## Feline Mewsings \#44




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## * Editorial / Introduction

My fruit trees seem to be doing well so far, though I'm still waiting for leaves to appear on the persimmon trees. Both loquat trees are starting to branch at the top. I didn't have the same luck with the cacti and succulents I bought. I've lost most of the ones I put in the ground due to the number of cold nights this winter. Some of my potted plants also did not fare well, some being eaten by some critter, possibly the antelope squirrel featured a couple of issues back.

Fluffy continues somewhat well. His left eye is effectively gone. It's totally useless and atrophying. His chemotherapy continues, and I won't know until after this issue is in the mail whether a change in treatment will be made. He has been limping for the last ten days or so and has had some problems with diarrhoea.

My own much less serious health woes continue. I had a second course of cortisone injections in the hopes that treating arthritis between spinal joints would relieve the butt pain. It did not work. I'm to try a second course of physical therapy using some different techniques; the orthopaedist now thinks the pain may be a side effect of bursitis. I also had to have the third dental implant removed due to infection. It was replaced in mid-May. The infection there (upper jaw) may have spilled over into my sinuses; I had a sinus headache for about a month; fortunately it responded well to antihistamines and eventually went away. I'm dealing with stress problems caused at least in part by Fluffy's illness. My body has always had problems dealing with stress. A good soak in our Jacuzzi tub seems to have helped a lot. I have also been doing some exercises to alleviate tension problems.

In late February and early April, we had two more freezes. They were not bad episodes, but some of my poor plants were weakened by the previous ones and succumbed. I need to get some that are more cold hardy. I'm still learning a lot about gardening here. Information from Tucson is not generally reliable, since Tucson is mostly so much lower in elevation. I've discovered that the best populated area equivalent to Oracle is Sedona. We have friends there, so I may be consulting with them for gardening tips.

This zine is being done in Pages. As Roger Wells said back in disty 292, it is not easy to use. For this one, I just imported my Word document into Pages. This seems to be working well. When I have more time (ha ha), I need to find a tutorial. Apple's short training videos are useless. There are many similarities to Publisher, which I used many years ago.

## * Local Outings

Otello: This Verdi opera was presented in early March by the Arizona Opera Company. Neither this opera nor the Shakespeare play it's based on has ever been among my favourites, but I quite enjoyed this performance. This is quite a tribute from me, since I was very upset about parking problems we had. The performers were Allan Glassman (Otello), Jennifer Black (Desdemona), Todd Thomas (Iago), Jason Karn (Cassio), Stephanie Foley Davis (Emilia), Cameron Schutza (Roderigo), Jeremy Milner (Locovico), and Kevin Wetzel (Montano and Herald).

Lost in Yonkers: The Arizona Theatre Company presented this well-known Neil Simon play in March. I'd seen another stage version done by the Colony Theatre in Burbank and the movie version. I thought this one was superior to both of those. The acting was excellent and received a well-deserved standing ovation. The actors were Ryan DeLuca (Jay), Maxx Carlisle-King (Arty), Spencer Rowe (Eddie), Kate Goehring (Bella), Judy Kaye (Grandma Kurnitz), Preston Maybank (Louie), and Kerry McCue (Gert).

The Abduction from the Seraglio: The Arizona Opera Company ended the 2010-11 season with this Mozart comedy. The sets were very nice. The dialogues were spoken in English and the songs were done in German with supertitles. It was an excellent production that deserved the standing ovation it received. The performers were Caitlin Lynch (Konstanze), Sarah Callinan (Blonde), Jonathan Boyd (Belmonte), Tracy Wise (Pedrillo), Andrew Funk (Osmin), and Peter Strummer (Pasha Selim). I particular enjoyed Caitlin Lynch's singing.

The Mystery of Irma Vep: This marvellous sendup was the final production of the Arizona Theatre Company's 2010-11 season. Sendup may not be absolutely accurate. I just don't know a better word. The play reminds me of The Phantom of the Paradise and The Rocky Horror Picture Show except without music (mostly). Written by Charles Ludlam, a proponent of the theatre of the ridiculous, it parodies many literary and cinematic works and makes many passing references to many others. To begin with the story is largely a parody of Rebecca. The story is set at Mandacrest. Lady Enid Hillcrest is the second wife of Lord Edgar Hillcrest. The housekeeper, Jane Twisden, is partial to the former Lady Hillcrest, Irma Vep. She advises Enid to wear a certain dress, and Enid discovers that Lord Hillcrest abhors the dress that was previously worn by Irma Vep. Other very obvious references are to "The Hound of the Baskervilles", Dracula, Wuthering Heights, Jane Eyre, various Mummy and werewolf stories, voodoo, Shakespeare, Phantom of the Opera, Poe's "The Raven", Oscar Wilde, Anthony Trollope, and even Star Wars. All this is done on an excellent set designed by Drew Boughton by only two actors, Bob Sorenson and Oliver Wadsworth. The costume changes are so quick as to be almost unbelievable. The two actors play seven different characters. It was a hilariously entertaining production and deserved the standing ovation we gave it.


Message from Amy: For the foreseeable future, "Amy's Motley Media Musings" will resurrect all the reviews in my files in alphabetical order, for they are not readily found anywhere else any more. I hope these will contain some interesting perspectives to amuse and enlighten on various genre and popular culture offerings in the past several years-opinions from a curious, feminist, inquiring, and, I'd like to think, culturally educated, mind. I hope Feline Mewsings readers find what I have to say worthwhile. Thank you very much for your attention.

Boneyard: Volume 1 written and illustrated by Richard Moore. NBM Publishing, Inc., NY, July 2002, \$12.95, trade paperback, ISBN\#: 1-56163-316-X. www.nbmpublishing.com http://www.geocities.com/farwestfans/

Up and coming American comics creator Richard Moore, already well-known for his mixed genre fantasy series Far West (for mature readers 18 or over), adds further lustre to his reputation with the launch of another continuing sequence of fantastical stories for all ages in the graphic novel Boneyard: Volume 1, which contains the first four episodes. This extra-large ( 9 " x 12"), 96 -page trade paperback (soon to be reprinted in standard size), offers ample space to appreciate Moore's excellent black and white artwork printed on heavy stock, high quality paper.

Cleverly mixing darkly supernatural elements with humour, Boneyard, set somewhere in the heartland of the United States, concerns Michael Paris, a young man who has just inherited a plot of land in the remote town of Raven Hollow. Upon arriving Michael observes that the settlement appears to be shaded by an oddly permanent cloud cover, and then he discovers that his grandfather has bequeathed him a cemetery and a haunted one no less. The gravesite inhabitants consist of quite a lively bunch of weird beings that would be very much at home in any Halloween scenario.

The townspeople, heavily influenced by Mayor Wormwood, and believing it and its spooky-looking denizens accursed, find the graveyard anathema and want it destroyed. Paris, willing to consider both sides of the story, makes the acquaintance of the dwellers in his boneyard, only to discover that beneath their seemingly frightening or otherwise outre exteriors, they really aren't that bad at all, rather preferable in fact to the rigidly antagonistic and hateful attitudes of the villagers, especially their leader.

The reader, along with the protagonist, quickly grows to sympathize with and eventually to ally with the cemetery's colourful crew, most notably Abbey, the gorgeous, smart and feisty vampire babe; Leon and Boris, the very animated guardian gargoyles of the gate; Ralph, the imposing-looking but genial werewolf;

Sid, the sarcastic, cigar-chomping skeleton; Mr. Vincent, the ghoul, and his eternally embalmed "practice corpse" sporting Victorian-era style suit and top hat; Edgar, the very articulate, bespectacled raven; Nightcrawler, the giant sentient worm with six pairs of eyes needing three pairs of glasses; Hildy, the archetypal, complete with perpetually bubbling cauldron, witchy crone constantly quarrelling with Glump, the demon who wants to use her cooking vessel for a hot tub; and a truly odd couple,the hulking Frankenstein-like Brutus married to the flirtatious, strangely attractive Nessie, a friendly, female version of the Creature from the Black Lagoon!

The story arc of Boneyard: Volume 1 involves Paris's growing affection for the entities living in his inherited plot, an attitude enhanced when Raven Hollow's sheriff and mayor make blatant attacks on Abbey. This compels Paris to take a decisive stance as events build to a crisis and the true nature of the mayor as the Adversary gets revealed. This only begins to set the stage for the long-term continuing struggle to come in subsequent episodes of the tale.

Describing Boneyard in this manner shouldn't spoil the utter enjoyment the reader will experience with the story, the characters, and the artwork. Richard Moore's delightful blend of wacky, frequently satirical, wit with dark fantasy, genuine suspense and thrills and his skill at creating colourful yet compelling characters, whether they be the protagonists or the formidable antagonists, makes this graphic fiction series a treat. Moore's visuals, rendered in highly detailed yet very clearly defined, sharply contrasting black and white inks, dazzle the eye with their vibrant energy, superb compositional flow across the panels, and the artist's ingenious ability to communicate cartoony humour and suspense simultaneously. Boneyard offers refreshingly quirky entertainment, along with comically exciting plotting that contains some thoughtful subtexts concerning tolerance of personal, cultural, and spiritual differences while also examining the nature of good and evil and the recognition of same. Do come and visit the Boneyard and discover why you'll want to stay there for a very long time!
-- Amy Harlib


# MYSTERY OF MYSTERIES: PRIME NUMBERS by Jonathan Vos Post, former Adjunct Professor of Mathematics at Woodbury University 

## 1. Introduction: the mind will never penetrate

The great Leonhard Euler (born 15 April 1707 in Basel, Switzerland, died 18 Sept 1783 in St Petersburg, Russia) commented, "Mathematicians have tried in vain to this day to discover some order in the sequence of prime numbers, and we have reason to believe that it is a mystery into which the mind will never penetrate" (Havil 2003, p.163).

Yet I have, for the past two weeks, been teaching prime numbers in depth to roughly one hundred twenty impoverished Mexican-American students at Olive Vista Middle School in Sylmar, California. Some of these students have been failing math classes for years. If they "get it", then so can any human being of average intelligence if it is presented in an interesting way. No actual students were killed or injured in the making of this article.

[^0]In a 1975 lecture, D. Zagier commented, "There are two facts about the distribution of prime numbers of which I hope
to convince you so overwhelmingly that they will be permanently engraved in your hearts. The first is that, despite their simple definition and role as the building blocks of the natural numbers, the prime numbers grow like weeds among the natural numbers, seeming to obey no other law than that of chance, and nobody can predict where the next one will sprout. The second fact is even more astonishing, for it states just the opposite: that the prime numbers exhibit stunning regularity, that there are laws governing their behaviour, and that they obey these laws with almost military precision" (Havil 2003, p. 171).

So what is this "mystery into which the mind will never penetrate", these "building blocks of the natural numbers", that "grow like weeds"? Are they the basis of billions of dollars of computer security? Are they a key for communicating with extraterrestrial civilizations? Let's find out!

## 2. Definition: my father was wrong

My father was a famous science fiction book editor whom I miss very much. But in one case, he was wrong. The only math publication that my father ever authored was a letter to the editor of a Rhode Island newspaper, the same one to which H. P. Lovecraft had contributed an astronomy column, ironic given that my father published H. P. Lovecraft, saying that one was a prime number and why. To explain why he was wrong, though not in a naïve way, I shall begin with a definition. Later, we will tweak and edit that definition, when you are motivated to see why.

My Caltech co-alumnus Dr. Eric W. Weisstein, editor of the great MathWorld online encyclopaedia, puts it this way: A prime number (or prime integer, often simply called a "prime" for short) is a positive integer P, greater than 1 , that has no positive integer divisors other than 1 and itself.

More concisely, a prime number P is a positive integer having exactly one positive divisor other than 1 . For example, the only divisors of 13 are 1 and 13 , making 13 a prime number, while the number 24 has divisors $1,2,3,4,6,8,12$, and 24 (corresponding to the factorization $24=23 \times 3$ ), making 24 not a prime number.

Positive integers other than 1 which are not prime are called composite numbers.
Prime numbers are therefore numbers that cannot be factored or, more precisely, are numbers N whose divisors are trivial and given by exactly 1 and N .

So I could say that my father was wrong by definition.
The number 1 is a special case which is considered neither prime nor composite (Wells 1986, p.31). Although the number 1 used to be considered a prime (Goldbach 1742; Lehmer 1909, 1914; Hardy and Wright 1979, p.11; Gardner 1984, pp.86-87; Sloane and Plouffe 1995, p.33; Hardy 1999, p.46), it requires special treatment in so many definitions and applications involving primes greater than or equal to 2 that it is usually placed into a class of its own.

A good reason not to call 1 a prime number is that if 1 were prime, then the statement of the fundamental theorem of arithmetic (I'll get back to that later) would have to be modified since "in exactly one way" would be false because any $\mathrm{N}=\mathrm{N} \times 1$. In other words, unique factorization into a product of primes would fail if the primes included 1.

A slightly less illuminating but mathematically correct reason is noted by Tietze (1965, p.2), who states, "Why is the number 1 made an exception? This is a problem that schoolboys often argue about, but since it is a question of definition, it is not arguable." As more simply noted by Derbyshire (2004, p.33), "2 pays its way [as a prime] on balance; 1 doesn't."

With 1 excluded, the smallest prime is therefore 2 . However since 2 is the only even prime (which, ironically, in some sense makes it the "oddest" prime), it is also somewhat special; and the set of all primes excluding 2 is therefore called the "odd primes". Note also that while 2 is considered a prime today, at one time it was not (Tietze 1965, p.18; Tropfke 1921, p.96).

One needs to consider the Fundamental Theorem of Arithmetic: "Every positive integer can be written as a product of powers of primes in exactly one way" ...

Calling 1 a prime would make it untrue since then we could write $6=1^{*} 2^{*} 3$ or $6=12^{*} 3$ or $6=1^{*} 1^{*} 1^{*} 1^{*} 2^{*} 3$ or...
Let me flash back to the amazing man Euler, a character I could never have invented in my science fiction. By 1740 Euler had a very high reputation, having won the Grand Prize of the Paris Academy in 1738 and 1740 . On both occasions he shared the first prize with others. Euler's reputation was to bring an offer to go to Berlin, but at first he preferred to remain in St. Petersburg. However political turmoil in Russia made the position of foreigners particularly difficult and contributed to Euler changing his mind. Accepting an improved offer Euler, at the invitation of Frederick the Great, went to Berlin where an Academy of Science was planned to replace the Society of Sciences. He left St. Petersburg on 19 June 1741, arriving in Berlin on 25 July. In a letter to a friend Euler wrote:- "I can do just
what I wish [in my research] ... The king calls me his professor, and I think I am the happiest man in the world."

## 3. War Between the Numbers

In my short story , "War Between the Numbers", I show the readers why 1 is the most powerful character.
Once upon a time, not twice upon a time, there was war between the numbers.
We are not sure exactly how it started or which number fired the first shot. We think that there were two numbers very close together, like 97 and 98, that got into a heated argument. They yelled so loudly at each other that soon other numbers rallied around one side and around the other. Soon there were two sets of numbers in quarrel. Uneasiness spread up and down the number line until all but very very big numbers knew that something had disturbed the harmony of natural order.

This is very important, you understand. For numbers are the very foundation of the world. Without numbers there would be no Earth, and we would have no place to live. Without numbers, there would be no Sun, no stars, and freezing darkness would embrace the universe. All life would die.

Because all numbers share this honour of upholding the cosmos, they had never fought before. It is true, of course, before time began, that letters and numbers were once the same things. After that was sorted out, there was protracted negotiation between the numbers and the letters as to who would be responsible for what, and who was to go first, who second, and so on. We all know the story of how 1 led the rest of the numbers, Aleph was the first letter, and modest Beth came second of all the letters. But this story is only about the numbers.

At first as allies gathered for the first two dissenting numbers, it seemed that this might be a mighty struggle between the even numbers and the odd numbers. 4, 6, 8, and 10 glared at $3,5,7$, and 9 , who glared right back. This threatened to divide the numbers exactly in half, alternating on one side or the other, all the way up the line.

But mighty 2 spoke out clearly, his voice as close and vital as a heartbeat, "This fight must end! There shall be no squabble between the even numbers and the odd numbers. For that is merely a disagreement about who is closest to me. Every even number is in my double image. 4, you are like unto 2 of me. 6, you are the double of 3. 8, you are the double of 4. 10, you are the double of $5 . "$

And thus spake also 2: "Every odd number stands hand-in-hand with an even number on each side. 3, you stand beside me and also beside 4. 5, you stand beside 4 and also beside 6. 7, you stand beside 6 and also beside 8. 9, you stand beside 8 and also beside 10. Even and odd, like left and right, like up and down, like black and white, like hot and cold, are incomplete without the other. By standing beside each other, in friendship and in trust, there are no gaps among us and we cannot be broken."

The tumult calmed, but in the almost silence came a sneering voice, "Two-faced 2 speaks with a forked tongue!"
"Who said that?" demanded 2. There was an embarrassed shuffling of feet, but nobody confessed....

## 4. The first few Primes

The first few primes are $2,3,5,7,11,13,17,19,23,29,31,37, \ldots$ (Sloane's Aoooo40; Hardy and Wright 1979, p. 3).
"Sloane's Aoooo4o" is a citation into Dr. Neil J. A. Sloane's On-Line Encyclopedia of Integer Sequences (OEIS), which is a database of over 180,000 web pages with sequences of whole numbers, cross referenced, searchable by a special search engine, and citing to other sources on the web, in journals, and in books. As of this morning, I have made 2,852 contributions to the OEIS, which this year was handed over from Dr. Neil J. A. Sloane, who had run it via a large set of associate editors as it migrated from index cards to book to web site hosted by Bell Labs, to one hosted by AT \& T Research Labs, and is now run by a foundation as a wiki.

A mnemonic for remembering the first seven primes is: "In the early morning, astronomers spiritualized nonmathematicians" (G. L. Honaker, Jr., pers. comm., 4 Aug 2005). The first word has 2 letters, the second word has 3 letters, the third word has 5 letters, the fourth word has 7 letters, the fifth word has 11 letters, the sixth word has 13 letters.

In the novel The Curious Incident of the Dog in the Night-Time (Haddon 2003), the protagonist, Christopher, amusingly numbers the chapters using the prime numbers instead of the (much) more traditional positive integers.

One can say more about each of these early primes in the sequence. Here are a few of the many examples, adapted from the Prime Curios web site which, as of this morning, has 10,266 "Prime Curios" compiled by the two university editors from 881 submitters. I am, as of this morning, the \#2 submitter in the world, with 533 contributions. The
king of the Prime Curios is Shyam Sunder Gupta with 606. He heads the railroads in a state of India and spends much of his free time inventing new facts (some fascinating, some trivial, but who am I to judge?) about prime numbers.

2: The Pythagoreans considered 2 to be the first "feminine" number. UCLA mathematician and prime number researcher Terence Tao taught himself arithmetic at age two. A child prodigy, he was the youngest ever professor at UCLA and runs a must-read blog, "What's New", which he describes as "Updates on my research and expository papers, discussion of open problems, and other maths-related topics by Terence Tao". There are two books of the King James version of the Bible that end in a question mark: the books of Jonah and Nahum. As noted by Brower, "Mars is the only known planet to have two natural satellites." Which, I can't help but recall, was predicted as science fiction in Gulliver's Travels, originally entitled Travels into Several Remote Nations of the World in Four Parts ... by Lemuel Gulliver (1726), in which reference is made to two (then undiscovered) moons of Mars. The astronomers on the flying island of Laputia, says Gulliver, have "... discovered two lesser stars, or satellites, which revolve around Mars, whereof the innermost is distant from the centre of the primary exactly three of his diameters, and the outermost five: the former revolves in the space of ten hours, and the latter in twenty-one and a half."

When the two Martian moons, Phobos and Deimos, were eventually found by Asaph Hall at the US Naval Observatory, their orbits proved to be quite similar to those described in Swift's novel. Phobos is actually 6,000 km from the surface of Mars and revolves around Mars in 7.7 hours, whereas Swift gave the values $13,600 \mathrm{~km}$ and 10 hours, respectively. Deimos averages $20,100 \mathrm{~km}$ from Mars and orbits in 30.3 hours; Swift gives 27,200 km and 21.5 hours, respectively.

As the Internet Encyclopedia of Science puts it, an on-line A-to-Z of science maintained by astronomer/author David Darling: "Some cult literature has sprung up specifically to address how Swift could have 'known' about the Martian moons and has arrived at some spectacular solutions, including the remarkable one that Swift himself was a Martian! In fact, the idea that Mars might have two satellites goes back to Johannes Kepler..."

Anyone with an IQ in the top 2 percent of the population can join Mensa, as my late friend Dr. Isaac Asimov had. He still enjoyed his Mensa meetings, up to the year of his death.

3: This is the first odd prime number. The Pythagoreans considered 3 to be the first "masculine" number. Captain Kirk and Science Officer Spock played chess three times on the television series Star Trek. Kirk won every game. The only state capital containing three words is Salt Lake City. The "Three-fold Law" is a common tenet held by some Wiccans stating that both the good and the evil that one creates in the world come back to benefit or hurt them, magnified three times over. This is not to be confused with the law of proportions, called "Rule of Three'" by the Indian mathematician Brahmagupta (598-668), which became a standard of rational thought. For example, Abraham Lincoln wrote that as a young man he "could read, write, and cipher to the Rule of Three." Charles Darwin wrote, "I have no faith in anything short of actual measurement and the Rule of Three." Perhaps less known is the fact that Abraham Lincoln and Charles Darwin were born on the exact same day (12 February 1809).

Speaking of the great Brahmagupta, Lekraj Beedassy, who ranks \#3 in the world of Prime Curios after Gupta and myself, with 485 to his credit, says: "According to Hindu scriptures, the universe is a 3 -world-cosmology abode called 'Triloka' that comprises the perceptible Physical world along with the subtler realms of the Celestial and the Nether worlds."

Octopuses have three hearts. There are three sets of chromosomes in the mosquito. Jinsuk comments: "The threetoed sloth reaches sexual maturity at about three years of age." Amarnath Murthy, who has 86 prime curios to his credit, points out that: " 3 is the only prime sandwiched between a prime and a composite number." That is to say, 3 has the prime 2 immediately less than it, and the composite $4=2 \times 2$ immediately greater than it. Every greater prime has composite numbers as its immediate neighbours. Can you see why?

And, harkening back to our two-part article in Feline Mewsings about Alicia Boole Stott and the fourth dimension, in the fifth and all higher dimensions, there are only three regular polytopes. There is something curious in our having only three dimensions of space, and living on the "Third Rock from the Sun."

5: As we recall from that same article on Alicia Boole Stott and the fourth dimension, there are five platonic solids (convex regular polyhedra). 5 is provably the only prime that is a member of two pairs of twin primes. I'll come back to "twin primes" later. The mineral apatite is 5 on the Mohs hardness scale. A limerick is a light humorous or nonsensical verse of five lines that usually has the rhyme scheme aabba.

Rachlin reminds us that five is the fewest number of moves for pawn promotion to occur in chess. Patterson, ranking \#7 with 358 Prime Curios adds: " 5 is the smallest number of queens needed to attack every square on a standard chess board." Russell writes: "The word prime contains five letters." Pooh Sung, ranking \#19 in Prime Curios, with 115 curios says that the USA, the UK, France, China, and Russia are the five permanent members of the UN Security Council. We all know that there are five vowels in the English language: a, e, i, o and u. But Bown asks: "Is 'abstemious' the only English word which uses all five vowels just once in alphabetical order and contains the same

## number of consonants?"

An ace is a military aircraft pilot who has destroyed five or more enemy aircraft. The element boron, so important in moderating slow neutrons and thus added to the seawater used to stop those nuclear reactors in Japan from total meltdown after the killer quake and tsunami of 2011, has five letters and five protons in its atomic nucleus. Every type of true worm has five hearts to pump blood through its long body. Some giraffe species have five horns on their heads.

I gave several Prime Curios about 5, which will later lead us to look at different special kinds of primes:
5 is the first centred square prime number. [Post]
5 is the first prime Apéry number. [Post]
5 is the smallest prime numerator of a Bernoulli number. [Post]
Adams was the first with a prime number of letters in his last name among the presidents of the United States of America. Obama is the most recent. [Post]

The American 5-cent piece, called a "nickel", weighs 5.000 grams. It used to be made of nickel but is now mostly a copper alloy. The Canadian 5-cent piece is still made of the element nickel; because Canada has the largest nickel mine in the world, in Sudbury. They are, in fact, mining a small asteroid that crashed to Earth aeons ago.

7: Gupta writes: "There are seven letters in Tuesday, which is the only day of the week whose name contains a prime number of letters." Beedassy jokes that "Seven is the only odd prime that becomes 'even' by deleting a letter." The Seven Bridges of Königsberg is a famous solved mathematics problem inspired by an actual situation and place (now called Kaliningrad, Russia), as I expounded on at great length in my still unpublished science fiction novel Fermi's Oracle. If you turn a U.S. one-dollar bill upside down and place your thumb over the eagle's head, the shield becomes the Menorah, or the seven candlesticks of Israel. There are seven indeterminate forms involving 0,1 , and infinity, where a mathematical expression can also be said to be indeterminate if it is not definitively or precisely determined:
o/o
o x Infinity
Infinity / Infinity
Infinity - Infinity
$o$ to the power of 0 .
Infinity to the power of $o$.
1 to the power of Infinity
But I choose not to digress into calculus, where we learn that certain forms of limits are said to be indeterminate when merely knowing the limiting behaviour of individual parts of the expression is not sufficient actually to determine the overall limit.

The Clay Mathematics Institute announced in May 2000 a prize of $\$ 1,000,000$ for each of the seven unsolved Millennium Prize Problems. The Poincaré conjecture (essentially the first deep conjecture ever made in topology) has been the only Millennium problem solved thus far.

André Gustavo Gevisier, ranked \#49 in Prime Curios, writes: "The 'Tractatus Logico-Philosophicus' of Ludwig Wittgenstein brings seven groups of aphorisms. The seventh group brings only one (a very curious one): Wovon man nicht sprechen kann, darüber muss man schweigen (About what one cannot speak, one must keep silent)."

Grenville Croll, ranked \#35 with forty curios about thirty-two different numbers, says that there are "seven deadly sins" used in early Christian teachings to educate and protect followers from basic human instincts (pride, envy, gluttony, lust, anger, avarice, and sloth). On the bright side, the seven heavenly virtues are prudence, temperance, justice, fortitude, charity, hope and faith. 7 is the number of rank and good ears of corn that came up upon one stalk in Pharaoh's second dream (Genesis 41:5). There were seven rings of power for the dwarf-lords in the stories of J.R.R. Tolkien.

I worked as Mission Planning Engineer at JPL for the Voyager fly-by of Uranus and was specially tasked with a new approach to imaging, used for Miranda. Uranus's moon Miranda (as viewed from space) has a " 7 " embedded in the middle of a rectangular corona that appears to have been formed by viscous icy lavas. Uranus is the seventh planet from the Sun.

7 is the smallest Woodall prime, and the smallest cuban prime. The name has nothing to do with Cuba the country. 7 is the smallest Carol prime. We will return later to such specially named kinds of primes.

Tait showed that seven is the number of distinct "prime knots" containing seven crossings. Alas, much as I love knot theory, it would take us too far off-topic fully to explain prime knots, other than to quote Weisstein:
"A knot is called prime if, for any decomposition as a connected sum, one of the factors is unknotted (Livingston 1993,
pp. 5 and 78). A knot which is not prime is called a composite knot. It is often possible to combine two prime knots to create two different composite knots, depending on the orientation of the two. Schubert (1949) showed that every knot can be uniquely decomposed (up to the order in which the decomposition is performed) as a knot sum of prime knots. In general it is nontrivial to determine if a given knot is prime or composite (Hoste et al. 1998). There is no known formula for giving the number of distinct prime knots as a function of the number of crossings."

Atop the Statue of Liberty there are seven spikes, representing the seven seas. Seven of the major planets in our solar system have natural satellites.

There are seven hidden dimensions in 11-dimensional supergravity, which is the "low energy approximation" to M theory, which also has seven hidden dimensions. Again glancing at higher dimensions, the first known exotic differentiable structure was a 7 -dimensional hypersphere. It was found by Milnor (1956) using the calculus of octonions. I am fascinated by these exotic differentiable structures and have used them in science fiction, but they take us too far from our topic.

I'll give just five of my own Prime Curios about 7.

* 7 is a double Mersenne prime.
* 7 is the first centred hexagonal prime.
* 7 is the smallest prime whose reciprocal has semiprime period length. Maybe I'll get to semiprimes later.
* Although baseball's first World Series, in 1903, was an 8-game series, as was 1912, 1919, and 1921, it has ever since been a best-of-seven-game series.
* The sum of seven consecutive primes beginning with 7 is seven times the seventh prime.

11: The only palindromic prime with an even number of digits due to the fact that all palindromes with an even number of digits are divisible by 11. Aibohphobia (the fear of palindromes) is palindromic itself and contains eleven letters. The secret formula for Kentucky Fried Chicken includes eleven herbs and spices. 11 is the first repunit prime. The term repunit (coined by A. H. Beiler in 1966) comes from the words repeated and unit, so repunits are positive integers in which every digit is 1 . The repunit 11111111111 (which has eleven ones) has only two prime factors: 21649 x 513239. A number such as this, with exactly two prime factors, is called a semiprime.

Sunspot activities seem to follow an 11-year cycle. "Elevenses" is a British and colonial meal that is similar to afternoon tea but eaten around 11 o'clock in the morning.

Enoch Haga, ranked \#30 with 65 Prime Curios, says that seven is the number of cards, including the Significator (the focus card), typically used in a Tarot reading. The works of Charles Babbage, published in London by Pickering and Chatto Publishers, is an 11-volume set.

Jud McCranie, ranked \#24 with 96 Prime Curios has four good ones: 11 Downing Street in London is the official residence of the Chancellor of the Exchequer. The badge number of Napoleon Solo in the TV show The Man From U.N.C.L.E. is 11. A pack of Life Savers candy contains eleven pieces. The rock group Spinal Tap has amplifiers that "go to 11 ".

But speaking of movies, Ocean's Eleven (2001) is a film with George Clooney and Brad Pitt. This film won three awards and had seventeen nominations ( 3 and 17 are prime also). I wish that more attention was given to the original film of which the 2001 version was a remake. Ocean's 11 was a 1960 heist film directed by Lewis Milestone and starring five (a prime number) of the Rat Packers: Peter Lawford, Frank Sinatra, Dean Martin, Sammy Davis, Jr., and Joey Bishop. Centred on a series of Las Vegas casino robberies, other stars included Angie Dickinson, Cesar Romero, Richard Conte, Akim Tamiroff, Henry Silva, Ilka Chase, Norman Fell, Harry Wilson, and Buddy Lester, as well as cameo appearances by Shirley MacLaine, Red Skelton, and George Raft. I wish that this was more widely known; because living legend George Clayton Johnson co-authored the original story, with Jack Golden Russell, that was adapted to the screenplay by Harry Brown \& Charles Lederer, plus an uncredited sweetening by Billy Wilder. In a world run by fans, George Clayton Johnson would be as famous as George Clooney.

The name for the now dwarf planet Pluto (discovered by Clyde W. Tombaugh in 1930) was proposed by 11-year-old Venetia Burney of Oxford, England. She is now a retired teacher whose married name is Venetia Phair. Joseph-Louis Lagrange (1736--1813) is widely regarded as the finest mathematician of the 18th century. He was the first-born of eleven children.

13: A "baker's dozen" is a group of thirteen. Its origin can be traced to a former custom of bakers to add an extra roll as a safeguard against the possibility of twelve weighing light. There are thirteen cards of each suit in a deck of playing cards. There are thirteen tricks in each hand of bridge. The dice game Yahtzee consists of thirteen rounds. The olive branch on the back of a U.S. one-dollar bill has thirteen leaves (and Prime Curios fails to mention, thirteen olives). Why? Because the United States flag once had thirteen stars and thirteen stripes, which represented the thirteen original colonies.

At most thirteen baseball players can be in play: nine fielders, three runners, and one batter. Beethoven's Sonata in C
minor "Pathetique" is Opus 13. The Beatles recorded thirteen albums during the time in which they were together as a group.

The Munsters, in the 1960 America television comedy, lived at 1313 Mockingbird Lane. Why? Because " 13 " scares some people. The fear of the number 13 is called triskaidekaphobia. A coven usually consists of thirteen witches. The fear of Friday the 13th can be traced back to the suppression of the Templars and the confiscation of their property by Philip IV of France on Friday the 13th in October 1307. The Jewish sage Moses Maimonides established thirteen principles of the Jewish faith during the Middle Ages. The longest name of a book of the KJV Bible is Thessalonians with thirteen letters.

There are thirteen Archimedean solids; my geometry students build some of these in class, from paper and glue. The smallest, emirp: a number that is prime and the same digits backwards make a different prime. 13 is an emirp because it is prime, and Reverse $(13)=31$ is prime. Can you figure out the next emirp?

The 13th of May 2011 will be a "double Friday the 13th," i.e., the sum of the digits of $5 / 13 / 2011$ equals 13 . The next time this will happen in a prime year is $1 / 13 / 2141$.

13 has lots of TV and movie references. PG-13 is a movie rating that admits all ages but suggests parental guidance of children under age 13. Friday the 13th is a franchise that consists of several movies, a television show, novels, comic books, and related merchandise. In the Walt Disney movie The Computer Wore Tennis Shoes, Dexter Reilly is asked to raise 13 to the 9 th power (and then take the square root of this). Cosmos by Carl Sagan was originally a 13-part television series. Alfred Hitchcock's directorial debut was the film Number 13, which was never completed. Oprah Winfrey ran away from home at the age of thirteen and was sent to a juvenile detention home, only to be denied admission because all the beds were filled.

My wife and I love the movie Apollo 13, one of the few non-science fiction movies with a science friction feel and that exalt engineers. Apollo Lunar Mission number 13, which was aborted while en route to the Moon because of an explosion of a fuel cell in the service module, left the launch pad at $13: 13$ (CST) hours military time and the accident occurred on 13 April.

I contributed this one: Mice have only thirteen pairs of ribs.
Euclid (circa 300 B.C.) and Diophantus (circa 300 A.D.) each composed thirteen books. Ah, Euclid. That reminds me. He was the first person we know who proved that there are an infinite number of primes.

The below is adapted from a web page by Susan Stepney, Professor of Computer Science, University of York, United Kingdom.

Euclid's proof that there are an infinite number of primes (by reductio ad absurdum):
Assume there are a finite number, $n$, of primes, the largest being $p \_n$.
Consider the number that is the product of these, plus one: $\mathrm{N}=\mathrm{p} \_1^{*} \mathrm{p} \_2^{*} \mathrm{p} \_3^{*} \ldots \ldots{ }^{*} \mathrm{p} \_\mathrm{n}+1$. I'm using an asterisk (*) for the multiplication sign, so as not to confuse the letter x with the usual multiplication sign).

By construction, $N$ is not divisible by any of the $p \_i$ (Think this through. If a whole number $K$ is divisible by a whole number J greater than 2, we can be $100 \%$ sure that $\mathrm{K}+1$ is not divisible by that whole number J greater than 2).

Hence N is either prime itself, or divisible by another prime greater than $\mathrm{p} \_\mathrm{n}$, contradicting the assumption.
Q.E.D.

For example:
$2+1=3$ is prime
$2^{*} 3+1=7$ is prime
$2^{*} 3^{*} 5+1=31$ is prime
$2^{*} 3^{*} 5^{*} 7+1=211$ is prime
$2^{*} 3^{*} 5^{*} 7^{*} 11+1=2311$ is prime
$2^{*} 3^{*} 5^{*} 7^{*} 11^{*} 13+1=30031=59^{*} 509$
$2^{*} 3^{*} 5^{*} 7^{*} 11^{*} 13^{*} 17+1=510511=19^{*} 97^{*} 277$
$2^{*} 3^{*} 5^{*} 7^{*} 11^{*} 13^{*} 17^{*} 19+1=9699691=347^{*} 27953$
$2^{*} 3^{*} 5^{*} 7^{*} 11^{*} 13^{*} 17^{*} 19^{*} 23+1=223092871=317^{*} 703763$
$2^{*} 3^{*} 5^{*} 7^{*} 11^{*} 13^{*} 17^{*} 19^{*} 23^{*} 29+1=6469693231=331^{*} 571^{*} 34231$
$2^{*} 3^{*} 5^{*} 7^{*} 11^{*} 13^{*} 17^{*} 19^{*} 23^{*} 29^{*} 31+1=200560490131$, is prime
$2^{*} 3^{*} 5^{*} 7^{*} 11^{*} 13^{*} 17^{*} 19^{*} 23^{*} 29^{*} 31^{*} 37+1=7420738134811=181^{*} 60611^{*} 676421$
And so forth. Forever.
Isn't that amazing? There is no final prime, no last prime, no greatest prime. They keep on going, on to infinity. And Euclid published that about 2,500 years ago. We'll remember this simple proof a bit later, when we dabble in Twin

## * Yellowstone Trip

Saturday, 12 February 2011, we left home shortly after breakfast. We made a rest stop south of Phoenix. A badly disguised cell tower was spotted in Chandler. A better disguised one was seen by the airport.

About noon I ate the lunch I packed.


We reached Sedona about an hour later and stopped at a couple of view points before we reached the motel. For those of you unfamiliar with the place, it's south of Flagstaff. From our place north of Tucson, it took about four hours of driving mostly at highway speeds to reach. Sedona is famous for its red rock formations (see above), which abound in many places in the West. It's not large with a population of about 10,000 , but it's a tourist mecca. There are many hotels and restaurants. It straddles two counties, and half the city is inside the Coconinno National Forest. Many of its residents are artists, so there are many galleries and much street art.

After we checked in at the Matterhorn Inn and got set up in the room, we called some friends who live in town and drove to their place. We got the nickel tour and met their six Persian cats. After chatting for a while, they drove us to a nearby park for some views. Then we went to Picazzo's, a restaurant that featured gluten-free selections, including the pepperoni/sausage/ricotta pizza we had; there's now a Picazzo's in Tucson, and we're planning to try it out soon. Afterwards we went back to our friends' house for coffee and more conversation before returning to our motel.

I got up the following morning using my alarm, since I had to walk down the street to get breakfast, the motel not having a restaurant. I ate at the Wildflower Bread Company, a breakfast and brunch place. I noticed they have a Chihuly sculpture in their dining room. On the walk back to the motel, I noticed a lot of public art and took photos of the ones on my side of the street.

We left the Matterhorn Inn about o8:00. On our drive out of Sedona, we stopped at a viewpoint at Oak Creek Canyon; it was cold and windy. Outside Flagstaff we stopped for gas at a Mobil station.

A while later we stopped to take pictures when we went over the Colorado River at Marble Canyon. A while after that, we stopped near the border of Utah to take pictures of a beautiful panoramic view of Utah.

We stopped at a McDonald's in Kanab, Utah, to relieve and feed ourselves.


We returned to the hotel for dinner.

We reached the Best Western Ruby's Inn about 15:00. After we were settled into the room, we went to Bryce Canyon National Park. We had enough daylight hours left to hit the open viewpoints that were easy to reach. If you've never been there, it is a spectacular and very photogenic place with many interesting rock formations, many of them with a reddish tinge (see photo left). There was snow in the park, but the main road had been ploughed and most of the viewpoints. Ruby's Inn is itself a historic place. It's been there in some form since 1919. Today it's quite a large motel with many amenities.

Monday I had breakfast in the hotel shortly after the dining room opened.
We were checked out by 08:00. Mike filled up the car at the gas station next to the motel. Cold morning--about $18^{\circ} \mathrm{F}$.

I was so sleepy during the drive. I should have slept in this morning, and we didn't see any interesting places to stop on the way. When we reached our motel in Provo, they didn't have a room ready yet; so we went to a nearby Olive Garden for lunch; Olive Garden has a gluten-free menu.


After lunch we filled up the car in preparation for a long drive the next day. Then we returned to the
motel and checked in.
I spent the afternoon reading e-mail, taking a nap, and doing some Internet stuff.
Then we left to get dinner. This being Valentine's Day, there were long waits everywhere. We ended up at the Olive Garden again.

Tuesday I used the alarm to get up.
I had the free motel breakfast, which included ready-made omelettes with salsa filling and yogurt.
We were ready to check out about 07:45.
Right after we crossed into Montana, we made a rest stop. I bought Mike a Chapstick to replace the one that self-destructed (melted in the car). As we drove on, I noticed a number of wind farms.

We stopped outside Rock Springs to have lunch at a Village Inn. Afterwards we got gas for the car.
We reached our friend Charles's house about 15:30. His cat, Wendy, looks s bit like our Fluffy. Unfortunately she'd been losing weight, and a vet was running a blood panel. Since the trip, I've heard that Wendy is doing better.

After chatting about various and sundry things, we went out to get dinner at the Safari Room, a very nice restaurant at a nearby motel.

After we returned to Charles's place, he and I talked for a while after Mike retired.
I apparently set the alarm wrong for the following morning, but I got up anyway. Actually I slept only fitfully.

Charles joined us for breakfast at the Black Bear and picked up the tab. He also went to the Dinosaur Center museum (see photo bottom previous page) with us. In summer you can see the dig sites nearby. We returned to his place, packed up the car, and departed for Cody.

We reached Cody about 14:00.
I spent the afternoon reading e-mail.
For dinner we ate at the restaurant next to and owned by the motel.
It's pretty blustery Monday morning. I think the wind blew all night.
After I dressed I walked to the front building for the free breakfast.


Shortly thereafter we walked to the Buffalo Bill Historical Center not too far down the street and got there shortly before opening. We were able go in out of the wind before then.
The museum has five sections. The first one we went to was the part about Buffalo Bill (photo at left shows one of the exhibits). The exhibits are apparently changed frequently, and there was no room devoted to Oracle as had been reported to me by a fellow Oracle resident. Then we went to the natural history section. After that we had lunch, though Mike only had a cookie. We split up after that, because Mike was more interested in the firearms section than the art. I spent well over an hour in the art section. Then I went to the native American section. On the way there, I took some video and stills of birds and art outside the glassed in walkway. I rested and rehydrated myself before going to the firearms section. Mike was already finished looking at everything. The firearms section also contained some art. In the gift shop, the saleswoman had lived in LA and had been married at the Wayfarer's Chapel on the Palos Verdes Peninsula where we used to live--small world!

We left the place about a half hour before closing. After we returned to the motel, I recharged the iPhone somewhat.

We drove to the Wyoming Rib \& Chop House for dinner, not that far away but farther than I wanted to walk in the cold. Dinner was delicious. I had a delicious pork chop so big I couldn't finish it and a very decadent dessert made mostly of ice cream, whipped cream, pecans, and chocolate.

Friday I had the free motel breakfast.
Shortly thereafter we checked out of the motel, bought gas, and were on our way.
We made a rest stop somewhere in the middle of Montana.
About noon we stopped to get gas right after we got off the interstate. About that time I was hungry and ate leftover pork chop for lunch.

We reached Yellowstone early in the afternoon and were able to check in. When we went back down in order to go to the Mammoth Spring Terraces (see photo at right), we met our tour leader Ann Iijima and some of the other members of our party. This group tour was organized by Carleton College, my alma mater. We were also advised to get strap-on crampon things, so time was used up doing that. We spent much time at the springs, so we ran out of time to see the museum. Mammoth Springs is a hot springs formation. When we saw it, much of it was snow covered; but the hot water kept much of it clear of snow.


In early evening we had an intro meeting to introduce everyone. From there we went to the dining room for an international buffet, where the waitress was very helpful to me in pointing out what I could eat. The international buffet is an event that is attended by many locals as well as the tourists. There were Mexican, Mediterranean, and Japanese cuisines represented. Unfortunately I couldn't eat most of the Japanese cuisine because of soy sauce, the second ingredient of which is wheat. After that there were overview talks on photography and the history of Yellowstone.

I used my alarm to get up about o dark hundred on Saturday. We had a really early departure. We both woke up in the middle of the night when the radiator made a lot of clanking noises so didn't sleep as well as could be hoped.
As soon as Mike was dressed, he returned my food bag to the car. After I was dressed, we took our suitcases down to the pickup point for our ride to Old Faithful. Then we took everything else down, checked out, and got breakfast.
After breakfast we boarded a bus to take us to the snow coaches to take us to the Old Faithful site. Snow coaches are small buses that are on treads. They cannot travel very fast. We also made a few stops on the way, at least a couple of times because of bison blocking our way (see photo above, which also shows a vehicle somewhat similar to the one we rode). Our group was split up among three snow coaches. There were many animal sightings, including many bison, some coyotes and foxes, some bald eagles, and various other birds, including ravens, dippers, and a Clark's nutcracker.

We reached the Snow Lodge at Old Faithful about 13:00. We had to wait for Ann to arrive before we
could get our room keys. Our room here was very nice, especially compared to Mammoth Springs, which seemed Spartan by comparison.

Immediately after we got our luggage into our room, we went down to lunch. We had a few minutes before the after-lunch talk, so we scouted around a bit outside.

The after lunch talk was another photo talk (how to), and I don't think I'm going to be attending any more of those. After that we went to see Old Faithful erupt. Because of overcast it didn't look all that spectacular against the grey sky. We briefly went to the visitor centre but didn't have time to do much. Back at the Snow Lodge, we went to the gift shop and bought postcards, water, and a T shirt for Mike.

Mike didn't want dinner, so I went down by myself and had great conversations with a lot of people.
At that point it was so late that I just returned to our room. I called Mother a bit later. I also wrote four postcards.

I used the alarm to get up Sunday morning. It's snowing.

Mike went down to breakfast with me.

After breakfast there was a presentation about the wildlife and other issues in the park.

Then we went for a hike in the geyser area (see photo at right). We didn't make it to the end of the trail, because there were bison in the way. We're supposed to give them twentyfive yards of clearance. Still we saw and photographed a lot of stuff. Unfortunately we also saw a dead bison calf.

After we returned to the

lodge, we had lunch.
I went back to the visitor centre after that and bought a few items, including three more postcards. Back in our room, I wrote a couple more postcards and did some writing.
I went downstairs about 18:00 to deliver a selection of Mike's photos to the people who are making a slide show of the trip. He came down a bit later for dinner.

Monday morning I awoke to my alarm. The weather was clearer than it had been but still mostly cloudy.
We were joined at breakfast by Ann Iijima and the man whose son had to leave the previous day.
After breakfast we went out to photograph Old Faithful with a blue sky backdrop (see photo at left). It makes a big difference. Then we returned to the room to finish packing. I walked down the hall for the talk about rangers, which turned out much more interesting than I'd expected. Then we took our suitcases down to put with the others bound for Mammoth. After that we vacated our room and checked out.
We waited near the dining room until they started serving lunch and went in when they did.
Then it was a waiting game for our snow coach. I took the opportunity to catch up with some e-mail.
We were a little late leaving the Snow Lodge. We made one long stop in an area with hot springs and a couple of shorter stops for various reasons. We reached Mammoth

Springs a bit late, but our luggage was later. Our room was kind of cramped.
We convened for a special buffet dinner about 19:15. Afterwards there was a slide show compiled from a selection of everyone's photos and another of people done by tour member Mark.

I used my alarm to get up Tuesday morning, though with all the kids running past our door, I was probably already half awake.

While I was finishing my toilette, Mike went out to check the car and brush the snow off it. It hadn't snowed a great deal during our stay, but there was still enough to obstruct the windows.

After he returned inside, we went to breakfast. After we'd started eating we were joined by Don, the physician from Iowa City.

Then we finished packing and checked out. Shortly thereafter we were on our way out of the park. I discovered later that I had left a white sweater at the hotel--nothing of any great value, as it was fairly old.

In Livingston we stopped at an Albertson's to stock up on beverages and also bought a snow scraper/ brush and used the restroom.

We stopped in Billings to get lunch at a McDonald's and get gas.
We reached Sheridan, WY, about 15:00 and checked into the Mill Inn. We did our laundry there. Including the money for laundry detergent and fabric softener, it costs a not inconsiderable amount.

After putting away the laundry, we went out in search of dinner.
We had dinner at a rather mediocre place called JB's.
After we got back to the motel, we both got on our computers. The Wi-Fi seemed very intermittent, so Mike gave up, and I also gave up eventually; but I was up late cleaning up Mail. I also touched base with Carolyn, whom we were seeing the next day. Good thing since she had erroneously developed the idea that we were arriving for lunch.

I woke up to my alarm Wednesday morning.
I had the continental breakfast offered by the motel.

We checked out shortly thereafter. We stopped for gas before getting on the interstate. Just outside Sheridan we stopped at a viewpoint to take photos of the panoramic scenery. A bit farther down the road, we saw pronghorn and bald eagles.

In Douglas we stopped at a Village Inn for lunch. The waiter initially made a mistake on my order, so it had to be completely redone. Afterwards Mike got gas. On the way to Laramie, we saw deer, more pronghorn, and magpies.

We arrived in Laramie in mid-afternoon. Elevation there is 7200 feet, and I had a bit of a headache. Our motel was only a year old, and our room was very attractive.

After we brought our luggage to the room, we called Carolyn. Then we drove over to her place. We called Claudia from there. After Carolyn showed us around her place, we drove over to Claudia's workplace, which contains a small art museum. After we looked over the exhibits (see photo at right), we drove over to the Altitude Chophouse and Brewery for dinner. They have
 their own micro brewery and reminded me of another place we ate at once. Carolyn insisted on treating us.

I was awakened by my alarm the next morning.
After dressing I had the motel's complimentary breakfast.
We got checked out okay. Then there was a problem with the Lexus Enform program. We didn't get any help, but the problem was minor and seemed to fix itself. Then we topped off the gas.

We reached John and Lea's house about 11:30. John is Mike's best friend from college. After chatting for a while, we went out for lunch. We also stopped at a Safeway where I bought water and a birthday
card for Dad, whose birthday is at the beginning of March.
At night we went out to have dinner at an interesting restaurant. They serve your meat on these hot stone slabs. While the food was good, the stones made me nervous.

After we got back to John and Lea's house, I called Jeff and confirmed plans for the next day.
I used my alarm to get up the next day.
About an hour later, we hauled most of our luggage downstairs, made breakfast, and sat and talked with John for a while. We got on the road about 09:45. We stopped for gas before getting on the freeway.

We reached Colorado Springs about 11:00 and checked into Courtyard by Marriott by 11:15. We had a bit of a problem. The first room we were assigned was smoky; understand that the entire hotel is supposed to be smokefree. After that was straightened out, we went to a nearby Flatiron Grill, which turned out to have a gluten-free menu, for lunch.

I spent the early afternoon doing computer stuff. Documents To Go failed to sync.
About 16:45 Jeff picked us up at our motel. Unfortunately his wife, Carol, was out of town. We went over to his house until it was time to go to the restaurant for dinner. Two of their four dogs were at home. The restaurant was a fairly ritzy place with a view, but it was foggy that night.

Back at the motel, I caught up with e-mail and much Internet stuff and stayed up way too late.
I was already awake Saturday morning when my alarm went off.
I had breakfast in the motel. Then we checked out.
We made a rest stop after we entered New Mexico.
A short while later, we stopped to refuel.
I didn't feel like eating lunch, so I made do with a snack bar.
We reached the Best Western Rio Grande in Albuquerque a bit after 14:00. When I planned the trip, I thought we could go to the nearby zoo, but I really didn't feel like it. Possibly the trip had tired me out, or I had some kind of subclinical virus.

I spent the afternoon catching up with e-mail. In early evening we decided to get dinner in the motel. At night I did Internet stuff, called Mother, did some writing, and read.

I used my alarm to get up the following morning. I felt really crappy. My eyes did not want to be open, and I had a headache. I was also too queasy to eat, so I skipped breakfast. As a consequence we were on the road early. It was sunny and mild when we left Albuquerque. We took a southerly route, since there were reports of road closings because of snow on the northerly one.

About 09:00 we stopped for gas. The wind was really fierce.
We made another fuel stop in Deming.
Shortly after we entered Arizona, traffic came to a virtual halt because of road construction.
In mid-afternoon we finally found a lunch place, a Denny's south of Tucson near Tombstone.
By the time we reached Tucson, the sun had emerged amidst fluffy clouds. As long as we were driving past it, Mike stopped at the AT\&T store to pick up his free microcell, which he later was unable to get to work and had to return. He also stopped for gas.

We reached home about 17:00. There was snow on the ground that had fallen earlier that day, though it had warmed up. Considering how tired I'd been feeling, it took only a few days for me to catch up with the piles of mail waiting for us. On the other hand, I seemed to be behind with everything else.

## * Mailing Comments on FAPA \#293

Knud Larn (Fandom Forever, Vol. 1, No. 1): Welcome to FAPA. I hope you enjoy your stay here.

## Jim Caughran (A Propos de Rien--intended for August): I'm happy to hear that your

cancer episode turned out not to be serious and easily taken care of.
Since the light fixture that the birds are nesting on is seldom turned on, I doubt any heat from it is of any help, not to mention that the bulb is a CFL.

The LA opera had lectures before each opera. Those were very useful and interesting. That's not the case in Tucson.

I was unable to use the illustrations that Jonathan had for his article about Boole because of copyright issues. I
thought related illos would help to break up the text. Apparently you did not find them particularly useful. My apologies.

I gave up using BOINC on the old computer. I felt the computer was slow enough without that running in the background. I have no plans currently to run it on my new computer, but I may change my mind.

Robert Lichtman (King Biscuit Time, No. 56): Like you I noticed the last time I checked out the web site for the N3F that it had not been updated. I haven't checked since. I believe David Speakman and Ruth whose last name escapes me at the moment were in charge of the sites. David Speakman was for a while busy studying for the law boards, but I believe he's back at work on one of the web sites. I'm not sure about the other one. Heath Row edits the National Fantasy Fan, though he will be retiring that post after this year. I think he's the current president. He also did a lot to get review copies of books for the members to review. Just checking, it seems the main site for the N3F is http://tightbeam.net/. Much of the site is visible only to members who $\log$ in.

Jim Caughran (A Propos de Rien): My problem with e-zines is that I never seem to get around to reading them. Sitting at my computer to read them is not something I enjoy. The iPhone is really too small to allow reading them comfortably. A while ago, I chucked a whole mess of them unread. They're piling up again. I will soon be getting an iPad2. Maybe that will make a difference.

Robert Michael Sabella (Ride the Lightning): I would like more information about Reliv, in particular about the arthritis product. Currently I use several supplements that help my arthritis and arthralgia. I'm wondering if the Reliv product might replace all of them. What does it taste like?

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## * Mailing Comments on FAPA \#294

Robert Michael Sabella (Visions of Paradise \#159): My condolences to your brother David on the passing of his dog Morgan.

Overseas mailing costs have also gone up very steeply. I recently mailed a book to a friend, and the postage was more than the cost of the book. There has to be a better way of doing this.

Katrina "Kat" Templeton (The Days of Miracle and Wonder, ep. 4): Nice to see you here again. Thank you for sharing your problems with us.

I hadn't realized that Rancho Seco was decommissioned. Or maybe I once knew and forgot.
Knud Larn (Fandom Forever \#2): I enjoyed "Chronodyssey" by Frank Roger. I've read other time travel agency stories, but this one was a bit different.

I'm sending you e-mail about reviewing the anthology.
Dale Cozort (Science Fiction Adventure Magazine, Vol. 5, No. 2): I just want to remark that you undoubtedly missed some or many fan fiction sites. There's at least one I know of that you did not mention, and it may be a bit different from the others. Simegen.com hosts some fan fiction, and some of it is vetted by Jacqueline Lichtenberg or Jean Lorrah, who created the universes written about.

Dale Cozort (Science Fiction Adventure Magazine, Vol. 6, No. 1): No specific comment, but I really enjoy reading your zine. It has a nice variety.

Rogers Cadenhead (Release the Hounds! \#3): Welcome to FAPA!

## * Letters to the Editor

The text of letters received will be in brown. My replies to the letters will be enclosed in double parentheses and will be in black. I will also routinely make editorial corrections in punctuation, spelling,
and the like.

## Rodney Leighton, Tatamagouche, NS

## 7 January 2011

Thanks for FM \#42 which arrived yesterday; read right away.
A critter story: I have a shed which is in need of being replaced; I keep saws and gas and firewood in it. Late last month I was in there transferring gas from a big jug into smaller containers to take to work and saw a movement out of the corner of my eye. There is a small hole in the floor next to the door, and there was a weasel sticking its head out. Swivelled around and saw me and vanished only to pop up again in a second. I said, out loud: "Well, you ain't all white yet" and it disappeared. Might still be under there. Old farmer's weather forecasting tale: if a weasel is white, there will be snow within days; brown the snow is done for the year; various shades in between suggest that spring or winter is coming. This guy, or gal, was about $85 \%$ white. Sure enough, six days later, snow arrived.

I don't recycle fanzines to other readers, because I don't know any who would want to read them. I save an occasional zine for my sister and will save this issue since she has an interest in cats and critters and also writing. I did think about whom I might pass FM on to and was thinking about whom I know who might be interested in sf fanzines. John Hertz--if he doesn't get it there must be a reason. Tim Lane \& Elizabeth Garrott (I believe Joe shares fanzines with them). Lyn McConchie in New Zealand who is an author and also has a cat named Fluffy. Also friends with Eric LIndsay and may get copies from him and could likely do so easily. Chuck Connor in the U.K. But he' s~computerized and could pluck it off the web. And that's it.
((John Hertz is on my mailing list. He sends me copies of his APA-Lzine. I'm unacquainted with Tim Lane and Elizabeth Garrott. Lyn McConchie I know slightly but never talked or corresponded with her at any length. The last three are aware of my posting my zine online and may or may not read each issue. Eric is still in FAPA as far as I can figure out, so he gets the physical zines.))

I don't have a computer.
Thank you for the offer of printing out select zines. Some people have done this in the past but usually it was a case of those folks using their time, energy, money, and whatever else is involved to provide me with zines off the net and getting little if anything in return.

Henry Welch keeps pestering me to write something for him, but I think my zine reviewing days are over. I just started a project of sorts called 100 (or so) Books, which is mostly for my own use; but I expect I will get a few copies made once it is complete and ship them to folks. Next Alexiad should have a comment about how I was thinking of doing the same with fanzines, but I expect it would take me about four years to reach 100. I did start it; has two zines on it. I am not doing any reviewing in there, just brief comments.

My thoughts: if you wish to send me a list of zines you would print out, I will indicate which I would like and send that back. I will tell you right away that this will likely be purely a gift from you to me and nothing much in return. I will likely write and thank you, although that will likely be mixed in with thank you letters for FM. I will list any you send on the list I mentioned, but whether that is ever copied much less completed is unknown. Small possibility that I might put together a review article on them and ship it to Henry, or to you if you might want it. But I don't want to do any writing; all my interest in doing reviews is gone, so I don't really expect to do that.

In all likelihood: if you do print some zines and mail them to me, I will be happy to receive them; I will read everything that interests me and will write some sort of response to you. Then they go into the recycling bag. Unless you print on only one side of the paper, in which case they become letter paper. Which would, of course, greatly increase your printing costs and postage costs. I figured out a while ago that at one stage of my life I would have reached a hundred zines in about three months or less. Many would be non-sf fanzines. In those days I used to get lots of letter paper from zines printed on one side only and fliers and things.

Once when I was looking to obtain a copy of E1 someone was going to print a copy for me. After some months, wondering where it was, I asked. She said: It will take about 150 pages--lots-of ink and postage.

Haven't ever seen one of those. Except Chuck put one on a CD which I tried to read on the DVD player. Almost worked; print was too small to read easily.

Anyway, consider this carefully and if you feel like spending time, effort, ink, money, and whatever on doing this for nothing but gratitude, send me a list.

I will not be unhappy if you decide against doing this.

## Henry 'Knarley' Welch, Los Gatos, CA

21 March 2011
Thanks for the latest issue of Feline Mewsings.
Jonathan Vos Post presents an interesting authorship question regarding the sonnets. However, my interpretation would be that the lines of the sonnets are already in a fixed tangible form as a creative work and the ship has already sailed on the copyright issue. (Special disclaimer required of my profession - this should not be construed as providing legal advice. Every situation is different; if you have a real legal question, go ask your own attorney. :-))
\#

## Hope Leibowitz, Los Gatos, CA

Great otter photo for the cover!

## Amy Harlib, New York, NY

12 April 2011
Enjoyed FM \# 43 as always! Love the cover weasel! So glad Fluffy is still with you and lots more vibes and hugs he can be with you for as long as possible. Also lots of vibes and hugs for your good health and freedom from pain.

You posted only one of the two reviews I sent. I assume you'll post the other one in the next issue?
((I only received one review. I have had problems receiving e-mail from Amy. We think we've found a solution.))
"Jonathan's Science Corner" was rather dense for me this time - what I could "get" was very interesting.
Films I loved recently: Gnomeo and Juliet in 3D, Rango, Little Red Riding Hood, Beastly, Your Highness, Nostalgia for the Light (documentary), Black Death, The Butcher, The Chef and the Swordsman (A Chinese/HK co-production), Carmen in 3D (from the Royal Opera House, London), and Lord of the Dance in 3D. Sucker Punch had dazzling visuals and very disturbing portrayals of women. Lots of operas in cinema these days that I try never to miss - I love that!

My Mom just died at 87 from advanced breast cancer and old age peacefully at home with my older sister and a hospice nurse by her side. She lived a long and good life, and the loss is far worse for me than when my dad died. I did not get along well with Dad my whole life long. Mom was always very near and dear to me in my heart even. The past decade she spent in CA with my sister and nephew geographically far from me in NYC. Her cremated remains will be flown back to her NY home accompanied by my sister and my nephew to have a memorial service for the rest of our small family - all in the NY vicinity. Now I have so much mourning to do.

## ((My heartfelt condolences.))

Meanwhile, the show must go on!
((Photos accompanying this letter are of Amy performing.))

Yoga Odyssey successfully celebrated the Chinese Lunar New Year in the 'O Pear' Variety Show/Surreal Estate, 7 PM, Wed. Feb. 2nd, Surreal Estate, 15 Thames St., Brooklyn, NY. http:// surrealestatenyc.wordpress.com/2011/01/26/o-pear-variety-show/

Techno Trance Yoga Dance entranced the audience in The Gloria Glitter Show, Mon. Feb. 7th, 9 PM, Broadway Comedy Club, 318 West 53rd St., NYC. http://beverlybonner.com/id13.html, http:// www.facebook.com/reqs.php?fcode=5bo45e665\&f=610747400\#!/beverly.bonner

Techno Trance Yoga Dance triumphed again in Playing With Meds Theater Party and Fundraiser, Wed. Feb. 9th, 7 PM, Stone Creek Bar, 140 East 27th St. (bet. Lex. and 3rd), NYC. http://www.facebook.com/ reqs.php?fcode=b6d47do19\&f=100000418187422\#!/event.php?eid=123945054341677

Yoga Trek thrilled the audience at NERDLESQUE: EPISODE III, Sat. Feb. 12, 11 PM, The Brick Theater, 575 Metropolitan Ave., Brooklyn, NY. http://www.facebook.com/event.php? eid=123945054341677\#!/event.php? eid=125473000854275

Yoga Odyssey to the kora music of Malang Jobarteh, successfully collaborated and jammed together at The Dark Night of Shiva Show, Thurs. Mar. 3rd, 7:30 PM, Surreal Estate, 15 Thames St., Brooklyn, NY. http:// surrealestatenyc.wordpress.com/ 2011/02/25/the-dark-night-of-shivashow/, http://www.facebook.com/ event.php?eid=203180156359170

Yoga Yenta, with the klezmer music of Harlan Muir, and Jedi Yoga were joyously successful in the Post Show Entertainment, after Compasses Pointing Past the Past and Present: a One-Act Play Festival by Matthew Ethan Davis, March 2-6, 2011, the variety acts appearing at 10:30 PM on Fri. Mar. 4th and Sat. Mar. 5th respectively, at The Richmond Shepard Theatre, 309 E. 26th St., btwn 1st \& 2nd Ave., NYC. http:// www.facebook.com/event.php? eid=173273429384236

NEW! Avante Yogarde: The Limber Leading Edge of Contortion and Cello, music played by the talented Tim Rusterholz, delighted the audience, debuting at my 12th participation in the Bindlestiff Family Cirkus Open
 Variety Show, Mon. Mar. 7th, 8 PM at the Galapagos Art Space, 16 Main St., Brooklyn.
http://galapagosartspace.com/wordpress/, http://www.facebook.com/event.php?eid=168439813204649
Yoga Odyssey joyously jammed at Third Friday Sessions with Julz-A and Friends, Fri. Mar. 18th, my act starts with the musicians at 9:30 PM at Pianos, 158 Ludlow St., NYC.
http://www.facebook.com/group.php?gid=144521858904307\#!/event.php?eid=129801530425024

Yoga Yenta with live klezmer accordion music by Melissa Elledge, was a smash hit at the JFREJ Annual You Better Work Purimshpiel: A Very Precarious Purim, Sat. Mar. 19th, 7:30 PM, St. Cecilia's, 2 N. Henry Street, Brooklyn, NY. https://www.facebook.com/event.php?eid=1444421322860o8\&ref=ts, http:// www.greatsmallworks.blogspot.com/

Yoga Odyssey was a huge success, dance jamming with the band Not Waving But Drowning at their new CD release party, Sat. Mar. 26th, 9 PM, An Evening With Lady Luck at The House of Collection, Williamsburg, Brooklyn, NY. http://www.facebook.com/wavingdrowning?ref=ts\&sk=wall\#!/event.php? eid=187013458001552, https://sites.google.com/site/yourfavoriteguncle/upcoming-events/ saturdaymarch26th-aneveningwith ladyluck

Yoga Trek beamed into and wowed the crowd at the Tiny, Dangerous and Fun Show, Tues. Mar. 29, 8 PM,


Sycamore Bar Basement, 1118 Cortelyou Rd. at Westminster Road (Q train to Cortelyou), Brooklyn, NY. http://www.johnleo.net/tinydangerousfun.php, http://www.facebook.com/event.php? eid $=197475466953775$

Yoga Cougar was a sensation, strutting her stuff to the strobe violin music of Pinky Weitzman, in Debauchery in Double D, Wed. Mar. 30, 9 PM, Bar Teneleven, 171 Ave. C (bet. 10th and 11th), NYC. http://www.facebook.com/event.php?eid=185228164855329

Avante Yogarde: The Leading Limber Edge of Contortion and Accordion with the music of Matt Dallow, delighted the crowd, in Le Squeezebox Cabaret, Mon. Apr. 4th, 9:30 PM, Public Assembly, 7 N. 6th St., Brooklyn, NY. http://www.facebook.com/event.php?eid=189670271069567, http:// www.lesqueezebox.com/

SPECIAL! Bendable Brunhilda: Stretch of The Valkyries! Fiercely Flexible! Triumphed, winning Third Prize! at the Horned Ball \#7: Road to Valhalla, Fri. Apr. 8th, doors at 8 PM, showtime at 9:30 PM, Santos Party House, 96 Lafayette St., NYC. http://www.facebook.com/event.php?eid=115929238481710

The Amazing Amy can be seen in these forthcoming shows.

Yoga Odyssey Dance Jams at regular monthly Third Friday Sessions With Julz-A (Squeeze Rock) and Friends: Special Guest, The Sweater Set, Fri. Apr. 15th, show time 7:30 PM with JAM at 9:30 PM, Pianos Upstairs Lounge, 158 Ludlow St., NYC. http://www.facebook.com/group.php?gid=144521858904307\#!/ event.php?eid=196349937072531

Jedi Yoga makes a special appearance in the Cash Test Dummies II, Round I Show (comedy-improv contest), Wed. Apr. 13, 9 PM, The Brick Theater, 575 Metropolitan Ave., Brooklyn, NY. http:// www.facebook.com/event.php?eid=118652794877210

Please keep those con reports coming too!

## \#

I also heard from: Andrew Porter, Jan Weasner, Delphyne Woods

## * Closing Remarks

Next issue I will be starting a new column titled "Kritter Korner", which will include animal photos and stories about animals by me or sent in by readers. The animals can be pets or others.

Saurraine<br>6 May 2011<br>revised 30 May 2011


[^0]:    There are many exciting tales to tell. In the season 1 episode "Prime Suspect" (2005) of the television crime drama Numb3rs, math genius Charlie Eppes realized that character Ethan's daughter has been kidnapped because he is close to solving the Riemann hypothesis, which allegedly would allow the perpetrators to break essentially all Internet security by factoring large numbers. The math advisor (as opposed the the FBI advisor) of Numb3rs was Professor Gary Lorden, formerly Executive Officer of Mathematics at Caltech. He retired last year, does lots of lucrative consulting, and remains a friend. He also wrote a great two-page letter of recommendation for me that has got me in the door for job interviews, at which I produce another letter - the one from Undersecretary of Science, appointed by Obama and confirmed by the Senate, Steve Koonin. But that's another story.

