OPUNTIA

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DECK US ALL WITH BOSTON CHARLIE: 2014
photos by Dale Speirs

Most Calgary shopping malls and skyscrapers have variations of Christmas trees, but some do try to make an effort to be different. At right is the lobby of the Bow Tower downtown, with giant glass ornaments.

Chinook Mall, in Calgary's south, uses an astronomical theme.

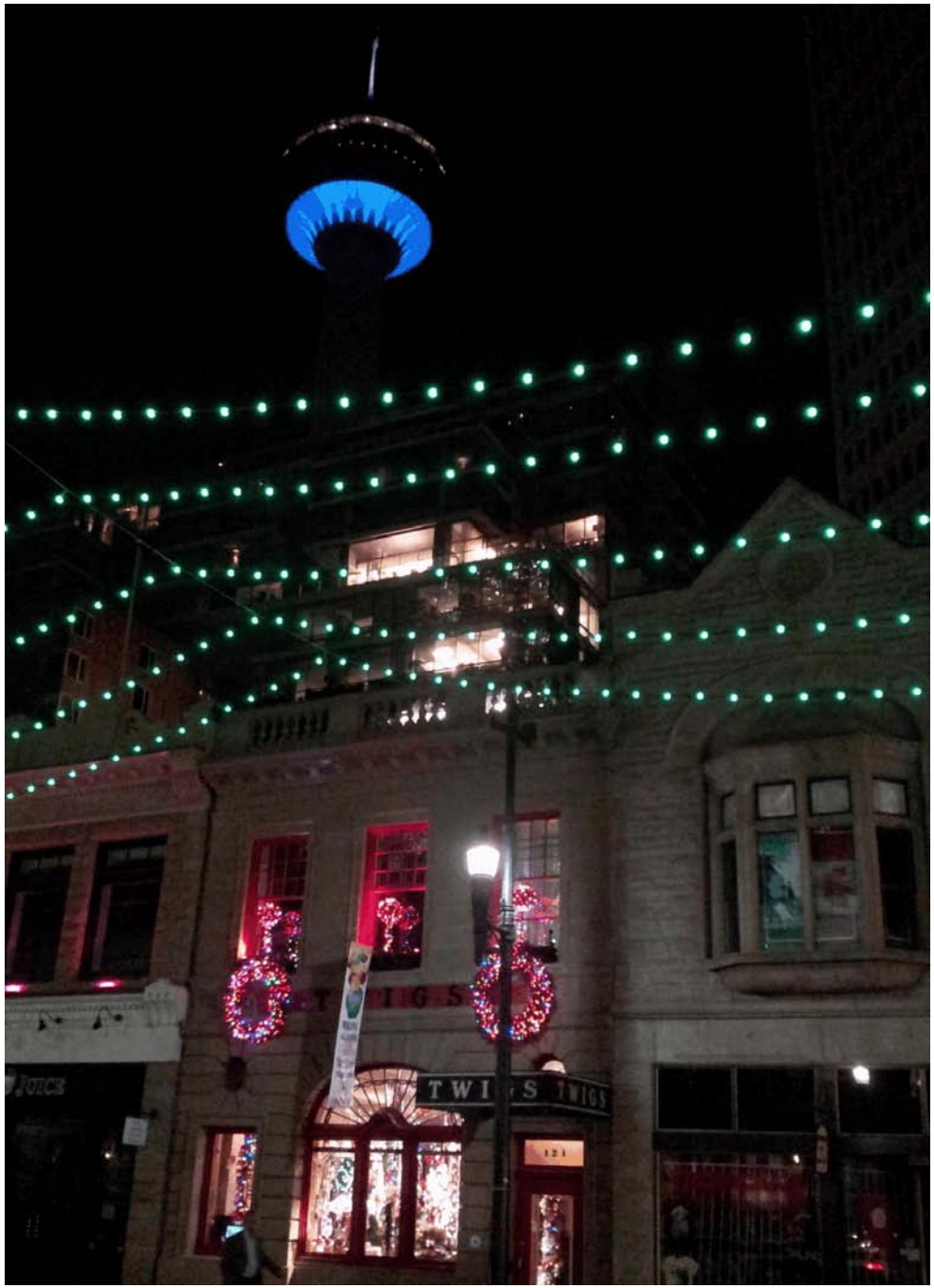
Bankers Hall downtown has a three-story atrium from which they dangle long strings of small white lights. It looks like a snow shower descending from the skylights.

Up until this season, the Stephen Avenue Mall downtown was decorated for Christmas as below.

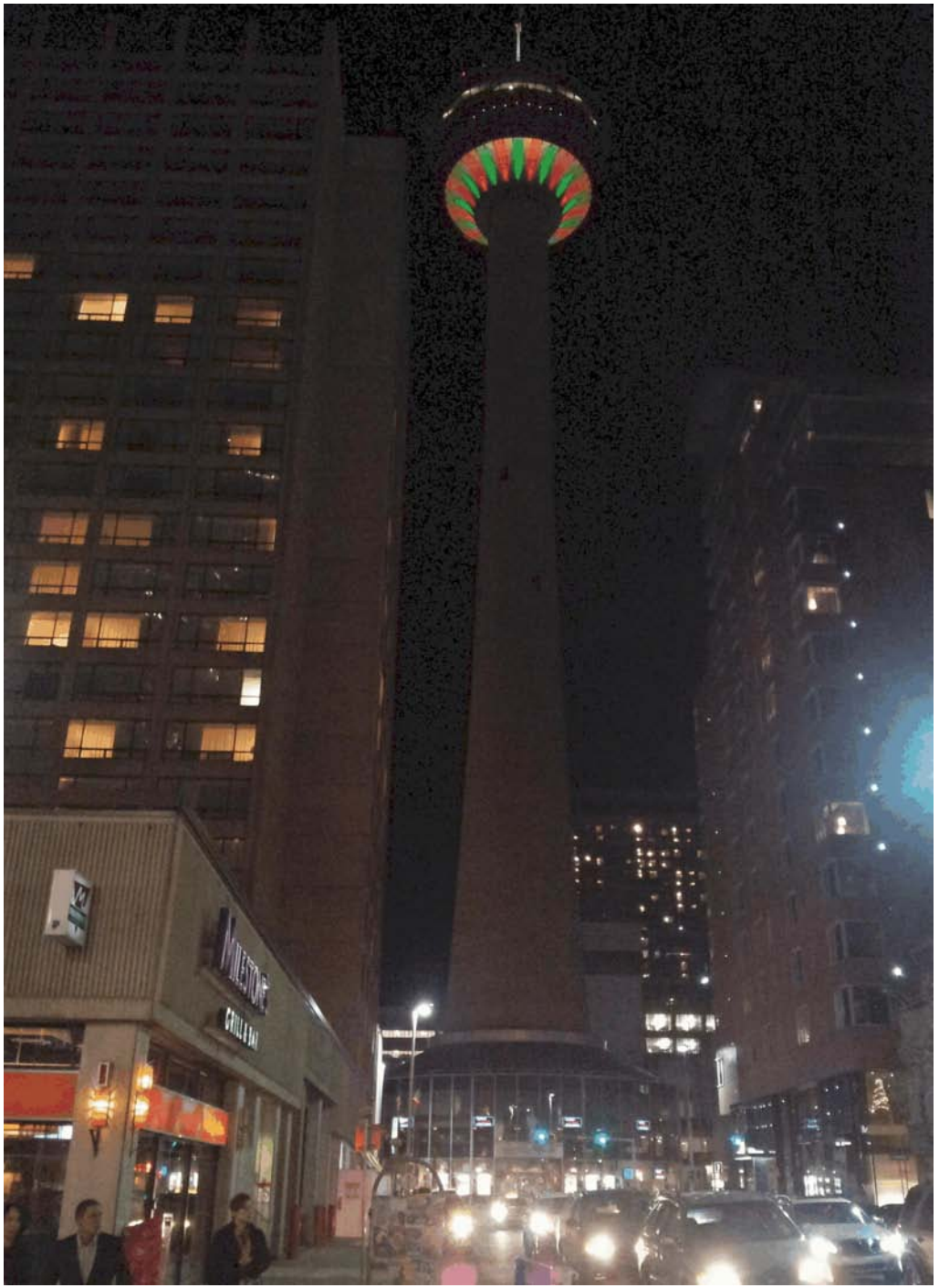
The mall is 8 Avenue SW, a pedestrian mall by day and a single lane of traffic in the evening for the theatre and restaurant crowd.

Unfortunately for 2014, the lights were rearranged as strands parallel to the mall, which makes for easier setup but isn't as pretty to view.

Looking up at the Calgary Tower, which is one block over on 9 Avenue SW. After it was completed in 1968, it was the tallest building in Calgary for many decades but now it isn't even in the Top Ten.



I was downtown again a few nights later and was startled to see that the Calgary Tower had changed its illumination to red and green. This view is looking down Centre Street South to where it terminates at the base of the tower.



FAR AS THE HUMAN EYE COULD SEE
by Dale Speirs

Humourist Stephen Leacock once wrote that if you make predictions for the future, always set them far ahead after you are gone. When he was a young professor he made predictions about life fifty years ahead, and was subsequently embarrassed when he was still around to see himself proven foolish. Therefore one should always predict things at least a century into the future, so as to be safely dead by the time the future arrives.

Predictions For The Year 2000.

It goes without saying that no SF writer of the 1930s to 1960s predicted the Y2K scenario. The consensus was that there would only be one giant mainframe, ruling the planet with remorseless logic. I came across an article by Robert Heinlein in the February 1952 issue of GALAXY, where he predicts what the year 2000 will be like. He showed a batch of curves on a graph, and went for the exponential curve as the basis for prediction. So how did he do when he got down to specifics?

1) "*Interplanetary travel is waiting at your front door, C.O.D. It's yours when you pay for it, which at the government is doing at least on an experimental basis*." Not even C.O.D. to low Earth orbit, alas, although the government is doing it experimentally with people to low Earth orbit, and robot probes to the rest of the solar system. The government is not paying C.O.D. either; that's all part of the national debt.

2) "*Contraception and control of disease is revising relations between sexes to an extent that will change our entire social and economic structure.*" Bang on (pun intended) for the 1960s and 1970s, although AIDS and antibiotic-resistance of traditional diseases has put a bit of a crimp in things since. Notwithstanding that proviso, the social changes still reverberate.

3) "*The most important military fact of this century is that there is no way to repel an attack from space.*" Absolutely true, not that it stopped the brass hats from spending a few billions on a 95% successful system. 5% of Soviet warheads detonating in North America would certainly muss our hair, to borrow a phrase from one of Dr. Strangelove's generals.

4) "*It appears utterly impossible that the United States will start a preventative war. We will fight when attacked, either directly or in a territory we have guaranteed to defend.*" From the context of the article, Heinlein was writing about nuclear war, not small Caribbean islands or Arabian Gulf countries. True enough as far as it goes.

5) "*In fifteen years the housing shortage will be solved by a breakthrough into new technology which will make every house now standing as obsolete as outdoor privies.*" Speaking as someone who lives in a bungalow built in 1956, I don't consider this a total hit, or miss, for that matter. Houses today are built faster and better by modular construction, such as roof frames and pre-hung doors and windows. However, it should be noted that just because something is obsolete doesn't mean it is useless. My elderly house keeps me warm and dry. Half-points to Heinlein.

6) "*We'll all be getting a little hungry by and by*." That depends who "we" is. North Americans and Europeans fret about their weight. Africans and Asians who lived with famine a century ago still live with it. The problem has never been food supply, for the world has always has a surplus of food on a planetary scale. The problem is distribution and economics.

7) "*The cult of the phony in art will disappear. So-called 'modern art' will be discussed only by psychiatrists*." Alas, 100% wrong on this one. Performance art, abstract art, punk collage, chicken scratches that pass as comic strips, just to name a few.

8) "*Freud will be classed as a pre-scientific, intuitive pioneer, and psychoanalysis will be replaced as a growing, changing 'operational psychology' based on measurement and prediction.*" Not quite, but not totally wrong either. The Freud fraud, which extrapolates the behaviour of a small sample of neurotic Viennese patients to the entire human race, is with us still. It is being challenged by scientific experiments but the new results (such as dreams being the brain's way of memory storage, not the subconscious running amuck) are not yet as universal as they should be. I'm with Heinlein on this one but I don't expect to see it in my lifetime.

9) "*Cancer, the common cold, and tooth decay will all be conquered. The revolutionary new problem in medical research will be to accomplish regeneration, ie., to enable a man to grow a new leg, rather than fit him with an artificial limb*." 100% wrong again. The first sentence guessed wrong on what diseases would be vanquished, but it is well to reflect that we have made some impressive strides against others, such as polio and smallpox. I was born a few months after polio vaccine was introduced to the rural Alberta county where I lived, and my parents were the first generation in history who did not have to worry about the polio season. For the second sentence, while there is some research into regeneration, the big money is out patenting every gene it can find.

10) "*By the end of this century mankind will have explored the solar system, and the first ship intended to reach the nearest star will be abuilding.*" Heinlein was thinking of manned ships, but I'll interpret him literally to give the benefit of a doubt. We have had robot probes buzzing around almost all of the solar system, so we'll give him those points. No starship in sight, even as a serious plan for the near future. I'll predict robot probes to the stars by 2100, after I am safely dead.

11) "*Your personal telephone will be small enough to carry in your handbag. Your house telephone will record messages, answer simple queries, and transmit vision.*" Excellent prediction, sir! We do indeed have smartphones, voice mail, auto-responders, and video conferencing.

12) "*Intelligent life of some sort will be found on Mars.*" Sorry about that.

13) "*A thousand miles an hour at a cent a mile will be commonplace; short hauls will be made in evacuated subways at extreme speeds.*" We had the Concorde but it fizzled out. Vacuum subways are doubtful because of their cost, not necessarily their technical feasibility.

14) "*A major objective of applied physics will be to control gravity*." Most applied physicists are scrambling to invent some new Internet gizmo that will earn them $1 billion in stock options by age 29. There's no money in applied gravity research at the moment.

15) "*We will not achieve a world state in the predictable future. Nevertheless, Communism will vanish from this planet*." For the first sentence, I would say myself that we will never have a world state ever, not just the predictable future. Communism is still around, but Heinlein wasn't too badly out in his timetable. It'll be gone as an effective practice in a few decades, although the name may linger on.

16) "*Increasing mobility will disenfranchise a majority of the population. About 1990 a constitutional amendment will do away with state lines while retaining the semblance.*" I have no idea what Heinlein is talking about here. Why would anyone be disenfranchised because they moved house? And I still put the state name on mail to my American friends. If Heinlein means 'state' as in general political boundaries worldwide, then he's way wrong on this one. The fall of the Soviet empire has produced numerous new states. Even Canada separated out a new territory in 1999.

17) "*All aircraft will be controlled by a giant radar net run on a continent-wide basis by a multiple electronic brain*." I'm impressed. Yes, we do have a network of air traffic control zones worldwide. "Multiple electronic brain" is a reasonable description of distributed computer systems.

18) "*Fish and yeast will become our principal sources of proteins. Beef will be a luxury; lamb and mutton will disappear, because sheep destroy grazing range.*" Bass ackwards on this one. It's the Newfoundland and Basque fishermen whose boats are idle for lack of fish, while hamburger outlets line every commercial street on the continent. Lamb and mutton are not common in North America compared to cattle but they are not scarce either. That supply is held back not by rangeland conservationists but by coyotes, who enjoy it as much as humans.

19) "*Mankind will not destroy itself, nor will civilization be wiped out.*" True enough, although we certainly had a few scares along the way. When it comes to things such as Peak Oil (which occurred in 2008) or the currency war (beginning after the Panic of 2008 when central banks started printing currency to bail out their friends in the financial districts), I do not believe in fall-off-the -cliff scenarios but rather a descending staircase for those who do not pay attention and a plateau for those who do.

To sum up, Heinlein got it right for 8 points but wrong for 11 points. The problem with estimating technology on the curves is that such curves are more evident in hindsight than foresight. Some technologies race ahead exponentially, while others, such as space travel, are sidetracked. And that's the way the future was.

DISCWORLD: PART 4. TIFFANY ACHING
by Dale Speirs

THE WEE FREE MEN (2003) introduces 9-year-old Tiffany Aching into the Witches story arc. She is a farmer's daughter in a mountain valley called The Chalk, a bright precocious girl who is unknowingly turning herself into a witch. While part of the Witches arc, the novels about her form an independent line as she grows into young womanhood.

Miss Perspicacia Tick is a well-established witch from elsewhere who has observed the disturbance in the world's magical field created by Tiffany, and has come to help. The plot gets moving when Tiffany's baby brother Wentworth is kidnapped by the Queen of (whose name must not be mentioned). The Nac Mac Feegle appear in strength as supporters of Tiffany and are underfoot, not just figuratively, but everywhere. They take her to their den where she learns about their culture and becomes their temporary kelda (hive mother) when the old one dies.

Then off to Fairyland to visit the Queen and recover Wentworth, with assorted adventures along the way. She succeeds, vanquishes the Queen, and returns to The Chalk. The last twenty pages are an anticlimax but do help set up future plot coupons. Granny Weatherwax and Nanny Ogg have walk-on roles, or perhaps better to say, fly-on roles, as they show up via broomsticks.

A HAT FULL OF SKY (2004) picks up Tiffany's life two years later. She is learning the art of borrowing, which the older witches do often. It is the ability of the mind to leave the body, take over a passing animal's mind, and travel with it, to see as it sees through its eyes. But it gets her into trouble, for a spirit being called a hiver spots her mind from a distance. It too, likes to borrow, and decides Tiffany is a good target, more interesting than sheep or rabbits. Tiffany is unaware it is stalking her, as she has just become an apprentice to the witch Miss Level and is thinking of other things.

The inevitable happens and while Tiffany is borrowing the hiver takes control of her. The hiver carries with it the memories and learning of all those it has parasitized over the centuries, gradually suppressing their personalities and merging their knowledge into its own intellect. Granny Weatherwax is called to the scene to help the remnant of Tiffany's mind fight back against the hiver controlling her body. They succeed in throwing out the hiver, but it is not the end of the story. The hiver remains in the vicinity, circling about like a shark

waiting to pick off its prey. Everyone knows that the hiver takes over minds to hide, but it isn't until after the Tiffany incident that the question is asked about what the hiver is hiding from. The answer is another anti-climax, mixed in with how Tiffany settles back into the witches community, and the novel slowly peters out.

WINTERSMITH (2006) begins when Tiffany is thirteen, partly on her own and partly still apprenticing, this time from Miss Treason. The witch takes Tiffany along to a Morris dance, where Tiffany disobeys instructions and instead of just watching, joins in the dance when she sees an empty space among the dancers. Unfortunately she attracts the attention of the Wintersmith, the spirit of snow and ice, who was supposed to occupy that space. It falls in love with her and won't leave, as a result of which spring never arrives.

The rest of the novel covers the attempts of Tiffany to undo her mistake, during which time she matures a bit as she realizes that all actions have consequences. She finally overcomes the Wintersmith, and in the process meets up with his opposite, the Summer Lady. The latter warns Tiffany not to trifle with her either, and not to barge in where she doesn't belong. And so to a happy ending. This novel does a better job than the previous one, showing how Tiffany grows and learns from her mistakes.

I SHALL WEAR MIDNIGHT (2010) is a darker story than the previous volumes. At fifteen years of age, Tiffany is now a freelance witch on her own, although she still meets with older witches for help and advice. She is finding out from personal experience that many citizens do not appreciate witches and will blame them for tragedies they had nothing to do with. When the Baron of The Chalk dies, Tiffany is in trouble. There is evil being spread about by a being called the Cunning Man, and she is the target.

It doesn't help that she is beginning to buckle under her workload, for a witch in The Chalk is also a practical nurse, a psychologist, and a social worker. It never ends, especially among people who can't or won't help themselves but know how to make others feel guilty. She must deal with poor people who live in filth that they could clean up themselves with little trouble, who won't wash their cutlery, and who can't be bothered to sort or arrange their possessions instead of just leaving them scattered about on the floor. By the end of the novel, as Tiffany manages to destroy the Cunning Man, she is starting to understand that she can't save the world by herself. Not a book to read when you are feeling depressed.

SEEN IN THE LITERATURE

Egel, Richard (2014) **Origins and emergent evolution of life: The colloid microsphere hypothesis revisited.** ORIGINS OF LIFE AND EVOLUTION OF BIOSPHERES 44:87-110

Author's abstract: "*Self-replicating molecules, in particular RNA, have long been assumed as key to origins of life on Earth. This notion, however, is not very secure since the reduction of life's complexity to self-replication alone relies on thermodynamically untenable assumptions. Alternative, earlier hypotheses about peptide-dominated colloid self-assembly should be revived. Such macromolecular conglomerates presumably existed in a dynamic equilibrium between confluent growth in sessile films and microspheres detached in turbulent suspension. The first organic syntheses may have been driven by mineral-assisted photoactivation at terrestrial geothermal fields, allowing photo-dependent heterotrophic origins of life. Inherently endowed with rudimentary catalyst activities, mineral-associated organic microstructures can have evolved adaptively toward cooperative 'protolife' communities, in which 'protoplasmic continuity' was maintained throughout a graded series of 'proto-biofilms', 'protoorganisms' and 'protocells' toward modern life. The proneness of organic microspheres to merge back into the bulk of sessile films by spontaneous fusion can have made large populations promiscuous from the beginning, which was important for the speed of collective evolution early on. In this protein-centered scenario, the emergent coevolution of uncoded peptides, metabolic cofactors and oligoribonucleotides was primarily optimized for system-supporting catalytic capabilities arising from nonribosomal peptide synthesis and nonreplicative ribonucleotide polymerization, which in turn incorporated other reactive micromolecular organics as vitamins and cofactors into composite macromolecular colloid films and microspheres. Template-dependent replication and gene-encoded protein synthesis emerged as secondary means for further optimization of overall efficieny later on. Eventually, Darwinian speciation of cell-like lineages commenced after minimal gene sets had been bundled in transmissible genomes from multigenomic protoorganisms.*"

Speirs: The great debate about the origin of life is whether nucleic acids such as RNA emerged first and then began using proteins to do their actual work, or alternatively if proteins emerged first and developed nucleic acids as a back up copying mechanism. This paper argues for protein development in gels or membranes, which eventually developed bubbles that broke off into cells.

Planavsky, N.J., et al (2014) **Low Mid-Proterozoic atmospheric oxygen levels and the delayed rise of animals.** SCIENCE 345:635-638

Authors' abstract: "*The oxygenation of Earth's surface fundamentally altered global biogeochemical cycles and ultimately paved the way for the rise of metazoans at the end of the Proterozoic. However, current estimates for atmospheric oxygen (O2) levels during the billion years leading up to this time vary widely. On the basis of chromium (Cr) isotope data from a suite of Proterozoic sediments from China, Australia, and North America, interpreted in the context of data from similar depositional environments from Phanerozoic time, we find evidence for inhibited oxidation of Cr at Earth's surface in the mid-Proterozoic (1.8 to 0.8 billion years ago). These data suggest that atmospheric O2 levels were at most 0.1% of present atmospheric levels. Direct evidence for such low O2 concentrations in the Proterozoic helps explain the late emergence and diversification of metazoans.*"

Speirs: Metazoans are multicellular animals. Algae were first to evolve, generating oxygen. At first there was little oxygen in the atmosphere because it reacted with metals in seawater and exposed on the land. After billions of years, the oxygen ran out of metals to combine with and began existing as free gas in the atmosphere or dissolved in water, allowing the evolution of metazoans to begin.

Xiang, H., et al (2014) **Early Holocene chicken domestication in northern China.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 111:17564–17569

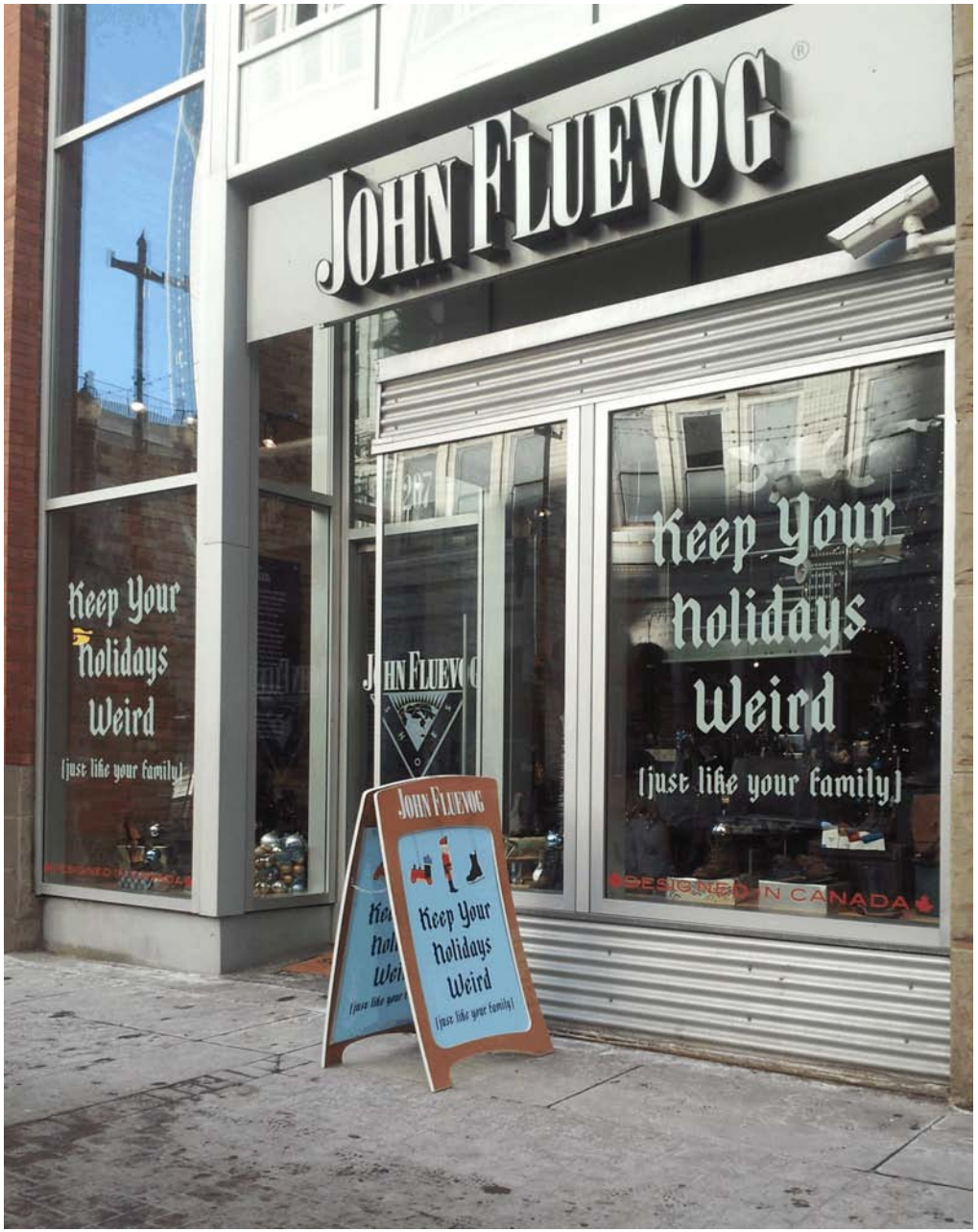
Authors' abstract: "*Chickens represent by far the most important poultry species, yet the number, locations, and timings of their domestication have remained controversial for more than a century. Here we report ancient mitochondrial DNA sequences from the earliest archaeological chicken bones from China, dating back to about 10,000 B.P. The results clearly show that all investigated bones, including the oldest from the Nanzhuangtou site, are derived from the genus Gallus, rather than any other related genus, such as Phasianus. Our analyses also suggest that northern China represents one region of the earliest chicken domestication, possibly dating as early as 10,000 y B.P. Similar to the evidence from pig domestication, our results suggest that these early domesticated chickens contributed to the gene pool of modern chicken populations. Moreover, our results support the idea that multiple members of the genus Gallus, specifically Gallus gallus and Gallus sonneratii contributed to the gene pool of the modern domestic chicken. Our results provide further support for the growing evidence of an early mixed agricultural complex in northern China. ... In his epochal work on domestication, Darwin suggested that domestic chicken (Gallus gallus domesticus) originated from red jungle fowl (Gallus gallus gallus) about 4,000 y B.P. in the Indus Valley. However, more recent evidence, based on both mitochondrial (mt) and nuclear DNA, refutes a monophyletic origin of G. g. domesticus. Analyses of large-scale mtDNA datasets strongly suggest that chickens were domesticated multiple times in different parts of Asia, including regions in South Asia, Southwest China, and Southeast Asia.*"

Venier, L.A., et al (2014) **Effects of natural resource development on the terrestrial biodiversity of Canadian boreal forests.** ENVIRONMENTAL REVIEWS 22:457-490

Authors' abstract: "*We address four questions: (1) To what extent have Canadian boreal forests changed due to natural resource development? (2) How has biodiversity responded to these changes? (3) Will the biodiversity of second-growth forests converge with that of primary boreal forests? (4) Are we losing species from boreal forests? We focus on trees, understory plants, insects, fungi, selected mammals, and songbirds because these groups have been most studied. We review more than 600 studies and found that changes in community composition are prevalent in response to large-scale conversion of forest types, changes in stand structures and age distributions, and altered landscape structure resulting from forest management and habitat loss associated with other developments such as oil and gas, hydroelectric, and mining. The southern boreal forest has been more highly impacted than the north due to more extensive forest management and the cumulative effects of multiple forms of development. There is abundant evidence that most species are not in danger of being extirpated from the boreal forest due to these anthropogenic changes. A few species, including woodland caribou (Rangifer tarandus) and grizzly bear (Ursus arctos), have, however, undergone long-term range contractions.*"

SEEN AROUND COWTOWN
photos by Dale Speirs

Below: One of the trendy boutiques on the Stephen Avenue Mall downtown.



Going home from downtown, I saw this guy carrying a large-screen television on the bus and sneaked off a photo on my smartphone. He got off before I did. I hope he didn't have a long walk.