OPUNTIA

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Whole-numbered OPUNTIAs are sercon, x.1 issues are reviewzines, x.2 issues are indexes, x.3 issues are apazines, and x.5 issues are perzines.

I HEARD FROM: Lloyd Penney, Kris Mininger, Ficus, Pascal Lenoir, Phlox Icona, Randall Fleming, C.Z. Lovecraft, Scott Crow, Kent Chamberlain, Terry Jeeves, Henry Welch, Tom Hendricks, Joel Cohen, Billy McKay, Chester Cuthbert, Joseph Major, Guido Bondioli

SEEN IN THE LITERATURE
noticed by Dale Speirs

Anonymous (1909 July) **A word the key.** SYSTEM 16(1):75

Discusses a new safe that opens only when the owner speaks the correct word into a microphone that also serves as the knob on the safe door. The microphone is connected to a needle which compares the spoken word with the same word recorded by the owner on a cylinder record inside. If the movement of the needle matches the groove on the cylinder, the safe opens. The article goes on to wonder what happens if the owner has a head cold or sore throat and isn't speaking with his normal voice.

Poole, Emma (2004-06-08) **Library book 100 years late.** CALGARY HERALD, page B1

A book checked out of the Calgary Public Library in 1904 was returned in March 2004 by the grandson of the man who originally took it out. It was found among the effects of the grandson's recently deceased uncle. The CPL waived the overdue fee of more than $3,000. The book was a 1902 novel by Samuel Rutherford Crockett titled THE RAIDERS: BEING SOME PASSAGES IN THE LIFE OF JOHN FAA, LORD AND EARL OF LITTLE EGYPT.

Pleil, J.D., et al (2004) **Air levels of carcinogenic polycyclic aromatic hydrocarbons after the World Trade Center disaster.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 101:11685-11688

The collapse of the Twin Towers first created a huge short-lived dust cloud, followed by soot from fires not fully extinguished until December, then pollution from diesel-powered equipment clearing the site that lasted until June 2002. The polycyclic aromatic hydrocarbon level on September 14 was the highest ever recorded for an outdoor source, but as the fires that generated the PAHs diminished over the next 100 days, so did the PAHs. Diesel PAHs dominated over the next 100 days but the level slowly declined to normal background levels. After the initial outburst of PAHs of the first few days, the levels were not a hazard to New York City residents, except salvage workers in the WTC. However, women who became pregnant just after the fall of the towers were afflicted with some medical problems.

Peritz, I. (2004-07-08) **School turns tail, lets man and dog into class.** GLOBE AND MAIL, pages A1, A2

This just in from the language police (which term has a different meaning in Canada than the USA). The University of New Brunswick barred a blind Québecois from taking an English immersion course because his guide dog only understands French commands. UNB officials said the course was to be entirely in English to help the francophone students learn the language, and French commands would be disruptive. They hastily backtracked after a nationwide protest. A University of Ottawa law professor, asked to comment by the reporter, said of the UNB rule: "*That sounds pretty dogmatic to me.*". The dog was on record as saying "*Woof, eh?*".

Wilson, D.R., and J.F. Hare (2004) **Animal communication: Ground squirrel uses ultrasonic alarms.** NATURE 430:523

The Canadian prairies host billions of Richardson's ground squirrels, one of the few species to have increased in number since the Europeans arrived. The squirrel requires shortgrass habitat, rare in nature but extremely abundant in cattle-grazed rangeland and suburban parks. Out west here, we are familiar with the high-pitched squeak of an alarmed ground squirrel. This alarm call can carry for a couple of city blocks but is extremely difficult to locate the source unless one is looking directly at the squirrel when it squeaks. In this paper, Manitoban researchers noticed that every so often a squirrel would move its mouth as if to squeak but no sound was heard. They determined that the squirrels were using an ultrasonic alarm call, inaudible to certain predators and highly directional.

CON-VERSION 21
by Dale Speirs

Introduction.

Calgary's annual convention was held August 6 to 8, 2004, at the Westin Hotel in the downtown core. The hotel is conveniently located midway between the hooker stroll and Chinatown, not five minutes from the bonny banks of the Bow River, lined with flowering shrubs and sleeping drunks. But of course every SF convention is a world unto its own, where we can escape the mundane cares of daily life and enter into a magical place with just as many cares but better costumes. Especially if it's raining outside, as we have had a wet summer.

The convention took place just a few weeks after Calgary's biggest costume ball, the Stampede rodeo, during which thousands of petroleum executives, junior accountants, and secretaries dress up in cowboy hats, jeans, and boots. They wander about the downtown core yeehawing and washing the dryness out of their throats in the taverns. The news media print supplements and run extra film at 11, and the whole thing is taken quite seriously, not like those SF geeks who dress up funny too but not in western.

Techies In Space.

The first panel I took in was "Technology In Science Fiction". Karl Johanson, who edits the Canadian semiprozine NEO-OPSIS, mentioned his pet peeve of authors who stop a story for an infodump about the technology, the infamous "As you know, Professor, the quantum garbulator ... ". The technology must be reasonably used, such as starting a fire pit with a match instead of a nuclear-powered ray gun. Lynda Williams mentioned that in her novel THRONE PRICE she had to think through the ramifications of any technological changes on her characters. Her editor wanted her to change her spacecraft technology to suit one part of the plot, but then this would have trashed the rest of the novel because it was a hinge point of the story.

Williams mentioned that authors who write too close to the present and specify exact details can have their stories rendered obsolete by technology by the time they are published. It is better to be vague about technology and concentrate on the social changes, not the nuts-and-bolts. Blair Petterson followed up this point by remarking that the widespread adoption of cellphones has rendered countless SF and mystery stories obsolete.

Technological change sets off unobvious chain reactions. In 1905 it was easy to predict automobiles being used to chase bad guys or

airplanes to transport people, but not the less obvious effects such as suburbia, freeways, flight path noise complaints, and airport terminal congestion. Petterson remarked that technology is more important in SF than other types of stories, so the authors have to get it right. Interior inconsistencies can ruin a story, but a good author can overcome them by fixes such as the Heisenberg compensator in Star Trek transporter beams. (Humans could not be transported by matter transmitters, not even in theory, because of the Heisenberg uncertainty principle.)

Karl Johanson mentioned that technological contradictions are not necessarily illogical, citing as an example people living in bush shacks with cellphones but no running water.

Panel: The Future Of Fanfic.

The panelists and all but three of the audience were female for this discussion about writing boldly where no man has gone before. Slash fiction sets up homosexual relationships between media characters, originally Kirk and Spock, but now for every television and book series running. Originally slash was based on male characters but femme slash is a growing segment. Slash is underground not so much for fear of obscenity laws but because its authors are intruding into copyrighted material and the studios do not take kindly to it. Book authors resent other people trying to drag their storylines away into something else.

The panelists gave as their reason for writing slash that all of them had read it and felt they could do better. Women dominate slash because they can write about characters as outsiders and not be personally implicated.. Most of the panelists are semi-professional writers who felt that fanfic improved their other writing. One of the panelists is a librarian and said that academia is now taking an interest in slash, and churning out the usual sort of unreadable papers on the subject.

Slash originated before the World Wide Web. The panelists agreed that the good slash is now buried under a mass of bad material on the Web, where fanfic has migrated en masse. Zines were not even mentioned in this discussion. Advice given by one panelist was to post stories behind a disclaimer link that required an age statement and warned about obscenities. Needless to say, write it under a pseudonym to avoid trouble with the studios.

The panelists agreed that one problem with fanfic is lack of constructive feedback. Most comments from readers are naive gushing praise that is meaningless because the trash gets just as much praise as the genuine good writing. A panelist mentioned that such praise is usually written in badly spelled or acronymic language. Authors expect only positive praise. One panelist offered some constructive criticism such as separating the dialogue of two characters into different paragraphs and got back a "Why are you flaming me?" diatribe.

One common acronym cited was BWP, Boring Without Plot, which refers to slash stories that emphasize sex without characterization. Sex has to be there for a reason, but the majority of slash writers put it in for its own sake. In the absence of proper editing, characters are usually impossibly perfect or else convert from their evil (read: heterosexual) ways in implausibly abrupt plot twists. The road to Damascus never had such instant conversions. The best stories are those that can be re-read, and stories that rely entirely on unexpected plot twists are seldom re-read.

Open Source, Freeware, And Linux.

This first panel of Saturday morning was, not surprisingly, largely attended by computer geeks on the side of righteousness and decency, as opposed to the real Evil Empire headquartered in Redmond. Blair Petterson, who uses open source for his law office, said the main advantage was not ownership but control. A common scenario is the manufacturer of a specialized proprietary software going out of business or discontinuing it, leaving users stuck with legacy code no one can replicate. Open source software allows the user to continue with and upgrade the software regularly.

Petterson discussed copyright and patent law, such as the recent extension of American copyright from creator's life plus 50 years to life plus 70. No doubt 20 years from now, the major corporations will want an extension again. This act was sponsored by Congresscritter Sonny Bono, and would be more accurately known as the Walt Disney Benevolent Act, since it was pushed by them due to the Mickey Mouse copyright about to expire. Petterson said the basic patent law was not a problem in itself but due to overworked patent examiners, patents had been granted for prior art such as "one-click shopping". It was mentioned in passing, by the way, that some software is more than a century old, since the punched tape of Jacquard looms and punchcards of tabulating machines are a form of software.

Art Show.

The usual run of furries, barbarian princesses, and bad media SF imitations. I did like one photoprint that Richard Bartrop was selling. This was a fictitious pulp magazine cover for THRILLING COMPUTER STORIES, depicting what a 1930s artist would have imagined a desktop computer to look like, with an exposed cathode ray tube and a portable typewriter cabled with heavy gauge wire to a box of vacuum tubes. The cover story was "Blue Screen Of Death", and showed two grim-faced men at a rolltop desk examining, well, you can guess yourself.
This would be

plausible; remember that Microsoft's head is more correctly known as Bill Gates III, so his grandfather could have been there and done that back when.

Technology Vs. Nature.

A look at trade-offs between technology and environmental preservation. A recent example from British Columbia is building wind generation farms in clearcut forests. In Alberta, new wind farms have to be below the skyline, not silhouetted along the ridges and hills. An example cited of inadvertent effects was the Chernobyl nuclear power plant disaster, now fenced off and a nice wildlife refuge. I've noticed this myself, where high-security buffer zones for our local water treatment and sewer plants have some of the last remaining native prairie inside the city.

Expanding A Short Story Into A Novel.

A common method of going from short stories to a novel is to merge the short stories together into what is called a fix-up novel. The modern trend is to add padding to a short story by explaining the background of the society (a.k.a. infodump) or developing the characters. Novelist Ed Willett said that a lot of good ideas are only suitable for a short story and if expanded to a novel result in puffed wheat stories. Expanding a short story usually requires more attention to characterization. The back story can often overtake the original story because both have the same climax and therefore the only place to add is before the beginning. Alternatively, the novel can be the short story plus a sequel.

Writers At The Improv.

The Imaginative Fiction Writers Association is a Calgary writers group who have various activities each year at Con-Version such as writer workshops and short story contests. Their annual improv event regularly plays to a packed room and is one of the crowd pleasers of the convention. It works by having three tag teams of writers, mostly IFWA members but also visiting pros (this year it was Ed Willett) who receive a word from the audience and then have 60 seconds to write a sentence using it. When time is called, the sentences are read aloud and the audience votes for the funniest one. Bad puns score heavily, and much of the humour is in the recitation and interplay with the audience. The process is repeated until a short short is built up. At the end, the audience votes for a title as well. The moderator is Tony King, whose golden voice can be heard weekdays in Calgary reading the morning news on CHQR radio. If a writer can't think of a sentence, he or she gets custody of the Brick of Shame, a foam brick. This year's story is below. The suggested words are underlined, and if the pun makes them unrecognizable I have put them in square brackets.

HORNY DEATH

Serena sighed lustfully, staring out the window at the Tower of Willett. Afro D. Ziac, Esq., stared down his long nose at Ed the Unworthy Willett and said to Serena, "I may be an agent of change, but there's no way I can get this one ready for the Fun-Happy Love-Love Ball of Eternal Soulmateitude.

And then the rhinoceros charged. Afro was feeling distinctly queasy. "Stay, Shonary!"* [greasy stationery], *he yelled at his pet 20,000 pounds of horny death. The rhino didn't pause, however, and Afro was forced to dive out of the way, cracking a rib on* [ribbon] *Serena's cast-iron poodle. "I'll sue", moaned Afro, clutching his side. "Ha!", cried Serena, "When I hired you, you waived all your legal rights lest I lock you eternally in the Tower of Willett." Tired of the charging rhino interfering with her romance narrative, Serena clubbed Shonary with the cast-iron poodle and hoped desperately for a productive segue. At that moment, Harold D. Attenborough, Narrator Extraordinaire, sashayed into the room and presented his card; "Segues R Us", it read.** Harold whipped out a blackjack and clubbed Afro senseless, so that there would be continuity with an alternate timeline that was only sustained by the probability of pity. Looking backward over the confused twisting narrative, Harold pursed his lips pensively. He contemplated all the work that needed to be done to correct the wayward story, at this, its penultimate moment. The pressure was on, and he swabbed sweat from his brow. With a flash of insight he saw the solution, and he opened his mouth to say the words that would solve it all. And then the world blew up.*

* The audience voted for this sentence for its sheer gall in sidetracking the narrative.

** At this point, Tony King remarked that if you are stuck in writing a plot, bring in a new character, but if you have 30 characters after the first four pages, then it would be best to abandon the story.

Westercon 58.

This was a publicity panel with Cliff Samuels and John Mansfield. Next year, Con-Version will not take place, giving way to the regional convention Westercon, to be held on July 1 to 4, 2005. This spread of dates not only covers the national holidays of Canada and the USA, but is also a few days before the Calgary Stampede, the world's largest rodeo. Out-of-town visitors can thus enjoy the convention, then make day trips to the Rockies (one hour west) or the Tyrrell Museum of Palaeontology in Drumheller (two hours east), and come back into town for the Stampede. Be aware though, that hotel bookings very quickly fill up before the Stampede, and procrastinators may not be

able to find a room in

Calgary anywhere. (Not just in the downtown core, but anywhere in Calgary.)

Based on paid memberships to date, about 1,000 attendees are expected. Memberships cost C$80 or US$60 until November 1, 2004. Mail to Calgary in 2005, Box 43078, Calgary, Alberta, Canada, T2J 7A7. Westercon is the western North American regional convention, much larger than the usual local convention, and will draw lots of American visitors.

The venue will be the Westin Hotel downtown, a hotel experienced in dealing with SF fans. Guests of Honour are: S.M. Stirling (Author), Mark Ferrari (Artist), Dave Duncan (Canadian Author), Dr. Phil Currie (Science), Cliff Samuels and Eileen Capes (Fan), Tom Doherty (Publisher), and David Hartwell (Editor). Twelve streams of programming are planned, as well as round-the-clock gaming, anime video, and movie video. There will be writer workshops, short story contest, masquerade, dance, and all the other regular activities of a convention.

The Future Of War.

Not surprisingly there was vigourous discussion on this topic, not only the panel but frequent audience interjections. This panel considered that there would never be any chance of peace because humans will always find some cause to fight and die for.

However, it is unlikely there would ever be any more set-piece wars where massive armies slug it out toe-to-toe. Rather, there will be longer, drawn-out guerilla wars with inconclusive results. The home public doesn't want to know, so if information is suppressed from television, a war can be kept going. To win a war will mean preventing the root causes of terrorism.

SF Improv: The 404s.

This is a new item with a home-grown group of improvisational comedians dealing with SF themes. The 404s, as I discovered in the panel following, were the convention anime track presenters as well. I won't attempt to record verbatim the sketches, but give a couple of examples. One sketch was Dr. Ruth, Dr. Strangelove, Dr. Seuss, and Dr. Evil taking turns to tell the Hansel and Gretel story. Another was a press conference where Luke Skywalker announced he was shacking up with a Wookie.

Anime Rant.

Once the laughter died away from the previous panel, the 404s sat down to discuss the current status of anime. Anime is not a genre; it is a form of mass media, with many subdivisions.. There is a huge flood of anime washing into North America, and it is impossible to collect all of it. Like any other large field of

collectibles, people specialize. There are even such things as golfing anime, and about as exciting, but people buy it. The anime movies often don't make sense or have apparent plot holes because they are distilled down from thousands of pages of manga, much the same problem as a Hollywood movie based on a novel.

The 404s are members of Anime Alberta, which holds to respect for copyright. They will not discuss illegal Internet downloads in public, not even at a convention panel. An audience member who asked about such downloads was told to speak privately to a member after the panel.

Annual General Meeting.

The AGM of the Con-Version Society was held late Sunday afternoon. Most of it was details of no interest outside Calgary. Since Con-Version will yield next year to Westercon, the committee actually have a two-year lead time. One year is too short to plan properly these days, especially in a boomtown like Calgary. This was mentioned by a concom executive, who said that in recent times even a local convention now has to plan at least two years in advance to get good hotel and Guest of Honour bookings. This year's Author GoH at Con-Version was George R.R. Martin; he mentioned that he is booked as far ahead as 2008 for conventions and other events.

I find the same thing is true in the philatelic world. I am actively involved in the local stamp show CALTAPEX, for which much planning is not just the next show but the one after that. For example, Calgary will host the national show of the Royal Philatelic Society of Canada in 2006; three years before the event we were hard pressed to find suitable space to rent for the show.

The convention opened Friday night. I had a quick trip through the pre-registration lineup, so the new committee learned from last year and separated pre-registered from at-the-door. They still continued the time-honoured bad habit of conventions everywhere of sorting membership badges by number, not name. This delays the counter staff, who have to cross-reference from an alphabetical list to the badges. Alas, the names on the membership badges were about 12-point type, unreadable unless you were standing on the person's toes. This is why some of my panel reports do not mention panelist names, since they didn't use name cards and reading their badge was out of the question. Garth Spencer has written volumes of fanhistory about how each generation of SF fans refuses to learn from the previous generation, so I won't dwell on the point.

In the gripes session, there were some concerns. The convention ran out of programme books midway through the weekend, but this would only affect day-trippers,
not those who pre-registered.

One GoH never showed; Spider Robinson wound up in hospital the day before the convention with a serious intestinal problem, and the programme had to be hastily re-juggled only hours before the convention opened.

Overall, the convention seemed to go quite well to those such as I who were not involved behind the scenes. The major kerfluffles did not affect me (I never attend Spider Robinson events, for one) and the events I attended went well.

THE RINGS OF EARTH

by Dale Speirs

That Saturn has rings is something even the lumpenproletariat know, if only because they saw it in a Duck Dodgers cartoon or the opening credits of a Star Trek: TNG episode. In time, scientists have discovered other planets with rings. Until 1977, only Saturn was known to have rings, but since then Uranus and Jupiter ring systems were discovered [10]. Earth is known to have faint shrouds of dust particles, and in the last four decades gained a ring of artificial satellites and clouds of debris from launches and old satellites [18], but nothing like Saturn. The idea of Earth with large visible rings like Saturn is a very science fictional idea indeed.

The Formation Of Rings.

There are several methods by which rings can form around a planet. Earth has had rings in the geological past formed by dust and debris lofted into orbit from asteroid impacts. Another way that rings can form is when an asteroid or comet is drawn into Earth orbit and the orbit gradually decays until the object reaches the Roche limit, at which point it is broken apart by gravitational stresses.

The Roche limit is named after the French astronomer Edourd Albert Roche (1820-1883) who calculated that an object orbiting a planet would break apart from tidal stresses if it came too close. The actual limit varies with the object's size and density [13]. Small objects such as artificial satellites can orbit close in without problem but as size increases, so does the propensity to break up because of flexing by tidal forces. High-density objects can get in close, but low-density objects have to stay further out to avoid breakup. Rings can exist inside the Roche limit but not moons.

There are several forms of the Roche limit equation depending on how precise one wishes to be, but a good general equation [14]is:

Roche limit = (2.423*(Planet radius)*(Planet density))/Moon density

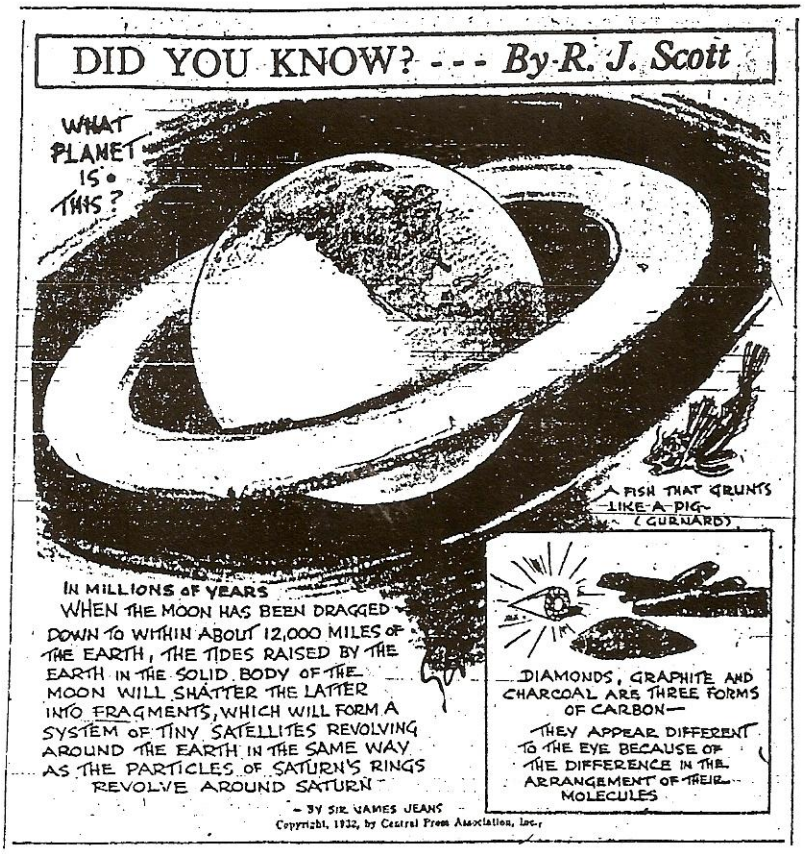

Figure 1: Ringed Earth from a Central Press feature [2].

Earth's density is 5.5, and the Moon's density is 3.34. Plugging these values into the equation shows that the Moon's Roche limit is 3.99 Earth radii. Any closer and it breaks up. The Moon is currently 60.27 radii from Earth, and it will take billions of years to get closer, so you can sleep easy.

The Ring Cycle.

When a British scientist named James Jeans mentioned in a 1931 book that the Moon would eventually break up and form rings circling the Earth, it caught the attention of the news media, and representations of such a sight appeared in newspapers around the world. The trigger to all this was Jeans book THE STARS IN THEIR COURSES [1].

Jeans postulated that the Moon is gradually orbiting closer to Earth, and millions of years from now will break apart when it gets too close. The tidal effects of gravity will be rough on both planets, but the Moon will take the brunt of it because it is the smaller body. It will break up first into a cloud of debris and dust surrounding the planet, but gravitational effects will quickly yank the cloud into a ring around the equator. The rings will reflect light and produce a spectacular view. The catch is that any survivors on Earth would be in bunkers to avoid the bombardment of lunar fragments, and would not be interested in the light show.

This last little bit was ignored by the news media, who played up instead long-range views of an Earth with rings. Over the next few years the idea was depicted in feature items. On 1932-06-08, a science-fact single-panel cartoon series titled "Did You Know?", syndicated by Central Press Association to newspapers, ran a sketch of a ringed Earth (Figure 1). The blurb explicitly cited Sir James Jeans as the source [2]. The NEW YORK TIMES ran its version of a ringed Earth on 1935-12-22 in its photo magazine supplement (Figure 2). Again, Sir James was listed as the authority [3].

Since then, research has provided a definite yes and no to Jeans hypothesis. While he was correct in some details, the more plausible scenario is different [9]. We know now Earth is transferring angular momentum to the Moon due to tidal forces. The lunar orbit is slowly being pushed out at an average of 4 cm per year.

Several billion years from now the Moon and Earth will be locked together in resonance and always facing each other. The month and the day will both be the same, 55 days long. One side of Earth will always have the Moon in the sky and the other hemisphere will never see it. But the Earth's rotation will begin to slow from solar tides, re-importing angular momentum from the Moon. It will gradually shrink its orbit back towards Earth, and in a few gigayears will fragment as it approaches the Roche

Figure 2: Ringed Earth from NEW YORK TIMES [3].

limit, at which point gravitational stresses break it apart. The cloud of debris will flatten into a gigantic ring system more spectacular than Saturn. Eventually the rings will shed all their load onto Earth's surface and the planet will grow.

Before then however, the human race will be long gone, hopefully to the stars. The Sun will be expanding and converting the inner planets into cinders, so lunar rings will remain a hypothetical disaster.

There Were Other Rings.

We know that Earth has been hit many times in the past by bolides, some of which were hard enough to eject debris from the impact out into space. The debris clouds settled into rings within a year, and the rings would last one to a few million years before dissipating. Ring systems are short-lived on the geological time scale. Saturn's rings will also dissipate within a few million years unless replenished by unfortunate asteroids or comets that stray too close.

Earth ring systems would have a definite effect on global climate. Because the Earth's axis is tilted, the rings would shade the poles during winter and in summer the rings would be edge on to the sun. The result would be colder winters but only slightly cooler summers [4].

The origin of the Moon appears to have created Earth's first set of rings, just as the death of the Moon would create the last. Alpha and omega. There is still some controversy about whether the Moon was captured by Earth or if it was spawned when a Mars-sized object collided with Earth. The latter view seems more likely since it requires fewer conditions and better suits Occam's razor [15].

An impact between proto-Earth early in its history and another object would have created a huge cloud of molten debris. This cloud was then pulled by gravity into an equatorial ring system. Because of the immense amount of impact debris, a few larger objects would grow by accretion in the rings and eventually coalesce into the Moon [8]. What is surprising is how little time would be required to form the Moon from the rings, about one month and no more than one year [16 and 17]. This contrasts with rings formed by smaller impacts such as asteroids, which would not have enough particles to form a moon and thus would eventually be sucked back down to Earth's surface by gravity and atmospheric drag.

The Moon in those days of many gigayears ago would be very close to the Earth, and tidal forces immense. This would lead to a transfer of angular momentum from Earth to Moon, and the

latter, being smaller, would begin drifting out into a farther orbit. As the Moon formed and evolved, the days on Earth began to lengthen, from 18 hours to our present 24 hours.

The K/T Impact.

The transition between the Cretaceous and Palaeocene periods about 65 megayears ago is most famous because of the disappearance of the dinosaurs. Current dogma is that the transition was hastened by a huge bolide impact that finished off the dinosaurs, who were already in decline. Other types of plant and animal life also vanished.

The impact was able to lift debris into near-Earth orbit and form a ring system. These rings lasted only about 40,000 years, based on a study of iridium distribution at the Cretaceous/Palaeocene boundary [11].

The Eocene.

About 34 to 35 megayears ago, at the end of the Eocene period, the climate suddenly cooled. There was a massive fall of tektites (glass globules arising from impact) sprinkled over the oceans. Some large craters, 85 to 100 km in diameter, were formed at the beginning of this transition. The conclusion of a number of authors (5 to 7) is that an asteroid impact lofted enough material into Earth orbit to form a short-lived ring system that cooled the Earth by its shade. The climate change only lasted about a megayear. This is too short to be caused by a change in the Earth axis but fits in with a short-lived ring system. When the rings dissipated, the climate returned to normal.

The Human Era.

As the Space Age shifted into second gear in the early 1960s, rocket scientists noticed peculiar and sudden orbital changes in the various satellites and rocket debris in orbit. For no apparent reason, individual satellites or spent boosters would suddenly have their orbits deflected by a small but noticeable amount. John Bagby studied the matter and came to the conclusion that the orbital changes were due to satellites crossing paths with a cloud of natural debris and moonlets [12]. These moonlets were in orbit at about 14,000 km and ranged in size from 7 metres to 30 metres. They perturbed the satellites by gravitational influence and by electrostatic field disturbance. Bagby calculated the moonlet orbits back to their origin and determined that they all merged on December 18, 1955. In other words, on that date a much larger moonlet, probably a captured asteroid, touched its Roche limit and broke apart due to gravitational stresses. The object wasn't big enough to produce a ring, but this demonstrates that the possibility of rings in our time is not as remote as one might think.

Humans have, of course, produced their own artificial ring of satellites and junk around the equator. Left to itself, with no additions, this ring would quickly dissipate in a few centuries.

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