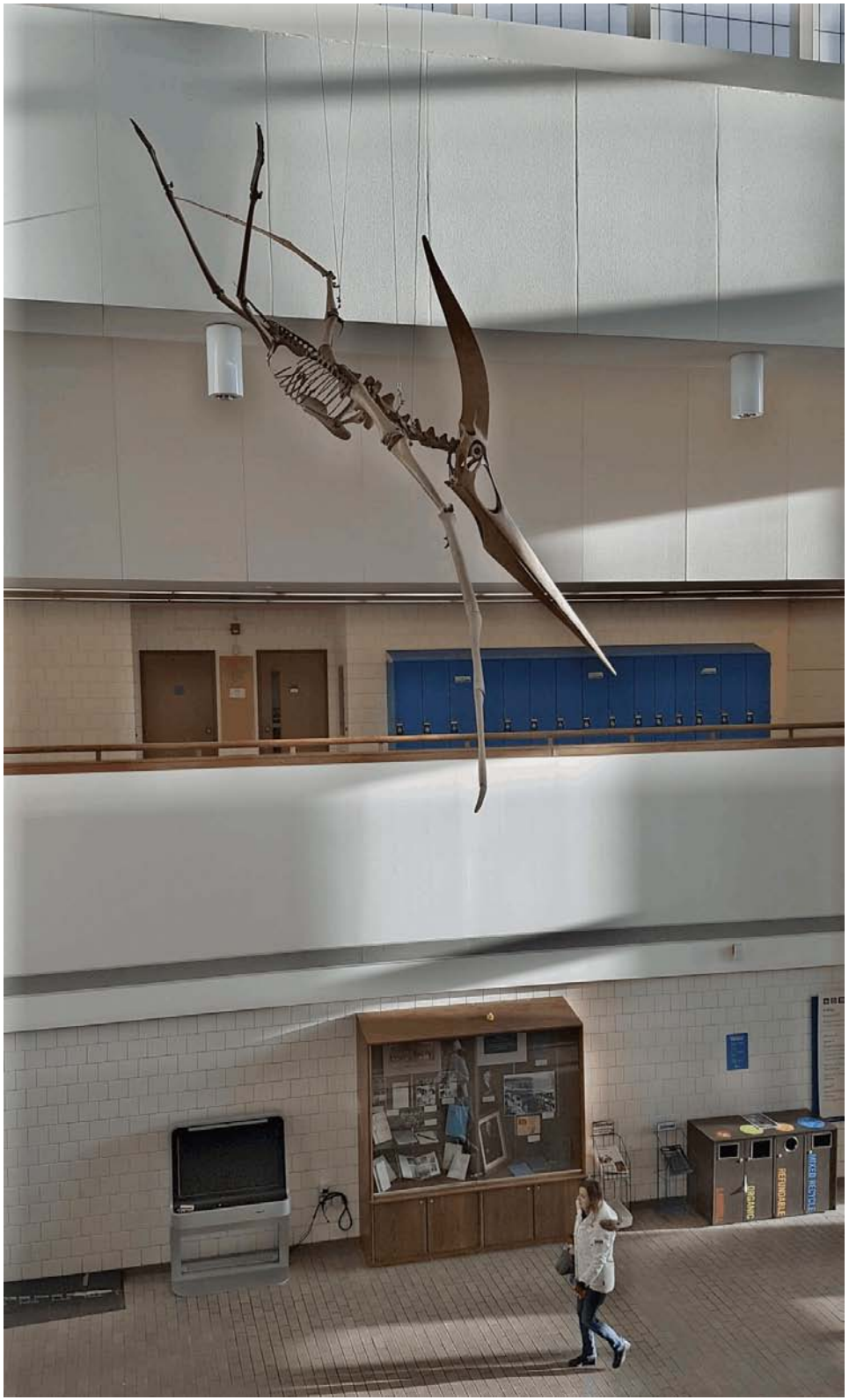
I have occasionally met naive tourists from Europe who don't realize how big the western provinces are (Alberta is three times the size of the British Isles), and want to visit both the badlands and the mountains in one day. Technically it might be possible with a fast car starting just before sunrise, with no stops except for fuel and bathroom breaks, but such a round trip would be 80% over the dry flatlands of southern Alberta, with no time to explore at leisure.

At right: A banner at the 4 Street SW LRT station in downtown Calgary.

I told you all that so I could tell you this. Mount Royal University has opened a tiny museum of the Cretaceous, free to the public. MRU is in southwest Calgary. It was founded in 1910 as Mount Royal College, adjacent to the residential district of that name in central Calgary. It grew like Topsy, and many decades ago relocated to an abandoned airbase out in the southwestern suburbs where it is now.

The distinguishing feature of the campus is that it has only one giant building filling up the core. Students need not go outside during the day, no matter what classes they take. Whenever the campus expanded, they just built another wing onto the existing building. The eastern entrance to the building, logically called East Gate, is home to a new free dinosaur exhibit that opened in January.

The university has no pretensions to competing with the Tyrrell Museum, but wanted to add dinosaur skeletons for teaching purposes and as an attraction to the general public. We don't all care to drive two hours to look at a skeleton. There are only two dinosaurs, a marsupial, and a pterodactyl. About fifteen minutes to view the exhibits. The photo below is looking at the East Gate of the building. The exhibits are just inside the doors on the second floor terrace. At right is a general view of the fossils.



Pteranodon was the most common pterosaur during the Late Cretaceous of western North America.

Alberta had marsupials during the Cretaceous. This is *Didelphodon vorax*, something like a possum but the size of a German shepherd dog.

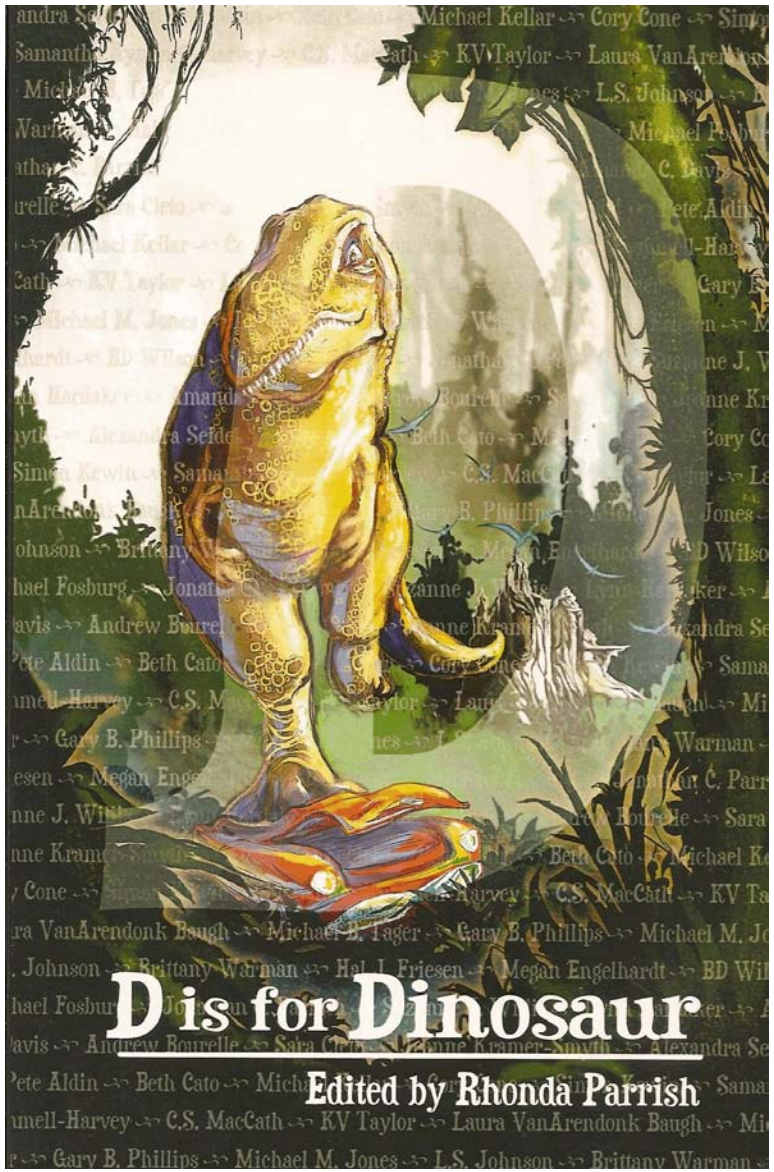
Triceratops horridus was common in Alberta. This is a juvenile about three years old, the size of a yearling calf.

There is a belief that *Nanotyrannus lancensis* may actually be the juvenile form of *Tyrannosaurus*.

VANISHED WORLDS: PART 3
by Dale Speirs

[Parts 1 to 2 appeared in OPUNTIAs #320 and 338.]

D IS FOR DINOSAUR is a 2017 anthology edited by Rhonda Parrish. It is part of a series of anthologies where each volume has a theme and within each volume there are 26 stories, one for each letter of the alphabet. In order to cram that many stories into a trade paperback, they have to be mostly short-shorts that rely on a one-trick punch line.



This volume has stories about dinosaurs, about people searching for dinosaurs, and off-topic stories not related to the theme. On the whole, I found about half the stories were good. If you are a dinosaur fanatic, this will be a volume worth reading but be aware that these aren't standard monster stories. I bought my copy at the When Words Collide dealer bourse but I should have waited for it to show up in the Calgary Public Library.

PRIMEVAL is a British television series that began in 2007 and had an on/off history, sometimes canceled and sometimes revived. The ensemble cast had some changes as well. This series is about chasing down dinosaurs and other large critters coming through into England via space-time warps referred to as anomalies. The SFX are very well done, as indeed they must be, to sustain the believability of the series. The animals are realistic and the actors mesh with them nicely.

The series began with strange creatures reported roaming the Forest of Dean in England, one of which is eventually identified as a *Scutosaurus* from the late Permian of 250 megayears ago. Later a *Gorgonopsid* comes through, another toothy carnosaur from that era, and events become exciting.

The Home Office assembles a team of misfits to round up the animals and chase them back into the anomalies to return them to the past. The first few episodes play variations on the same theme, with different creatures appearing in different circumstances. As an example, an anomaly opens up in a swimming pool that happens to be connected to a Cretaceous sea. A *Mosasaur* swims through the gap and has a swimmer for lunch.

Another variation is the realization that it isn't just big toothy creatures that can cause problems. A flock of dodos come through. Cute, funny birds, but they carry parasites that seriously affect humans. Not all the anomalies are linked to past eras. When some creatures come through who aren't in the taxonomy books, it is realized that they have evolved in the far future after humans have vanished.

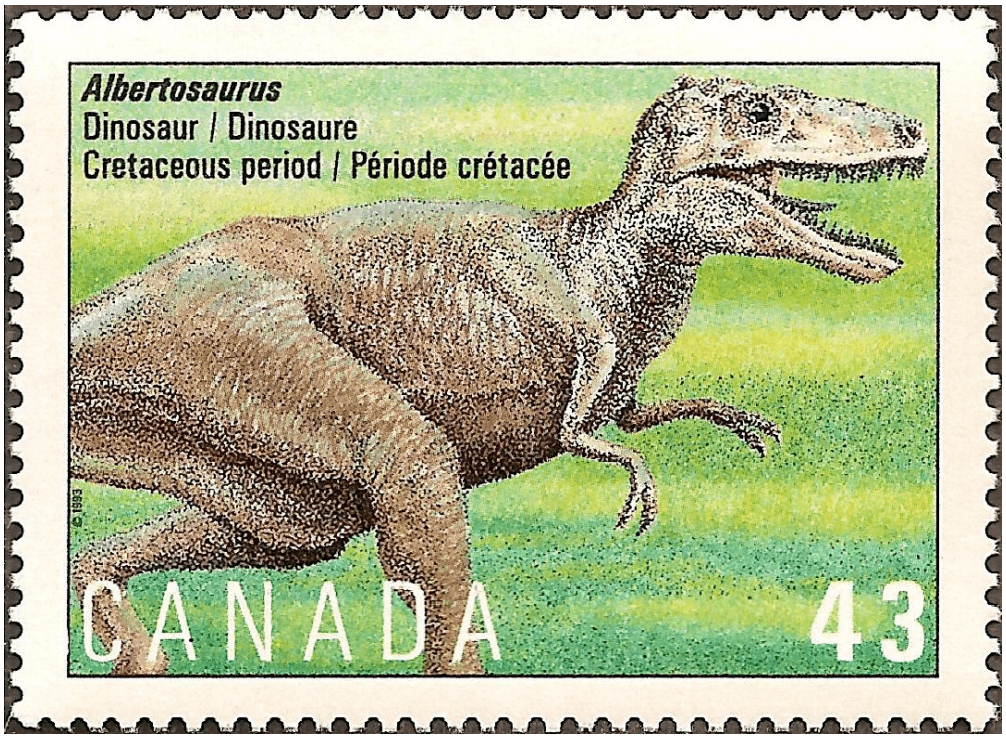
I won't catalogue all the animals, or subplots for that matter, one of which involves a really vicious ex-wife. I bought only the first two seasons of the DVDs; the first was the best. In the second season, the producers began to run out of ideas and I gave up on the series.

Hunting Real Big Game.

I generally avoid time travel stories into the past due to the Grandfather Paradox problem. In the realm of both dinosaur and time travel stories, L. Sprague de Camp's classic story "A Gun For Dinosaur" stands out. It was first published in the 1956 March issue of GALAXY and has been anthologized many times since.

The story is a recitation by hunting guide Reginald Rivers, who, influenced by money against his better judgement, takes two hunters back to the Cretaceous to find a *Tyrannosaurus*. One is Courtney James, a loudmouth bull-headed trophy hunter who believes in maximum firepower and is not inclined to take orders from a guide. The other is August Holtzinger, a milquetoast who can't handle a big rife and has to use a smaller bore.

On location, James is uncontrollable, blasting away at everything in sight. He empties his gun at a *Tyrannosaurus* and has to be saved by Holtzinger, who unfortunately dies when the dinosaur turns its attention to him. James eventually gets his just reward in what I consider a forced ending. The story broke new ground at the time of publication and today is considered one of the classics of science fiction.



DINOSAURS AND A DIRIGIBLE (2014) by David Drake is a collection of five stories mashed into a novel about Henry Vickers, a hunting guide who takes hunters into the Cretaceous. Drake acknowledges de Camp as an inspiration. Both authors recognized that most problems faced by hunting guides have to do with their clients, not the prey. I'll just mention the dinosaur stories in Drake's collection but there are others as well. All told, a good collection.

"King Tyrant Lizard" opens in the Borneo jungle where a *Tyrannosaurus* was brought via time machine but later escaped its compound. Vickers is part of the team tracking it. Drakes deals with an obvious problem of time travel by stating that the time machines can only go into the deep distant past such as the Cretaceous, where small timeline changes cancel out. Governments can't change human history by killing baby Hitler or scrambling all available fighter planes over Pearl Harbor at 06h00 on December 7.

The hunt for a *Tyrannosaurus* is more a problem in logistics and human behaviour, with plenty of politics thrown in, both covert and overt. The humans spend as much time intriguing against each other as they do in hunting the escaped dinosaur.

"Time Safari" follows de Camp's story. It opens with Vickers lecturing his clients before they make the time jump. Unlike Rivers in the de Camp story, who emphasized that big bore ammunition mattered, Vickers goes for penetration, not caliber or powder load. The plot is mostly predictable, but ends up in a three-way melee between human hunters, a *Tyrannosaurus*, and a group of gorgosaurs. The last-minute rescue after the time machine breaks down is almost anti-climatic.

"Boundary Layer" opens with Vickers and his new wife Adrienne tranquillizing a *Tyrannosaurus* and making it ready for transport to modern times. Politics intrudes as some VIPs barge in for a hunt and disrupt operations. They get a dinosaur but, again, there is as much going on between the humans as about the trip itself.

The twist in the story comes from a different direction. The time jump is to the end of the Cretaceous, when dinosaurs began dying out. That asteroid wasn't big enough to do the whole job. It was done by human contamination, bringing back a fungus that thrived in dinosaur lungs.

TRAIN OF EVENTS
by Dale Speirs

Disoriented Express.

Trains have long been a popular setting for murder mysteries, much like manor house mysteries. They are a confined space where the murderer cannot immediately escape, giving the detective a chance to solve the case before the next stop. That the murderer could escape at the next stop adds a sense of urgency to the investigation. The characters are usually strangers to one another when they get on the train, allowing the writer to sprinkle in a wide variety of types and pad out the novel or movie by explaining the background of each person and what load of guilt they might be carrying.

The most famous train murder story is Agatha Christie's MURDER ON THE ORIENT EXPRESS. Her detective Hercule Poirot is onboard the train running across Europe when a passenger is dispatched with more than the usual care. Poirot is plagued by a plethora of clues, finally explained when he realizes that everybody did it. The deceased was that unpopular and, for that matter, extremely guilty.

A 1974 movie was made of the novel, which was done well enough to win an Academy Award for one of the actresses. It has an all-star cast, who at times appear to be doing set pieces rather than a single movie. At 127 minutes long, the movie could have been edited to tighten up the narrative.

Not long after the murder is discovered, the train is stranded in deep snow in the Balkan mountains, thereby fulfilling one of the basic conditions of this type of fiction, isolating the scene and characters and forcing the solution of the crime before the train is finally dug out and proceeds to the next station.

The characters are introduced in the movie through a clever opening credit sequence, which explains the background of the story. Years ago, a small girl was kidnapped from the home of her wealthy parents and later found dead. It is an obvious version of the Lindbergh kidnapping. The story picks up when the family and friends of the little girl find the murderer in Europe and take their revenge.

The movie uses the claustrophobic aspect of trains, where everyone is jammed together, upper class and lower class alike. Even to pass each other in the corridors forces unwanted familiarity. To know that the murderer is in the same carriage is even worse.

"Orient Express" is a 1949 episode of the old-time radio series ESCAPE, based on a story by Graham Greene and not to be confused with the Christie novel. (This and hundreds of other OTR shows are available as free downloads at www.archive.org)

In this particular version, an American traveling to the Balkans finds himself in the midst of excitement when a young lady mixes him into an espionage plot. A freedom fighter is attempting to make it out of one country and into another, with, of course, government agents who object to the idea.

No one can get away from anyone else on the train. The narrow confines of the train help feed paranoia. Much to-ing and fro-ing, with the American trying to make sense of the plot along with the reader.

When the shouting and the shooting die down, the resistance fighter makes into Belgrade safely. The hero and the young woman are continuing on to Istanbul, and it becomes obvious they will be sharing a compartment the rest of the way. A routine spy story, but not bad for all that.

The late 1960s television series GET SMART was a spy comedy about the silent war between CONTROL (the good guys) and KAOS (the bad guys). It used the famous train for a Season 1 episode from 1965 titled "Aboard The Orient Express", written by Robert C. Dennis and Earl Barret. This seems to have been a parody of the Greene story, not the Christie plot.

CONTROL had been losing couriers on the Orient Express. The men were carrying the payroll for spies in the Balkans. Each of them was intercepted, so the Chief decides to send Agent 99, as she may be able to get past them. Unfortunately Maxwell Smart accidently chains the briefcase to his wrist. Only the agent at the receiving end has the key, and the briefcase is booby-trapped so that no one else can get it.

On board the train, Smart and 99 are surrounded by suspicious characters, any one of whom could be from KAOS. The train frequently crosses tiny countries, so the conductor is constantly popping in and out of compartments to handcancel everyone's passports (played by Johnny Carson in an hilarious cameo performance).

Smart bumbles along as he usually does, accompanied by various alarums and excursions from the other characters. There is a twist ending, but in spite of everything the money gets through. As usual, Smart succeeds in spite of himself. Slapstick comedy, not for the sophisticated.

Derailed By Murder.

Hugh 'Bulldog' Drummond, ex-Royal Air Force captain, was a character created by H.C. 'Sapper' McNeile. Originally published as novels and short stories, Drummond made the transition to movies and radio. Much like The Shadow, there are major continuity conflicts between the different media. Ignoring the others and concentrating on the movie series, let us consider BULLDOG DRUMMOND'S REVENGE (1937), with a screenplay by Edward T. Lowe. My copy is on the Mill Creek DVD pack of 50 Mystery Classics.

The regulars in Hugh Drummond's life were his long-suffering fiancee Phyllis Claverling and his blithering idiot pal Algy Longworth. Like Miss Marple, Drummond never set foot outside his house without tripping over a body, which brought in his foil Col. Nielson from Scotland Yard. A running joke through the movie series is that Drummond and Claverling were about to have their wedding ceremony, but had it postponed by events to the next movie.

Claverling's basic function was to be kidnapped or scream in terror at the sight of a corpse. Considering how many she had seen, one would have thought that she would quickly reach the point of shrugging her shoulders and telling Drummond that here's another one. Longworth would stretch out the plot by bumbling somehow and letting the bad guys get away. Nielson was Lestrade to Drummond.

The movie at hand begins with Sir John Haxton inventing a superexplosive called hexanite, one that would change the balance of power. Not quite a mad scientist, his private laboratory is in his manor house. He decides to fly a sample of the hexanite to London for the authorities to look at, ignoring offers from Scotland Yard to protect him on a train trip.

Haxton's plane is hijacked in midair and he is murdered. The villain parachutes the suitcase containing the hexanite to his accomplices. The plan goes awry; Drummond is roaring along in his sports car and finds the suitcase lying by the road. He takes it while the accomplices were still searching for it, not knowing the story.

The pursuit begins. The suitcase is manhandled and bounced around as it passes back and forth, no one being aware of how fragile the explosive might be. A fair amount of slapstick humour is interspersed through the movie. The body count begins to climb steadily.

This time the wedding was to be in Switzerland. Drummond combines two tasks into one, taking the boat train with Claverling from London to Paris, which also happens to be the same train the villains are on as they carry the hexanite to Europe to be sold off to the highest bidder. Much of the movie is the constant point-counterpoint on board the train between the two sides as the explosives pass back and forth. Compartment doors constantly slam open and shut as everyone searches for the MacGuffin. The finale comes on board the boat train, and justice is obtained.

One fascinating part of the movie is its location shooting, showing the busy streets and train stations of 1937, a true historical record. Everyone drives convertibles, which seems puzzling to me for England. A good comedy mystery.

MURDER EXPRESS is a 2008 novel by Robert Scott, set on board the Last Spike Special. It is a summer excursion train running between Vancouver and Calgary on the transcontinental railroad, for tourists who want to see what real mountains look like. (The last spike of the railroad was driven in at Craigellachie, British Columbia, in the heart of the mountains.)

The body shows up on the first page. Oscar Dempster suddenly departed this world when someone rendered him unconscious in the washroom and then strangled him. Oscar and his wife Ruby were boors, ill-mannered in every respect. It is no wonder that someone decided to terminate his unpleasant behaviour in such a decisive manner.

The heros are Jack Elton, an ex-cop now a private investigator, and his new wife Valerie Cummins, a police officer. They are on their honeymoon. After the murder is discovered, the train makes a brief halt at a whistle stop to pick up a police detective named Charles Roast.

He is a bitter man, holding a grudge against his parents for giving him that name, and loathes people calling him Chuck. Because it would be impossible to conduct an investigation in that remote area of the Rockies, Roast orders the train to continue to Calgary.

Jack and Val conduct their own investigation, hoping to snag the culprit before reaching civilization. The narrows down to a passenger whose young son was killed by Oscar in a car accident decades ago.

The J'accuse! explanation is the longest I have ever read, going on for the last quarter of the novel. Even after the train arrives in Calgary, Jack continues with his lengthy essay, repeating much of it to the CPS police officer who comes on board. The murderer confesses, which is just as well because Jack, Val, and Chuck had badly contaminated the evidence. A steady read.

Off Track Mysteries.

DYKE DARREL, THE RAILROAD DETECTIVE is an 1886 novel by Frank Pinkerton, available free from www.gutenberg.org. The private detective Dyke Darrel and his sister Nell become involved in the investigation of the murder of a family friend, who was an express messenger, killed defending himself in his car on the Central railroad, with $30,000 stolen.

I found the dialogue the most interesting part of the novel. It reads like amateur dramatics, with the same forced pacing one expects from a village fete play. Everyone talks like they are reading a script at first rehearsal.

"*I supposed you knew me too well, Harper, to imagine that danger ever deterred Dyke Darrel from doing his duty*." [said Dyke, who likes to refer to himself in the third person]

"*Of course; but this is a different case. 'Tis said that four men were engaged in the foul work, and that they belong to a league of desperate ruffians, as hard to deal with as ever the James and Younger brothers. Better leave it to the Chicago and St. Louis force, Dyke. I should hate to see you made the victim of these scoundrels*."

The plot needs no detailing, it being an obvious guess. The bad guys lark about, Dyke struggles, Nell is kidnapped, and assorted criminals who had been put away previously by Dyke want revenge on him.

"With Dyke Darrel on the trail, there's no knowing where it'll end. He's unearthed some o' the darkest work ever did in Chicago an' St. Louis. I would breathe a durn sight more comfortable like if Dyke Darrel was under the sod."

In separate incidents, both Nell and Dyke are thrown onto train tracks in bids to kill them. Unsuccessful, of course. In the case of Nell:

She felt a strange and awful numbness. With a mighty effort the girl roused herself to a consciousness of her awful position. Louder and louder roared the train. It was but a mile distant now, and the road was straight. Nell raised her head, and resting on her hands gazed down the track where, in the distance, gleamed the light of the locomotive. "God help me!" moaned the poor girl. Then she tried to throw herself from the track, but she could not. Her limbs were numb, and refused to obey her will.

A wild laugh rang out on the moonlit air. Madge Scarlet sprang up and glared through the bushes at her victim with maniacal delight. "Ha! ha! You cannot escape! Them pretty limbs'll be crushed and torn asunder! the white flesh cut and gashed, and that delicate body made a horrid mass of blood and mangled fragments! Then I will present them to you, Dyke Darrel. Ho! ho!" Her voice was raised to a high pitch now, and even reached the ears of the startled Nell. No help, no hope!

On thundered the iron monster. On and on till the eye of the engineer catches sight of something on the track—SOMETHING! Quickly the engine is reversed and the air brakes come into play. Too late!

A moan of agonized terror falls from the lips of the half dead girl, and then she sank helplessly to the ground. At the same instant help came from an unexpected source. A man dashed swiftly through the moonlight and flung a heavy oak tie in front of the slackened engine. A rumble and a jar, and then the train came to a dead stop, within three feet of the prostrate girl!

It was a narrow escape.

It certainly was. All is well in the end, at least for Dyke, who sends the gang to the gallows, and Nell, who gets married.

Science Fiction On Board.

John W. Campbell Jr's 1938 story "Who Goes There?" was published under his pen name Don A. Stuart, and established a new standard in SF writing. Set in Antarctica, the original story was about a group of scientists who discover an alien being frozen in the ice for 20 megayears. When thawed, it proves to be a

shapeshifter with the gift of mimicry and begins infiltrating the bodies of the human. It has to be destroyed by fire, but not before massive casualties among the contaminated scientists.

The concept was a good one, and it was often imitated. The story is considered to be among the best in SF. The first movie version was THE THING FROM ANOTHER WORLD, released in 1951. John Carpenter did another version in 1982 as THE THING, which had the advantage of a bigger budget and more modern SFX.

There is, however, an almost completely forgotten 1972 movie adaptation titled HORROR EXPRESS. It is available on the Mad Scientist Theater box set of DVDs from Mill Creek Entertainment.

The screenplay was written by Arnaud d'Usseau and Julian Halevy. It starred Christopher Lee and Peter Cushing, who added a bit of class. Instead of Antarctica, the venue is on board the Trans-Siberian Express in 1906, every bit as isolated as it rushes along the 10,000 km track. Lee, the movie's mad scientist, is bringing home a frozen caveman he discovered out in the boonies.

It transpires that the corpsicle is inhabited by an alien, who escapes and begins killing and absorbing passengers on board. It wants to build a spaceship to return home but needs to gain the knowledge of materials technology and engineering from its victims. It jumps from body to body, learning all the while.

The plot follows the usual routine, beginning with unawareness, then the dawning knowledge of the horror, and finally a fight to the death. Cossack police officers, led by a scenery-chewing Telly Savalas, board the train and try to stop the alien. The being takes over a Rasputin-like monk and explains its rationale to Lee and Cushing. They can't let it live though, and the end is foreseeable.

The movie begins slowly but hustles in the final quarter, with action aplenty. There is a cliffhanger ending, and not just figuratively, as the heroes run the Express at full speed off a cliff in an attempt to kill the alien.

The television series THE MAN FROM U.N.C.L.E. had a train episode in its second season in 1965 titled "The Adriatic Express Affair", written by Robert Hill. (See OPUNTIAs #361 to 364 for a general review of the series.) It takes place on an express train running from Vienna to Venice on December 31. Napoleon Solo and Ilya Kuryakin are searching for a virus culture smuggled on board, hampered by a train full of oddball characters, most of whom began celebrating New Year's Eve early.

THRUSH is involved peripherally but the main character is Olga Nemirovitch, the owner of a cosmetics company. Dr Ingster is one of her researchers, who was aiming at a rejuvenation formula to make people look young again. Instead, he came up with a virus that inhibits human reproduction. Nemirovitch is transporting it, hidden somewhere in her effects, with the idea of selling it to THRUSH. Its blackmail potential against the nations of the world is obvious.

Solo and Kuryakin have instructions to destroy the sample. Lots of action sequences, including the obligatory fight on top of the speeding train. A three-way tussle develops between UNCLE, THRUSH, and Nemirovitch, which would be comical were it not for the body count, steadily increasing at the rate of one corpse per act. A running gag is that a woman from Kansas on a grand tour of Europe is the person who finds each body.

The point-counterpoint plot is cleverly thought out, albeit there are a couple of random events that twist the story around. The claustrophobic confines of the train compartments and corridors emphasize that there is no escape. The final struggle takes place just before midnight. Nemirovitch meets her fate and the virus sample is destroyed, while the unknowing passengers joyously celebrate the turn of the year.

Hear That Lonesome Whistle Blow.

"The Locomotive Ghost" is a 1947 episode of the old-time radio series THE MYSTERIOUS TRAVELER, written by Robert A. Arthur and David Kogan. Two train robbers lie in wait one dark night on a spur line, aiming to wreck a mine train carrying $200,000 in cash for the payroll.

As they lurk, an old hobo named Boomer comes by and they chat with him for a while. They have to kill him because he could identify them to police, and do, but first they talk with him to pass the time. Boomer doesn't realize this. He tells them how ghost trains travel anyplace there are tracks and eventually get those who wrecked them. Only then does Boomer learn what the men are going to do, and is shot twice. He is a long time dying, and tells them they will eventually find themselves riding on the Judgement Express.

The train robbery is a success, the train is destroyed, the crew killed, and the $200,000 stolen. Once far away, the men are driving across some tracks when the car stalls for no reason. The other sees a ghost train, panics, grabs the cash, and flees. The other can't get out because the doors suddenly stick shut, and the car is hit by a real freight train, killing him.

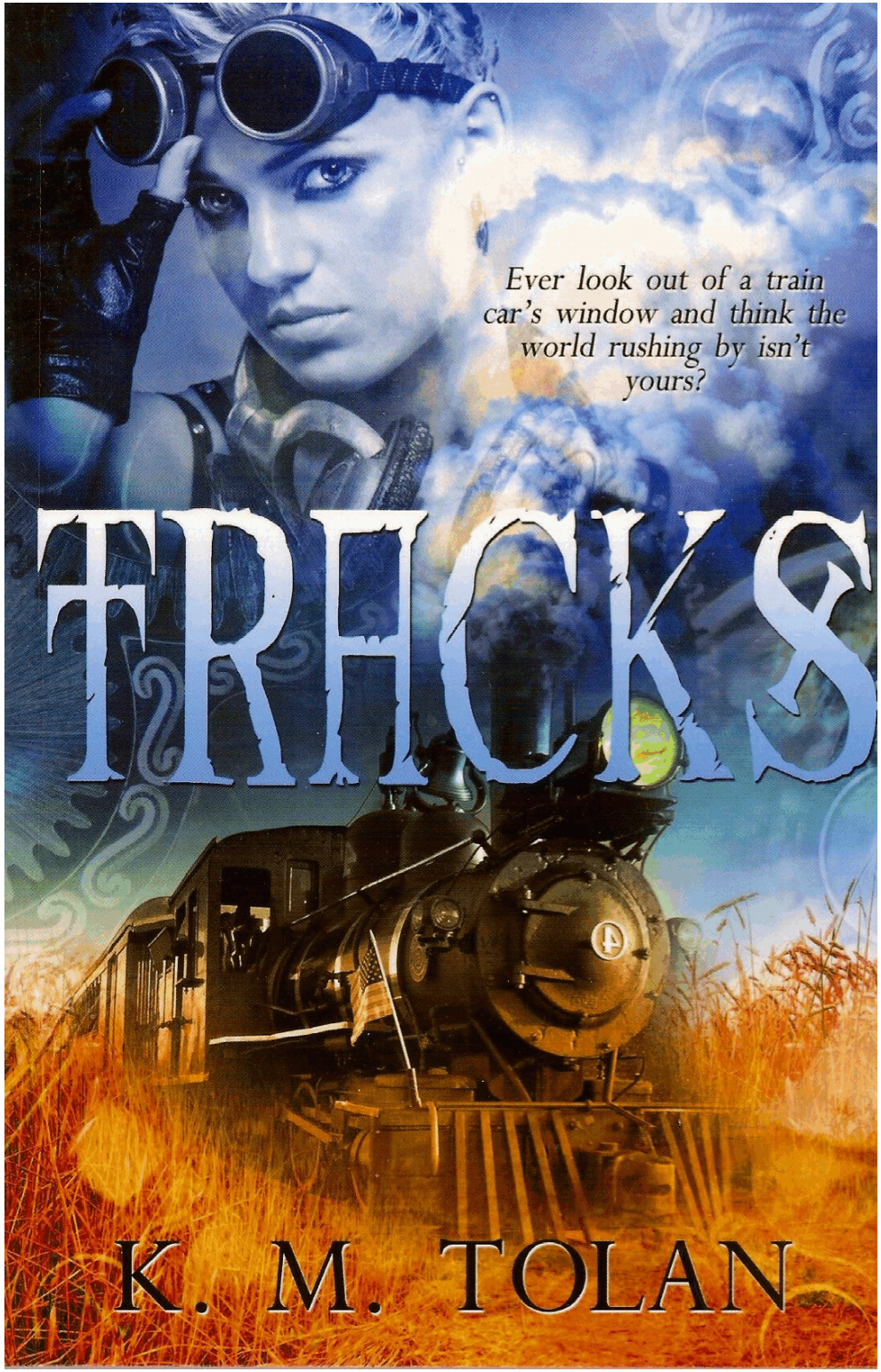
The survivor makes his way to New York City and takes lodgings, only to find the rooming house is next to railroad tracks. The whistles of the train affect him deeply, and he has horrifying nightmares. He finds himself on the Judgement Express, with Boomer as the conductor. "*I got promoted*", Boomer tells him. The Express has a thousand cars and thirty locomotives, and the robber is the only passenger, bound for the next life.

With constant nightmares and jumping every time a whistle blows, the robber decides to head north into the wilds of Canada. He settles in at a remote resort whose proprietors assure him there are no tracks within eighty miles. What they don't mention, because they didn't know it was important, is that there are rusted tracks overgrown by brush in the nearby woods, not used in decades since a lumbering camp closed down.

Out for a stroll, he blunders onto the rusted remains of the track and hears a whistle that no one else does. He begins running in terror as the Judgement Express draws near. The coroner's verdict was heart failure from overexertion. This episode is a little too frenetic in some respects, but a nice exercise in slow insanity as the guilty man flees when no one pursues.

TRACKS (2014) by K.M. Tolan is a trade paperback novel I bought at the When Words Collide 2017 dealer bourse. In looking at the blurb, I got the mistaken impression that it was an alternative history, but instead it takes place in a parallel universe where steam engines still rule. Vincent, the hero, shifts over from our timeline when he finds railroad tracks where none should be, and walks down them into another universe.

It is a place where hobos still roam but steam engines are under threat from diesels. The rail barons are intent on eradicating the old ways, and the hobos want their lifestyle to continue as if there was no progress. The struggle pulls Vincent in. He searches for his missing sister and tries to figure out how to behave in a world where railroad tracks can be summoned into existence as if by magic.



Pfalzner, S., A. Bhandare, and K. Vincke (2017-11-16) **Did a stellar fly-by shape the planetary system around Pr 0211 in the cluster M 44?** arXiv:1711.06043v1 [astro-ph.GA] Preprint at www.arxiv.org

Authors' abstract: *Ever since the first exoplanet was detected, the question arose whether planetary systems are equally common around cluster stars as those orbiting field stars. Although several planets have been detected, it is still far from clear whether planets are as common around stars in clusters as around field stars or not. Out of the approximately 3,000 exoplanets detected so far, only fourteen have been discovered in open clusters and the number of detected planets varies considerably from cluster to cluster.*

The reasons why planets could be less common in open clusters than around field stars are that disc destruction during the first few Myr could prevent planet formation, or already formed planetary systems could be destroyed in the dense duster environments in the consecutive Gyrs. Disc destruction can happen either by stellar fly-bys or external photo-evaporation by nearby massive stars.

Out of the about 3,000 exoplanets detected so far, only fourteen planets are members of open clusters: among them an exoplanet system around Pr 0211 in the cluster M44 which consists of at least two planets with the outer planet moving on a highly eccentric orbit at 5.5 AU. One hypothesis is that a close fly-by of a neighbouring star was responsible for the eccentric orbit.

We test this hypothesis. First we determine the type of fly-by that would lead to the observed parameters and then use this result to determine the history of such fly-bys in simulations of the early dynamics in an M44-like environment. We find that although very close fly-bys are required to obtain the observed properties of Pr 0211c, such fly-bys are relatively common due to the high stellar density and longevity of the cluster. About 10% of stars actually experience a fly-by that would lead to such a small system-size as observed for Pr0211 or even smaller.

Such close fly-bys are most frequent during the first 1-2 Myr after cluster formation, corresponding to a cluster age about 3 Myr. It is unclear whether planets generally form on such short timescales. However, afterwards the close fly-by rate is still 0.2-0.5 per Myr, which means extrapolating this to the age of M44 12%-20% of stars would experience such close fly-bys over this time span. Our simulations show that the fly-by scenario is a realistic option for the formation of eccentricity orbits of the planets in M44. The occurrence of such events is relatively high leading to the expectation that similar systems are likely common in open clusters in general.

Boyajian, T.S., et al (2018-01-02) **The first post-Kepler brightness dips of KIC 8462852.** arXiv:1801.00732v1 [astro-ph.SR] Preprint at www.arxiv.org

Authors' abstract: *We present a photometric detection of the first brightness dips of the unique variable star KIC 8462852 since the end of the Kepler space mission in 2013 May. Our regular photometric surveillance started in October 2015, and a sequence of dipping began in 2017 May continuing on through the end of 2017, when the star was no longer visible from Earth. We distinguish four main 1 to 2.5% dips, named "Elsie," "Celeste," "Skara Brae," and "Angkor", which persist on timescales from several days to weeks.*

Our main results so far are: (i) there are no apparent changes of the stellar spectrum or polarization during the dips; (ii) the multiband photometry of the dips shows differential reddening favoring non-grey extinction. Therefore, our data are inconsistent with dip models that invoke optically thick material, but rather they are in-line with predictions for an occulter consisting primarily of ordinary dust, where much of the material must be optically thin with a size scale 1 m, and may also be consistent with models invoking variations intrinsic to the stellar photosphere. Notably, our data do not place constraints on the color of the longer-term secular dimming, which may be caused by independent processes, or probe different regimes of a single process.

Speirs: This is the star that some people out on the fringe thought was surrounded by a Dyson sphere or massive orbiting alien civilization that was signaling to us by blinking the star light on and off.

Kasliwal, M.M., et al (2017) **Illuminating gravitational waves: A concordant picture of photons from a neutron star merger.** SCIENCE 358:1559-1565

Authors' abstract: *Merging neutron stars offer an excellent laboratory for simultaneously studying strong-field gravity and matter in extreme environments. We establish the physical association of an electromagnetic*

counterpart (EM170817) with gravitational waves (GW170817) detected from merging neutron stars.

By synthesizing a panchromatic data set, we demonstrate that merging neutron stars are a long-sought production site forging heavy elements by r-process nucleosynthesis. The weak gamma rays seen in EM170817 are dissimilar to classical short gamma-ray bursts with ultrarelativistic jets. Instead, we suggest that breakout of a wide angle, mildly relativistic cocoon engulfing the jet explains the low-luminosity gamma rays, the high-luminosity ultraviolet-optical infrared, and the delayed radio and x-ray emission. We posit that all neutron star mergers may lead to a wide-angle cocoon breakout, sometimes accompanied by a successful jet and sometimes by a choked jet.

Speirs: Elements heavier than iron are synthesized in major stellar events such as supernovas or, in the case of this paper, collisions between neutron stars. If you have gold jewelry or coins, that gold was born in a collision between two neutron stars.

Olson, S.J. (2017) **Long-term implications of observing an expanding cosmological civilization.** INTERNATIONAL JOURNAL OF ASTROBIOLOGY 17:87-95

Author's abstract: *Suppose that advanced civilizations, separated by a cosmological distance and time, wish to maximize their access to cosmic resources by rapidly expanding into the universe. How does the presence of one limit the expansionistic ambitions of another, and what sort of boundary forms between their expanding domains?*

We describe a general scenario for any expansion speed, separation distance and time. We then specialize to a question of particular interest: What are the future prospects for a young and ambitious civilization if they can observe the presence of another at a cosmological distance? We treat cases involving the observation of one or two expanding domains.

In the single observation case, we find that almost any plausible detection will limit one's future cosmic expansion to some extent. Also, practical technological limits to expansion speed (well below the speed of light) play an interesting role. If a domain is visible at the time one embarks on cosmic expansion, higher practical limits to expansion speed are beneficial only up to a certain point. Beyond this point, a higher speed limit means that gains in the ability to expand are more than offset by the first-mover advantage of the observed domain. In the case of two visible domains, it is possible to be 'trapped' by them if the practical speed limit is high enough and their angular separation in the sky is large enough, i.e. one's expansion in any direction will terminate at a boundary with the two visible civilizations. Detection at an extreme cosmological distance has surprisingly little mitigating effect on our conclusions.

Speirs: This is the stuff of countless space opera stories and films, the clash of galactic empires.

Haqq-Misra, J., R.K. Kopparapu, and E.T. Wolf (2017) **Why do we find ourselves around a yellow star instead of a red star?** INTERNATIONAL JOURNAL OF ASTROBIOLOGY 17:77-86

Authors' abstract: *M-dwarf stars are more abundant than G-dwarf stars, so our position as observers on a planet orbiting a G-dwarf raises questions about the suitability of other stellar types for supporting life. If we consider ourselves as typical, in the anthropic sense that our environment is probably a typical one for conscious observers, then we are led to the conclusion that planets orbiting in the habitable zone of G-dwarf stars should be the best place for conscious life to develop. But such a conclusion neglects the possibility that K-dwarfs or M-dwarfs could provide more numerous sites for life to develop, both now and in the future.*

In this paper we analyse this problem through Bayesian inference to demonstrate that our occurrence around a G-dwarf might be a slight statistical anomaly, but only the sort of chance event that we expect to occur regularly. Even if M-dwarfs provide more numerous habitable planets today and in the future, we still expect mid G to early K-dwarfs stars to be the most likely place for observers like ourselves. This suggests that observers with similar cognitive capabilities as us are most likely to be found at the present time and place, rather than in the future or around much smaller stars.

Speirs: The Drake Equation and the Fermi Paradox are both insoluble at the moment and probably for centuries hence, because we can't do more than make guesses at what type of stars will support life-bearing planets.

Meech, K.J., et al (2017) **A brief visit from a red and extremely elongated interstellar asteroid.** NATURE 552:378-381

Authors' abstract: *None of the approximately 750,000 known asteroids and comets in the Solar System is thought to have originated outside it, despite models of the formation of planetary systems suggesting that orbital migration of giant planets ejects a large fraction of the original planetesimals into interstellar space. The high predicted number density of icy interstellar objects (2.4×10^{-4} per cubic astronomical unit) suggests that some should have been detected, yet hitherto none has been seen. Many decades of asteroid and comet characterization have yielded formation models that explain the mass distribution, chemical abundances and planetary configuration of the Solar System today, but there has been no way of telling whether the Solar System is typical of planetary systems.*

Here we report observations and analysis of the object 1I/2017 U1 ('Oumuamua) that demonstrate its extrasolar trajectory, and that thus enable comparisons to be made between material from another planetary system and from our own. Our observations during the brief visit by the object to the inner Solar System reveal it to be asteroidal, with no hint of cometary activity despite an approach within 0.25 astronomical units of the Sun.

Spectroscopic measurements show that the surface of the object is spectrally red, consistent with comets or organic-rich asteroids that reside within the Solar System. Light-curve observations indicate that the object has an extremely oblong shape, with a length about ten times its width, and a mean radius of about 102 metres assuming an albedo of 0.04.

No known objects in the Solar System have such extreme dimensions. The presence of 'Oumuamua in the Solar System suggests that previous estimates of the number density of interstellar objects, based on the assumption that all such objects were cometary, were pessimistically low. Planned upgrades to contemporary asteroid survey instruments and improved data processing techniques are likely to result in the detection of more interstellar objects in the coming years.

Speirs: Telescope technology has made astonishing strides in the last few decades. The new telescopes can have detected more than 3,000 exoplanets. The technology is now getting down in resolution to where it can detect small asteroids previously out of the resolution of older telescopes. This one caused a sensation because it is the first positively confirmed extra-Solar asteroid, come from away, as my Newfie friends would remark. It's a great time to be an astronomer.

Snodgrass, C., et al (2017) **The Main Belt comets and ice in the Solar System.** ASTRONOMY AND ASTROPHYSICS REVIEW 25:doi10.1007/s00159-017-0104-7

Authors' extracts: *Water, usually in the form of ice, is found throughout the Solar System. Beyond Earth, it has long been recognised in the outer planets and comets, and is now also observed throughout the terrestrial planet region. Evidence for water is found with now almost monotonous regularity on Mars, but more surprisingly, ice has also been identified in permanently shadowed craters of Mercury and the Moon. While these deposits could plausibly have been delivered by comet impacts in the geologically recent past, evidence for ice in smaller bodies is more difficult to attribute to an exogenous source.*

Radar mapping of Mercury suggested the presence of polar ice in 1991. Thermal models show that in permanently shadowed regions of high-latitude craters, water ice covered by a regolith layer can be stable to evaporation over billions of years. The ice is thought to have been implanted by either constant micrometeoritic, asteroidal and cometary influx, or to stem from a few large impacts by comets and/or asteroids.

On Venus, water has been found only in the form of atmospheric vapour in spurious quantities of the order of a few parts per million in the nitrogen- and CO_2-dominated atmosphere. The high deuterium-to-hydrogen ratio in the Venusian atmosphere is interpreted as an indication for an earlier escape of water to space from the upper atmosphere, which would be more efficient for the lighter isotope. The absence of water from the Venusian atmosphere has been connected to the strong greenhouse effect that makes the existence of ice or liquid water on Venus unlikely.

Saturn and Jupiter contain water in liquid and solid form in their lower cloud layers, but its abundance in these gas giants is not well known. Uranus and Neptune are thought to contain a large layer of ices, including H_2O, above a rocky core. Also their atmospheres contain H_2O. The rings of the giant planets contain water ice at various fractions. While Saturn's rings consist mainly of water ice with a small admixture of organics and other contaminants, the rings

of Jupiter, Uranus and Neptune contain at best a small fraction of water ice. Many of the moons of the outer planets and Pluto contain a significant fraction of water, with Tethys possibly consisting almost entirely of water ice. Some, such as Jupiter's Europa and Saturn's Enceladus, are thought to contain a tidally heated global or local subsurface ocean of liquid water beneath the outer shell of ice.

Compared to the major planets in the Solar System, small icy bodies have experienced much less thermal evolution and their physical properties are well preserved. The Kuiper Belt objects (KBOs) are numerous small icy bodies beyond Neptune, which are thought to be the most primitive remnants from the early Solar System. As these objects were formed far beyond the 'snow line', volatile ices (especially water ice) are believed to be a principle constituent in KBOs.

Comets generally have small, irregularly shaped nuclei that are composed of refractory materials (such as carbon, silicates, etc.) and icy grains (e.g., water ice, carbon dioxide ice and methanol ice). These objects may have experienced very little alteration since their formation in the coldest regions of the young Solar System. As such, comets serve as the best probe for studying the physical conditions (e.g., temperature, pressure and composition) of the outer Solar nebula. However, direct detection of water ice in comets is surprisingly scarce. To date, solid ice features have only been observed in a handful of comets via ground-based facilities and in situ observations.

Martin, A., and A. McMinn (2017) **Sea ice, extremophiles and life on extra-terrestrial ocean worlds.** INTERNATIONAL JOURNAL OF ASTROBIOLOGY 17:1-16

Authors' abstract: *The primary aim of this review is to highlight that sea-ice microbes would be capable of occupying ice-associated biological niches on Europa and Enceladus. These moons are compelling targets for astrobiological exploration because of the inferred presence of subsurface oceans that have persisted over geological timescales. Although potentially hostile to life in general, Europa and Enceladus may still harbour biologically permissive domains associated with the ice, ocean and seafloor environments.*

However, validating sources of free energy is challenging, as is qualifying possible metabolic processes or ecosystem dynamics. Here, the capacity for biological adaptation exhibited by microorganisms that inhabit sea ice is reviewed. These ecosystems are among the most relevant Earth-based analogues for considering life on ocean worlds because microorganisms must adapt to multiple physicochemical extremes. In future, these organisms will likely play a significant role in defining the constraints on habitability beyond Earth and developing a mechanistic framework that contrasts the limits of Earth's biosphere with extra-terrestrial environments of interest.

Wade, J., et al (2017) **The divergent fates of primitive hydrospheric water on Earth and Mars.** NATURE 552:391-394

Authors' abstract: *Despite active transport into Earth's mantle, water has been present on our planet's surface for most of geological time. Yet water disappeared from the Martian surface soon after its formation. Although some of the water on Mars was lost to space via photolysis following the collapse of the planet's magnetic field, the widespread serpentinization of Martian crust suggests that metamorphic hydration reactions played a critical part in the sequestration of the crust.*

Here we quantify the relative volumes of water that could be removed from each planet's surface via the burial and metamorphism of hydrated mafic crusts, and calculate mineral transition-induced bulk density changes at conditions of elevated pressure and temperature for each. The metamorphic mineral assemblages in relatively FeO-rich Martian lavas can hold about 25 per cent more structurally bound water than those in metamorphosed terrestrial basalts, and can retain it at greater depths within Mars.

Our calculations suggest that in excess of 9 per cent by volume of the Martian mantle may contain hydrous mineral species as a consequence of surface reactions, compared to about 4 per cent by volume of Earth's mantle. Furthermore, neither primitive nor evolved hydrated Martian crust show noticeably different bulk densities compared to their anhydrous equivalents, in contrast to hydrous mafic terrestrial crust, which transforms to denser eclogite upon dehydration. This would have allowed efficient overplating and burial of early Martian crust in a stagnant-lid tectonic regime, in which the lithosphere comprised a single tectonic plate, with only the warmer, lower crust involved in mantle convection. This provided an important sink for hydrospheric water and a mechanism for oxidizing the Martian mantle.

Conversely, relatively buoyant mafic crust and hotter geothermal gradients on Earth reduced the potential for upper-mantle hydration early in its geological history, leading to water being retained close to its surface, and thus creating conditions conducive for the evolution of complex multicellular life.

Grimm, R.E., and S. Marchi (2018) **Direct thermal effects of the Hadean bombardment did not limit early subsurface habitability.** EARTH AND PLANETARY SCIENCE LETTERS 485:1-8

Authors' abstract: *We assess the effects of protracted bombardment on subsurface habitability of the Earth prior to 3.5 Ga. Subsurface habitable volumes, defined by sub-boiling temperatures, increase continuously over time. The Hadean subsurface was always habitable somewhere.*

Intense bombardment is considered characteristic of the Hadean and early Archean eons, yet some detrital zircons indicate that near-surface water was present and thus at least intervals of clement conditions may have existed.

We investigate the habitability of the top few kilometers of the subsurface by updating a prior approach to thermal evolution of the crust due to impact heating, using a revised bombardment history, a more accurate thermal model, and treatment of melt sheets from large projectiles (>100 km diameter).

We find that subsurface habitable volume grows nearly continuously throughout the Hadean and early Archean (4.5 to 3.5 gigayears ago) because impact heat is dissipated rapidly compared to the total duration and waning strength of the bombardment. Global sterilization was only achieved using an order of magnitude more projectiles in 1/10 the time. Melt sheets from large projectiles can completely resurface the Earth several times prior to ~4.2 Ga but at most once since then.

Even in the Hadean, melt sheets have little effect on habitability because cooling times are short compared to resurfacing intervals, allowing subsurface biospheres to be locally reestablished by groundwater infiltration between major impacts. Therefore the subsurface is always habitable somewhere, and production of global steam or silicate vapor atmospheres are the only remaining avenues to early surface sterilization by bombardment.

LETTERS TO THE EDITOR

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

FROM: Lloyd Penney 2018-01-14
Etobicoke, Ontario

OPUNTIA #394: As always, great photos of the Rockies. Such climbs can be dangerous, but I am one tourist who will not take any chances. Gravity kills, especially with unsure footing. Cascade Pond is much more my speed.

[I only hike, not climb. You're in greater danger crossing the street in a city or tripping on the stairs.]

[Re: Radio fiction reviews} Ooo, wireless telephones, what will they think of next? I wish today's juveniles had a grand new technology they could wonder about. There's nothing like it in today's Indigo stores. Given how newspapers today are generally failing everywhere, seeing that ad about making good money in radio is a little painful to see.

Being a transit fan in Toronto is a busy time right now, as soon as Bombardier can actually get us more of the new streetcars. We have a subway extension up to York University and Vaughan, and I have more places to look for work. I have been employed for over four months now, but part-time and minimum wage means the search continues. Yvonne, on the other hand, is quite happily retired as of the beginning of this year.

OPUNTIA #395: Halloween can be a fun time for us, as long as someone thinks of us for a party. That doesn't usually happen, so we just have a quiet night in, and we are usually better off for it. Purdy's [chocolate store] is everywhere here, but it's been years since we've had anything there. As you say, quite expensive. I've never been a horror fan, which may be another reason Halloween doesn't really get me, or me it.

My letter in a previous issue: Yvonne took ten boxes of books to a bookstore chain that will purchase good books, and she brought back $100. We were hoping for a lot more. Nevertheless, that goes into the London fund to get us back to England in 2019, we hope. In weeding our book collection, I was able

to pull out all of our old Ace Doubles, and put them together. The collector in me wants to keep them; the old SF reader in me wants those old days again.

OPUNTIA #396: I think we all look back at the romance of early space adventures, and perhaps wish we didn't know as much as we do so we could enjoy that old goshwow feeling. Yes, they've dated terribly, but still, it would be great to enjoy that old thrill again. A symptom of age for me, no doubt.

[I think these days are as exciting as ever for astronomy, as per the discoveries I mention in my "Seen In The Literature" column. Telescope technology is on a roll, and we can now spot exoplanets the way we used to spot asteroids.]

OPUNTIA #397: Seeing Remembrance Day was on a Saturday in 2017, attendance at the various ceremonies in Toronto were well attended. There is often one just up the street at the Etobicoke Civic Centre, but if I recall, we were both quite ill. We watched the ceremony on Parliament Hill on the CBC.

I very much enjoyed the movie MR. HOLMES, with Ian McKellen as a quite retired and irascible Holmes looking somewhat dejectedly at the end of his career, but there is one cold case that he wanted to wrap up. I'd happily watch it again. McKellen said that he needed some make-up to look older, and was disappointed to find the amount of make-up needed wasn't much.

OPUNTIA #398: Always great photos, and the one with local fauna is always the best. I have never had pets, as much as I would have enjoyed them, but there are a few cats who have made their impacts on my life. Fond skritches for Tiffany, ChatChat and Momcat. I miss having a purring cat curled up in my lap.

[Someday I'll have to write an essay on all the critters we had on the farm back in my childhood. That's the best place for cats and dogs because they can roam free in natural surroundings.]

OPUNTIA #399: There is always something to do. In many cases, you just have to look in the right place. For me, that right place is Facebook, which keeps me apprised of the kinds of events I like to go to. Much of the sidewalk lettering around here is gone, but all that is left are the oval seals to indicated who poured the concrete, and when.

[I'm not on Facebook or any other social media, but I check news sources online and see posters around town. There's lots going on in Calgary for free.]

The idea of books as tombstones may be a little distressing, but I can't argue as to the fact of the idea. Not only is there the idea of preservation of history, but also the rapid disappearing of the publishing industry.

[Project Gutenberg, fanac.org, efanzines.com, and many other Websites are doing tremendous work in preserving books and periodicals for future generations and making them much easier to find and read. As an example, eventually a lot of academics are going to discover the Fanac and Efanzines sites, which have thousands of old zines impossible to obtain as print copies, and which make good historical reading.]

OPUNTIA #400: Congratulations on that marker!

[Re: Calgary Christmas train] We used to go and see the CPR Christmas train as it winds its way to Toronto, usually on a day of the week. We'd get crowds like that in your photo, but we'd want to see the train in spite of all the taller adults around us, and if we spoke up, or tried to find a better spot to see the train…well, one year, we were threatened if we didn't move back. We're not here for that nonsense, so we give the train a pass.

[Setting aside my height (182 cm), I've found the only truly dense crowds were right around the bandstand car, and elsewhere I could easily move. Or, it may just be that Calgarians are naturally polite.]

OPUNTIA #401: We've had our share of snow, but more than our share of the cold. Wind chills of -35C? We've had 'em. We had a white Christmas, and a brown New Year's.

[Calgary weather has been fluctuating between several days of -25C, followed by a chinook for a week, and then the cycle repeats. I can live with that. It beats bomb cyclones, 100 cm of snow in a day, and hurricanes.]

OPUNTIA #402: Hmm, I've never seen a copy of PULP LITERATURE before. I guess I am still used to magazine racks, and there are so many magazines and online publications that will never see a rack in my neighbourhood. I have seen some notices of CanCon, the annual litcon in Ottawa, but I am sure I will find other things to do that weekend.

[I found PULP LITERATURE at the dealer bourse at When Words Collide 2017.]