OPUNTIA

323

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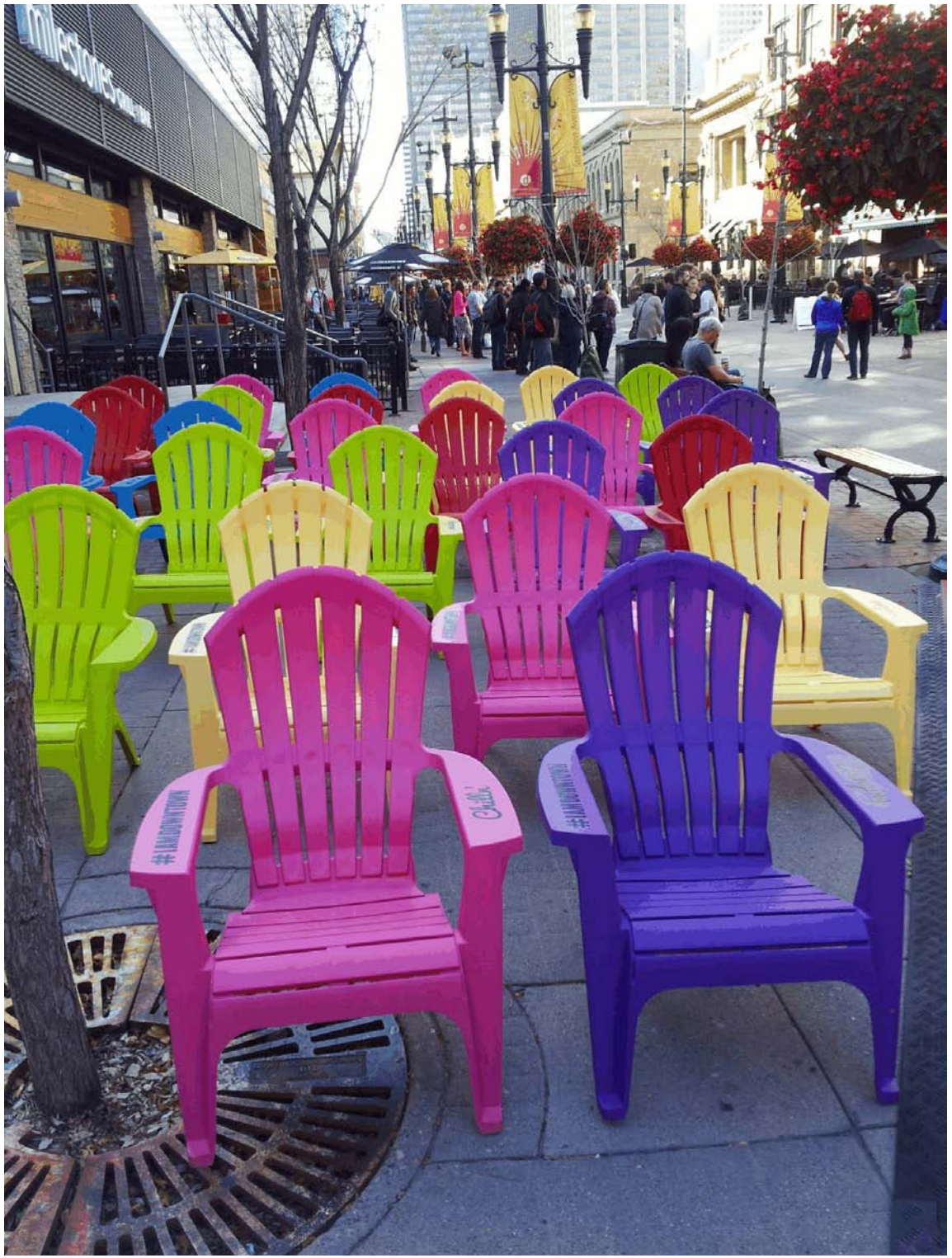
Opuntia is published by Dale Speirs, Calgary, Alberta. It is posted on www.efanzines.com and www.fanac.org. My e-mail address is: opuntia57@hotmail.com When sending me an emailed letter of comment, please include your name and town in the message.

CULTURE DAY 2015

by Dale Speirs

Alberta's Ministry of Culture declared the last Friday in September to be Culture Day. Since Calgarians will take any excuse for a party, we had one. As per usual with festivals, it was downtown on the Stephen Avenue pedestrian mall and the Olympic Plaza. The festival went on all weekend with various events, but those were the high priced tickets at concert halls. I stuck to the free events on the mall.



No, the chairs are not installation art. It's just that the performances at the portable stages had not yet begun.

Dueling pianos and vocalists.

Usually it ain't over until the fat lady sings, but the Cowtown Opera Company doesn't have any.

The plywood image of a bison is actually a giant printing plate. A printing arts group got the use of a dynamic packer from the Roads Dept. to pull off bedsheet sized prints from these plates.

On the next two pages is a sequence I took of the group running off another giant print. First the wooden printing plate is laid on the ground, then a bedsheet, then a blanket, and finally an ordinary sheet of plywood. The City worker then drove the dynamic packer, normally used for laying asphalt roads, over the plywood. Finally, everything is peeled back and voila!, another print.


Entrance
HR 12706
ROADS


Entrance
HR 12706
ROADS

VON NEUMANN MACHINES
by Dale Speirs

The mathematician John von Neumann (1903-1957) carried out studies on how self-replicating machines would behave. He called them Universal Assemblers and worked on them as mathematical theory. It didn't take long for others to extend his concept into space, the idea being that a civilization could launch self-replicating machines to explore the galaxy faster than they could otherwise. The machines, now commonly referred to as von Neumann probes, would examine planets and asteroids of each system they explored, use the raw materials to build more of themselves, and disperse in multiple directions. They could thus multiply exponentially.

If their programming did not take into account the presence of life on a planet, the von Neumann probes would destroy it. They would therefore become a threat to other civilizations. This has been used as an argument in the debate about Fermi's Paradox, which asks that if there are alien spacefaring civilizations, then why haven't we detected their presence? Some say that intelligent species would realize the damage that von Neumann probes would do and thus hunt them down and their makers. Others have pointed out that stellar systems are mostly gases and that any von Neumann probes mining for minerals would not be conspicuous.

The Berserkers.

The concept of von Neumann probes has been used in science fiction many times. Fred Saberhagen (1930-2007) wrote a series of novels and short stories about malicious machines called Berserkers, which were programmed to destroy all organic life they could find. The first Berserker story was "Without A Thought", which originally appeared under the title "Fortress Ship" in the 1963 January issue of WORLDS OF IF. The novels and short stories were published from 1963 until 2005. Over such a long period of time there were some continuity problems, and if read too many at one time they can be repetitious. The individual stories explored variations on the theme of fighting Berserkers, as well as interrelations of humans and other aliens also defending themselves against the Berserkers.

The machines were left over from some ancient alien war in the galaxy. After their builders won the war against the enemy, the Berserkers turned on their masters and eliminated them. They then continued to roam the galaxy, searching out and destroying organic life. The individual Berserker spacecraft were not von Neumann probes in themselves but collectively the machines did propagate themselves with automated factories that stripped minerals out of planets or asteroids to build more Berserkers. The Berserkers were intelligent and could change tactics. They varied in shape and size, and were sometimes assisted by "goodlife", who were humans who betrayed their own species in order to stay alive as long as they could.

I'm not going to review all of the Berserker stories, but will pick a few at random. "Stone Place" (1965 March, WORLDS OF IF) starts off slow but eventually gets to the plot. The Berserkers have captured some life-units (as they call humans) who survived a battle on the planet Atsog, and are interrogating them. On learning that the humans are planning a major offense, the Atsog Berserkers call in reinforcements from the galactic rim. Meanwhile, humans trap a Berserker and manage to board it, rescuing some humans held captive inside. That Berserker was a decoy, for they are studying human psychology and have brainwashed the captives, turning them into Trojan horses who will create dissent with humans. The two fleets clash and it appears that humans have won. The ending is but a prologue to the next story, for the Berserkers learn continuously and will make use of their knowledge in the next stories.

"The Bad Machines" (1996, in the anthology THE WILLIAMSON EFFECT) takes place at the Selatrop Radiant, a galactic crossroads that the humans and Berserkers are struggling over. Some strange messages have been received from the human garrison there, and a warship is sent to investigate. It discovers that the garrison has been overrun by a second, unrelated von Neumann machine group. They are humanoid machines and inter the humans in prisons on the grounds they are programmed to protect life. The humanoids and the humans are battling the Berserkers as a common enemy, but the humanoids insist on control. Since they have better technology, they get it. The humanoids will not allow the humans to do anything; they cage them and turn them into passive observers. The humans escape while the two sets of von Neumann machines fight it out. There is now a three-way battle between humans, humanoids, and Berserkers.

Blue Hair, Red Hair, Or Cornrows?

The television series LEXX (four seasons, 1997 to 2002) had as a long-running story arc, the problem of the Mantrids, self-replicating machines of a mad

scientist, which eventually consumed the universe. The series was about a group of misfits on the run from the law in a stolen biomechanical starship called Lexx. The starship has to feed every so often on asteroids or planets to stay functional. There are assorted standalone adventures and several story arcs.

The von Neumann story arc begins in Episode #1 of the second season when the crew tangle with a dying mad scientist named Mantrid. He is in the process of transferring his mind to a machine body and succeeds. The crew try to destroy Mantrid using the Lexx but he escapes. With him goes an arm-shaped flying robot that is a von Neumann machine. It begins to reproduce but the significance of the Mantrids (as the machines are called) is not immediately made obvious. In Episode #3, the Mantrids make a cameo appearance when a swarm of them chew up a planet to create more of themselves. They reappear in Episode #12 when a few of them manage to infiltrate the Lexx and begin consuming it. After some difficulty, the old "reverse the polarity" routine is used to cleanse the ship of Mantrids.

By Episode #14, the crew's attention is drawn to patches in the sky, as vast segments of the universe black out when stars, planets, and galaxies are converted into Mantrids. They are now a substantial portion of the Universe's mass as they spread exponentially. In the final episodes of the season, from #20 to #24, the Mantrids play an increasing role in the stories as the Universe is almost completely converted to them.

The original Mantrid re-appears, boasting in the way that mad scientists usually do, and taunting the crew that he is the all-powerful Master of the Universe, etcetera. Lexx heads in to the centre of the Universe to attack him, and Mantrid calls in all his von Neumann machines to concentrate around him for protection. What he overlooks is that if almost all the mass of the Universe is now von Neumann machines, he is creating a Big Crunch as the gravitational pull of the collected machines collapses the Universe into a black hole. Using a hand-waving maneuver, the Lexx manages to fly into the centre of the collapse and then eject itself into another universe, where the crew began a new and unrelated set of adventures in the third season.

LEXX is available on DVD and I highly recommend it as intelligent SF that avoids the usual cliches. The use of von Neumann machines in such an original way is an example of the good quality of the series.

Action Adventure.

Invasion of Earth by von Neumann probes makes an obvious story. The novel VON NEUMANN'S WAR (2006) by John Ringo and Travis S. Taylor starts off with astronomers noticing a worrying change on Mars. The planet's albedo has gone from red to grey. Assorted robot probes on or orbiting the planet are going silent one by one. The novel takes quite a while to get going, what with all the infodumps, character introductions (including one fighting in Iraq), and a spotweld-that-busbar subplot about how engineers build and launch a space probe that will reach Mars in only four months to find out what is going on.

The probe is destroyed by unknown forces just as it arrives, but not before it was able to send some photos. Mars is being terraformed and converted to buildings and machines. The conclusion is that von Neumann probes have arrived, either preparing the way for their masters or operating on their own. They convert entire planets into more von Neumann probes, and are working their way in from the outer planets.

The Moon takes the next hit, and finally it comes time for Earth. Paris, France, is the first landing site, but the von Neumann probes spread rapidly. Conventional military tactics are useless against the swarms. Nukes don't work. Anything metallic, such as fighter planes or missiles, is food for the machines and their swarms quickly gobble them up. Various methods are tried but the von Neumann probes learn and readjust their capabilities.

Finally, computer hacking starts to work, although I find it difficult to believe that the alien von Neumann probes happen to use the same software protocols as humans. That might go over with the average action-adventure reader who knows little or nothing about computers, but it sticks out like a sore thumb to anyone who has ever tried to configure a recalcitrant blade server or get a new printer to work with an older laptop. But the end is in sight, and the novel concludes with the reassurance that the human race still has a chance, excluding the poor Frenchies. I skimmed a number of pages, but it is breathless reading.

"None So Blind" by Hayford Peirce (1975 July, ANALOG) is about an inventor named Richard W. Watkins who has created a robot that, among other capabilities, can manufacture more of its own kind, making it a Von Neumann machine. He can't just let it loose because the raw materials have to be supplied already processed, such as purified metal in sheet or wire form rather than ores. He first takes his machine to Washington, D.C., where he gets the runaround

from politicians and then the Pentagon. Each time Watkins brags that the robot could make thousands of its own kind, which in turn could make millions more, doing away with the need for human workers. The last thing a politician wants to be held responsible for is increasing unemployment, but Watkins will not see it that way and stubbornly makes the rounds trying to interest someone in the matter. He finally ends up in a South American country whose Marshalissimo doesn't particularly care for the peons. He accepts the robots wholeheartedly, first building up a massive army of them, then using them to kill off all the poor people in his country and leaving only the middle and upper classes. Having solved the poverty problem, he has the robots propagate an invasion force to take over the USA.

Defending Against Von Neumann Machines.

"Vanguard Of The Lost" by John D. MacDonald (1950 May, FANTASTIC ADVENTURES) is about alien spaceships settling onto Earth at various locations. The story is told from the point of view of a science fiction writer, who is frustrated that the alien invasion isn't going the way he and other SF authors wrote it. There is no mass panic, for people have their own lives to get on with, and while the military tries the usual bombs, the aliens don't strike back, so there is no war. The spaceships disgorge machines which start building structures, but the work is done sloppily. They are von Neumann machines but very, very old and showing their age, with some breaking down and others not following the proper templates. Their purpose seems to have been to prepare the way for those who would follow, but that civilization seems to have died out millions of years ago. Instead, the Earthlings are happy to reverse-engineer the broken-down machines and ships, a lucky break that will give us a chance to go to the stars.

"Programmed For Destruction" by John Gribbin (1985 March, ANALOG) is about Earth sending out a self-replicating AI robot, a Von Neumann machine, as a long-duration experiment to explore the galaxy and send information back to future generations of Earth. However, another alien race left its own machines in its stellar systems to attack and destroy any Von Neumann machines, including the Earth probe. If such machines were allowed to propagate, they would convert the entire galaxy into machines. Both humans and the aliens later self-destroyed their civilizations through war, and were reduced to primitive species with no ability to go into space. This explained why Earth could not detect alien civilizations before it sank back into medieval village cultures. This is an interesting answer to the Fermi Paradox.

BOTANICAL FICTION: PART 4
by Dale Speirs

[Parts 1 to 3 appeared in OPUNTIA #316, 317, and 320.]

A favourite theme of SF stories, especially in ANALOG, is what I call the ecopuzzle. Something is wrong on a planet, an ecosystem is crashing, and it is up to the scientists to figure out the problem.

Space Ecology.

Michael Swanwick's novel VACUUM FLOWERS (1987) is an average cyberpunk novel on the face of it. What caught my interest was the effort he made to provide a verisimilitude of background ecology, specifically the vacuum flowers of the title. The novel takes place in an era of orbiting space habitats. Every spacecraft ever built leaks gases from its seams and joints, so the vacuum flowers were synthesized which grow on the outside hulls and capture escaping gases. They grow unchecked as a monoculture, and must be harvested every so often for recycling. The flowers act as a counterpoint for the characters in the novel who are the equivalent for their space-faring society, spreading out everywhere and impossible to eradicate.

That plants could grow in a vacuum is believable. They are known to grow inside rocks (microscopic algae), in stagnant waters with no oxygen (swamps), and on the highest mountain tops where humans have to breathe oxygen from a bottle. Plants have tough cuticles and could easily be bred for exposure to the vacuum of space.

The concept of vacuum flowers dates back further. "Garden In The Void" by Poul Anderson is a short story in the 1952 May issue of GALAXY magazine. A husband-and-wife asteroid mining team discover an asteroid with plants growing on the surface. The species are adapted to life in a vacuum. They then find a stranded astronaut who tends the plants in exchange for oxygen and food, and who has developed a symbiosis with the plants. He has built up an artificial ecosystem. He is old and wants the plants to continue after he dies, so he sabotages the miners' ship and leaves them to take over the symbiosis.

Plants may go into space by themselves. Jack Vance wrote a 1951 story "Winner Lose All" for GALAXY, about two competitors, humans and an energy being, who discover a planet at the same time and begin competing for

its uranium deposits. While they are fighting, neither notice that the vegetation is also feeding on uranium. Humans and alien fight each other to a draw and both abandon the planet. The vegetation then grows vertical cannons with its spores within. The uranium the plants absorbed from the soil is then concentrated until fission occurs and the spores are blown into space to seed other planets.

Larry Niven tried a similar story "A Relic Of The Empire" (1966 December, WORLDS OF IF) about a planet where trees have solid-fuel cores inside their trunks. When mature, they ignite and boost into orbit, spreading seeds to other planets.

Ecopuzzles.

R.V. Humphrey's story "The Taste Of Money" (1968 January, WORLDS OF IF) is a typical example of an eco-puzzle. A company is harvesting shrubs on an alien planet for valuable food items, but the shrubs are dying out. A botanist sent to investigate finds the shrubs grow with tall trees whose tops are out of sight from the ground. Caterpillars come down from the trees, eat the blossoms on the shrubs, and then burrow into the ground. Field crews were collecting and destroying the caterpillars as pests. The botanist determines that the trees and shrubs were two forms of the same species. The caterpillars were actually mobile ova which ate the pollen, fertilized themselves, and then buried themselves into the ground as seeds.

Harry Turtledove did the same sort of ecopuzzle story with "Nothing In The Night Time" (1989 March, ANALOG). Human traders visiting an alien planet notice that the arboreal aliens are now living in fragmented forests that are gradually shrinking. The aliens had wiped out a local giant herbivorous beast called the omphoth which, while it did not directly attack them, was destructive in its clumsy way. It turns out that the trees could only reproduce if their fruits passed through the digestive system of an omphoth. It was therefor an easy job to round up a few surviving omphoths and teach the aliens not to kill them.

The stereotypical ecopuzzle story is about humans colonizing an alien planet. "Mnarra Mobilis" by Sydney J. Van Scyoc 1973 June, WORLDS OF IF) is set on a planet and is about two individual plants with mobile roots. Each day they send up leafy stalks to collect sunlight for food energy while the giant underground root system migrates. As the roots move away from a given location, they disconnect themselves from the stalks at the rear, which promptly wither and die. This baffles human explorers who don't know about the root systems because the dying vegetation does not appear to be related to the seasons or any disease or pest. One of the underground plants is in the northern hemisphere of the planet, and the other in the southern hemisphere. They occasionally meet at the equator and mate, producing new plants.

A nice turnabout-is-fair-play story is "Much Ado About Nothing" by Jerry Oltion (1982 November, ANALOG). Aliens arrive on Earth and begin exploring it just as autumn arrives. They mistakenly believe they have introduced a major disease because so many plants are turning yellow and shedding leaves. Now what I really like about this story is that it happened to me when I was with the Calgary Parks Dept. I received a call from a recent immigrant from Singapore that something was wrong with the trees in her neighbourhood. I drove out to talk to her and determined that it was just autumnal leaf drop. She had just arrived in Calgary from a tropical country on the equator where the vegetation is green year-round and had no idea. I did my part and also gave her advice about what to do when frozen water, known as snow, fell out of the sky a couple of months hence. She had no idea whatsoever about winter.

Janet Kagan's "The Flowering Inferno" (1990 March, ASIMOV'S) is a standard ecopuzzle story set on the planet Mirabile being colonized by humans. The geneticists mixed up the genes of the seed stock of crops and livestock brought to the world, and now the genes are re-assorting on their own. The trees, for example, descend from fire ecology habitats where forest fires are used to sprout their seeds into an ash bed for regrowth. Kagan tends to write too much in the anthropomorphic tone of voice for what is a basic puzzle that takes the scientists too long to figure out what is obvious. The trees are shedding flammable bark and deliberately igniting fires so their seeds will germinate. Because of their Mixmaster genes, the fire ecology has been synthesized in a different way but obvious to the reader. Once every fifteen years the forest will burn and thus regenerate itself.

Humans stubbornly refuse to see the obvious and are shocked, shocked when the villages go up in flames. Actually, that much is true even in our world today. Not an hour's drive from where I live are towns and villages in the mountain forests that get a bad scare every decade or so because people love to build particleboard houses with cedar-shake roofs right up against the trees. When a forest fire comes through, the houses burn like Roman candles and the occupants are in denial ('*It's all the government's fault!*"). Getting back to the

story, it is a routine ecopuzzle with no suspense, but it does serves as a useful lecture about forest ecology.

A subtler method is one tried out in Ruth Laura Wainwright's story "Green Grew The Lasses" (1953 July, GALAXY). An alien plant turns women green and then causes parthenogenetic pregnancies. Early feminism?

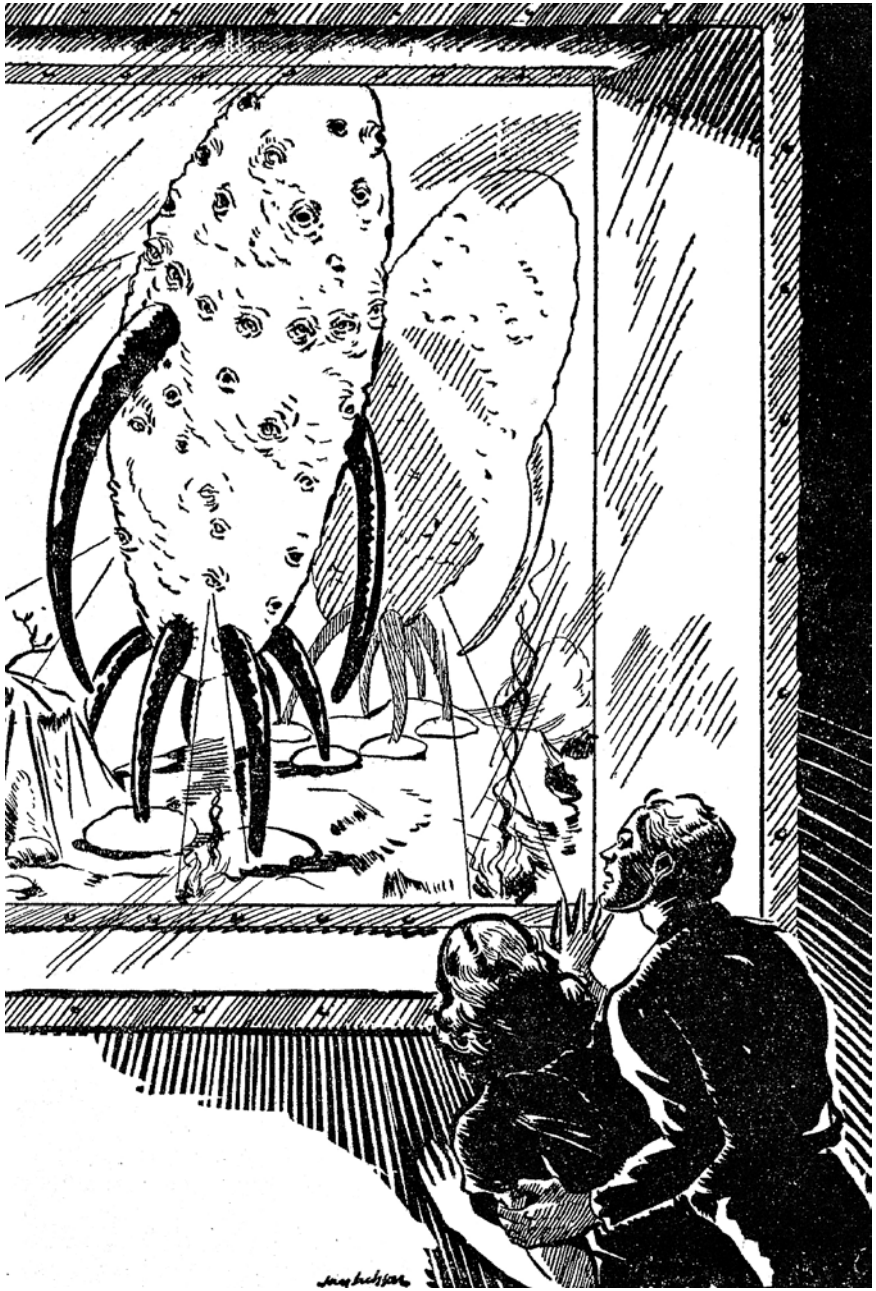
There Were Giants In Those Days.

The idea of a super-fertilizer that makes plants grow into giants goes back to H.G. Wells, who contemplated what would happen if food came from the gods. A pulp fiction knock-off is "Moss Island" by Carl Jacobi (1932 Winter, AMAZING STORIES QUARTERLY) which has the hero roaming an island off New Brunswick looking for geological specimens. In a rock cavity, he finds a strange oil and collects a Thermos full of it. Possibly the worst foreshadowing ever written then follows, as he remembers a professor telling him about a miracle oil that causes plants to grow tremendously fast. The hero then tries a drop on a moss, which suddenly sprouts up. This startles him and he jumps backward, tripping and spilling the entire contents of the Thermos on the moss. It grows in seconds to house size and keeps growing. The hero barely makes it off the island as the moss consumes everything in its path and takes over the whole island.

Also from the god-awful category is "The Meteor Monsters" by Arthur R. Tofte (1938 August, AMAZING), written in the days when men were men and SF was still pulp. Tofte's story is about a meteorite crashing into Wisconsin, taking out most of the state. From the crater emerge giant rutabagas on stilt legs who aim to conquer Earth (illustration at right from the story). The plot was lifted from H.G. Wells and the characters taken from Buck Rogers. There is the learned astronomer, his beautiful daughter, and the handsome young hero courting her. The monsters have a method of blacking out the planet's electrical systems, but the real excitement is that they are building a structure at the centre of the crater that will divert Earth out of its orbit. The planet will dive past the Sun, cooking all life to death, then head out into the frozen wastes of interstellar space.

Exciting! Lots of exclamation marks! Lots of footnotes in lieu of infodumps in the main text, which would be a good idea except that many of the things explained in excruciating detail didn't need more than a sentence in passing. The fiendish aliens are foiled by the hero sneaking up and dynamiting the structure.

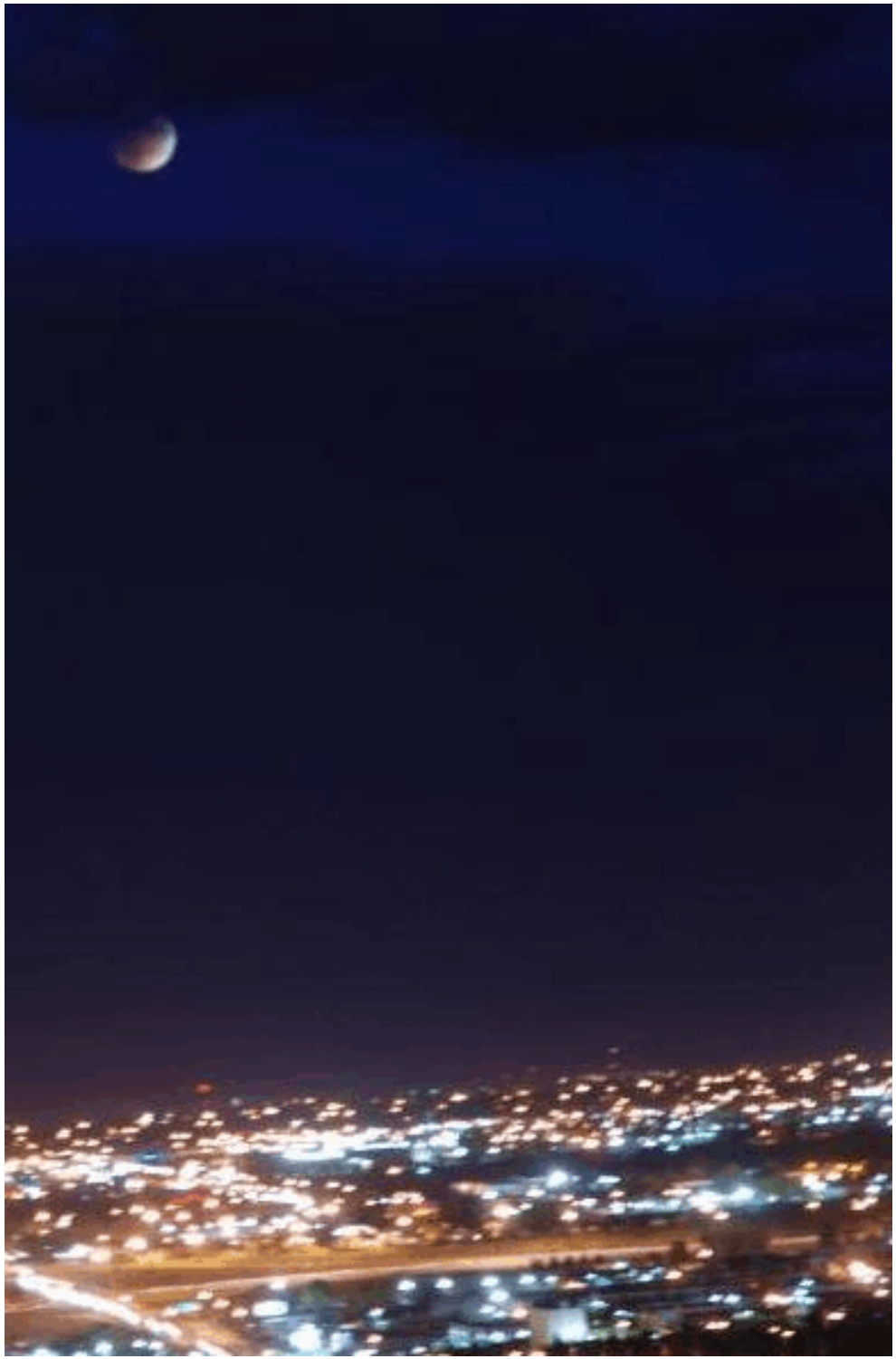
This also triggers a huge fire that consumes the aliens. Apparently Wisconsin was sitting on a previously and still today unknown massive oil field that the aliens drilled into. I say apparently because, strangely enough, there is no footnote explaining this unusual turn of events. After the destruction of the giant rutabagas, the Earth straightens out its orbit and settles back into near normalcy.



LUNAR ECLIPSE AT CALGARY 2015-09-27
by Dale Speirs

Calgary is a tough place to view eclipses, whether solar or lunar, because invariably clouds move in just before the event. Last October, I got lucky with a solar eclipse, as reported in OPUNTIA #288. Tonight was a lunar eclipse combined with a supermoon. I decided to view it from Nose Hill Park, the highest point within Calgary. So did several hundred other Calgarians. I got there an hour before sunset and had to park two blocks away.

Naturally the clouds moved in, but there were gaps within them, so we all stubbornly stayed. Moonrise was not visible, but at about 10° above the horizon there was a gap, and eventually we were rewarded with a view of the shadowed moon. After about fifteen more minutes, the Moon moved up into overcast clouds and we all went home.



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: Milt Stevens 2015-09-23
Simi Valley, California

I like the examples of utility box art that you publish. In Los Angeles, there is some art in freeway overpasses which is supposed to discourage graffiti. Most of it looks like the work of a Mexican Communist in 1935. It's sort of a graphic representation of fingernails being scraped along a blackboard. Los Angeles does have a Municipal Arts Department. They specialize in buying art from people with more pretensions than talent. At one point, the city council suggested that Municipal Arts might try selling some of the $6,000,000 worth of art they had bought. Unfortunately, paying $6,000,000 for art doesn't mean you have $6,000,000 worth of art. Years ago, I happened to see some of their store of art. It's the sort of stuff that would give a cockroach nightmares.

I like the idea of print oriented cons like When Words Collide. I wish there were more of them. Unfortunately, most of the small-time con runners think they can become big-time con runners by featuring costumes and gaming. I'd like to encourage a few exceptions.

Due to my professional background [in police work], I avoid all forms of crime fiction. I know that computerized information is frequently represented as magic in crime fiction. Some police executives think the same thing. Humans are the biggest limitation of computers. Police types are secretive. They don't like to share information. Narcs don't want to share with detectives, and Vice doesn't want to share with narcs. Nobody wants to tell Patrol anything, and Patrol suspects everybody else spends most of their time shopping. Computer types want to share information, but that may be one of the reasons everybody else thinks they're weird.

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 them directly.]

BANANA WINGS #59 (Editorial whim from Claire Brialey and Mark Plummer, 59 Shirley Road, Croydon, Surrey CR0 7ES, England) SF genzine, with some commentary on the Sad Puppies debacle, conventioneering, what to do with that leftover phosphorous, and the connection between Turkey and Germany. Lots of letters of comment.

SEEN IN THE LITERATURE

Anizelli, P.R., et al (2015) **A prebiotic chemistry experiment on the adsorption of nucleic acids bases onto a natural zeolite.** ORIGIN OF LIFE AND EVOLUTION OF BIOSPHERES 45:289–306

Speirs: I'll put my comments up front since not everyone will understand the abstract below. Zeolites are natural clays that attract and latch onto ions, as a result of which they are commonly used as spill absorbents. In discussing the origin of life, the question is how nucleic acids accumulate in the harsh environment before eventually being enveloped into cellular membranes and becoming the first step to living cells. It may have been they sheltered on clay particles such as zeolites, which provided a structural framework that prevented them from being torn apart by radiation and ultraviolet light, far stronger in pre-life Earth when there was no free oxygen to produce an ozone layer.

Authors' abstracts: "*There are currently few mechanisms that can explain how nucleic acid bases were synthesized, concentrated from dilute solutions, and/or protected against degradation by UV radiation or hydrolysis on the prebiotic Earth. A natural zeolite exhibited the potential to adsorb adenine, cytosine, thymine, and uracil over a range of pH, with greater adsorption of adenine and cytosine at acidic pH. Adsorption of all nucleic acid bases was decreased in artificial seawater compared to water, likely due to cation complexation. Furthermore, adsorption of adenine appeared to protect natural zeolite from*

thermal degradation. The C=O groups from thymine, cytosine and uracil appeared to assist the dissolution of the mineral while the NH2 group from adenine had no effect. As shown by FT-IR spectroscopy, adenine interacted with a natural zeolite through the NH2 group, and cytosine through the C=O group. A pseudo-second-order model best described the kinetics of adenine adsorption, which occurred faster in artificial seawaters."

Raghavan, Maanasa, et al (2015) **Genomic evidence for the Pleistocene and recent population history of Native Americans.** SCIENCE 349:aab3884, 1-10

Authors' abstract: "*Using ancient and modern genome-wide data, we found that the ancestors of all present-day Native Americans, including Athabascans and Amerindians, entered the Americas as a single migration wave from Siberia no earlier than 23 thousand years ago (ka) and after no more than an 8000-year isolation period in Beringia. After their arrival to the Americas, ancestral Native Americans diversified into two basal genetic branches around 13 ka, one that is now dispersed across North and South America and the other restricted to North America. Subsequent gene flow resulted in some Native Americans sharing ancestry with present-day East Asians (including Siberians) and, more distantly, Australo-Melanesians. Putative "Paleoamerican" relict populations, including the historical Mexican Pericúes and South American Fuego-Patagonians, are not directly related to modern Australo-Melanesians as suggested by the Paleoamerican Model.*"

Lu, W., and F. Qiu (2015) **Do food deserts exist in Calgary, Canada?** CANADIAN GEOGRAPHER 59:267–282

Authors' abstract: "*This study investigated the accessibility of supermarkets and farmers' markets in the city of Calgary, Canada. Two communities with proportionately large populations of children and seniors coupled with low income levels and limited access to healthy food sources, were identified as food deserts. The results also suggested that farmers' markets provide surrounding neighbourhoods with significant benefits, even though the overall alleviating effects on the lack of access to healthy food are limited. ..."*

"The term "food desert" was introduced about two decades ago by a working group for the Low Income Project Team of the Nutrition Task Force in the United Kingdom (Beaumont et al. 1995). Later, the term came to be used extensively in the United States to describe both urban and rural neighbourhoods that have a high need for healthy and affordable food with attendant limited access (US Department of Agriculture 2009). High-need neighbourhoods are related to deprivation factors, and household income is the key factor that determines whether a household can afford to have a sufficient quantity of quality food needed to meet daily dietary requirements. ..."

"*Despite concerns that farmers' markets are seasonal and have limited hours of operation, the promotion of farmers' markets has been viewed as a potential strategy to increase availability and consumption of fruits and vegetables, which in turn may improve public health and reduce the risk of chronic diseases. Farmers' markets can also affect the cost of living in a food desert. For example, one new farmers' market that opened in a food desert is reported to have had a major influence on reducing grocery prices (by almost 12% in three years) for people living in nearby neighbourhoods.*"

Speirs: An interesting report for a Cowtowner like me. Now that I am retired, I seldom use my car except for country driving, club meetings or family gatherings, and grocery shopping. I am fortunate to have easy access to two direct bus routes downtown, a circle route, and a crosstown route that connects to the universities. All of them connect to the LRT system as well.

There are several supermarkets within five minutes driving time of my house where I usually shop. Occasionally if I only need a few items or a blizzard makes for bad driving, I shop at a downtown supermarket because it is directly on a bus route that stops within one block of my house in the inner-city suburbs. My neighbourhood supermarket is a couple of minutes driving time but an eight-block walk to and from the bus route, not something to be endured when carrying grocery bags. Thus, my sense of geography changes dramatically depending if I go by foot or drive. If I walk or take the bus, most of my neighbourhood is too troublesome to visit, and it is faster and easier to go downtown or to the universities via bus.