# OPUNTIA 336

Saint Urho's Day 2016

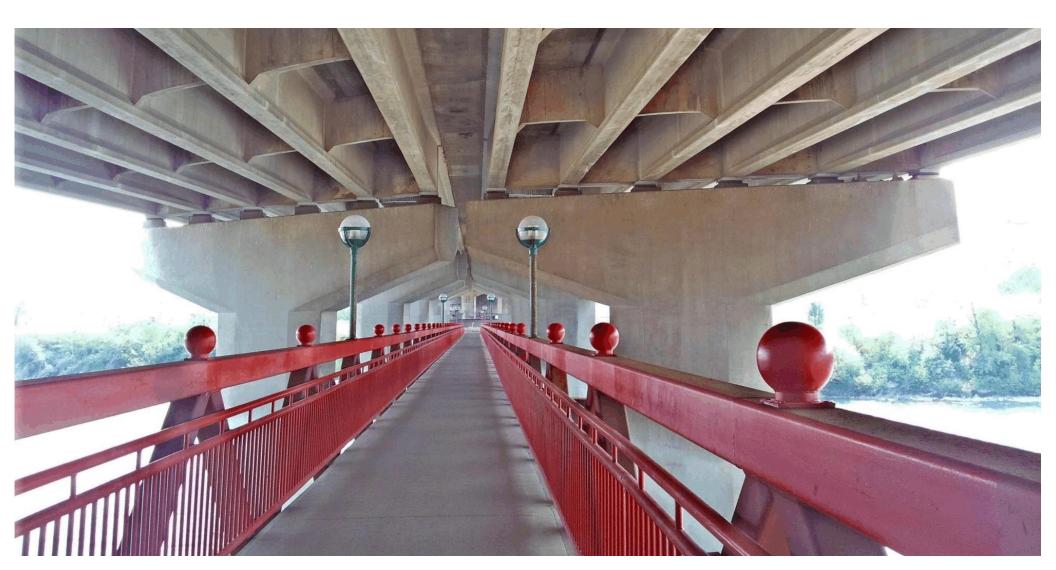
**Opuntia** is published by Dale Speirs, Calgary, Alberta. It is posted on www.efanzines.com and www.fanac.org. My e-mail address is: opuntia57@hotmail.com When sending me an emailed letter of comment, please include your name and town in the message.

#### AROUND COWTOWN

photos by Dale Speirs

The older freeways in Calgary are called Trails because they were originally just that during pioneer days, wagon trails or cattle drive trails. As Calgary grew, so did the trails, and most today are six or eight lane roads. During peak commuting hours, they are linear parking lots. A cowboy could amble along on his horse faster than the cars.

The photo below is a pedestrian underpass beneath Crowchild Trail where it crosses the Bow River. Eight lanes of traffic above, while the pathway system running along both sides of the river cross-connects with this bridge.

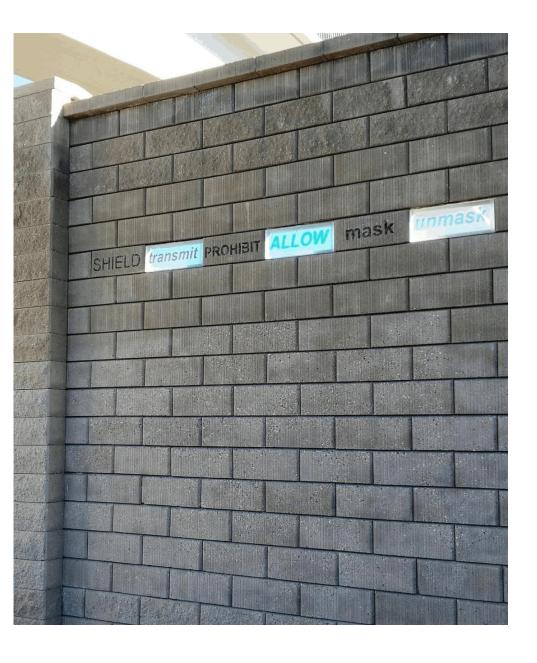


Glenmore Trail South is a typical freeway. First it was a two-lane gravel road out in the country. When the suburbs reached it in the late 1950s, it was paved. During the 1960s, it was expanded to four lanes, and reached its final size in the early 1980s when it spread out to eight lanes.

Like the other freeways cutting through pre-existing suburbs, the noise problem was dealt with by lining them with Berlin Wall type sound barriers. I took this photo last summer from a pedestrian overpass styled in Early Industrial concrete. I pity the schoolchildren who have to use this overpass in winter when the wind is blowing.



Some bright spark down at City Hall decided to try and make the sound barriers artistic. This is what the inside of the Glenmore Trail barriers look like. I guess they imagined the pedestrians would stop and contemplate the meaning of life instead of hustling to school or the bus stop.





City Council finally recognized that they couldn't keep smashing roads through inner neighbourhoods just so suburban commuters could get to work a few minutes earlier. About a decade ago, transportation policy shifted to LRT trains and bus lanes. It has actually succeeded on a few routes, where vehicle traffic into the downtown core has declined over the past ten years because it is faster and cheaper to take the bus or train.

#### **TEMPUS FUGIT**

by Dale Speirs

This issue marks the 25<sup>th</sup> anniversary of OPUNTIA, which first began on the Papernet in March 1991. Where did the time go? It started out as a photocopied typewritten zine, then was laid out on a 1998 Toshiba laptop. In March 2014, Canada Post raised postage rates to ruinous levels, and OPUNTIA became a pdf-only zine.

Issue #1 is available at www.efanzines.com or www.fanac.org. All the back issues have been scanned and are slowly being placed online. There is also a cumulative subject index, which I started mainly because it enabled me to keep track of what I had written about. It's nice to see more and more fanzines available as pdfs but what would be even better is if they all had their own subject indexes. It is said that all knowledge is contained in fanzines, but just try and find it.

25 years ago, I was a District Foreman in the City of Calgary Parks Dept., where I was to spend 31 years before retiring in 2010. In 1999, I was promoted to Trouble Calls Supervisor. In 1991, we used handheld radios to communicate with our crews out in the field. When I retired, we all had cellphones. As issue #1 was being mailed out, each Parks depot had a secretary to assist the foremen, and the Area Offices each had a half-dozen secretaries, two timekeepers, and a supply clerk. When I retired, there were no secretaries anywhere, and only one receptionist at each Area Office. There were only a handful of timekeepers and supply clerks down at City Hall, and they were now for all departments, not just Parks. We sent email ourselves instead of dictating memos, payroll and supply were on Oracle systems that we handled ourselves, and trouble calls were routed via computer instead of phone calls.

25 years ago, Dr. Timothy Berners-Lee wanted an easier method of exchanging technical papers with his fellow scientists, so he invented a method called the World Wide Web. Only geeks had practical access to it back then. Now it has destroyed several industries and changed how we do things.

25 years ago, there were street newspaper boxes every three blocks in my neighbourhood. Every morning as I emerged from my house en route to work, I would first walk a few paces to the corner and buy a newspaper. I stopped buying newspapers circa 1999 when I realized that everything I read in them I had already read the previous day online. I'm not sure when all the street boxes

disappeared from my neighbourhood, but it was sometime in the first few years of the new millennium. Today, Calgary's two newspapers share common editorial offices and the same printer. In 1991, they each had their own plant and were vicious competitors owned by rival families. They each had a massive building, but now rent space on a few floors in an industrial building. Street boxes only exist downtown or at high-density locations such as LRT stations or shopping malls.

In 1991, I researched my articles by going over to the University library and browsing the stacks. Finding the data was a chore involving paging through thick heavy volumes of indexes. If the library didn't have a volume I needed, the only recourse was Interlibrary Lending, an expensive process. Today, the reference book industry is dead because everyone's first instinct is to Google an unknown topic.

In 1991, if I was away from home and needed to make a telephone call, I stopped at a nearby telephone booth. In 1998, I got my first cellphone and ditched my landline. Today I occasionally see a telephone booth here and there around the city, usually in a shopping mall. It used to be that if you saw someone talking loudly to themselves, you crossed the street to avoid them. Now it's understood they're just talking on a Bluetooth device.

In 1991, pedestrians walked about with heads up and looking at the world around them. The advent of smartphones has resulted in a worldwide change in human behaviour, as the majority of people on this planet now walk about with heads down. A couple of years ago, the Calgary Police Service had to introduce a new category of accident reports, for distracted pedestrians who walked out into traffic. At about the same time, the provincial government of Alberta passed a law regarding distracted driving.

In 1991, tweeting was something that birds did. Touch screens were unknown. GPS was only used by the military and scientists tracking wildlife. A camera was a separate item that hung around your neck. Tapping a credit card against a point-of-sale device was undreamt of. Amazon was a big river in South America. The word "Facebook" made no sense.

25 years from now, I will probably be dead, based on family genetics. The world the younger folk will be in can't be imagined by us, anymore than SF writers back in the 1950s imagined pedestrians walking about with heads down.

#### ALTERNATIVE HISTORY REVIEWS

by Dale Speirs

### What Hath Hugh Everett Wroth?

Everett, in case you are wondering, is the physicist who in 1957 put the many-worlds or multiverse idea on a scientific footing. His work solved the paradox of Schrodinger's cat. See OPUNTIA #286 for an essay on the science of alternative history.

One of the more subtle stories about alternative timelines is the well-crafted "A Passage In Italics" by William Dean (1972 May, MAGAZINE OF FANTASY AND SF). The setting is a Manhattan barbershop in 1952, where the barber and his customers begin discussing the possibility of different time streams. The setting seems to be in our timeline, but as the story progresses, there is a change to a timeline where the Nazis got the atomic bomb first and won the war. The barber is of Italian descent and reasonably immune to the Manhattan gauleiter who suddenly appears and questions his customers. The story is a mood piece which demonstrates how dictatorships can sustain themselves with fear.

"How I Lost The Second World War And Helped Turn Back The German Invasion" by Gene Wolfe (1973 May, ANALOG) supposes an economic war rather than a fighting war. The venue is an auto exhibition in Bath, England, where the Germans, Japanese, and British are demonstrating their people's cars. Hitler himself opens the Volkswagen display. Churchill, thrown out of government long ago after he botched the Dardanelles, challenges Hitler to have a contest of cars on a test track designed to simulate everyday urban driving, where the drivers have to parallel park repeatedly along the way. Churchill rigs the contest so that the British car will win. The story is narrated by a German-American military officer, first name Dwight, who decides that since there is no sign of war in Europe, he might as well resign his commission and go back to Kansas to open a Buick dealership. An amusing story well told.

A TRANSATLANTIC TUNNEL, HURRAH! (1972) by Harry Harrison is set in the year 1973 in a timeline where those American colonials lost their revolution back in 1776, and the Muslims held southern Europe. Steam locomotives are in the process of converting to nuclear reactors to generate their steam, while airships are powered by coal-dust turbines. The story is written in the style of dime novel melodramas, with love lost and regained, stormy scenes with villains, and enough skullduggery to empty a cemetery.

As the title of this novel suggests, the story is about the engineering derring-do of building a train tunnel from Britain to the USA. Captain Augustine Washington is in charge of the operation. He is still trying to live down the shame of his not-so-illustrious ancestor being shot dead while losing the Battle of Lexington. The project is running into financing difficulties, and Washington is asked by the Board of Directors to try and raise more money from his recalcitrant fellow colonists. There are also monied interests who would lose by the existence of the tunnel, and are desperately trying murder and sabotage to stop the project.

The novel gallops along with a crisis in every chapter, to the point where about two-thirds of the way through the book I began skipping pages. The infodumps are not too bad, about how the tunnel is being built, particularly an underwater bridge to go over the Mid-Atlantic Rift, which is spreading out at 5 cm per year. This novel was written in the days before word processors caused so much verbal diarrhea among novelists, so it clocks in at only 190 pages, a quick read.

# We Hold A Vaster Empire Than Has Been.

AGENT OF BYZANTIUM (1988) by Harry Turtledove postulates that Rome never fell and Islam never arose. This alternative history is set in the early 1300s, its main protagonist being Basil Argyros, an agent of the Byzantine Empire. The novel is a fix-up of a half-dozen short stories that appeared in SF magazines, so the narrative is episodic, galumphing along from one discovery to the next.



The world's f i r s t Christmas stamp was issued in 1898 by Canada.

The book opens with Argyros as a scout against the horse barbarians whose armies are once again intent on assaulting Constantinople and who must be held back in the buffer areas to the east. The Roman army is having trouble though, because whenever they go into battle, the barbarians seem to anticipate their every move. Argyros notices that a shaman in the rear ranks keeps holding up some sort of tube to his eye, then relaying orders. After not a little difficulty, Argyros manages to penetrate the barbarian camp as a spy and steal the magic tube. It has a piece of crystal on each end, and is actually two overlapping tubes. When the tubes are shortened or lengthened, one can seen through them and faraway objects appear close. The shaman was also using bits of crystal to shine a focused beam of sunlight on dry tinder and thus start a fire, much faster and easier than tedious rubbing of two sticks. And so the telescope comes to Europe three centuries before Hans Lippershey\*\* invented it in 1608 in our timeline.

The next chapter has Argyros working as a desk-bound bureaucrat in Constantinople. Smallpox sweeps through the city in one of its periodic plagues, killing Argyros's wife and their infant son. He himself survives because he had a bout of cowpox. When he notices that dairymen and their families and employees seldom, if ever, died of smallpox, he eventually makes the connection, and suggests to local medics that they innoculate uninfected citizens with cowpox. The story takes a while to get going while establishing the background of daily life in the city, and building up the ambience. This can be forgiven because there is no suspense or mystery in the story, since as soon as the word "cowpox" makes its first appearance, the reader knows where the plot is going.

The third chapter takes place in 1315, when the Empire is having trouble with restive natives on the northern frontier. The Franco-Saxons have invented some sort of hellish device that blows up fortress walls and kills entire cohorts in a single blast. Argyros once more investigates. The story is interesting not so much from the explanation of how the northern monks figured out to mix sulfur, saltpeter, and charcoal to make gunpowder, but that they thought of it in terms of the Trinity. The northern Christians are feuding with Rome about the interpretation of the Trinity, and which eventually inspired the use of the new weapons by turbulent monks.

From there to the most dangerous weapon possible, the printing press. The Persians are stirring up the natives in the eastern buffer states of the Empire, partly by plastering everything with posters advocating riot and disorder. The posters are not handwritten by scribes but are all identical down to the typos and crooked lines. The troublemakers can put up papyrus faster than the soldiers can rip them down. Argyros goes to investigate and finds the source. Someone is manufacturing thousands of little hardened clay letters that appear backwards but when inked and stamped on paper are correct. The implications quickly sink in for Argyros and his bureaucratic masters.

One of those implications is considered in the next chapter, when the rise of the iconoclasts, threatens to wreck the Empire with theological disputation as to whether or not icons should be allowed in churches. Argyros finds that Persian spies are helping to stir up the trouble with fifth columnists. He reverses their influence using printed handbills and pamphlets to spread the Empire's point of view. The fear of the Empire had been that printing would spread dissent, but Argyros realizes that printing could just as easily spread the government's point of view.

The final portion of the book begins with Argyros discovering that a tavern keeper is producing a new and potent form of drink called superwine. He has, in fact, discovered distillation of alcoholic liquors, about the same time as in our timeline. (The technique of distillation was known long before that, but not mass production of brandy from wine.) At the same time, Argyros is ordered to investigate trouble in a buffer state separating the Romans from the Persians, and where nomads are infiltrating and stirring things up. He uses both the superwine and gunpowder pots to demoralize and chase away the horsemen.

The book as a whole has pedestrian plots that one can see coming several pages ahead, but the descriptions of the people and places help make it a better read. Religion mattered in those days, and the debates over minor points of policy influenced Argyros timeline. Such a thing could never happen today, of course.

# Tell The Old, Old Alternative Story.

"Herman Melville: Space Opera Virtuoso" by John Kessel (1980 January, MAGAZINE OF FANTASY AND SF) supposes that the famous author was born out of place and time, and writes up his biography in essay form. He becomes an early SF writer, starting off with Hugo Gernsback's pioneer prozine AMAZING. It was in the February 1937 issue of ASTOUNDING that

<sup>\*\*</sup> Not invented by Galileo as many people think, although he was a early adopter who made better use of it than most of his compatriots. Lippershey was German-Dutch, and his name was pronounced in those languages as "lip-ers-hay".

Melville's greatest work began to be serialized in five parts, titled "Starry Deeps, or, The Wail". It is about the voyage of the starship Peascod, under the command of Captain Ahab Habbison, on a mission to save the human race. "The Wail" burned out Melville, whose subsequent work was inconsequential. He was a regular at SF conventions of the 1940s and 1950s, but over time the younger generation of fans forgot him.

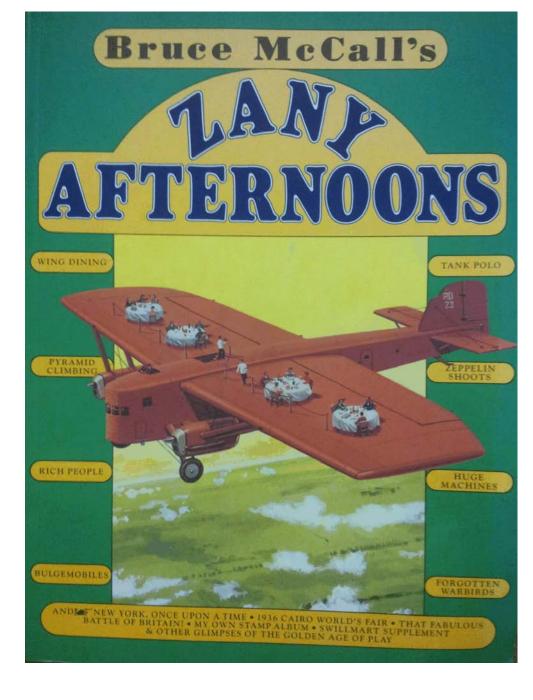
"Oh Tin Man, Tin Man, There's No Place Like Home" by Brad Strickland (1987 May, MAGAZINE OF FANTASY AND SF) puts the narrator into an alternative timeline when he is electrocuted by a strange gadget he bought cheap, too cheap as it turned out. He is an entertainment editor and a movie buff. At first he doesn't notice any change because he was at home doing chores around the house. He later relaxes by watching some old movies, starting with THE WIZARD OF OZ. He notices some cast changes; Buddy Ebsen is the Tin Man and W.C. Fields was the Wizard. His reference books say that was indeed the case. Since his job requires that he know these things, he goes on a moviewatching binge. Some movies are as he remembers them. He sees Gene Kelly singing in the rain, and HIGH NOON is as it was.

Others are very disturbing. John Wayne plays the lead role in THE SANDS OF OAHU, a true story about the last-ditch defense of Hawaii against the Japanese invasion. That movie, made in 1946, tanked because it was released just as the USA signed a peace treaty with Japan, giving it southeast Asia and the Pacific. Ronald Reagan and Ann Sheridan starred in CASABLANCA. There are many other movies that never existed in our timeline. As the narrator watches movies in chronological order, he sees them become more racist and mean-spirited, reflecting a society out there that must be the same way.

The narrator goes outside for a walk and sees his city is shabby and dilapidated. There is a new currency to replace the old dollar as a result of economic collapse that made the Great Depression look like a walk in the park. He doesn't turn on the television news for fear of what he will see.

# Show The Old, Old Alternative Story.

Bruce McCall was an artist who had a series of full-page art in the 1970s which were eventually collected into ZANY AFTERNOONS (1982), a large foliosized coffee-table book. The top-quality art chronicled the life of the idle rich during the Great Depression as they squandered money in heedless disregard of those on the breadlines.



The book starts with activities such as tank polo, autogiro jousts, zeppelin shooting, and wing dining (shown on the cover of the book). From there, a look at alternative Manhattan. The Ironing Board Building was a skyscraper with only the top floor built before the money ran out, and nothing at all underneath

that floor except an elevator shaft. The Moto-Ritz Tower had vehicle ramps spiraling up the outside of the skyscraper, with blind corners and no guardrails.

From there, a visit to the 1936 Cairo World's Fair. An ocean liner was hauled overland by gangs of fellahin, then left stranded in the desert when they went on strike. Not to worry though, as other buildings included the Museum of the Hat, the Digest-O-Rama where visitors could whirl through a giant digestive tract, and the It's A Corrugated World pavilion, all cardboard, which unfortunately blew away in a sandstorm.

Next up is a brochure for the RMS Tyrannic, which made other ocean liners look like rowboats. Vast empty spaces the size of cattle ranches for the first-class passenger decks, and steerage quarters not fit for steers but adequate for immigrants and other poor folk.

A report on the London Blitz exaggerates the phlegmatic attitude of the English. When a Me-109 smashed through a stained-glass window and buzzed around inside the House of Lords, three members were moved to write letters deploring the attitude of the Nazis. Families built fighter planes in their houses, and schoolboys trained on Spitfires.

Stamp collectors get a look in with such issues as the USPS Blessings of American Life series, which included stamps honouring heated shaving cream, cheese-flavoured dog food, static-free socks, and feminine hygiene sprays.

The section on automobile ads doesn't quite succeed because they are too close to the real thing. The exaggeration and pomposity of luxury car ads cannot be parodied because they already parody themselves. Streamlined cars such as the Airdreme don't seem too much of a divergence from the real Airstream cars in our timeline, nor do the land yachts running down slow pedestrians differ much from the big Detroit Iron vehicles of the 1950s.

All told, a nice look at an alternative world that never was but could very easily have been.

#### Alternative Alternatives.

ALMOST HISTORY (2000) is a compilation of real documents that might have been used had history taken a different course, as well as some miscellaneous items on counterfactuals.\*\* Unfortunately most of them are not really AH but

just original documents related to historical events, such as a police report on Vice-President Spiro Agnew's bribe taking while he was in office.

The very first example is a handwritten note by General Dwight Eisenhower, which he scribbled as a contingency in case the D-Day landings failed. In it he said that the decision to land was based on the best available information and that he accepted full responsibility for the failure.

A quarter-century later, President Richard Nixon had a speech prepared in case the Apollo 11 astronauts failed to lift off the Moon, commending them for their bravery: "Others will follow, and surely find their way home. Man's search will not be denied." A different type of what-might-have-been is the road not taken in personal lives. Nixon, as a young college man, had applied in 1937 to the FBI for a job as an agent. The report by his interviewer is shown, indicating he had potential but not enough compared to all the other applicants.

An interesting item is Einstein's letter to Roosevelt recommending research into the atomic bomb. Roosevelt approved the project and gave the order on Saturday, December 6, 1941, the day before Pearl Harbor. Had he decided to take the day off instead of slipping into the Oval Office to clear up a bunch of paperwork, it is possible that the Manhattan Project would have been lost in the following excitement.

The book is an interesting read but does not live up to its title. It is almost entirely about American history, with a few nods to Europe and elsewhere. As seems to be the case for most alternative history, the American War Between The States and WW2 predominate, but with few actual turning points.

# Steampunk.

Steampunk has many fathers and depending on how it is defined, the modern era began sometime between the 1960s and 1980s. The original form began as alternative history fiction, which influenced comics and then costumers. Many modern steampunk fans have no idea where it came from. They took it up from costuming. I have talked to some of them who were surprised to learn that there are novels and short stories of AH from way back when.

<sup>\*\*</sup> Alternative history is fictional, while counterfactuals are speculative fact. Alternate history doesn't exist, despite the widespread use of that term, which is an abuse of the English vocabulary.

An early entrant for the modern era is "In The Days Of The Steam Wars" by Eugene Potter and Larry Blamire (1980 January, GALAXY). It is a future where the USA and France are at war in 1897 for some reason, fighting their battles with giant steam robots. The Americans are complacent about their machines, 50-feet tall, powered by coal and thus needing frequent refueling, and which require large crews to operate the machines. As an example, each arm and leg has its crew member to swing them in synchronization, while the bridge is in the face and the main gun in the chest.

The Normans still own New France, and have sent a new oil-fueled, 150-foot-tall giant steam man south from Montreal to pillage the Eastern Seaboard. They need fewer crew to operate the machine, and easily take out the American machines. The plucky and brave Yanks are outgunned but in the end try a suicidal attack of head-butting the French machine and then firing their main gun at point-blank range into the giant. The story is a basic action-adventure and reads well as such. I did wonder about the plausibility of some of the historical divergences, especially France being at war with the USA.

STEAM DETECTIVES by Kia Asamiya (1998, English translation) is a graphic novel about a private detective in Steam City. Coal is the only energy source, so everything runs on steam. There are zeppelins in the background, so that confirms it must be alternative history. The lead character is a private detective named Narutaki who has run-ins with assorted villains and steam-powered cyborgs with human brains.

There is, for example, the Machine Baron, who steals secret plans not because he wants to rule the world but just because he is a collector of such things. No one can doubt that Dr. Guilty is a villain. A chapter chronicles a battle of megamatons, steam-powered robots which never just softly land on the ground but smash through ceilings, floors, walls, and any other structures carelessly left standing about.

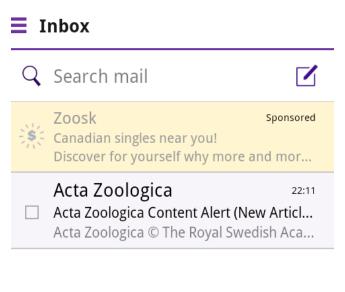
The artwork tends to be busy and confusing. One stares at the full page splashes not to soak in all the little details that a good artist puts in, but to try and figure out what the scene represents. Jagged blobs could be anything from the hero's haircut to passing clouds, and it takes several moments to puzzle out what the artist was intending, not a good sign. I didn't bother with Volume 2.

#### BIG BROTHER IS SORT OF WATCHING YOU

by Dale Speirs

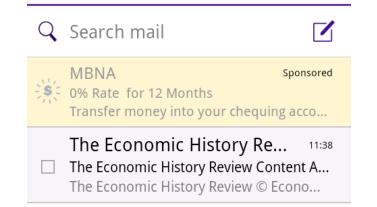
If you use "free" services such as email or social media, when you set up your account, you agreed to Terms and Conditions which included the right for the company to monitor your use of the system, analyze the results, and sell the information to advertisers. I get a kick out of how the advertisers still haven't quite got their systems to work properly in targeting the user. All of the screenshots below are from a few days on my Yahoo email account.

# Keywords Are Not Necessarily The Key Words.

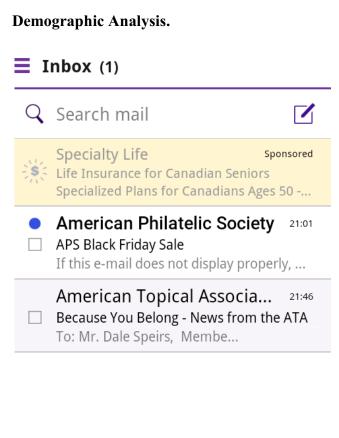


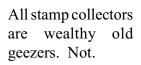
You can tell by these screenshots that the computer was using noncontext dictionary software.

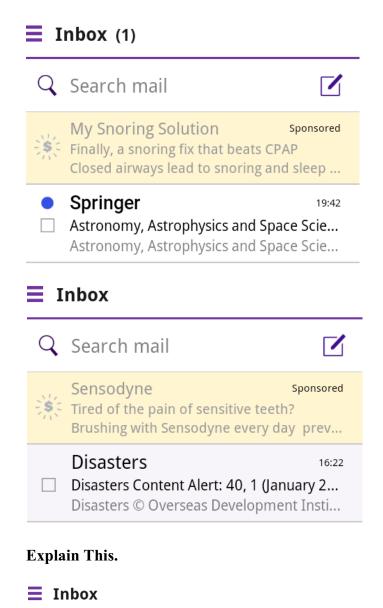




Anyone who reads economic journals must be interested in opening a new bank account, right?







It makes sense that people be come astronomers because they have trouble sleeping at night.

Millions die in disasters, but that isn't real pain.

# **Inbox**

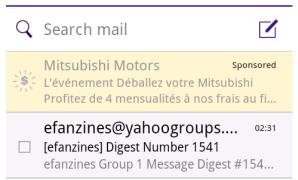
Q Search mail



Match Sponsored
Single and Over 50?
Find your next date. Click here to see pics!

History 18:05

History Content Alert: 100, 343 (Decem... History © The Historical Association and... Nobody under 50 could be interested in history, therefore hit up the senior citizens here as well.



Then again, some companies just use random blasts. I guess they figure that because I'm Canadian that automatically makes me bilingual.

#### 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.]

[The Usual means \$5 cash (\$6 overseas) or trade for your zine. Americans: please don't send cheques for small amounts to Canada or overseas (the bank fee to cash them is usually more than the amount) or mint USA stamps (which are not valid for postage outside USA). US\$ banknotes are still acceptable around the world.]

LES CARNETS DE RASTAPOPOULOS #11 (The Usual from Robert Gauvin, 7 Larch Street #2, Ottawa. Ontario K1R 6W4) Rob does a lot of international flying.. This issue is about those lost souls trapped at airport terminals for years because they were refused entry into the country but can't or won't go back to their point of origin. Some of them lived off the kindness of strangers for years inside the security zones. They may have lost their passports or other papers, or run out of money for a return flight, or fear the dictatorship of their home country.

BANANA WINGS #61 (The Usual from Claire Brialey and Mark Plummer, 59 Shirley Road, Croydon, Surrey CR0 7ES, England) SF fanzine with commentary on fan funds and lots of letters of comments about SF fandom and coffee drinking.

#### SEEN IN THE LITERATURE

Adam, Z.A. (2016) Temperature oscillations near natural nuclear reactor cores and the potential for prebiotic oligomer synthesis. ORIGIN OF LIFE AND EVOLUTION OF BIOSPHERES 46:171–187

Author's abstract: "Geologic settings capable of driving prebiotic oligomer synthesis reactions remain a relatively unexplored aspect of origins of life research. Natural nuclear reactors are an example of Precambrian energy sources that produced unique temperature fluctuations. Heat transfer models indicate that water-moderated, convectively-cooled natural fission reactors in

porous host rocks create temperature oscillations that resemble those employed in polymerase chain reaction devices to artificially amplify oligonucleotides. This temperature profile is characterized by short-duration pulses up to 70–100 °C, followed by a sustained period of temperatures in the range of 30–70 °C, and finally a period of relaxation to ambient temperatures until the cycle is restarted by a fresh influx of pore water. For a given reactor configuration, temperature maxima and the time required to relax to ambient temperatures depend most strongly on the aggregate effect of host rock permeability in decreasing the thermal expansion and increasing the viscosity and evaporation temperature of the pore fluids. Once formed, fission-fueled reactors can sustain multi-kilowatt-level power production for 105–106 years, ensuring microenvironmental longevity and chemical output. The model outputs indicate that organic synthesis on young planetary bodies with a sizeable reservoir of fissile material can involve more sophisticated energy dissipation pathways than modern terrestrial analog settings alone would suggest."

Speirs: I published an article in OPUNTIA #30 about natural fission reactors that existed several billion years ago on Earth, when uranium concentrations were much higher. This paper suggests that the heat generated by such fossil reactors could have also provided energy for the synthesis of organic molecules that were the precursors to life.

Dennig, F., et al (2015) **Inequality, climate impacts on the future poor, and carbon prices.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 112:15827–15832

Authors' abstract: "Hundreds of published papers produce "optimal" trajectories of global emissions of carbon dioxide, and corresponding carbon prices, over this century, taking into account future damages inflicted by climate change. To our knowledge, in all instances the models ignore inequalities in economic variables beyond regional differences. Here, we introduce heterogeneous subregional populations (distributed by income) and explore how the optimal trajectories are affected by whether regional damage afflicts the poor predominantly. We find that when future damage falls especially hard on the poor, considerably greater global mitigation effort is optimal than when damage is proportional to income."

Speirs: Carbon taxes and other related economic changes hurt the poor and rural residents the most.

Calgary has one indoor public park, the Devonian Gardens downtown in a skyscraper atrium. An oasis of serenity.

