

Writing Notes for *Hylozoic*

**Also known as *PS2*, the sequel to *Postsingular*,
Being my 18th Novel and 30th Book,
Written January, 2007 – October, 2008.**

by Rudy Rucker

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Last update: February 25, 2009
Number of words in these notes: 195,319
Number of words in the novel: ~91,000

Log

Here's a list of my writing activities while composing *Hylozoic*. I've indented and [bracketed] the side projects that weren't directly related to the novel.

- Sept 13, 2006. Created this Notes document.
[September 13-16, 2006. Revised *The Hollow Earth* for 2nd Edition. 1/2007.]
[October 7, 2006. Story: "The Imitation Game." *Interzone*, Spring, 2008]
[December 15, 2006. Story: "The Third Bomb." *Flurb* #2, 1/2007.]
[Oct 8, 06 - 1/15, 2007. Story w. Sterling: "Hormiga Canyon." *IASFM*, 8/07]
- Jan 15, 2007. Sent off Version 1 of my proposal for the novel.
- Jan 22, 2007. Started writing the novel.
- March 21, 2007. Done Chapter One.
- April 9, 2007. Sent off Version 2 of the outline and proposal.
[April 7, 2007. Essay: "Psipunk," Amsterdam lecture.]
[April 24, 2007. Fix-up story: "Postsingular Outtakes," *Flurb* #3, 4/24/07.]
- May 9, 2007. Done Chapter Two.
[May 20, 2007. Story w. Laidlaw: "The Perfect Wave." *IASFM*, Jan, 2008]
[May 30, 2007. "Our Synthetic Futures" for *Newsweek International*.]
[June 2, 2007. "Gnarly CAs" for *Make* magazine.]
- June 18, 2007. Done Chapter Three.
[July 17, 2007. "The Great Awakening" for *Year Million* anthology and *IASFM*, 8/08.]
- July 23, 2007. Done Chapter Four.
[July 23, 2007. "On Mundane SF" for *New York Review of SF*.]
- September 11, 2007. Done Chapter Five.
[September 19, 2007, Story: "Bosch's Apprentice", *Flurb* #4, Fall-Winter, 2007]
[October 2, 2007, *Postsingular* appears in hardback.]
[November 4, 2007, I release *Postsingular* online for free.]
[November 9-11, 2007, My art show at Live Worms in SF.]
- November 14, 2007. Done Chapter Six.
[November 15-Dec 7, 2007, Story: "*Jack and the Actuals*" for Templeton Foundation and *Tor.com*, Fall, 2008.]
[Jan 9-20, 2007, Essay: "*Everything is Alive*." For *Progress of Theoretical Physics* (Kyoto)]
[January 22, 2008. Email interview about *Frek and the Elixir* for a webzine called, *Buck Rogers in the 26th Century*.]
- January 25, 2008. Done Chapter Seven.
[January 28, 2008. Email interview about *Alice in Wonderland* for an academic volume.]
- February 8, 2008. Finish Chapter Eight and therewith the First Draft.
- March 6, 2008. Finish Second Draft, send it to Tor.
[March 28, 2008. Story: "Tangiers Routines" *Flurb* #5, Spring –Summer, 2008]
[April, 2008. "Qlone", to appear in *Flurb* #6, Fall, 2008]
[May 4-6, 2008. "Message Found in a Gravity Wave", *Nature Physics*]
[May 10-July 16, 2008. "Colliding Branes" (with Bruce Sterling), sold to *IASFM*.]
- June 4, 2008. Start Third Draft.
- July 10, 2008. Mail Third Draft to Tor.
[July 24, 2008. Short story from the novel, "After Everything Woke Up," accepted by *Interzone*.]
- August 15, 2008. Mail Fourth Draft to Tor.
- October 18, 2008. Mail Tor my corrections to the copy-edits.

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To Do

Keep in mind that that Thuy and Jayjay love natural gnarl.

Check in Seth Lloyd’s work how many bytes of information are in a human body’s ten octillion atoms. And check my claim that the tulpa simulation requires ten tridecillion integers.

Make it clearer in Chapter 6 that Chu has a turning point in that he learns to enjoy and embrace chaos.

In Chapter 3, the Peng behave quite a lot like humans, but I want to claim they don’t have RDF (remorse-doubt-fear), so perhaps I need to change their emotional tenor. This said, I think it’s more enjoyable to read about characters that do behave so much like humans.

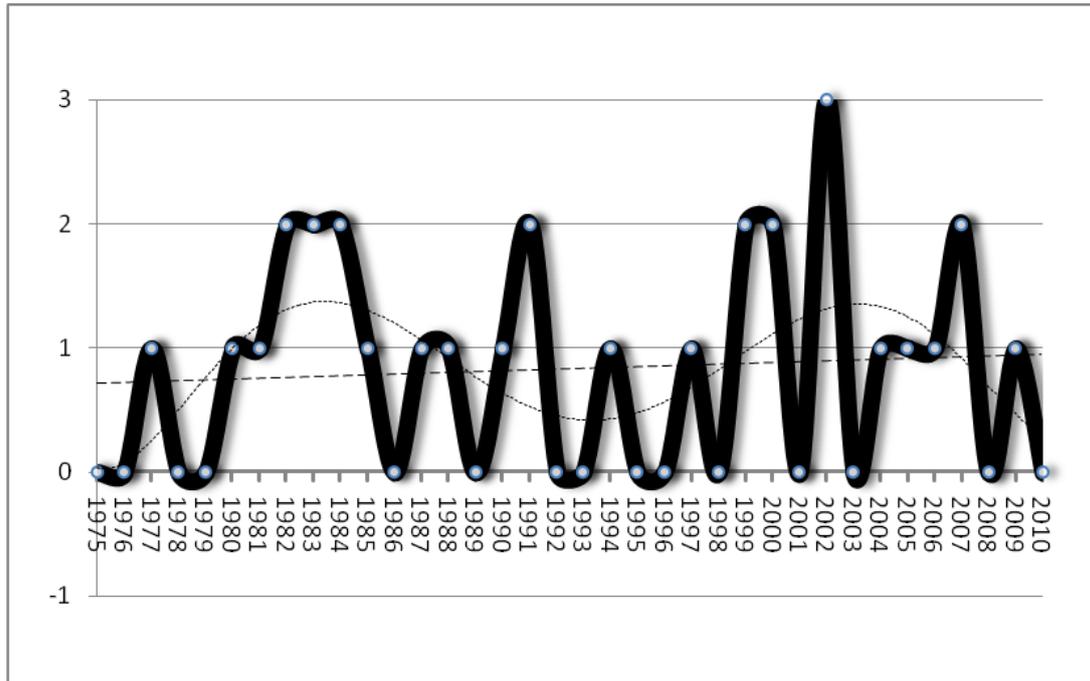
Discuss the phenomenal consciousness of silps, the fact that, like us, they enjoy the sensations of things.

Third Draft To Dos:

- Should we see Thuy’s mother again in the novel after T’s visit before she goes surfing? Should Thuy make her peace with Minh near the end?
- Should Pekklet, Pekka’s agent, look different than just a big Peng bird? What if she looked like a planet? But then I’d have to change the fight scene at the end. Human gods often look like big humans, after all.
- I need to say a little more about how the rune wears onto and off a person’s body. If you leave the ranch it goes away quickly, if you come in it doesn’t attach to you.

Plans

Publication Rate



November 13, 2007. I whiled away a couple of hours making up this chart in Microsoft Excel, plotting how many new books I published each year (I'm not counting reprints or editing jobs, although I am counting my own story anthologies). I tacked on a few zero-production years before my first book just to smooth out the graph.

I guess I made this graph to reassure myself about the likelihood that I won't finish *Hylozoic* until February or March, 2008, which may be too late for it to still come out in Fall, 2008. For the graph, I'm assuming *Hylozoic* comes out in 2009, and that I won't have a new book ready for 2010.

In this case, my "linear trend line" (the nearly level dashed line across the lower part graph) will still be slanting up! The wiggly dotted line is a 6th-order polynomial approximation to the curve, and is a different kind of "trend line." The polynomial trend line looks somewhat different for different order polynomial approximations—since this one is based on a degree six polynomial it "has" to have five max-min points (the curve wants to curve up at the left and right ends).

Interesting chart—at least to me. Looking at the polynomial approximation, it seems that my writing life has two acts. (But do keep in mind that if I was using an 8th-order polynomial curve, I could just as well get three acts.)

A big burst in the early years; that's when I was freelancing in downtown Lynchburg; I had two books a year for three years in a row.

Things slid back when I started teaching at SJSU in 1986, and I was in a trough in the mid-nineties. I was drinking too much and smoking a lot of pot, and I was spending a lot of my energy on programming. Intermission.

After I got into recovery in 1996, I got a second wind. I was still programming a lot (writing the *Pop* game framework in fact), but with sobriety my writing amped up anyhow. I had a good run since 1996, helped a bit by my retirement from teaching in 2004.

It could be that I'll taper off before long. That might be okay. Maybe I'll start painting more.

Word Count

Here's the recent counts.

The Hacker And The Ants 92,000

Freeware 97,000

Saucer Wisdom 85,000

Realware 105,000

Bruegel 138,000

Spaceland 91,000

Frek and the Elixir 163,000

The Lifebox, the Seashell and the Soul 158,000

Mathematicians in Love 110,000

Mad Professor 87,000

Postsingular 89,100

Started Chap 1 on Jan 22, 2007. Dates mark initial finish of each stage.	Chap #	Word Count on the Date in Col 1	Days into the book	Final Chap Word Count. Average is 11212	Chap Draft Words/ Day	Book Words / Day	Estimated Days To Reach 90,000 Words
March 21, 2007	1	11417	57	14427	200	200	393
May 9, 2007	2	18247	127	8553	98	144	498
June 18, 2007	3	29367	166	11493	285	177	343
July 23, 2007	4	42393	197	11825	420	215	221
Sept 11, 2007	5	61289	252	15627	344	243C	118
Nov 14, 2007	6	73367	311	12176	205	236	70
Jan 26, 2008	7	84128	384	8033	147	219	27
Feb 12, 2008	8	91070	401	7558	408	227	-05
Mar 6, 2008	2nd Draft	89900	424			212	

Table 1: Word Count

February 13, 2007. Here we go again! Machinating about the lengths of my book and of my chapters. There's really no reason to push for an overlong book length, as this is part of a trilogy. And less length means better font size in the printed edition. So I'm only shooting for 85,000 words. I currently have a shapely outline with four parts of three chapters each, making twelve chapters. So I'm talking about 85K/12 words per chapter, that is, I'd want to average a shade over 7K words per chap—7,080 words to be a bit more precise. Presently I'm about half done with Chapter One, and it's 4,300 words, so I'm on track.

March 12, 2007. Chapter One is up to 7K and I still have a lot to do. Maybe I shouldn't worry about the chapters all being the same length. This chap could easily run to 11K. If the chaps are long then, hey, I'll just have nine of them, say, instead of twelve. Or—wild and crazy concept—have chapters that aren't all approximately the same length.

March 17, 2007. I went over the outline and combined some chapters to get it down to eight chapters. If I do it this way, I need an average of about 11,500 words per chapter. And I think I can hit 11K for Chapter One, it's at 7,800 now, and I've got three scenes to go: the somewhat bungled jump, the party in the woods, and Jayjay getting high off the Gaian Pig.

May 4 - 16, 2007. In April I revised the outline a bunch more times and I ended up with only seven chapters. With only seven chapters, I'd need for them to average 12,000 words each to get close to 85,000 words. Chapter One was just over 11,500 words, which is close enough. But Chapter Two came in at under 7,000 words, what a flop. So, okay, my chaps won't all be the same length, that's fine, really, it makes the book approachable. To pick up the slack, I did a third (working) outline with more story and eight chapters. I'll need the eight chapters to average 10,500 words each. Hopefully I'll pick up the slack from Chapter Two, but if that doesn't work out, I might need nine or even ten chapters. Or maybe I should go back and just frikkin' pad Chapter Two like mad. Wouldn't be that hard, I could put in a lot more conversation. Well, first I'll see what happens with Chapter Three.

July 23, 2007. I filled out Chapter Two some more, did a long Chapter Three, and now I just about finished Chapter Four, with a decent length, about 10,000. So, good, I'm over 42,250 today nearly at the halfway point, meaning I am on target to bring the book in at 85 K words in Eight chapters as planned.

November 4, 2007. I'm 10,000 words into Chapter Six, and there's still more stuff that has to happen. It could run to 14,000. I'm going to average easily 12,000

words per chapter, with eight chapters, which makes it look like a 100 K book. Well, maybe the last chapter, chapter 8, can be a short bail-out. But chapter 7 is another Bosch chapter, so it may run long, as I love writing about that period. For now, let's re-estimate the final length as 95 K. At my present deliberate pace this means I'll finish early in February, which means the book won't be done early enough to come out in Fall, 2008, but that's should be okay—although, given my recent pace of production, it makes me uneasy to have *gasp* a full calendar year go by without a new book by me appearing in it. I'll have the paperback and electronic release of *Mathematicians in Love* in Spring, 2008, and *Hylozoic* can come out in Spring, 2009.

Feb 1, 2008. I've got 85,000 words now, with 7 chapters done. I think I can wrap it up with a 5,000 word Chapter 8. I'm expecting to finish the book this month. Once I finally got going on Chapter 7, I wrote 7,500 words in two weeks, and I think I can get going on Chapter 8 quite soon. I really want to be done. I'll set the target as 90,000 words, although when I clean it up in the second draft, I might drop down closer to 85,000.

Goals

Move on from *Postsingular* into a series.

Write about: Hieronymus Bosch, panpsychism, intergalactic civilizations.

Fight against: monoculture, the work week, the tyranny of the mass media.

Explore new forms of postsingular art.

Understand telepathy and psychic powers.

Write about living gods and work towards the transfinite.

Title

Given that I don't know when I'll settle on the title, I'm gonna start out by calling this book *PS2*—that's short for *Postsingular 2*. And then *Postsingular* itself is *PS1* and a possible third volume is *PS3*.

I was thinking about infinity the other day, and I thought of some title possibilities along these lines for *PS3*: *Infinite Regress*, *Infinite Loop*, *Infinite*, *Levels of Infinity*, *The Actual Infinite*, *Infinity*, or just the symbol ∞ . Regress is a weak and negative notion though, as is loop. "*Transfinite*" is nice as it resembles "*Postsingular*," but Joe Fan wouldn't know what it means, though maybe he wouldn't mind if he was unsure of the meaning, he'd like the math buzz of the word anyhow.

I read an article about dark energy in the paper, and I was thinking that'd make a good book or story title. *Dark Energy*. Could have some evil characters, natch. But I think that's for a different tale.

How about some feasible titles for *PS2*?

Universal Computation? Too boring. *Quantum Computation*. *Analog Computation*.

The Universal Daydream. *The Hyperlinked Daydream*.

Intergalactic Server Farm is what we don't want Earth to become.

Intergalactic Spam. (I'm thinking of the PKD title *Intergalactic Pothealer*.)

The Magic Harp. I like that. It's attractive and clear. Magical. And there's a lot about the harp in this volume. I checked on Google and Amazon, and this title hasn't been used very much, there are some titles like it for books on how to play a harp, also there is in fact a small press YA book called *The Magic Harp*, and it's about a boy who inherits a harmonica once belonging to Little Walter!

Unfortunately, Hartwell thinks *The Magic Harp* is too fantasy-sounding. Hartwell thinks the title should somehow continue the stylistic theme implicit in

“*Postsingular*”. And if I were to call *PS3 Transfinite*, then it would make sense to have something more science-like for the middle one too. Quite specifically, the form is prefix + adjective, with the prefix connoting “after” or “beyond”. Trans, post, super, ultra.

After Words. Kind of cutesy. Also a bit close to collection of, like, Toastmasters talks: *Afterwords*.

Aftermath is kind of nice as it’s a relevant pun, like post-singular and after-math. Not to mention being a Stones album title. But it has a slightly negative vibe.

Maybe I could call it *After Everything Woke Up*. I like that a lot although, again, it’s not very techie. But it’s got “after” to go with the “post” of “postsingular”.

The Ultrafilter. That’s a math word with a specific meaning relating to transfinite set theory. That meaning wouldn’t obviously apply here, although if the Harp proves to be a transfinite being, it could actually apply. In any case, I’d initially be using the word to mean something else in this context. Maybe it means the anti-spam ware that the Hrull and the Magic Harp help Jayjay develop to protect the Earth from the Peng. There’d be a nice rhythm in the three titles.

PS1: Postsingular; PS2: The Ultrafilter; PS3: Transfinite.

Or, *PS1: Postsingular; PS2: After Everything Woke Up; PS3: Transfinite.*

I like the second sequence better, it’s not so relentlessly nerdy, and it reads more like a story.

Animism. Postanimism. After Animism. The New Animism. Animism Redux. Do You Like My New Animist Car?

January 19, 2007

Hartwell suggests

After Everything Awoke instead of
After Everything Woke Up.

At first I didn’t like the idea, but it’s growing on me. His version is easier on the eyes, even though I feel like “awoke” isn’t a word I’d ordinarily use. But if you can’t use high-falutin’ literary words in a title, then when?

I talked it over with Terry Bisson yesterday, and he was kind of relentlessly negative, didn’t like either version, said they were sentences not titles. I think that I happened to mention, as an impossibly strange title, *Hylozoic*, and he was, like, “Now *that’s* a science fiction title. Go with that!”

Resisting Terry, I suggested *After We Woke*, which has a nice rhythm, but the exciting thing is really that it’s “everything” that’s waking up, not just “we,” so that’s no good. I want the “After” to match the “Post” in *Postsingular*, and then maybe I can have the “Trans” in *Transfinite* to echo the same idea. Is there a shorter “After” title?

Terry was all, “Forget the poetry. Use *Hylozoic*.”

After Dawn. After the Flood. After Lazy Eight. After Awakening. Upon Awakening. Into the Light.

I still like *After Everything Awoke*. Or, hell, *After Everything Woke Up*.

January 24-25, 2007.

I started actually writing the novel the other day. And seeing *After Everything Awoke* on the title page suddenly seemed annoying. Maybe I don’t like the way it sounds or reads. Or Terry Bisson discouraged me the other day.

I’m reaching for a simple one-word adjectival title now.

Hylozoic. I kind of like this one. It means “pertaining to the doctrine that every object is alive,” which is exactly what I’m on about. The meaning of “hylozoism” is slightly different from “panpsychism.” Hylozoism says everything is alive, while Panpsychism says everything has a mind or soul. Often the two beliefs go hand in hand. But, strictly speaking, I think hylozoic is a more accurate description of having all objects become alive due to the synergy between their innate computational complexity and the lazy eight memory upgrade introduced at the end of *Postsingular*. This said, it’s maybe too odd and unfamiliar a word. *Posthylozoic*. *After Hylozoism*.

If you look in Wikipedia, the words panpsychism, hylozoism, and animism are discussed in concert. They’re all different shades of the same notion.

Or maybe *Panpsychic*.

A good, unexpected word. And fits in the trilogy flow.

Postsingular, *Panpsychic*, *Transfinite*.

Problems with *Panpsychic*: it’s hard to say, it has the odd-looking “chic” in it, and it has a woo-woo New Age vibe because of “psychic.”

In my sleep last night, I thought of calling the book *Oversoul*, referring to the Gaian mind. After, over, trans, get it?

This morning, I checked the *Oversoul* title on Amazon, and there’s a Jane Roberts “Seth Speaks” trilogy about *Oversoul 7*, and that really undermines that word for me. “Seth spake here.” Flies circling a mound of dung.

Everything Is Alive. I kind of like this one. It echoes the best-seller title *Everything Is Illuminated* in the same way that *Mathematicians in Love* echoes *Shakespeare In Love*. But it’s static, tendentious. How about *After Everything Came Alive*. Which is bringing me, um, full circle.

And maybe really *After Everything Awoke* is a better title than *Everything Is Alive*. More revelatory, more incantatory, more filled with promise. Maybe I just stay with that while, and never mind Terry’s cavils and never mind that Dave helped me think of it?

January 29, 2007.

But, you know, the problem with *After Everything Awoke* or *After Everything Woke Up* is that my similarly soft title *As Above, So Below* bombed when I put it on my Bruegel novel. Terry had told me to call that book *Bruegel in Love* and we was so right. So I decided to go for *Hylozoic*, as Terry likes it. That word is so cool.

I emailed Dave Hartwell today:

I was talking to Terry Bisson about using “After Everything Awoke” or “After Everything Woke Up” as a title for the book, and he was vehement that these weren’t good titles, he felt they were too long, like sentences.

I don’t always agree with Terry, but he did get me thinking.

And then I came up with what might be a better title. It sticks in the mind like a jagged crystal. Though requires a bit of explanation.

HYLOZOIC

This is a bona-fide dictionary word, it means “relating to hylozoism,” where hylozoism is the philosophical belief that

objects are alive --- which is the main science gimmick in my book. There's even a Wikipedia entry on Hylozoism,
<http://en.wikipedia.org/wiki/Hylozoism>

I think I'd want to use the word HYLOZOIC, in adjectival form, so it matches adjectival form of POSTSINGULAR. If I used the "ism" form it would look too static, like a book on philosophy.

One minor problem is that one might expect HYLOZOIC to be a book about prehistory --- due to the "zoic". But I don't think that's a serious problem. It's such a cool-looking word, nobody's ever used it, and really does stick in the mind. Like a pebble in your shoe.

Terry loves the new title; what do you think?

Dave wrote right back:

"Ya' know, I like it. It is so bloody stefnal. Not like ordinary books' titles except of course I have just been writing copy on a reissue of *Slan*."

I actually had to go to Google to find out WTF "stefnal" means, and I found this quote by Paul Di Filippo:

Historically, within the genre, "stef" has been another long-standing term for "science fiction." The derivation comes from the old "scientifiction," which was always abbreviated "stf". The vowel was interpolated so that one could actually pronounce the term. "Stefnal" has three fewer syllables than "science-fictional," always a plus for economical writing. Additionally, it functions as a totally baffling shibboleth.

So, cool, I've got a title.

Hylozoic.

How stefnal!

June 19, 2007.

I decided to make the third one be called just *Infinite* instead of *Transfinite*. And then the three titles are all describing odd, non-standard realities:

Postsingular

Hylozoic

Infinite

July 25, 2007.

Thinking about a short imaginative piece, "[Imagining Infinity](#)," I flipped back to *Transfinite* for PS3. After all, we're not talking about merely *infinite* minds, we're talking *transfinite* minds with actual infinities of various orders.

Postsingular

Hylozoic

Transfinite

POV

I'll probably stick with one individual's POV for each chapter. I considered starting the first chapter with a series of POV of objects. A rock, a tree, a breeze, a

wave, a surfboard, Rick Mustane, Bixie, Jil, Ond, Chu. Or have a chapter from one object's POV. But that's not so likely.

Chap	POV
1	Jayjay
2	Thuy
3	Chu
4	Thuy
5	Jayjay
6	Chu
7	Thuy
8	Jayjay (or Chu)

If I go with Jayjay for Chap 8, it's JTCTJCTJ. Nice and off-balance, not too symmetric.

And then I'll have total chapters of Jayjay:3, Thuy:3, Chu:2, setting Jayjay and Thuy as the main characters, but introducing Chu so he can perhaps play a bigger role in *PS3*.

Jan 8, 2008. I'm thinking more and more of giving Chu the last chapter instead of Jayjay, as he's become a more interesting character to me. If do that, I'll have this rhythm to the POV switches: J TCT J CTC. Here it would be two halves starting with J's, for what that's worth in terms of pattern analysis.

In terms of chapters "owned," it would be Jayjay:2, Thuy:3, Chu:3. Thuy is still major, but Jayjay's being phased out for Chu. This is fair enough, as *PS1* was almost all either Thuy or Jayjay POV, with a little bit of Chu, Ond and Nektar POV near the start.

In a sense I think of Thuy as really the main character throughout the three books, I like her the best. Maybe *PS3* can be Thuy, Chu, and —who? Maybe Bixie, assuming I can concoct an interesting personality for Bixie which, lamentably, I haven't yet done. But an interesting Bixie might just be Thuy. So I might need another character for the third in *PS3*.

Jan 26, 2008. I decided to end with three short chapters in a row. So I have

Chap	POV
1	Jayjay
2	Thuy
3	Chu
4	Thuy
5	Jayjay
6	Chu
7	Thuy
8	Jayjay
9	Chu

So that's three chapters each: JTC TJC TJC.

Calendar

MASTER CALENDAR

This calendar includes the events in the prequel *PS1*, as well as the new events in the novel to hand, *PS2*.

Re. the Hibrane date column, keep in mind that Hibrane time runs 6 times as slowly. And the two branes' times match at the instant when Bixie first jumps over to the Hibrane; the first person to make the trip from the Lobrane. This is about 10 PM on September 1, 2005; there is a full moon.

But there will be a different relationship between Lobrane and Hibrane time in *PS2*, as our timeline bent away from the Hibrane at the end of *PS1*.

***** Begin POSTSINGULAR *****		
Lobrane Date:	Hibrane Date:	
2000		Craigor born.
2003		Jil born.
2010		Jayjay born, Thuy born.
2023		Chu born.
2024.		Momotaro born.
2025		Bixie born.
Mar, 2029		The nants are sent to Mars.
Mar, 2032		Mars is a Dyson sphere.
Saturday, May 1, 2032	Aug 3, 2034	Nant Day. The nants attack Earth. and are turned back. Dibbs executed, Bernardo Lampton elected.
Sunday, May 2, 2032		Ond turns the nants back. Dibbs and his Veep are summarily executed. Communist Speaker of the House Bernardo Lampton takes office.
Sept 1, 2035 = Saturday	= Sept 1, 2035	Orphid Night. Ond releases the orphids. Ond and Chu to Hibrane.
Tuesday, Oct 21, 2036	Nov 9, 2036	<i>Postsingular</i> Chapter 2. Big Pig Posse meets Nektar. Thuy sees Luty in the ExaExa lab.
Tuesday, Nov 4, 2036	Nov 11, 2035	Dick Too Dibbs is elected.
Sunday, Jan 18, 2037	Dec 24, 2035	<i>Postsingular</i> Chapter 3. Thuy's reading.
Monday, Jan 19, 2037	Dec 24, 2035	Battle at ExaExa. Our heroes show up about 8 a.m. and fight till noon or 1. T & JJ get to Easter Island at 3 or 4. (In Jan, the clock on Easter Island is three hours later than in California.) Thuy goes to Hibrane and comes back that evening, it's about six Lobrane hours later, say 10 p.m. (=only 1 Hibrane hour later (but she had 6 hrs of experience there, moving fast)).
Tuesday Jan 20, 2037	Dec 24, 2035	Lazy Eight Day. The nants are released at midnight. The Hibraners push our timeline so it bends away from theirs. Shortly after midnight, Jayjay unfurls unfurl the 8th dimension. The silps kill the nants. Gaia awakes. Later in the day we have Dick Too Dibbs's Inauguration.
***** End POSTSINGULAR *****		

Table 2: Master Calendar for *Postsingular*

***** Begin HYLOZOIC *****		
Lobrane Date:	Hibrane Date:	
Friday, May 1, 2037	*	Three months and ten days later. Jayjay and Thuy have sex, move their house. Jayjay gets high and attracts the Peng. Phase of the moon: Just past full (was full on April 29, 2037.)
Saturday, May 2, 2037	*	About 5 a.m. Jayjay runecasts Yolla Bolla. No gnarl in Yolla Bolly. Surfing at 9:30 a.m.. Gnarl leaves SF. Meet the Peng in Yolla Bolly 11:45 a.m. Meet the Hrull. Try to kill the Peng and fail. Jayjay paralyzed.
Sunday, May 3, 2037	Saturday, June 25, 1496.	Jayjay and Thuy on the road to Killeville and Charlottesville. Thuy and Chu have sex inside Lusky. Thuy and Jayjay flee to the Hibrane with the pitchfork around 8 p.m. Jayjay and Thuy arrive in 's-Hertogenbosch at 3 a. m. local time. Phase of the moon: Full. Chu spends the night with Glee in Portland.
Monday, May 4, 2037	Saturday, June 25, 1496.	Chu spends the day with Glee and the Hrull, goes to spend the night with the Yolla Bolly Peng.
Tuesday, May 5, 2037	Saturday, June 25, 1496.	Chu designs viral runes, and the Peng are taking over the planet. Around 2 p. m., Chu jumps to the Hibrane, traveling inside Duxy with Glee. They should arrive 7 Hibrane hours after Jayjay and Thuy, that is, 10 a. m. Saturday morning. Why? Chu departure - Thuy departure is 6 hours short of 2 full days = 42 Lobrane hours = 7 Hibrane hours due to the 6-to-1 scale factor.
Tuesday, May 12, 2037. [The Hibrane day's action starts on May 10, 2037.]	Sun, June 26, 1496	Lazy eight unfurls at 5 a.m., June 26, 1496, in Hibrane 's-Hertogenbosch (=26 Hibrane hours after arrival=6.5 Lobrane days later=morning of Lobrane May 10). Day of big procession in 's-Hertogenbosch. Thuy and Jayjay are arrested and nearly executed. Chu and Duxy rescue them around 3 p.m. =36 Hibrane hours after they arrived = 1.5 Hibrane days=9 Lobrane days after they left = 8 p.m. May 12, 2007.
Wednesday, May 13, 2037	Sunday, June 26, 1496	Although they are outside of time as aktuals, we can suppose they have a missing twelve hours of Lobrane time, so that they get home in the morning of Wednesday, May 13, 2037.

Table 3: Master Calendar for *Hylozoic*



Figure 1: 2037 Calendar (from timeanddate.com)



Figure 2: 1496 Calendar (Julian old style)

I'm trying to let Jayjay figure out the time from the moon.

Here's a table of the moonrise and moonset for Amsterdam in June. I couldn't find a 1496 chart, so used a 2007 chart. I rounded off the times on this chart. Also I subtracted an hour from each time in the chart, as they would *not* have been using daylight savings time in the Middle Ages.

I'd never realized that the duration of the moon's visibility depends on the phase!

Phase	Moonrise	Zenith	Moonset	Duration
Full	10 PM	1 AM	4 AM	6 hrs.
Third quarter (waning half)	1 AM	8:15 AM	12:30 PM	13:30 hrs.
New	4 AM	1 PM	10 PM	18 hrs.
First quarter (waxing half)	1 PM	8:15 AM	12:30 AM	13:30 hrs.

Figure 3: Moonrise and Moonset

Year	Chu / Bixie Age
2029. Nants to Mars.	6 / 4
2032. Nant Day.	9 / 7
2035. Orphid Night	12 / 10
2036. Election.	13 / 11
2037. Inauguration.	14 / 12
2037. First Peng Problems in PS2.	14/ 12

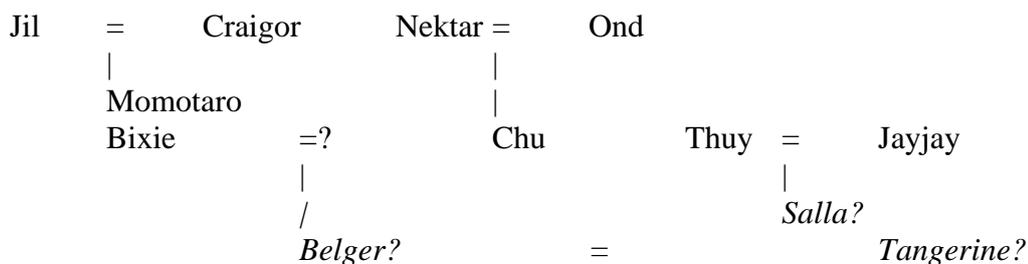
Table 4: Chu and Bixie Ages

CHAPTER DATES

Chap	Date	Cast	POV
1			
2			
3			
4			

Table 5: Chapter Dates

The Postsingular Dynasty.



Characters

Jayjay

(b. 2010). He likes to stare at patterns, at things in nature, he's open to natural paracomputation. He's 27, Mexican parents, real name Jorge Jimenez. His mother works in the Supertaqueria, has five kids, his father isn't around, Papa got busted for pot, went to prison, got killed there in a gang fight.

Jayjay visits home sometime, but his mother's new boyfriend Paco doesn't like him. Jayjay used to have a minishoon earring. He'd like to be a physicist. He's smart. Not all that sociable, not good at putting himself across. Tends to say nothing and then to say too much. Doesn't know what to do with his life.

During the ten or so years after he dropped out of high school. I have Jayjay living in a squat with Thuy while she finished high school and college. Let's say he never did have a job. He made a little money playing videogames.

So in *PS2*, Jayjay is buying a house. What is he doing for money? In *PS1*, he didn't actually work at all. He was living on the street, and boning up on physics. He was getting some money from the reality show *Founders*.

He went to the Hibrane in *PS1*, brought back the Magic Harp and played it, unfurled the eighth dimension. Maybe he'd be kind of a hero for that? In the sense that people are interested in him.

So he'd be even bigger on *Founders* than before. That's how a famous person makes money. They make a realtime vlog of their life and sell ads in the sidebars.

Kind of intrusive into the story, but also kind of cool. And it's also transreal, as I myself am a blogger (albeit without ads).

Thuy

(b. 2010). She's 27. Her parents are Vietnamese, old-world, don't speak English, wouldn't let her date, wanted her to marry Vinh Phat who ran the Vietnamese restaurant supply company Golden Lucky where Thuy was working.

Thuy brought home Jayjay one time to help with her homework, and his earring really freaked out her parents. He dropped out, but she stayed in school.

She likes classical music. Her parents gave her violin lessons. She's into air violin through the orphidnet. Wants to be a composer. Like opera. She plays metaviolin that sounds like a symphony orchestra.

She had an affair with Jayjay, then drifted away as he was so self-centered, and Kittie got her for awhile.

She wears striped leggings and a miniskirt, her hair is black, in two pigtails. Gold Yoon Shoon sneakers with a dragon's head on them, Jayjay got them for her off a dead jogger.

She is aloof, likes attention, self-centered, enjoys flirting with one and all, doesn't like to commit. I think of her as a bit like a certain young Swiss woman I've known for years. She has hyper outbursts, but can fall into passivity.

I see her as having very lively eyebrows and facial expressions.



Figure 4: Clothing for Thuy Nguyen

I get Thuy's clothes from a slender, intriguing CS student I only slightly knew who always wore the same striped leggings and miniskirt and a red plaid coat.

Thuy is quite Californianized.

Childlike, greedy, avid, likes to look sharp but prefers to stay in one good outfit, wants to make a symphony, dreamy, sees herself on a stage getting applause, ambitious, lazy, distractible, likes being caressed, likes bathroom humor, uninterested in money, would like to live in a tree in a park in a city, doesn't like to wash, interested in perfume but doesn't like to wear it, likes lipstick and mascara, likes to brush out her hair straight but wears it in a ponytail, likes to dance, likes to sing nonsense syllables, scared of dogs, scared of being cooped up, likes sweets, skinny, oily skin, slightly zitty, strange pungent body smell, anime Skare Kat underwear, honest, likes to sleep.

Thuy is a Singularity-enhanced *novelist*! Now I really *care* about her! A *metanovelist*, you understand. I can be Thuy. Thuy is transreal Rudy-the-writer — wearing a female, ethnically Vietnamese (but culturally Californian) persona.

Sonic.

Jayjay's friend. They were in a videogame tournament together.

He has his hair spiked like Sonic the Hedgehog. His parents were migrant workers, they gave up and went back to Mexico, Sonic didn't want to come along, he liked the games up here. He hid and stayed, he's been on the streets since he was thirteen. He loves video games, would like to enter a game championship. The game he plays is based on String Theory and is called Warped Passage.

He wears a wool suit jacket with a skull painted on the back.

I'm having him be a bit harder in *PS2*, toughened by being a Gaian Pig stoner.

Sonic's sexuality is a little ambiguous, I've always thought he had a crush on Jayjay. I think I'll have him hook with an alien; perhaps one of the Peng. I could play on that James Tiptree thing of having some people be hot for aliens. Cf. in the Garth and Wayne movie, when Garth mentions being sexually attracted to Bugs Bunny when Bugs dresses as a woman.

Jil.

(b. 2003) Jil Zonder is cute, black Irish, one quarter Japanese, a touch of Mexican, but don't mention her race, that's a distraction. Straight nose, ready laugh, talking about being spiritually lost and then "going to church and in the stained glass it says, God — Is — Love." She's in recovery from sudocoke addiction. Jil wants to make a job doing ads for companies. She's a freelancer, not getting much work, and also with a day job (see below).

She got married at age 20, in 2023, had Momotaro the next year in 2024, she's 32 when first we see her in 2035.

As a designer, she was wooing Yoon Shoon, a Korean just-in-time athletic-shoe manufacturer, they mail you goo and grows on you. Jil is also working a temp job at a company called ExaExa (a reorganized version of the bankrupted Nantel), the plant is in the China Basin biotech region in San Francisco Jose near the bay. She's a booth bunny at virtual trade fairs; she wears a motion-capture suit and acts like a sexy help icon showing things. It's a sexist and demeaning job; she got into it in her druggy days.

Jil leaves ExaExa. She resigned, or maybe they fired her for her association with Ond.

Jil has made some money off the shoons, who are in fact named after her original Happy Shoon. Jil's built up her shoon biz.

The silps enjoy being in shoons, some of them like to be pets or companions to people. A simple need for social warmth. Jil makes the shoons attractive.

What's Jil up to in *PS2*? Still making her shoons, but with silps running them.

My original model for Jil's appearance in *PS1* was a woman I saw around Los Gatos a few times. I never really talked to her, but I liked looking at her, I thought she was cute, the way she moved. I didn't see her for a long time, and then I saw her again while I was starting *PS2*, and she was having a bad day or something, and seemed unhappy and unfriendly. And this seeped into my depiction of Jil in *PS2*, where she's uptight and is to some extent Thuy's enemy, even though Thuy had looked up to her in *PS1*.

The wise transrealist doesn't divulge his activities to his models. "Hi, you don't know me, but I've been admiring you from afar, and I made you a main character in this book I'm writing and..." "Yaaaagh! Stalker! Call the police!"

Ond.

Ond Lutter. He's from Minnesota, he went to UCLA and majored in robot and artificial life studies.

He's a geek, a programmer at Nantel/ExaExa. A lanky man with thinning blonde hair. Among strangers he can seem kind of autistic himself. But he is warm and friendly within the circle of his friends and immediate family.

Ond isn't much of a drinker or druggie, one beer makes him reckless.

In *PS1* he works for Nantel, and stops the nants, then he works for ExaExa as Chief Technical Officer and creates the orphids. Then he goes to the Hibrane and when he comes back, the lazy eight hits.

What is Ond doing for a living (or to pass his time) in *PS2*?

Suppose that ExaExa went down the tubes, all their funds were confiscated. People are still interested in Ond, but he's managing to opt out of *Founders*. But how, then, does he get bread? His whole computer-expertise thing is out. On the other hand, the networking aspect of the Gaian Pig is still important.

Possibly the Gaian Pig consults with him, and pays him directly. She could easily pay him by teleporting things to him that he needs. Lost things that she knows about. Or simply steals--like the scam where hackers shave a few pennies off everyone's bank account.

But, given that the GP knows all, why would she need Ond? Can't she just pick his brain? Maybe she can't predict him, though. She simply fosters him because she likes to see what he comes up with. He's like a research fellow on a grant.

So what *is* Ond obsessing on with all this free time? Everything he'd wanted has come about, no? Earth is alive with a global mind. Well, maybe Ond is working on immortality. Not in the bad sense of having the nants eat you right now, but in the good sense of effectively remembering you after you're dead. Or, no, Ond is working on electric trees.

Nektar.

Nektar is tall and slim and poised with a heavy blonde ponytail. I'm seeing her as looking like the actress Liv Ullman. Sexy.

Backstory. She grew up in Arizona. She's kind of like a Scandinavian, rather proper. Maiden name Lindstrom. I'm thinking of Elena V's manner of speaking. She doesn't curse, doesn't use street slang. Nektar is self-centered, stubborn, has strongly held opinions she won't back down on.

Nektar got a college degree at UCLA in Media Studies. She had wanted to be a screen writer or in some way involved in film. She was having an affair with a woman when she met Ond at college, Ond also at UCLA.

They got married and moved to the San Francisco when Ond got his job at Nantel. For awhile Nektar worked at a local theater doing lighting, also she was helping the theater cater the food for benefit events, and then she went to chef school and started working as a chef at a touristy place near the Ferry Building.

But after she had Chu she had to stay home for quite awhile. She was unhappy taking care of Chu.

She's impulsive, depressive, cries a lot. But she has a flair for theater and some business sense. Can be hardheaded. She's mystical, also.

She develops a career as a cook, has an affair with Jose, another chef.

Those first days after Ond and Chu left for the Hibrane had been very hard. Annoying as those two had been, they'd been Nektar's core reason to live.

Chu.

(b. 2023) He's 14. High-functioning autistic. A born mathematician or programmer.

Not much sense of humor, but he's kind of funny anyway. I mean you can laugh at him, but it's more of an admiring laugh than a mocking laugh. He's just so much *himself*.

Self-centered.

Chestnut cap of hair.

Bixie.

(b. 2025) She's 12.

Eventually, I'd like to set up a romance between Bixie and Chu. Mentions of Bixie in *PSI*:

Bixie singing made-up songs that Chu tried to sing too.

"Happy morning, it's the crackle of dawn," sang exuberant Bixie.

Chu's checking the coordinates of Craigor's things with his global-positioning locator. Momotaro's being the museum guide. And Bixie's hiding and jumping out at them.

Bixie came skipping back, her dark straight hair flopping around her face. ... She leaned against Jil, lively as a rubber ball. Jil often thought of Bixie as a small version of herself.

Bixie, still slouching beside Jil's chair, had just stuck out her tongue at Chu, which made Chu stumble uncertainly to a halt.

Bixie looked up at Jil curiously. To Jil, her daughter's face looked ineffably sweet and vulnerable behind the dancing images of nanomachines.

Jil hugged Bixie to her side, covering the slender girl's dark cap of hair with her hands as if to keep the orchids off her.

"Orchids sound like teachers," said Bixie. "Shut up, orchids. Blah blah blah. ... I want to see the *Spice Dolls* show. Ooo, there's Kimmie Kool and Fancy Feather. Hi, girls. Are you having a party?" ... "More tea, Fancy?" said Bixie, holding an unseen teapot.

"I see another one," said slender Bixie, peering across the water at the dinghy coming in. "A big angel in front of Chu's little boat. She's scolding him. She has white hair. Oh, and now the nice boy angel from our boat is dancing over there to argue with her. He's her nephew. The angels move slow, but they hop fast. ... Chu calls the angels' world the Hibrane. Sweet! And he just now messaged me a link to a magic spell for going there." Bixie stood on tiptoe and called out to Chu in the dinghy. "Try and catch me, Chu!" The air flickered and Bixie disappeared.

Thanks to the telepathy, Jil could see Bixie in the dark—and she could sense her daughter's whole mind, sweet as a summer day. A moan of relief escaped Jil; she sped to embrace the girl. "I'm scared of that dog," said Bixie, disentangling herself.

"Hi, Mom," said Bixie from the cabin door, looking hopeful, attracted by the happy sounds. "Oh, Bixie," said Jil, holding out her arms. "Give me a hug. I've been sick and now I'm getting well. I will. I'm ready. I can do it. I know how." The girl ran to her mother, then hesitated awkwardly. Jil stood up and embraced her.

"The nants ate me," recalled Bixie. "But then I came back, and I couldn't remember what Virtual Earth was like. But I still remember the ants biting me." She shuddered.

Momotaro.

(b. 2024) He's 13.

Some mentions of Momotaro in *PSI*:

Momotaro put his fingers up by his mouth and wiggled them, imitating a flying cuttlefish.

Momotaro stood at his father's side.

Momotaro and Bixie were cheering and laughing to see the freed cuttlefish jetting about in the shallow waters near the boat.

"Blah blah blah," echoed Momotaro, laughing. "Can you show me the *Space Pirates* online video game, orchids? Oh, yeah, that's neat. Bang! Whoosh! Budda-budda!" He aimed his fingers, shooting at toons he was seeing in the air.

Momotaro slugged Jayjay in the crotch. Bixie had a screaming fit. And usually she's so calm.

Momotaro came out as well, leaning against Jil, his arms twined around her and Bixie, Jil's hand smoothing the hair on his head.

"Remember the giant ads in the sky?" said Momotaro, lowering his voice and making a goony face. "Hi, I'm Dick Dibbs! Come live with me on Virtual Earth! ... Why *haven't* they caught that freak Jeff Luty? Why do they let him stay free so he can do the same thing over and over again? ... I still don't see why it has to be you and Ma that go fight him."

Lureen Morales.

Lureen Morales is a bad girl, but has some good to her. A nutty Californian. She's Mexican. At one time I wanted to call her Tawny Krush, which is also a great name, but I used "Tawny Krush" for an off-stage rock guitarist.

Lureen has low cunning, in fact she's fairly witty, even smart. Possibly a member of the Homesteady party. She slept with Luty once. Perhaps she's spreading the beetle virus by sleeping around. Craigor moves in with her for awhile after leaving Jil.

I am imagining Lureen as resembling the busty MILF rough-gal porn star Chantz Fortune, a tough Latina. But I also see her as being like the transsexual Aztec-costumed "woman" I saw in the Pride parade at Santa Cruz, and whom I thought of as "La Azteca." Well, she can be a little of both.

I think it would be good to suppose that Lureen is in fact TS. Perhaps she can even grow back a penis on demand—just as Chantz in some of her videos wears a strap-on.



Figure 5: La Azteca.

Kittie

(b. 2013). Kittie Calhoun. White, stocky, butch, her parents are together, doing reasonably well, but her father abused her so she left home. She's lesbian, she is having an affair with Thuy, but then settles down with Nektar.

She has rough skin, oddly red-streaked hair, weird-shaped glasses. A plain face, but warm. She'd make a decent-looking man. A brilliant blue tattoo on her neck. The SF artiste type. Wears a pendant on a chain of a woman holding a butcher's knife and a paintbrush.

She picks up a little money painting murals on vans.

Mabel

Mabel is the kid sister of Darlene Gow. She's sixteen or seventeen, the love interest for Momotaro. An image for Mabel is a girl softball player I saw while riding my bike past Los Gatos High School the other day. Tall and graceful as a green plant. Her hair pinned up with wisps escaping. A perfect mouth, the face of a Vogue model. Mabel.

She's a surfer, she's the one who gets the surfari to the Potato Patch happening.

Craigor.

(b. 2000) Craigor Connor is white, a California boy, an artist and making money as a fisherman. He's handsome and not too bright or ambitious. Craigor is a packrat, he can't throw anything away, and he wants to be able to categorize what he has. He drinks a bit too much, gets high a little too much. Craigor means to be an assemblagist sculptor, but he never fastens things together, just accumulates junk and arranges it in patterns on the pancake of their boat. He talks about Kurt Schwitters's apartment, the "*Merz Bau*," he calls the scow the *Merz Boat*.

Craigor is making ever more kinky assemblages. Some of them have orphidnet AI so they balance themselves, for instance, a wobbly Cat-in-the-Hat stack of things that never falls over no matter what.

The orphidnet AIs don't really want these things for bodies, most of them, though a few do think they're cool. Like a body with hoes for legs, or a bowling ball for a body. All the brain can be in orphidnet. Also, thanks to the orphids, no extra sensors are needed, no eyes. All that's needed are a few muscles. These also are conventionally piezoplastic, although solenoids could work.

Craigor feels like his life is slipping away, he leaves Nektar so he can have a lot of affairs.

Gladax.

Gladax is a made-up name that had hit me. Like a corruption of Gladys or Gladiolus.

I'm thinking maybe give Gladax a voice like old Elena. She had this certain way of talking that I can reproduce in my head.

She is a seventy-year old Negro, and the mayor of San Francisco. Messy, like an artist. Her art is politics. She's a metamind. She is the people's will. A metamind. She's like the mayor of San Francisco. A broker. A living network.

She doesn't bother to wear good clothes.

Suppose that she has a magic harp like the giant in Jack and the Beanstalk, and my characters steal it.

Perhaps Ond helps Gladax improve her network.

Azaroth.

The Rebel Angel Hibraner who befriends Thu, Ond, and Chu.



Figure 6: Azaroth in my Traffic School

I saw him as resembling one particular Indian CS student I had in several classes, he worked on the moving platforms in a “JumpSport” game with a little jumping man. Dark hair, beaky nose, soft spoken, ready smile, staring off into the distance thinking. I also mixed in a Sikh boy I saw in traffic school. His hair in a stocking (literally) cap with a topknot covered by the stocking as well. Light mustache and beard, straight nose, thoughtful brown eyes. I also recall a Sikh student I advised on his thesis.

The Sikhs don’t actually cut their hair, they keep it in a topknot or bun that they call a *joora* or a *juhra*. Normally the knot is hidden under a turban, although some just wear a stocking cap. Most Sikhs live in Punjab, the northern-most province of India. The biggest city is Ludhiana which has a large bicycle factory. There are also some Jains in Punjab.

My Azaroth character is a would-be programmer, but he makes money working as a cuttlefisher. A rebellious nerd. Naive. Doesn’t grasp the true power and threat of the nants. He thinks computers are cool. Like Bill Gates or Steve Wozniak. Entranced by technomothia. Have him goggling at flashing lights.

So that Azaroth can get away with more, I’m going to assume that Gladax is his aunt. How so?

Azaroth’s grandparents Aad and Baalak Kaur (the first names are gender neutral and the Kaur means girl) migrated to the US from Ludhiana, Punjab State, India. And they had two children: Azaroth’s father Harpeet and his brother Charminder. Charminder married Gladax, a Chinese-Flemish mix, and then Charminder died. Azaroth’s name was given him by his father Harpeet who was a rabid online videogamer.

Dick Too Dibbs.

Dick Too Dibbs helps save the day.

The Big Pig → Gaia

For reference, here’s just about all the descriptions of the **Big Pig** from *PS1*. Surprising how few words this amounts to; I have such a clear idea of the Pig from having written this little bit. It’s like in painting, how a very few brush strokes can seem to limn, say, a skeleton riding on a horse.

...the outrageously rich and intricate Big Pig like a birthday *piñata* stuffed with beautiful insights woven into ideas that linked into unifying concepts that puzzle-pieced themselves into powerful systems that were in turn aspects of a cosmic metatheory—*aha!* Hooking into the billion-snouted billion-nippled Big Pig made Jayjay feel like more than a genius....

The Big Pig was absorbing, mirroring and amplifying their exchange, layering on further sounds, clips, and links from the simmering matrix of global info...

Although the ideas felt familiar from Jayjay's last trip into the Pig, he knew the details wouldn't stay with him for long. So what. Pig trips were all about relaxing and enjoying the show. *Aha!*

The virtual images of the Posse members spiraled upwards through the orchidnet—not “up,” exactly, the direction was more like “in”—they all knew the way by now, and here were the billion snouts, tails, trotters, and flop-ears of the Big Pig metabeezie, the all-seeing eye atop the pyramid whose base held the ten sextillion networked orchids of Earth.

The Pig extended a wobbly nipple towards Jayjay, and as he fastened on, the Pig passed him a time-lapse movie of a snowdrift being sculpted by the wind. The other Posse members found teats beside Jayjay, the four of them lined up like worshippers in a pew.

She circled up past them to discover a new diversity among the higher-level minds: a logic-zeppelin, a floating lake of emotive thought, a wisdom-dragon chasing its tail, an endlessly regressing simulation tree. The pink hypersurfaces of the Big Pig arched overhead like a dingy circus big-top crawling with bottle-green flies—the flies being kiqqies, so many more of them here than two months ago. Hoping she'd be able to remember what she'd come for, Thuy homed in on the Pig and grabbed herself a teat.

As usual, the Pig immediately downloaded a nature video onto Thuy: a perfect image of a sunset campfire on a beach, with sparks popping from the logs, smoke twisting in the breeze, and the surf breaking on the shore, each sunset-gilded water-drop ideally rendered, each foam bubble reflecting the entire world.

“Show me your face,” she said into the maelstrom of words, images, and hyperlinks that flowed from the Big Pig.

“Behold,” said a voice in her head.

And now Thuy was looking through her normal eyes, looking at a sheep on the hillside ten yards off. The sheep's wool was writhing like tendrils of flame—and within the flame was the face of a goddess.

Okay, so how should **Gaia** look in *PS2*? Here's a draft of her first appearance, written February 12, 2007.

Gaia presented herself as fat Earth globe wearing a cartoon face: big green lips and strong teeth, playfully rolling sea-blue eyes, streamers of hair made up of gold-tinted clouds. A wobbly vortex sucked Jayjay through the vasty caves of Gaia's ear-hole and into the interior of a giant pitcher plant—a space demarcated by great smooth walls of living green tissue, and filled with a gnat-swarm of agents visiting

from the seething planetary porridge of minds. Pale green pistil swung through the information matrix like snakes; each pistil's fuzzy triangular top forming a rudimentary face with two eyes and a mouth.

"Aha," said one of the faces, cozily addressing Jayjay one on one. "It's you again." There was something every-so-slightly pig-like in the visage Gaia showed Jayjay; indeed her human interface was derived from the former Big Pig.

Plugging into the planetary mind always got Jayjay kind of high. The overmind was brim-full of wonderful perceptions that hooked together to make thought patterns which tessellated into great world systems. Communing with Gaia made Jayjay feel like the scientific genius he longed to be. It required a distinct effort to stop himself from dropping everything and merging into her for hours at a time—effectively going on the nod. But Jayjay resisted the attraction, both because Thuy hated it when he went mentally missing, and because, as he'd painfully learned, there were rarely any practical uses for the all-but-infinite ideas he got while merged with the overmind. Most of the time, Gaia's cosmic truths were scaled too large to apply to daily life's problems.

Keeping things simple for now, Jayjay told Gaia he was looking for flat rocks nearby. The triangular face bobbed gently, then spat out a silver, glowing orb. A hyperlink to the natural world—just the perfect address, as it turned out, a shale cliff in the very forest where Jayjay was building his house.

The Peng

I have a family of three Peng in the Yolla Bolly wilderness, and three in SF. For more about the Peng in general, see my "[Pengö](#)" entry.

Suller. The Dad. Something of a mafioso. A new age style developer. "Life is good." R2's realtor. A mortgage broker. BC from Bernco.

Gretta. The Mom. Shrill, annoying, bossy, demanding, fey. Savage and kittenish by turns. The Fisherman's Wife (always wants a bigger castle). I was also thinking of calling her Rhetta, but Gretta is betta. GD from college and MW from Los Perros.

Kakar. The Son. A comic foil. Loud and wacky. Irreverent. Smart. Sta-Hi. NH from Mathland.

And we'll have another family of Peng in San Francisco, I see them living in the Legion of Honor museum, eating the paintings.

Blotz. The Dad. A more vulgar superdeveloper. Russian? Mr. K in Alexandria.

Noora. The Mom. Self-centered. Ugly but very well dressed. Sarah Jessica Parker. Yessica Sunshine from *Frek*. I almost want to use that name again.

Pookie. The Daughter. Liza Minnelli played a Pookie in *The Sterile Cuckoo*. Good-hearted. Arty. Drama queen. Terminally self-involved. *Such* a grating fingers-on-a-blackboard kind of name! EL from Killeville.

The Hrull

See the [Hrullwelt](#) entry for general stuff about the Hrull race. I just describe some specific Hrull characters here.

I'm thinking of their big mouths. Grandgousier and Gargamelle were the father and mother of Gargantua, who married Badabec, who bore him Pantagruel, whose had a friend Panurge. There's an opera about Panurge where he's lost his wife Colombe (Dove). Panurge and Duvvy? Panurge too formal.

- Think of the way a manta ray moves. Undulator. Waver. **Wobble**, like Jah Wobble. Wobble is spontaneous, noisy, greedy, Rabelaisian? Or, no, maybe he's spitty, a policy wonk, like a very earnest Greenpeace guy. Or, better, he's the former pretending to be the latter.
- Wobble's girlfriend is Duvvy? No, **Duxy**. Like doxie. Did I use that name for an alien in some other novel? I'll have to check. She sounds like a spit-talking teenage girl. A little New Age, but also a wild gal who likes adventure.
- And the big one who carries them is Duxy's mother. Grandgousier, Grandgullet, Macromouth, Macromoto. Make it more German or maybe Hungarian. Nagyluk. Grossmund. Maxmund. Oh, but she should be female. Maxmunda. Maxmunda is businesslike, but likes a laugh. A skipper. (I used Maxmunda all through June, 2007, while writing the third chapter and even while writing most of the fourth chapter, on July 21, 2007, I decided Maxmunda was confusingly close to Panpenga, so I changed the mothership Hrull's name to **Lusky**. I got this name because I was walking in SF and saw a street named LUSK, and thought, "What a wonderully nasty-sounding name, it combines lust and musk.") Also Lusky echoes the Tusky of *Frek*.

If I need another pair of the rays, I can have a pair of high-spirited tiny ones, Squirm and Flop.

The deceased slave pusher inside will be called Sheckman in honor of my mentor, who originated the pusher concept. The Sheck Man immortalized once again. Great.

July 21, 2007. Lusky is going to die, leaving Duxy and Wobble on their own. In the absence of her mother, Duxy will quickly grow to mothership size. It's a hormonal thing with the Hrull.

Up till now, Duxy and Wobble rode inside the mothership, but once the mothership dies, her daughter grows to replace her.

What's Wobble's role in this? Well, he was Lusky's husband and Duxy's father. And now he has only a temporary berth in Duxy. She'll need to get rid of him and take in a husband of her own, who'll give her a daughter (and perhaps a son) who will ride along as well.

It may be that the replacement of Wobble is inevitably violent; perhaps the suitor of a single mothership always has to kill off or at least evict the father lurking inside the "gal." That's be psycholgoically fraught in an interesting way, and in some sense reflective of the way things really are. "My sons-in-law just slay me!"

So Wobble's going to be uneasy as soon as he's riding in Duxy, and his anxiety will grow quite intense when they return to the Hrullwelt. We can have a nice battle scene there, a bit like the mating battle of the Orpolese in the scene right after they're inside the sun in *Frek*.

The Harp and the Pitchfork

From *Postsingular*: When Thuy first gets hold of the harp. "For just a moment she could sense the strange otherworldly mind of the harp. The harp was an intelligent being from another order of reality. Gazing into her mind was like standing at the lip of a high, windy cliff. Thuy grew dizzy, she tottered on her feet."

Jayjay, too, senses it: “The harp is incalculably old and strange, a higher order of being.”

A two-tined pitchfork standing on its butt, hopping. The sorcerer pitchfork. It gives off a note, like a tuning-fork.

At first I thought the pitchfork is an enemy of the harp. I had the idea that the harp is pro-hylozoism, and the pitchfork is anti. That the harp wants unification, and the pitchfork wants plurality.

But maybe not. Maybe they’re husband and wife. Working together to bring about our dawning awareness of infinity. A yin and a yang.

Maybe I should just make it butt-simple: the harp is God, the pitchfork is Satan. But they’re better friends than Earthlings realize; in fact they’re mates. Like I said, the yin and the yang. Pitchfork is yang, Harp is yin.

If I literally do it, we could have the discussion about how humans have always known about the harp and the pitchfork (as God and the Devil), but oversimplified their view of them.

Hieronymus Bosch

These Bosch notes are based on my [visit to s’Hertogenbosch](#), and on a [couple of Bosch books](#) that I read. All I’ve done here is to compile those other notes and reorder them. I see using them in Chapter 5 and in Chapter 7.

Bosch Notes For Chapter 5 (Jayjay’s POV)

s’Hertogenbosch 1498. The town throbs with beggars and the poor, but the Burgundian nobles are living high off the high taxes.

The lingering Gelrian wars have pitted Brabant against Gelderland since 1480. They’re burning each others’ cities, like Oss and Driel.

The Burgundian troops are in town all the time, as this is the border. The soldiers assemble in the market to go fight against pillaging Gelrian soldiers.

People playing jacks with knucklebones. Pigs in the streets. Raw sewage. Cripples are viewed as people marked by the sign of the Evil One. Beggars are excluded from society.

The chapel of St. Anthony was at the end of town just inside the gate. Built by the Brotherhood of St. Anthony and finished in 1491, an expensive building of imported stone, the monks were well off.

The brotherhood of St. Anthony, or the Antonites, ran infirmaries where the monks took care of the persons suffering from St. Anthony's fire, also known as *ignis sacer* or holy fire. People would blister up and their limbs would rot off: “a great plague of swollen blisters consumed the people by a loathsome rot, so that their limbs were loosened and fell off before death.”

If prayers and ointments were of no avail, in most cases the lower legs or arms were amputated, so that the vital organs were not affected by gangrene.

The cause is black smut or fungus called ergot or *claviceps purpurea*. After bad harvests ergotism became an epidemic, as rye-flour was consumed which had been contaminated by the fungus. When milled the ergot is reduced to a red powder,

obvious in lighter grasses but easy to miss in dark rye flour. The alkaloids can also pass through lactation from mother to child, causing ergotism in infants.

People had no clue what caused it until about 1670. It was a cumulative poisoning, so it took more than one dose to poison you, so the connection wasn't obvious. But if you survived the beginnings of an attack, you never forgot the hallucinations.

Jayjay knows about this, due to his interest in getting high.

Convulsive symptoms: Painful seizures and spasms, diarrhea, , itching, headaches, nausea and vomiting. Usually the gastrointestinal effects precede central nervous system effects. As well as seizures there can be hallucinations resembling those produced by LSD and mania or psychosis.

Gangrenous symptoms: Dry gangrene from a constriction of the blood vessels. It affects the fingers and toes and even the limbs. Starts with loss of skin, weak pulse, loss of peripheral sensation, edema and goes on to the death and loss of affected tissues.

The Binnendieze River ran through the town. Two other rivers (really more like wide streams) met here: the Dommel and the Aa.

The big houses had their backs on the Binnendieze river.

Vismarkt on Orthenstraat with a crane unloading ships.

Boats on the Binnendieze called pleyten, flat bottomed barges.

Den Bosch has a small triangular town center, with a triangular marketplace in the middle, mirroring the fact that the town originally had three gates that led to the three other main Brabant cities: Brussels, Leuven, and Antwerp. The town's also triangular because it's wedged into the delta where two small rivers meet: the Aa and the Dommel. The Binnendieze cuts across.

Originally there was just a wall around the triangular Markt plaza, but by Bosch's time there was a larger city wall with five large gates, some smaller gates, five water gates and 23 towers. There were a number of wooden windmills outside the walls. A gallows field near the Vughter Gate.

Within the walls many areas were still undeveloped. Vegetable gardens. A big Franciscan monastery near the Markt. They were also called the Friars Minor. Had a church 80 meters long. 40 churches and chapels in the town.

The Brabant landscape, with the rows of trees along the edges of the green fields. Milky sky. Willow stumps with fresh spring shoots.

Twenty percent of the locals were priests, monks, brothers, or nuns. Town called Little Rome. The religious don't pay tax.

Jeroen van Aken (1450?-1516), known as Bosch. The locals say his name like "Yeroon Bos" or, more likely, "Yeroon van Aken." Bosch born a citizen.

He's in his late forties.

Bosch's family all artists. Grandfather, father Anthonis, uncles Goossen and Jan and brother Goossen.

Father Anthonis, also known as Thonis die Maelder, died in 1481, the family divvied things up and assigned his little house to Jeroen van Aken's brother Goossen van Aken. The family has as workshop in this house.

Brother Goossen's wife is Kathelijin. They have a son Jan or Johannes (1470-1537) and Anthonius (1478-1516) who were, respectively a painter-sculptor and a painter.

In 1481 Goosen decorated the high altar in St. John. Maybe Hieronymus helped him or did the paintings. Also Jeroen worked on the altar piece for the Brotherhood of our Lady.

Bosch lives on the north side of the market with his wife, Aleid van de Meervenne (married 1481) in a big house they bought together, called "In den Salvatoer". Its windows face south so the sun streams in, also the sounds of the market. The house backs onto the Binnendieze river.

The houses had wood facades with a couple of brick walls within for strength and to support the fireplaces. A typical house had a big front room, used partly as an office or store, with a balcony backing onto the warm fireplace wall. The rear part had the bedrooms. Cellar entrance in front of the house under a little shed called a pothuis. Hearths in cellars too.

Wooden ceilings decorated with floral motifs and vine paintings. Murals on many interior walls, flowers, and religious paintings too.

Weekly market on Thursday. Marketplace sounds: church bells, geese honking, wooden cartwheels on cobblestones, pigs squealing, children shouting, cows mooing, people talking, sheep baaing, a smith hammering an anvil.

Things for sale: sheets, shoes, stockings, leather shoelaces, hats and caps, pins, baskets, kettles, pots and pans, twine, vegetables, fruit, flour, meat, butter, cheese, cloth. Butter market, corn market, and fish market as well in other spots. Anyone could sell stuff in front of their house.

Traffic in the Markt: wagons and carts, horses and oxen, wheel barrows, and sledges even when no snow.

In the studio, he's wearing a robe and a hat with earflaps. Jayjay sat at his work table watching him, listening to the sounds through the window, talking to him a bit. On the table were copies of some of his drawings, bowls of berries, a bowl of eggshells, a peacock feather in a glass jar, gourds. A cow skull on the wall. A stuffed heron and a stuffed owl. A lute.

Bosch began from the standpoint of reality and in his paintings transformed this by portraying objects out of proportion or by changing them into bizarre creatures or objects.

Bosch's work is simultaneously cryptic and inaccessible, yet totally open, with the lowest of thresholds. This is painting for both the most serious art-lovers and for those who virtually never visit a museum..."

Bosch's drawings. Two pages filled with cripples; 32 on one page, 30 on the other. Most of them are smiling devilishly. Bosch shared the medieval belief that cripples were in fact evil, and that they had an easy life since they were deemed unfit for ordinary work. Their expressions almost seem to say, "We've got it made! We're beggars!"

Another drawing shows a dog bemusedly looking back at his butt, which has turned into a legless warty lump. As we'd say in German, "Ach du lieber, wo ist mein Arsch?"

Thuy's favorite drawing is of a kind of lizard man, also with a warty, hairy gross butt. He's posed with his butt towards you, looking back at you over his shoulder, which makes me laugh, as this is such a shop-worn "sexy" pose for women in ads, "Hey there. How do you like my butt?" Thinking of the Bosch beast is way to throw cold water on that tired commercial cliché.

Bosch shows Jayjay a scene with eyes in the field and ears on the trees, which was by then a familiar saying and rebus. And at the top he wrote, "Miserrimi quippe est ingenii semper uti enventis et numquam inveniendis," which means, "It is characteristic of the most dismal of minds always to use clichés and never their own inventions," the phrase drawn from a 13-th century pedagogical treatise then believed to be by Boethius.

Garden of Earthly Delights was a youthful success by Bosch, he painted it when he was about 25 in 1475 (Dendrochronology puts the wood's earliest possible use date at 1460-1466.) It hangs in the Nassau palace in Brussels. He has a copy in his studio. He's sick of hearing about it.

His wife Aleid van de Meervenne is from a well-off merchant's family, and three years older than him, so that when they married he was 31 and she 34. In his paintings one never sees real intimacy. There's no love or sexual passion, even in the famous "dogpile orgy" of *The Garden of Earthly Delights*, which is more like a cool tableau. All those toothy, red mouths in the Hell pictures suggest a fear of the *vagina dentata*. Yet Bosch was obsessed with sex. All those bursting seed pods speak of fertility. And the occasionally coprophagic depictions of excretion certainly betoken a fetishistic interest in sex.

Bosch had no children because health conditions were poor in those times, and it's possible that at 34 Aleid was infertile. Also, records indicate that infant mortality was very high in Aleid's family, so it could be that they had some children but lost them in infancy.

He worked on investing and managing his wife Aleid van de Meervenne's inheritance.

The donor who commissioned a picture would often be added into the painting, kneeling in prayer on the side with his wife. In Bosch's painting *John the Baptist*, which also contains a human-shaped mandrake root, there's a huge mound of elaborate foliage in the middle of the picture, and infrared shows there's a kneeling donor under the foliage. This painting was commissioned by the Swan Brotherhood of Our Dear Lady for their chapel in the Saint John's church. The president of the society was Bosch's neighbor, Jan van Vladeracken, and he had gotten himself painted into the picture, and then the other members said, "Hey, that's our society's joint money you're paying with, don't hog the credit and have just yourself in the picture, Jan." So Bosch took it out. And then Vladeracken and Bosch quarreled over this. Vladeracken and unpleasant bullying large Dutchman. Resentful. A drunkard. Bosch's neighbor.

Bosch's other neighbor is rich merchant Lodewijk Beys (Ludwig) who went to Jerusalem in 1500 and 1503.

In his time a painter was just a kind of craftsman, who might take all kinds of decorating jobs.

Guilds not particularly for artists. No concept of “artist”. They were like ordinary craftsmen who worked with their hands, not in a special guild.. Only after Bosch’s death did people start calling him master. Probably not in a trade guild. Most of work on commission.

Bosch’s fellow artists earned money from decorating homes as well.

Duke Charles 1467-1477 pissed away money on wars and took in a lot of tax. Riot after Charles died fighting in Nancy, people attacking magistrates. Maria of burgundy succeeded Charles, pardoned them. She came through town with her husband Maxmillian of Austria and many other nobles. Bosch saw this, he was 25, it inspired *The Haywain*.

There was a popular religious movement called Devotio Moderna. Each individual must continually choose between good and evil. Awareness. You are a wayfarer.

Bosch is against poor impulse control, festive pleasure, laziness. For discipline, modesty, industry. Deep seated rejection of fun in the morality of the burghers. They were always trying to ban festivals. Hated Shrove Tuesday.

The medieval people were really under the thumb of religion. They were endlessly obsessed with sin and punishment, and with the notion that God was always ready to judge you.

The Lisbon *Temptation of Saint Anthony* is a triptych showing three torments of Saint Anthony—on the left the devil lifts him high into the sky, on the right he’s besieged by lustful women, and in the middle he’s surrounded by monsters. *Temptation of Saint Anthony* is dendrochronologically dated to 1495-1501. Let’s say he painted it for the Brotherhood of St. Anthony in 1496 when he was 46.

Bosch has had some long, strange nights under the influence of light doses of ergot-tainted rye. Maybe he was fighting off the effects as he didn’t want his legs to fall off. He really relates to St. Anthony.

They visit the Dominicans with the abbot of the Antonites. A fireplace lintel is adorned with a sculpture of a skinny Borzoi dog with prominent ribs and little bat wings, his tail growing out long and tapering into a leafy vine. Needle-like teeth.

In the Dominicans’ church is an altar piece by Bosch that he did a couple of years ago, like 1492. High on the ceiling above the transept is a triangle with the eye of God. Staring down, watching our every move, continually assessing whether we’re bound for Heaven or Hell.

The altar piece has in its center the lost composition: *Saint Leaving the City*. Shows people doing “swine clubbing” typing up a pig and getting blind people to try to club the animal to death. They hit each other—big laughs from the callous onlookers. Once the pig’s dead they can eat it. Monks might give a barrel of wine or beer to beggars.

On the inner wings are on the left: *Ship of Fools & Allegory of Gluttony*, on the right: *Death and the Miser*. And on the outside is the *Wayfarer* (painted after 1487-1493).

And let's suppose it was in the church of the Dominicans.

The Wayfarer (or *Pedlar* or *Peddler*). He's white-haired, intelligent, worn. It might be Bosch himself. The man is on a narrow path approaching a change; in one version it's a little bridge, in the better version of the picture (now in Rotterdam) it's a gate. Thomas said the gate (or bridge) stands for a transition the man is approaching: death. Not immediately, perhaps, but it's closer than it used to be. In both he's fending off a nasty dog with a stick; the dog is the devil, the stick is his faith.

The pedlar is looking back—on his past life, perhaps, or on the worldly things he's avoided. We see an inn with pigeons flying in and out, which in medieval iconography indicates that it's a brothel. The good news is that an ox or cow stands beyond the gate the weary traveler is approaching; the ox is a symbol of Christ. The pedlar is bound for greener pastures!

Bosch identifies with the wayfarer, he feels like he's him. He's trying for on the narrow path, avoiding evil, and death is certainly closer than before. He is avoiding the taverns and the smiling, beckoning prostitutes. But he is weary from life's long journey, tired of putting himself on the line. Maybe heaven is real. Maybe it would be nice to go there.

Bosch Notes for Chapter Seven (Thuy POV)

oneerlicke herbergen = dishonest taverns.

15th century pottery. Very thick plates, very coarsely made. Pottery kettles with four legs. Everything heavy and clumsy. A key with a barrel and a single square S-squiggle.

Punishments in front of Town Hall. Flogging, or mutilation by sword. Hung, broken on the wheel, or beheaded. Exhibit the bodies outside the Vughter gate on gallows or on a wheel in the air.

Staple diet was bread or porridge, vegetables, fish, bacon, fat or dairy products. No mashed potatoes. Thin tasteless beer was the drink (no germs). Clothing of poor subdued.

Inns had *stoven*, heated rooms where people bathed. Licentiousness. In the *Stoofstraat*, the bathhouses were brothels.

The marketplace's old well at night, a gathering place. The beggars and cripples might hang out here.

's-Hertogenbosch was known for knife making and for bell making. Casting a bell was a dangerous thing; the big bells for churches had to be cast on site, as they were so heavy. Thuy sees a guy burned to death during the casting.

Visual rebus on the town name “s-Hertogenbosch” = oor + ogen + bos (ear + eye + woods). Or = hart + ogen + bos (stag + eye + woods).

A big annual market on the Sunday after June 24, after the procession for the Virgin Mary. Militias, guilds, images of fairs, actors pretending to be biblical figures, floats, litters, canopies, painted banners. Bosch family did work for this. Tableaux of bible scenes.

Processions, costumes, jokes. cockfights. eating and drinking. fights.

Merchants, country people, city people, musicians, beggars, charlatans, conjurers, magicians, acrobats, pickpockets, cutpurses in town for the market.

This is the day that Jayjay plays the magic harp and everything wakes up.

Language

Possible Names

Tulla. She was Edvard Munch’s girlfriend.

“Dynamic Hieroglyphic of the Bal Tabarin,” by Gino Severini.

Hibrane and Future Slang

At first I was using standard 60s hippie voices for the Hibraners, but that’s way tired. I’m trying for a slang that’s influenced by the fact that they’re telepathic. Azaroth says “you touch” instead of “you dig.” And “I glow dogs” instead of “I like dogs.” I should flip a few more things. After all, it’s also 2035 in the Hibrane even if they are in some ways like 70s hippies. “The Land Where The Summer Of Love Never Stopped.”

I’ll * the entries that I expect the Lobraner kids to be using as well.

addle	fuck up, mess with
dumpty	humble
glow	like
flurb*	bungle
glowy	good
hoppy	fast
humpty	bossy
ject	dislike, hate
jitsy*	bad, creepy
spike	good idea, a flash
spiked	happy
squish	wipe out
starky	outstanding
teep	communicate telepathically
wave	dig, wave, grok
vibby*	funny, cute

Table 6: Slang

Detailed Active Outline for Hylozoic

While working on the book, I repeatedly update the outlines of the chapters or subsections that I haven't written yet. The outline is continually in flux. Usually when I finish a chapter I spend a week or even a month in revising the outline of the parts still to come.

I used to fastidiously update the outline retroactively. But I got tired of doing that.

That is, it usually happens that when I actually write a chapter or a subsection, I deviate from the last version of the outline that I used. But I've taken to leaving the (now inaccurate) penultimate version of the outline as it was. Mainly I want to avoid pointless make-work projects—once the chapter's written, why keep working on the outline? And, really, in terms of a record of my writing process, it's probably more interesting to have the outline not always match the text.

The text is the final revision of the outline. The map that's finally the same size as the terrain.

[Note that the chapter numbers in the published book are different from these "old" chapter numbers, as each of the original chapters were split into two or three pieces during the creation of the Third Draft. See the [table summarizing the splits.](#)]

Chapter 1: After Everything Woke Up

(Jayjay's POV.)

A number of the basic facts about the world are worked into the opening chapter: We find ourselves in a highly postsingular world where a mysterious being called the magic harp has unrolled our eighth dimension—which was formerly curled into a tiny circle. This unfurling—which took place at the end of *Postsingular*—had momentous consequences. Every human on Earth has omnividence, endless memory, telepathy, teleportation, and telekinesis. That is, you can see any spot in the world, you can remember every detail of everything that happens to you, you can "teep" into

other people's minds, you can instantly hop from one spot to another, and your mind can take hold of objects and move them about.

As if this weren't enough, every object on Earth is now conscious. By the way, the philosophical belief that objects have minds is called panpsychism or *hylozoism*—thus the title of the book.

Objects have telepathy like us, but fortunately they can't teleport. As it turns out, although telepathy is not so unusual in the cosmos, the ability to teleport is limited to the very few humanoid species that have arisen.

(1.1) The story begins with our two main characters Jayjay and Thuy, who are recently married. They're setting up a homestead in the Yolla Bolly Wilderness area of Northern California. They got the land rather cheaply, as it has no improvements. They've already built the house in the driveway of their friend Ond in San Francisco. And now they're in Yolla Bolly building a foundation for the house. They're in telepathic contact with the stones and with the stream. The stones like being in a wall, but the stream is angry they are moving in. They're being watched by the public as well: they're stars on the *Founders* reality show that people watch telepathically.

(1.2) They go to San Francisco to round up a dozen people to help them teleport their pre-built house from SF to sit atop their little stone foundation wall in the woods. Jayjay starts by corralling his old friend Sonic, who's strung out on ecstatic contact with the Gaian Pig, the overmind of the planet. Sonic leads telepathic tours, helping people see natural phenomena as video games.

Jayjay and Sonic go to the home of Ond, Jil and Nektar, where the cottage is waiting. Jayjay talks to the charming Jil, who's working with some of her shoon robots. Jil's kids Bixie (13) and Momotaro (15) appear, and then Jil's current partner Ond, the nanotechnologist who brought about the Singularity. The next to show up are Ond's ex-wife Nektar and their somewhat autistic son Chu (14), and then Thuy's friend Kittie and the sex-star Lureen. And finally Thuy and her father Kanh arrive. So they have twelve people: Jayjay, Sonic, Jil, Bixie, Momotaro, Ond, Nektar, Chu, Kittie, Lureen, Thuy, Kanh. Six men and six women. These are all returning characters from Volume 1: *Postsingular*.

(1.3) The teleportation of the house works pretty well, although Thuy's father screws up. He's distracted by Thuy's mother Minh who has refused to help. Minh effectively undermines him. Thanks to the Khan's slip-up, the porch of the house is chewed off by the subbies of the subdimensions—these are creatures that one is vulnerable to while teleporting.

They patch up the porch with a redwood log. And then they have a cookout with the gang amidst pleasant chit-chat. Momotaro talks about taking Bixie and Chu surfing tomorrow. Thuy overhears them, says maybe she'll come along. And then Thuy gets into talking about her "metanovel" writing projects.

(1.4) Weary from the day's work, Jayjay grows bored and goes off to sit by the stream with Sonic. They start playing a nature game with the water—herding eddies in the stream. Somehow this leads to them hooking into the Gaian Pig, and they end up stoned and on the nod. It's the "drunk groom on his wedding-night" archetype. Jayjay has a vague sense of Thuy shaking him—and of settling deeper into his trip.

In the wee hours, Jayjay and Sonic have a vision of growing a beanstalk out of earth, up high into the intergalactic communication aether. Jayjay has a vision of the magic harp, and of a higher mind than Gaia's: the giant Cosmos. The harp and the Cosmos ordain Jayjay as a "runemaster," able to make a kind of power sound. Jayjay

sings a rune and then recklessly opens a channel to an alien planetary mind. The aliens' planetary mind seems avid to exploit Earth, and the alien mind seems to dive into Jayjay's very soul. Oh, oh.

Chapter 2: The Missing Gnarl

(Thuy's POV.)

(2.1) Thuy wakes from uneasy dreams. She has a feeling that something's changed, but she's not sure what. She hears bird squawks.

She's angry at Jayjay for getting high the night before, but she can't crank up much of a mood. She feels oddly calm, and curiously remote, even though Jayjay is still asleep on the floor.

Sonic shambles in. He says something cryptic about a weird vision with Jayjay—but he can't remember the details. He fetches some coffee and food, and then rushes off, he's leading a squid and whale fight tour, one of his most popular telepathic safaris.

Thuy tries to ponder what metanovel to write next. But she can't think of anything interesting. And she can't focus on details. Her mind feels bland. She keeps thinking in platitudes.

Thuy is about to head for Ond's house to meet up with the kids for surfing. At the last minute Jayjay wakes up. He pours cream into his coffee and the cream just makes a blob instead of a chaotic swirl. Odd.

Jayjay says he can't remember exactly what happened to him last night. His memories of last night's vision have been erased.

They teleport to San Francisco.

(2.2) Things still feel normal in SF. And with their gnarly emotions back in full sway, Thuy and Jayjay have a big argument—which ends by clearing the air. The newlyweds are still in love. They borrow surfboards and psipunk wetsuits via the web.

Thuy, Jayjay, and the kids go surfing in the gnarly forty-foot waves of the Potato Patch shoals off the Golden Gate Bridge of San Francisco. In the old days this would have been insanely dangerous, but now it's feasible, due to teleportation and hylozoism. You can hop out of harm's way, and you can talk to the waves and your surfboard..

But then Jayjay has a fit which lasts about two minutes. He's shaking all over, almost dissolving, he looks like a cloud of dust. Thuy peers into his mind; for those two minutes, he's acting as a channel of transmission, like a spirit medium, he's spewing out—musical tones, one to every atom within sixty miles of where they float, including thirty miles up into the atmosphere and down into the Earth's crust.

The spell passes. And now the ocean had turned tame. There's a simpler spectrum of wave-sizes than before: the tiny ripples are gone, as are the really big rollers. The sea is like a sloshing bathtub. The clouds in the sky look overly simple. All of physics seems to have gone flat. It's as if natural objects are busy computing—something else. Jayjay says something is stealing our gnarl.

Thuy is feeling bland again, and so are Jayjay and the kids and their intelligent surfboards. Obviously the missing gnarl results from Jayjay's fit. But what *was* it? Thuy watched it happen, but it's like studying low-level computer code. You can't tell what it means.

(2.3) They hop back to Ond and Jil's house. Kittie is hanging out with Jil, she's just recovering from a catty love-triangle-fight with Nektar and Lureen. The drain of emotional gnarl has chilled her out. Kittie has a blook (like electric paper) of Hieronymus Bosch paintings with her. Kittie shows the Peng the *Garden of Earthly*

Delights and *The Temptation of Saint Anthony* in the Bosch book. She says she'd like to paint like this, though just now she feels too dumb to paint. The pictures seem to glow as they study them. Thuy remarks that Bosch painted objects as if they already were alive.

(2.4) Thuy gets in touch with Gaia, and finds there are presently only two areas with missing gnarl: San Francisco and the Yolla Bolly wilderness.

Gaia is very concerned about the missing gnarl phenomenon. Gaia worries the theft of our gnarl will suffocate her like parasitic ivy strangling an oak. She thinks some aliens are already active here, but she can't see into the core of the two missing-gnarl zones. Gaia says the aliens are getting Earth's matter to compute bodies for them—which Thuy dubs “[tulpas](#).” (This is a word used by Tibetan Buddhists for thought forms that take on material form; it's been used by a range of F&SF writers.)

Gaia says that a tulpa is a much stronger type of emulation than a mere program that lives within a virtual reality. Tulpas have mass and physical presence. They're the output of a heavy-duty distributed quantum computation spanning the particles in a hundred-kilometers-on-a-side cube of matter.

She suggests cauterizing herself with an extinction-event-level antimatter-matter explosion under the infected zones. Thuy volunteers herself and Jayjay to try something in person first.

(2.5) Gaia give Thuy three guns, based on the burgeoning new science of femtotechnology. The blue stonker cancels out atomic vibrations so that things collapse into atomic dust. The copper-and-crystals klusper excites things into evanescent plasma. The gobble gun is a localized black hole that sucks in matter and spews out a string of degenerate matter in back, the string coils up like a black whip. Momotaro tries to grab the stonker, and Thuy just about shoots him with the klusper.

(2.6) Thuy, Jayjay, and Chu teleport to their new home in the Yolla Bolly wilderness, hoping to get to the bottom of the problem. Their creek, Gloop, and their redwood tree, Grew, are terribly tranquil. The water is limp and simple; there's no eddies. The tree branches are hanging motionless.

Somewhere far off in the woods they hear harsh alien bird cries. The squawking draws closer.

Chapter 3: The Peng

(Chu's POV.)

(3.1) Three large alien birds come flapping and walking into the woodsy clearing by Thuy and Jayjay's house. They move rapidly in an urgent, stealthy gait. They resemble plump, grubby kiwi birds with long beaks, but with more powerful legs than kiwis. They can hop quite far. The beaks are toothy, like those of pterodactyls. These flightless alien birds are smelly and omnivorous. Lots of pecking and squawking.

Jayjay is holding the gobble gun, Thuy the klusper, Chu the stonker.

The aliens introduce themselves as Suller and Gretta, a married couple, along with Kakar, their ne'er-do-well full-grown son.

They share in the lazy eight telepathy—which is how they talk to Thuy, Jayjay, and Chu.

Thuy shoots at them, the aliens flare up into flames, starting a fire in Grew's branches. But then the aliens are back. Jayjay fires the gobble gun at them, which sucks in stuff making a hole through the woods, making the aliens disappear for a minute, then he aims it up to suck in the flames, dousing the fire in Grew. The gobble

gun puts out the fire. It leaves a long coiled turd of degenerate matter in back. But now the aliens reappear once again.

Chu grasps that although the Peng seem quite solid and real, they are indeed tulpas that result from a distributed quantum-computational emulation. Their reality is distributed. He's able to see the contribution of each atom, he has that kind of mind. He sees the process as a Fourier series. Chu quietly stashes his stonker in his pocket.

Meanwhile the aliens aren't even acting that pissed off. The big one just says, "Stop that!" And he snatches the klusper and the gobble gun—and eats them. The tulpas' long, gnashing beaks are more powerful than ordinary matter beaks.

Suller says they wanted to thank Jayjay for having enabled their emigration to Earth, even if he did try to kill them just now. But he's annoyed.

Gretta says our Earth is like a paradise—or will be once the mammals are eliminated. She explains that their planetary overmind Panpenga is entangled with Jayjay and that Jayjay is like a spirit medium for them. Gretta has a high, annoying voice and a fey manner.

Suller says mockingly that now everywhere on Earth that Jayjay goes, he opens up a channel through which some new Peng tulpas can be installed. Chu checks with his father Ond, and, indeed a family of three Peng have now settled in San Francisco: Blotz, Noora and Pookie. "They're a fine family," says Suller. "Once we have a solid string of Peng ranches between here and there, I'm hoping that Kakar and Pookie can get together." Suller brags about how few and elite are the Peng who can come here. "The very cream of Peng society."

Young Kakar says, "Right. Blotz was a failure like Dad. They both sold out to Warm Worlds. They're the developers who ship rich oldsters to Peng ranches on the new lazy eight planets that we discover." Suller gives Kakar an angry peck for having revealed this.

Kakar explains that the million-cubic-kilometer block of slaved quantum-computing matter that computes a family's tulpas is called a Peng ranch. He remarks that the whole of Earth's surface has room for something like five thousand Peng ranches. Suller scolds and pecks Kakar again. Kakar hops up on the cabin's roof to get out of reach.

"Yes," we'll need for Jayjay to go on the road for us," says Suller. "That's why am still willing to make you a generous commission offer. You'll have to visit each new Peng Ranch site in person, as otherwise the entanglement signal isn't quite hi-res enough. You'll be like a traveling preacher blessing each new home. We can't come with you, as we can't leave our own ranch."

Jayjay is horrified. "I won't do it." Suller: "Yes you will. One way or another." Gretta remarks that, if the truth be told, the reduction of gnarl will in any case be good for humans' mental health. She sounds like a snotty social worker telling a black family that jazz is bad for them. She reiterates Suller's remark that Jayjay is going to develop the whole surface of Earth. "We'll work together, moving as quickly as we can."

Jayjay wants to kill himself. Chu is teeping into Jayjay, and he's shocked by the depth of Jayjay's pain. Chu is still new to empathy; in the old days he wouldn't have picked up on this. It hurts. Maybe empathy is more pain than it's worth.

Thuy comforts Jayjay. Thuy asks why are the Peng depending on Jayjay for their invasion conduit?

Suller answers that the Peng haven't mastered intergalactic space travel. In fact they can't do telepathy. Suller drops a prefiguring hint about the Hrull.

(3.2) If humans can really teleport through space, maybe he should go somewhere. He liked the trip to the Hibrane. He has cosmic wanderlust. He asks the Peng for more info about Pengö.

Gretta shows a kind of movie about Pengö which I write in the present tense second person you-are-there style, setting it off by asterisks.

[Start Movie ***]

The planet Pengö is in a galaxy the so-called Great Attractor zone. It's forested, and covered with birds, insects and trees. It's a lazy eight world, everything is alive. The planetary overmind is Panpenga. But, although Pengö is forested, it's ancient and fissured; its once-molten core has crystallized. And the plants aren't diverse. All in all, it's a senescent, uninteresting world—like the Peng civilization itself. The Peng society is very stiff and mannered, their art is regimented and uniform. They're an ancient and decadent civilization, reduced to endlessly copying what their ancestors did. The film speaks of the Peng's art as "mature" and "highly perfected."

The experience of becoming a tulpa is simple for a Peng. You jump into a certain volcanic hole. The fissure leads down to some lava that dissolves you. Panpenga, the global mind of Pengö, extracts the full details of the quantum computation your body contains, cleans up the data a bit, and then transmit this pattern via quantum entanglement to a distant world. The patterns create matter-wave simulations on the distant worlds, and the simulations are the physical and very real-seeming tulpas.

Panpenga likes the notion of spreading tulpas of her denizens across the cosmos. Access to the tulpafication treatment is, however, expensive. It's the final big pay-off for a prosperous Peng life, it's like immortality. Warm Worlds maintains fine facilities over the transfer vent, and they require all of a Peng's resources in trust—and the resources have to be very high. Only the finest families can come.

[End Movie ***]

(3.3) The Peng couple say that they want to build themselves a home right beside Thuy and Jayjay's. Kind of mocking them, Thuy sends them an image from Bosch's *Garden of Earthly Delights*, and they decide to make themselves a glassy pink marble castle like in the picture—instead of the usual stone dome.

The Peng are able to contact the atoms of the Peng ranch themselves, they can reprogram it. They use the massed computation of the ranch, which is like a supermind for them, and send the information out atom by atom to the ten tridecillion atoms of million cubic kilometer Peng ranch they're standing in. It seems to take only a few seconds.

Chu watches closely, teeping in, fascinated, he likes this kind of thing, in fact Chu invents an actual list of the atoms' names. Each name consists of nine more or less random English words. Most people, like Jayjay, wouldn't have the patience or will to memorize the names but Chu does, as he's autistic and a bit of a "savant."

The Bosch house appears.

(3.4) Now the bossy Peng say they don't like having Thuy and Jayjay's brand-new house as a neighbor; they want to scrape it down and replace it with a new one befitting Jayjay's crucial status as their personal medium. Once the other Peng start arriving, it might reflect badly on Suller and Gretta if their Earthly medium is ill-

housed. Jayjay says he wants to discuss redesigning the cabin with Thuy. He says, significantly, “The more I can learn about tulpas, the better.”

Chu and Jayjay both understand they are planning a counterattack, but Thuy loses her temper, she’s annoyed that Jayjay is changing their nest. She angrily flounces off for a walk, and Chu tags along with her. He’s quite drawn to her.

Thuy and Chu meets two flying, levitating manta rays. The Hrull. They’ve landed in a glen near the house. The Hrull are manta rays with glowing CA-style skin. They’re graceful, but their teep voices sound slobbery. They are Wobble (M) and Duxy (F). Wobbles mother Lusky, hiding near the cliff, is *much* bigger than them: she’s the mothership, an acre in area and as big in the middle as an aircraft hanger. [Later we learn that the little ones travel in the big one’s mouth.]

Lusky says she’d like Chu to join her crew, he’s not sure. On the one hand, Chu doesn’t like feeling Jayjay’s despair and he doesn’t like his feeling the pain of his rejection by Bixie. He doesn’t like feelings. Getting away from humans might be cool. He’d enjoyed his and Ond’s trip to the parallel world of the Hibrane, but in a way the Hibrane had just been a funhouse mirror-image of Earth. He’s tempted to take up the Hrull on their offer. But, on the other hand, Chu is suspicious of the Hrull’s motives. He recalls Kakar’s remark about Hrull pushers.

The Hrull say they can help stop the Peng. But they don’t want the Peng to know they’re here. The two races are fierce enemies. The Hrull present themselves as being eco-activists; they say they want to stand up for Earth’s indigenous culture against the imperialist Peng. They say that several years on a Peng ranch will make the human race de-evolve so as to become incapable of gnarly thought.

The Hrull say they can block the Peng Ranch computation with a special kind of mental algorithm that they call the atomic reset rune. The reset rune is a cross between a sound, a teep signal, and a matter wave. They demonstrate it: they make the water in a waterfall gnarly, and they make Thuy gnarly, freeing her atoms. Chu learns the rune.

(3.5) Thuy tells Chu she’ll distract the Peng while Jayjay and Chu try to decommission the Peng ranch.

Back at the now-palatial cabin, Jayjay is putting on a cookout for the Peng, roasting a whole pig that he teleported in for them. He’s also provided them with a keg of sparkling mead—fermented honey. Jayjay is worried because he still doesn’t see how to erase the Peng. In effect he destroyed his cabin for nothing. He apologizes to Thuy.

Jayjay and Thuy make up. Thuy gives him the good news about the reset rune, then takes over the work of distracting the Peng. She begins dancing for the Peng to distract and entertain them. They’re enthralled. She’s vibrant and lively, thanks to her matter being free, although the Peng don’t realize this.

Inside the cabin-turned-palace, Chu and Jayjay commune about how to disrupt the quantum computation that’s generating the Peng. Chu tells Jayjay about the reset rune that he learned from the Hrull: it’s a weird warble, plus a telepathic endless-regress loop, plus a matter-wave pulse. Jayjay describes it as a quantum-computational operator.

Chu can’t actually produce the reset rune himself, but Jayjay can. Because Jayjay is a runemaster, thanks to having been blessed by the harp and by the Cosmos. Jayjay tests out the reset rune by shaking out a handkerchief. How nice it is to see chaos again.

Chu can't quite get the hang of how Jayjay is doing this. He doesn't have a fundamental enough contact with matter, he doesn't have "the common touch." Jayjay tells Chu a little about how he was ordained a runemaster by the Cosmos and the magic harp.

Jayjay tries the rune on a candle the smoke gets gnarly. Duxy the Hrull appears in the back of the house peering in the window. This is the first Hrull that Jayjay has seen, he kind of freaks out. Jayjay and Chu agree that they'll need to be wary of the Hrull's agenda. Chu mentions Lusky's offer that he join her crew and he worries aloud about life as a Hrull pusher.

Jayjay is going to use the reset rune to disrupt the coherent state that's producing the tulpas, in effect resetting the atoms one by one. Chu says, "The tulpa Peng will fall apart without a steady influx of computation. They're like ice-sculptures in a blast furnace, being kept together by a zillion gnats with trowels and Slushy cones."

But can Jayjay find all the atoms? Fortunately, autistic savant that he is, Chu has memorized the full roll-call of all ten tridecillion atoms in the Yolla Bolly Peng ranch.

Chu begins running through the list of atoms, and Jayjay resets each atom. This is going to take two minutes.

(3.6) The Peng ioneers notice the attack, and they try to kill Chu and incapacitate Jayjay. Jayjay and Chu are freeing the silps concentrically from around the cottage house, so they has rings of allies around. Gloob and Grew and the local atoms are blocking off the Peng.

The Peng tulpas are looking weird, each of them have a half dozen ghost images, and their shapes are overly smooth in spots and with odd sharp cusps in other places, like Taylor series jets. Their thoughts are a bit incoherent as well.

Kakar lets out a crazed squawk and connects to Jayjay and—takes control of him. Jayjay is frozen like a wax-works model.

Jayjay's mind is working as a slaved medium for the Peng, now restoring the atomic computations that they just erased. Suller, Gretta and Kakar are pulling back together. Chu would like to unknit their progress but he can't.

The Peng notice Duxy the Hrull in the vicinity, which throws them into a wild fury. Duxy calls on Chu to help them escape. She can't teleport on her own just now.

(3.7) Chu runs with the Hrull for their big mother Hrull. As he reaches the Hrull's glen, Chu trips over something soft and yielding. The big Hrull dives down towards him, mouth agape.

Chapter 4: Coma Nurse

(Thuy's POV.)

(4.1) Thuy was horrified to see Jayjay frozen. Suller, Gretta and Kakar were standing over him like menacing ghouls. Thuy felt desperate, she pushed forward. "Get away from him! Let me touch him!" Suller sizzled a warning hole in the ground in front of her feet. Thuy could feel the heat.

Just then Thuy ot Chu's message of love, and she reflexively teleported to him, a little surprised at herself for leaving Jayjay so readily. She found a body on the stones where the Hrull mothership was. At first she though, *oh sob*, it's Chu. She was feeling a shockingly strong pang—did she have a crush on this odd little boy? But—the body wasn't Chu's, wasn't human in fact. The hands had bunches of fingerlets in place of the ring fingers, and the center of the forehead bore a third eye.

Chu was somewhere else. Mentally reaching out for him, Thuy could almost sense his teep signal—but it was muffled as if he were inside something.

Thuy hopped back to Jayjay's side. It was night. The Peng changed their tune. They wanted her to look after Jayjay, to nurse him like a coma patient. They said that if Thuy didn't play along, they might let Jayjay die.

(4.2) The next morning, Thuy woke to the sight of—the horror!—a human-looking Realtor. Gretta had shapeshifted herself. "What would it take to earn your business today?" said Gretta, her voice surprisingly smooth and unctuous. She cocked her head and fixed Thuy with a glittering eye. "Am I doing it right?"

The other two Peng resembled human Realtors too. Mr. Kakar and Mr. Suller, looking middle Eastern and Irish. And now two real human Realtors showed up. A married couple, Chick Garnish and Ducky Tarry, "We're the top-earning team in the Bay Area." Suller said, "We chose them because we like their names."

"Speaking of names," said Chick, staring at Kakar. "Are you from the Middle East?" "Further than that," said Kakar.

The plan was for Thuy to nurse Jayjay while she, Chick and Ducky schlepped him cross-country opening new Peng Ranches. The Peng had clients waiting for a dozen more Peng ranches; the plan was to situate them in the Midwest, where there might be less fuss. And of course the human Realtors would get a settlement fee for each successful ranch.

(4.3) Thuy, Kittie, Chick and Duckie teleported themselves and Jayjay to Killeville to start with. It was Sunday morning. They materialized in the busy parking lot of the Candler Road Church. Jayjay was in a wheelchair. He moaned and shuddered, setting up a Peng ranch.

Three people walked across the parking lot. They were glowing. It was the three new Peng wearing the shapes of three deceased people of local significance, to wit, the founder of Candler Road Church, Dr. Donnie Macon, a very fat man who'd died of a heart attack, his wife Bonnie, who'd died of cancer, and their son, Donnie Macon, Jr., the second preacher of Candler Road, who'd died in a drunk driving accident.

They go into the church, which was now in the hands of Donnie, Jr.'s son, Donnie Macon, III. With Jayjay's help, the Peng shaped like Dr. Donnie Macon turns stones into bread, water into wine, and makes flowers bloom from his fingertips. Though fat as a hog, he levitated and moved his body around as readily as a video game player moves Mario.

"This here is the Sleeping Savior," said Dr. Macon, pointing at Jayjay slumped in his wheelchair. "The Savior has manifested Himself in the body of an ordinary, sinful Latino man—in former times he was a kiquie, a rebel, a sensualist. God has planned a Day of Reckoning. You will know this day when Gabriel's trumpet reaches down from the beyond and the sky breaks open. But perhaps that's not coming so soon. And until that dreadful, wonderful horn does sound, the righteous people of this congregation can help the Sleeping Savior spread the good news. Some will oppose him, you know. It will be up to us to protect him."

"But you're an alien, Dr. Macon," said one of the assistant preachers; a charismatic woman with permed red hair. "An alien takeover seems a little Satanic."

"The Peng ranches are sacred zones," said Dr. Donnie's wife Bonnie. "You might say that gnarl is the same as original sin. Peng ranch people are more willing to open their stony hearts to the sweet honey of divine love. Peng ranch people don't question every little piss-ant thing."

“You shouldn’t curse in this tabernacle,” said Donnie III.

“Who are you to tell your grandmother what to do?” demanded Dr. Macon.

“Protect the Sleeping Savior,” said Donnie, Jr., holding up his hands. Some of the older members of the congregation cheered. Donnie, Jr., had been a popular man in his time. “And not only from the atheists and intellectuals. There will be another race of aliens challenging the Sleeping Savior. The Hrull. Flying devilfish. Kill them on sight.”

(4.4) They moved on to a woodsy location near the tiny hamlet of Yost, Virginia. A deserted freeway was nearby. What with teleportation, hardly anyone used roads anymore.

“Like bringing Elvis’s embalmed body to a mall opening,” remarked Chick put it.

Jayjay seemed especially weak now. He’d sunk into an even deeper coma.

Quickly they moved on to Charlottesville, Virginia. Jayjay couldn’t be roused to install the third Peng ranch. They decided to just spend the night here.

They were in a largish mansion that had been retrofitted into an inn. They could see out towards the University of Virginia.

Thuy was sitting on a chair. On one of the matching twin beds lay Jayjay, smoothly breathing. Kittie lay on the other bed. Chick and Duckie were in the next room, with a connecting door open between the two rooms. They were all drinking whiskey from a bottle of premium bourbon that Chick had obtained.

Duckie ran into the room. A mob of college students had formed, threatening to murder Thuy, Jayjay, Chick and Duckie. “This is bullshit,” said Chick, rapidly chewing gum. He stared out at the tree-lined street. “I mean look at this place. What the fuck difference does it make if our clients siphon off some pizzazz? It’s like arguing about two different flavors of Jello.”

“Don’t be such a callow Californian,” said Duckie. “This is a beautiful place. It has some history.”

The local mob was determined. Students, faculty, floaters. And they were being goaded on by the silps. They wanted to capture Jayjay and kill him. A teek counter-mob formed, the congregation of Candler’s Road, boiling up out of the air. A riot began. The mob broke down the guesthouse door.

(4.5) In the confusion, Thuy decided to bail. Things couldn’t get any worse. She sounded the Hrull whistle. The mothership manta ray appeared and swallowed her and Jayjay. Chu was inside.

Thuy had expected Jayjay to wake up inside Lusky; she’d thought the Hrull would be able to shield Jayjay from Panpenga’s connection. But she was wrong. Jayjay sleeps on.

Chu was with a humanoid, a female pusher named Glee. Apparently every Hrull starship has a male/female pair of pushers. Glee wasn’t doing so well, she was mourning the death of her mate. And, more than that, she was strung out on Hrull gel, which exuded from a conical organ inside Lusky.

Chu suggested that Thuy be a pusher too. Thuy said no.

The Peng were teeping to Thuy, telling her to bring Jayjay back down, threatening to kill Jayjay. But now Thuy realized that in fact the Peng would never use Panpenga to kill Jayjay, as they so badly needed him for their medium. She tuned out the Peng. Lusky was flying west again, back towards San Francisco.

Urged on by Glee, Thuy and Chu had a taste of Hrull gel. Wow were they high. They began fucking passionately. In medias res, Thuy flashed that Jayjay’s

mind was alert even though his body as in a coma. And he was starting to hum. Oh oh.

Panpenga was using Jayjay to—crash Lusky. Big heavy lamprey shapes were attached to the belly of the great ray. She spiraled down and crashed in San Francisco. Glee was killed in the crash.

(4.6) Guided by Ond, Thuy rapidly teleported Jayjay to the quantum-mirrored room at Seven Wiggle labs. Finally Jayjay became his old self. And boy was he mad about Thuy fucking Chu.

He had to leave Earth. The Peng were outside trying to peck down the lab. Inside the Peng ranches he was fated to be a slave. Outside the Peng ranches people would be trying to kill him. No place was safe. Jayjay decided to Jayjay hop to the Mirrorbrane. And Thuy followed along.

Just as they're about to leave, the sorcerer pitchfork turns up, solid and real and rubbery. Jayjay would like to ask it about how to undo the summoning rune. But now there's no time. The pitchfork follows them on the jump.

Chapter 5: Hieronymus Bosch's Apprentice

(Jayjay's POV.)

(5.1)

Jayjay sees a tilted sea. They're flying across it with the pitchfork behind them. Some bird heads poke up; the pitchfork generates Jacobs' ladder sparks and crisps the subbies away.

Jayjay and Thuy arrive in a small town in the night time. Pitch dark. It's a heavy summer night, with a full moon low in the west, it's about 3 a. m. The buildings are huge. Cobblestones. Stench of raw sewage. Medieval. It the distance a village is burning.

There's no telepathy; they've arrived before the lazy eight event for the Hibrane. So they can't talk to anyone. It's hard being without teep, omnividence, and silp agents. And their lazy eight memories are gone. On the upside, Jayjay definitely isn't linked to Panpenga here. And Thuy isn't on *Founders*.

The pitchfork is beside them, hopping on its butt. The pitchfork speaks to them via tuning-fork vibrations. The pitchfork says he's looking for the harp, they meant to come down to Earth together, but they got split up. He can hear her via ultrasonic vibes, she's locked up here in town, waiting to get painted. By the way, he broke up the Peng with vibrations.

The pitchfork's ringing tones awaken a big sleeping male pig, an ill-tempered creature that seems as big as an elephant. It's snuffling at them as if it might want to eat them.

Jayjay's surprised at the size of everything, but Thuy reminds him that, due to a six-to-one scaling factor between our world and the Hibrane (introduced in *Postsingular*), Jayjay and Thuy are effectively one foot tall, very dense, and much faster-moving than the Hibranners. Thuy demonstrates by leaping at the pig, thumping it and sending it squealing and running.

Some giant soldiers are approaching, bearing a lantern, their speech is incomprehensible. Dutch. The pig startles them. They spot Jayjay and Thuy, and want to beat them to death, thinking they might be demons or sorcerers or Gelder spies. Jayjay kicks one of their asses, the way Thuy did the pig. But more soldiers are coming, and they're armed.

"Here," says the pitchfork, and vibrates at them. He's just learned Dutch from the harp. And now he's vibing it into their brains. He wants to know the Lost Chord for the harp. She's forgotten it. But Jayjay can't put it into words. Words suck.

"I'm going to see about finding the harp," says the pitchfork and hops off.

They spot a one-legged beggar running down an alley and follow him through a series of passages. The beggars are active at night, scavenging. Jayjay and Thuy find shelter with the beggars sitting around a low fire under a bridge. Some are hallucinating, and parts of their limbs have dropped off. A real medieval scene.

The beggars are drinking from a cask of stolen wine. They've broken into the cellar of the St. Anthony monastery nearby. One of them, Lubbert, gives out that he's slated for amputation in the morning. He shows his leg. "a great plague of swollen blisters consumed the people by a loathsome rot, so that their limbs were loosened and fell off."

Jayjay offers Thuy a drink. She says she'd better not because—she's pregnant. She noticed after fucking Chu. She can't teep into herself right now, but now that she looks at her memories, she realizes it's true.

"Abort it," said Jayjay. "You don't want to be raising a weird kid like Chu."

"I owe this to him," said Thuy. "I stole his innocence and then I sent him off to die. Let me sleep. I'm so tired. I'm jonesing from the Hrull gel."

Jayjay sits watching over Thuy, drinking a little with Lubbert and the big fat drunk beggar called Lubbert. Jayjay can't decide how angry he is with Thuy. Mainly he's glad to be together with her. But his wounded pride bothers him. He doesn't know what to do. He's really hungry.

The beggars are gnawing some crusts of rye bread, dipping it in a gross broth. The bread tastes bad, fungal. Jayjay begins feeling like he's been dosed with a psychedelic. He recalls the notion of ergot poisoning. Sonic had been curious about it once, when they'd been looking into psychedelics in the days before Orphid Night. He also recalls that in the middle ages people didn't realize the poisoning was caused by rye.

Near dawn Lubbert wants to mess with Thuy, and Jayjay kicks his ass. Lubbert grabs a burning firebrand and threatens Jayjay. They're both seeing things in the flames.

Jayjay and Thuy run back into the street. Thuy still feels bad. The guard is coming by and calls out. They run around the corner and someone scoops them up in a sack; surprisingly this person knows their names, he tells them to hush.

(5.2)

Their captor carries them into a boat. He's a fisherman. Turns out he's a guy Thuy knew before: Azaroth from *Postsingular*. He says he saw a telepathic pitchfork who was looking for the harp; the pitchfork alerted him that Thuy and Jayjay were here.

From the boat they can observe that Den Bosch has a small triangular town center, with a triangular marketplace in the middle; the town is triangular because it's wedged into the delta where two small rivers meet: the Aa and the Dommel. The Binnendieze cuts across. Boats on the Binnendieze are called *pleyten*, they're flat-bottomed barges.

Thuy feels crappy from the Hrull gel withdrawal; Jayjay is kind of wired from the ergot. He's seeing trails and everything looks like a face.

They pass through a water gate into the Dommel river. Out here they can see the Brabant landscape, with the rows of trees along the edges of the green fields. Milky sky. Willow stumps with fresh spring shoots.

Azaroth tells his story. He jumped from our world to the Hibrane with the magic harp at the end of *Postsingular*, he too ended up in Bosch's time. Thinking this over, Jayjay formulates the explanation that the jumps from Lobrane to the Hibrane are skewed—because at the very end of *Postsingular*, the Hibraners bent Earth's time line to try and keep us away.

Azaroth is working as a fisherman—he was a cuttlefisher back in his home. He still hopes to find a way to get back to his own time.

Jayjay asks him about the magic harp. Azaroth says he's given the harp to a local artist to get the painting on its soundboard repaired, as it was damaged during the journey and Azaroth doesn't want his Aunt Gladax to be mad at him if and when he eventually gets the harp back home.

Jayjay remarks that Azaroth is right to get the harp fixed, but he has more to worry about than his Aunt being mad. He needs to worry about a temporal paradox. The harp is decorated in the future, and it really has to show up decorated again. "What was the pattern?" "Naked men and women touching each other." "You mean like an orgy?" "No, more chilled out than that."

Jayjay drops off to sleep in the morning sun. He dreams about a drawing of a fish full of fish. An ergot dream. An aktualization dream, too.

He wakes up when Azaroth catches a fish, just like in the dream. Thuy is helping Azaroth, chatting and laughing. She's over her withdrawal. When they slit open the fish, it's full of fish, again just like in the dream. A couple of the fish inside are weird and gnarly. Jayjay thinks queasily of aktualization and the helix of levels up and down.

The gnarly fish remind Thuy of something that Azaroth told her while Jayjay was asleep. "Guess who's the artist working on the harp?" It's Jeroen van Aken. He's fifty. Thuy realizes this is Hieronymus Bosch. It's 1496 and the town is 's-Hertogenbosch. Thuy tells about having Kittie talk to her about Bosch. They're surprised Bosch is doing this.

A painter is just a kind of craftsman, says Azaroth. He might take all kinds of decorating jobs. No concept of "artist". They were like ordinary craftsmen who worked with their hands, not even in a special guild.

Jayjay wonders if the harp and the pitchfork are somehow controlling all this synchronicity. Do they have some higher plan in mind?

Jayjay and Thuy are eager to meet the harp. Jayjay figures the harp might know a way to undo the summoning rune, that's what her pal the pitchfork says anyway.

Azaroth suggests they get jobs in Bosch's household. Bosch will probably like that they're midgets; he's into things like that.

Azaroth brings his boat back into town. The big houses have their backs on the Binnendieze river. The Vismarkt (fish market) on Orthenstraat has a crane unloading ships.

The city has five large gates, some smaller gates, five water gates and 23 towers. There were a number of wooden windmills outside the walls. A gallows field near the Vughter Gate.

Within the walls many areas were still undeveloped. Vegetable gardens. They pull up behind Bosch's house. Azaroth accompanies Thuy and Jayjay to Bosch's house to deliver the fish. They're bringing a gnarly couple of inedible fish along too, as the master likes to paint those.

(5.3)

Bosch lives on the north side of the market with his wife, Aleid van de Meervenne (married 1481) in a big house that her family owned. Its windows face south so the sun streams in, also the sounds of the market.

Marketplace sounds: church bells, geese honking, wooden cartwheels on cobblestones, pigs squealing, children shouting, cows mooing, people talking, sheep baaing, a smith hammering an anvil.

The houses had wood facades with a couple of brick walls within for strength and to support the fireplaces. A typical house had a big front room, used partly as an office or store, with a balcony backing onto the warm fireplace wall. The rear part had the bedrooms. Cellar entrance in front of the house under a little shed. Hearths in cellars too.

Wooden ceilings decorated with floral motifs and vine paintings. Murals on many interior walls, flowers, and religious paintings too.

Bosch's maid Kathelijn is around, she has it in for them. She thinks they're devilish. She hisses spell-warding counterspells at them. She's busy slaughtering a goose. She chases Jayjay and Thuy with the bloody knife.

Jayjay becomes an apprentice in the extensive Bosch family workshop, helping to prepare panels and make paints. But Bosch doesn't want to hire Thuy, he's leery of women. And Jayjay is kind of glad, he doesn't really feel like being around Thuy just now, he's so upset about Chu and her pregnancy.

Thuy plans to stay with Azaroth for now, helping him with his fishing and living in his room at the tavern, which is also a brothel.

(5.4)

Jayjay is mostly mixing paints. He can't get any time alone with the harp, which is locked up.

Jeroen Bosch is an irascible genius. He's a sour-puss, workaholic, strictly religious, but sometimes laughs oddly. Buttoned up. Bosch speaks of a religious movement called *Devotio Moderna*. Each individual must continually choose between good and evil. Awareness. You are a wayfarer.

Bosch is against poor impulse control, festive pleasure, laziness. For discipline, modesty, industry. Deep seated rejection of fun in the morality of the burghers. They were always trying to ban festivals.

The medieval people were really under the thumb of religion. They were endlessly obsessed with sin and punishment, and with the notion that God was always ready to judge you.

He has problems with his slightly older wife, who likes sex less than he does. She had several of painful miscarriages and still-births. That part of their life is over.

Garden of Earthly Delights was a youthful success by Bosch, he painted it when he was about 30 in 1480 (Dendrochronology puts the wood's earliest possible use date at 1460-1466.) It hangs in the Nassau palace in Brussels. He has a copy in his studio. He's sick of hearing about it. He wishes he could repeat it.

He's currently working on a triptych: the *Temptation of Saint Anthony*, which shows three torments of Saint Anthony—on the left the devil lifts him high into the sky, on the right he's besieged by lustful women, and in the middle he's surrounded by monsters. He is painting it for the Brotherhood of St. Anthony. He really relates to St. Anthony.

In the studio, he's wearing a robe and a hat with earflaps. Jayjay sat at his work table watching him, listening to the sounds through the window, talking to him a bit. On the table were copies of some of his drawings, bowls of berries, a bowl of eggshells, a peacock feather in a glass jar, gourds. A cow skull on the wall. A stuffed heron and a stuffed owl. A lute.

Jayjay notices that Bosch begins from the standpoint of reality and in his paintings transforms this by portraying objects out of proportion or by changing them into bizarre creatures or other kinds of objects. Bosch's work is simultaneously cryptic and inaccessible, yet totally open, with the lowest of thresholds. This is painting for both the most serious art-lovers and for those who virtually never visit a museum.

Bosch's drawings. Two pages filled with cripples; thirty-two on one page, thirty on the other. Most of them are smiling devilishly. Bosch thinks the cripples are in fact evil, and that they had an easy life since they were deemed unfit for ordinary

work. Their expressions almost seem to say, “We’ve got it made! We’re beggars!” Another drawing shows a dog bemusedly looking back at his butt, which has turned into a legless warty lump. As we’d say in German, “Ach du lieber, wo ist mein Arsch?”

Bosch’s neighbor Jan Vladeracken comes over to quarrel with Bosch, he’s an unpleasant bullying large Dutchman. Resentful. A drunkard.

It seems that in Bosch’s painting *John the Baptist*, which also contains a human-shaped mandrake root, there’s a huge mound of elaborate foliage in the middle of the picture, and infrared shows there’s a kneeling donor under the foliage. This painting was commissioned by the Swan Brotherhood of Our Dear Lady for their chapel in the Saint John’s church. The president of the society was Bosch’s neighbor, Jan van Vladeracken, and he had gotten himself painted into the picture, and then over the years other members said, “Hey, that’s our society’s joint money you’re paying with, don’t hog the credit and have just yourself in the picture, Jan.”

So Bosch wants to take it out. And Vladeracken has caught wind of it.

After Vladeracken leaves, Jayjay volunteers to paint over the donor. So he gets painting lessons from Bosch in the afternoon, which is great.

Bosch allows him to practice painting on his own with leftovers. He can’t do science here anyway, as he’s offline, and doesn’t have the agents helping him. Turns out Jayjay likes painting better. He feels fulfilled. As a scientist, he was always faking it to some extent, playing catch-up ball. He’d never been interested in Kittie’s somewhat tight air-brush style—but he likes smearing the oil paint around. He likes the alchemy of it.

(5.5)

Bosch’s nephew Thonis helps haul Jayjay get into the St. John’s cathedral this Saturday night before the great Procession of Saint Mary.

While repairing the painting of St. John, Jayjay sees something that scares him: the pitchfork is watching him from a dark corner of the church. It gives off a note, like a tuning-fork, talks to him. Jayjay tells the pitchfork he’ll take it to Bosch’s house to look for the harp. The pitchfork helps him, makes a light.

(5.6)

The job takes all night. Vladeracken sees them coming home in the morning, he sees the green paint on Jayjay.

Jayjay reminisces how at the end of *Postsingular* he stuck a special Lost Chord on this harp and unfurled lazy eight. And that the harp taught Jayjay the Lost Chord at that time. The harp says she needs to know the Lost Chord, she lost the knowledge on the jump across.

Jayjay remarks that this will make the Lost Chord arise via a closed causal loop, and he wonders if that’s dangerous for the integrity of spacetime. The harp says it’s okay, she’s an *aktual*. She says her whole life is an undivided whole, and that the passage of time is an illusion. Jayjay almost understands.

So now at dawn, Jayjay plays the Lost Chord on the magic harp in the Hibrane.

Chapter 6: Viral Runes

[Chapter title was originally “*Chu’s Serpent*,” but I changed it on Dec 22, 2007, to “*Dream Work*,” and then to “*Chu’s Kludge*” on Dec 28, 2007, and then to “*Viral Runes*” on Dec 30, 2007.]

(*Chu’s POV.*)

(6.1)

Chu and Glee walk down the San Francisco street, heading away from the body of Lusky. They have anonymized their teep to make themselves less visible, but they are still visible via the silps they're passing, because people know where to loo for them. Also they're visible through the eyes of people in houses.

Chu sets Gaia to scanning and summarizing the mentions of him in people's teep. He doesn't want someone to suddenly come up on him. Also he's trying to assess how badly he's disgraced himself. He picks up: sympathy, lust, envy, disgust. Chu and Thuy have been fired from *Founders*. That's fine with Chu.

Also he registers a great upwelling of public alarm over the crashed body of Lusky. Although word of the Peng has been filtering out, this is the first that most people have heard of the Hrull. Urged on by the Candler Road Church congregation and their connections, the media is denouncing the Hrull. And President Dick Too Dibbs is making a speech right now: to the effect that the Peng are our allies against the Hrull. In the past Too Dibbs had resisted right-wing religious elements, but his party is in trouble, so now he's pandering to the party faithful. Too Dibbs himself mentions that the government plans to question Chu and help him with counseling.

As this comes in, a government agent appears, a woman wanting to take Chu into custody. A matron, or maybe a pervert posing as one. Glee gets rid of her; she points her finger and threatens to beam a ray from her third eye. She's just jiving, but the matron chickens out and leaves.

Glee points out the pitchfork showing up to help Jayjay and Thuy at that geek pillbox Seven Wiggle. "I think I know him," she says. "His name is Groovy. I bet he's looking for his friend Lovva. She's shaped like a harp. The come from the same planet as me: Pepple."

The pitchfork chases off the San Francisco Peng, Thuy and Jayjay hop, the Peng come after Chu and Glee.

Glee sends out a Hrull whistle to locate Duxy, the Hrull teeps back. She's lying low with her father Wobble, in a cliff-top grove in the Sinkyone Wilderness on the Lost Coast south of Petrolia, California. They're seining microorganisms, jellyfish, squid, and salmon from the sea. Duxy has been monitoring the planetary news, she knows that Lusky is dead, she's upset. But she says she's already starting to grow.

Glee and Chu head towards northern California. Rather than going straight to the Lost Coast, they stop for a day in Eureka. Glee has a good stash of gel she salvaged from Lusky, and she wants to have a little look at how people on Earth live. A break from being inside a Hrull. She never gets all that much shore leave. She misses normal life.

Before jumping, Chu asks Gaia not to tell everyone where they're going—if you don't say where you're going, people can't automatically track where you teleport too. Ordinarily Gaia tracks this and makes the data public. But Gaia believes Jayjay can help heal her from the Peng, so she's helping him. All the silps are helping them too.

In Eureka, Chu talks to the silps, who tell him were to find stuff. Glee, still nude, waits in a lot while Chu goes into a second-hand store to pick up a kind of disguise for her: a watch-cap she pulls down over her third eye and lace gloves to hide her branching-tentacle thumbs. Chu himself puts on different clothes. The old ones were slimy

They walk around town looking at stuff that interests Glee. She's laughing and happy. Clothes, jewelry, snacks.

Chu is feeling junksick, and Glee tells him to take a little rub of Hrull gel, but he holds out. Glee says it'd just make him feel normal. She says you have to know how to use it, and this time the aphrodisiac effect won't catch him unawares. She herself is starting to seem cuter, and Chu realizes if he does gel with her enough times he'll fuck her, which he really doesn't want. He white knuckles it and doesn't take the gel.

Chu asks Glee about her home world and about that thing she said about knowing the pitchfork and the harp. She says her home world is called Pepple. She says again that she knows the harp and the pitchfork from way back, the harp, Lovva, was in fact a musician friend, and the pitchfork, Groovy, was Lovva's uneducated boyfriend, a carpenter. Glee herself left Pepple because she was in trouble. A scandal. She murdered a man who was stalking her. She stayed in touch with Lovva via teep. In fact Lovva gave Lusky the reset rune to bring to save Earth. A good deal for Glee, as she gets a reward from the Hrull for finding a new teeker world. "But a lot of the time I think it was a mistake to leave." The topic of her home world bums her out, she's homesick for an irrecoverable past.

Glee enjoys sitting and looking at people, seeing Earthlings walking along.

Chu and Glee go out for dinner together, sitting in a booth in a diner like the Spar in Olympia, Washington.

The waitress asks Glee about her green skin, and Glee says it's a new cosmetic treatment.

Glee and Chu chat over dinner, and teep together, relaxing, Glee rubs on a little more gel, but Chu doesn't want any. He's disturbed that the longing for the gel still hasn't gone away. Glee shares with Chu her memories of Hrullwelt: a toroidal archipelago of water globs; an belt of water asteroids. The Hrull leap from one glob to the next. The overmind of Hrullwelt is called Uruhull. Glee says not just any teeker can be an intergalactic pusher, but she can tell Chu has the knack, he's one of the few. Excited by the visions, Chu is stoked about going to Hrullwelt.

Glee says that first of all, only humanoids can push at all, and secondly, not all that many humanoids have the mental force for intergalactic pushing. So pushers are rare. But she and Lusky could tell right away that Chu as the right stuff. She and Kenee had it. The Hrull lured them away right after Glee murdered her stalker. Kenee was her pal, not exactly her lover at the time, though later he became her lover under the effects of Hrull gel.

They get a hotel room, and the clerk doesn't even look at Glee. They spend the night in the hotel together, and to distract himself from Glee using gel again, Chu gets into the silps in the room. The ocean of atoms. The eddies in the air. And then gets high on Gaia before falling asleep. He wonders about what Jayjay gained by going to the castle on the beanstalk. He's thinking about his infinite memory. He can't quite get the hang of infinite thoughts. Chu tunes out from Glee, and falls asleep grooving on the silps and visualizing the beanstalk again. He's getting closer to seeing a pattern. It makes a difference to know that aktualization is a solvable, feasible, and rather common process—and not a rare stroke of magic. He sees it as being an encryption problem, like hyperjumping to the Hibrane had been.

Sleeps till mid-morning, awakes with the problem almost solved.

When he wakes, Glee has used up all the gel and is already jonesing again. Chu realizes that he's still jonesing, too. Fuck.

(6.2)

They teleport to the Lost Coast, joining Duxy and Wobble. Wobble is angry about the Peng killing his mate Lusky. Duxy is less upset, as this means she can now be a mothership. She's already doubled her size. She spits up some Hrull gel for Glee and Chu. Chu finds himself smearing it on before he can stop himself. He finds himself sounding the Hrull whistle loud as he rubs on the gel; realizes he's been biting it back.

Glee and Chu go swimming, reveling in the silps. It's ice-cold in the water, but Chu is figuring out how to do some low-level direct matter control to warm up the water around them. He speeds up the motions of the atoms. They actually dive and catch a couple of salmon, using teep to find them. It's a beautiful day in nature. A campfire. Evening. Cooking salmon over the coals. A little more Hrull gel, why not? Glee nestles up to Chu. She smells better to him before. He realizes that if he stays on the gel, he'll eventually be fucking her. He tries to kiss her. Glee kisses him back, then has a moment of pity on Chu.

Glee tells Chu how Kenée died. They scored an extra large stash of Hrull gel as a reward for being the first Hrull to reach Earth. And Kenée overdosed. She tells Chu he should get out while he can. He decides for once and for all that he doesn't want to be a pusher. He still wants another chance with Bixie; he doesn't want to be a Hrull-gel junkie; and above all he wants to save Earth. And if he learns to become a runecaster, he can teleport long distances and create his own life-support system. Glee encourages him, though she's going to miss him. She appreciates and admires Chu's desire to get free.

Duxy overhears, and wants to force Chu to stay; she says it's too much trouble to find another intergalactic-quality pusher. She thinks the issue is that if Chu doesn't want sex with Glee—so she'll find him a better girlfriend. She gets all slimy and leering and suggests that they abduct Bixie. "You can teach little Bixie all the nice games that Thuy taught you." Chu is almost tempted by this suggestion, although at the same time he's horrified that he's even considering it. He draws strength from the silps.

Duxy lunges at Chu, trying to swallow him whole, but fortunately she's not big enough, she can only choke down his head and shoulders.

Chu teleports outta there. Where can he go and be safe from the Hrull? He might weaken as he kicks the gel, he might whistle for them. It occurs to him that one place the Hrull won't go is the Yolla Bolly Peng Ranch—because the Peng will shoot the Hrull on sight. So Chu goes there, planning to stay long enough to kick.

(6.3)

When Chu shows up at the Peng ranch, Gretta starts threatening him, but Chu—for the first time in his life—manages to tell a lie. He says he's interested in the Peng culture, and that he wants to help them. The Peng are vain and desperate enough to believe him. They are grasping at straws. Now that Jayjay's escaped to the Hibrane, and the pitchfork isn't working with the Peng, the Peng have no runecaster on Earth and no immediate prospects of getting a new one. Their whole invasion plan may fall through.

They're wondering if maybe Chu can learn to be a runecaster. Pekka says Chu should climb the beanstalk. It's in the interdimensional zone between the Lobrane and the Hibrane. She knows how to get there from Pengö. She suggests that Chu teleport to Pengö and head across the Planck sea from there. Chu balks about such a long journey. Pekka admits that the air on Pengö is lethal and that Chu would need life support.

Chu and Kakar start rapping about runecasting. Chu learns that Kakar is a kindred spirit, kind of an autistic genius too. Kakar has picked up some physics from teeping with Jayjay, and he has a series of conversations with Chu, where Chu thinks he's in control, but Kakar is in fact a jump or two ahead of him, he knows how to think infinite thoughts, but can't fully explain it to Chu. Keep in mind that the Peng themselves can't be runecasters because they don't have teek power, that is, they can't merge with matter and affect it. They would know, in principle, how to tweak matter to achieve a particular result—as they understand infinity—but they can't code the program into the matter.

Challenged by Kakar, Chu finds a cheap-trick short-cut for handling infinite sentences. For the test case, he has memorized one of Pekka's runes for creating an edible tulpa moth. Chu has heard Jayjay talking about infinitary logic and infinite thoughts, but he doesn't like thinking about infinity any more than he likes gnarl or chaos. Too messy. His cheap trick doesn't always work perfectly, but it works well enough to matter. He replaces the infinite sentence with a fixed point in a quantum computation. Chu calls it renormalization. He doesn't understand how to parse an infinite sentence. He just can't stand thinking about infinity; it's like trying to stare into the sun. But he knows how to devise a shortcut. To show off, Chu makes a tulpa moth from Pekka's rune. Kakar eats the moth, and in the eating, he learns the secret of Chu's Serpent.

Curious, Chu gets some more runes from Pekka, and casts them, using fixed point approximations. But he balks at runecasting Peng.

Note that knowing Chu's Serpent doesn't enable *Kakar* to runecast a moth, far less a Peng. Kakar is still lacking teek power. If he had teek power, he would be able to runecast a moth directly from Pekka's code, with no need for Chu's Serpent.

But, Chu's Serpent is simple and communicable, and Kakar brings in Steve and Julie from the Candler Roach Church in Killeville, and Kakar teaches Chu's Serpent to them. Steve can't get the hang of it, but Julie can, and she creates some moths. And then Steve gets it too.

The Peng are very happy. Using Chu's Serpent is much easier than trying to get people to go to the beanstalk via Pengö. In fact most fundamentalists wouldn't be able to teleport that far in any case. But with Chu's Serpent, the Peng have an army of Christian Soldiers.

Suller sends Julie and Steve down to create two Peng ranches linking the San Francisco Peng ranch to the Yolla Bolly Peng ranch. And now the Peng can roam from one to the other, and a Peng party begins, with special guests: Blotz, Noora, and Pookie.

(6.4)

Peng are fully taking over. Chu wants to figure out how to really use Chu's Serpent on his own; in particular he wants to design runes for things he wants so he can create arbitrary objects. At present he can only use the Pekka runes that he's memorized. He realizes that he needs to understand infinity, and he can no longer skirt around it with the fixed-point hack. He needs to go talk to Jayjay and the pitchfork, and probably he needs to climb the beanstalk.

Menaced by Julie and Steve, Chu hops back to the Lost Coast and sounds the Hrull whistle.

Now—Chu could just hop to the Hibrane on his own, but he wants to bring Glee with him. He feels worried about her. And he has the notion that it might be

useful to have Duxy around for the final battle against the Peng, however that plays out.

Chu lets Duxy swallow him. Wobble and Glee are inside. Duxy wants Chu to come to Hrullwelt. But, with Glee's help, Chu pushes Duxy across the Planck sea to the Hibrane, in search of Jayjay, Thuy, the pitchfork and the beanstalk.

Chapter 7: To the Gibbet!

(Thuy's Point of View)

(7.1)

When Thuy and Azaroth leave Jeroen "Hieronymus" Bosch's house in the Hibrane (the local year is 1496), they go out the back door, get his boat, and row to the Muddy Eel. Thuy really wants a bath, and goes to the public bath in the Muddy Eel. Thuy gets into the minds of the water and the fire. There's no teep yet on Hibrane Earth. But Thuy knows, from her life on hylozoic Lobrane Earth, that in fact every natural process is conscious. They just don't have memory yet. And she flashes that the water and fire *do* have memory in the One Mind sense.

She hears a voice and thinks its the lantern talking. But it's Anja. Anja is a cute, lively prostitute, formerly a housemaid. She claims she'd slept with Bosch—but only once—as he insisted on pouring out the contents of his chamber pot upon her naked body before they had intercourse.

Thuy is savoring how it feels to once again be in a world without telepathy. Enjoying the low hubbub from the marketplace. The old-school hive mind. She has dinner with Azaroth, they sit around talking to a jugglers and a conjurer. An older fortune-teller woman, a seer, reads Thuy's palm, she has a weird prefiguring of Thuy's impending trip beyond infinity. Magic is real. The seer tells Thuy she is pregnant and that she'll be give birth to Mother Earth. I personalize these characters, as they will be the ones being executed later in the chapter. Juggler: Menso, thin with uniform blonde stubble on his head and his chin, Conjurer: Luc, with double chin, wry smile and fluid hand gestures, Seer: Dora, with lank gray hair, only one tooth, and a gay reckless cackle.

The inn is full of merchants, country people, city people, musicians, beggars, conjurers, magicians, acrobats, pickpockets, cutpurses, soldiers. Wine is passing around; Thuy begins dancing on the table top. She's enjoying the spoken-word medieval hive mind. Groovy, the aktual pitchfork, shows up and hangs around a little. He tells Thuy that the beanstalk where he took Jayjay is actually in the subdimensions. Thuy says a little about the trip that she took to Subdee back in the first volume. The pitchfork says that if she'd gone deeper, she'd be a zenohead capable of ten tridecillion thoughts in a second—or maybe even an aktual, capable of infinitely many thoughts.

Groovy talks about how to think of the subdimensional land of Subdee as underlying the Lobrane, the Hibrane, and the interbrane Planck sea between them. He says to think of a city with two buildings on either side of a street: the buildings are the branes, and the ground level is the Planck sea. Although we see the sea exposed in between the buildings, this dividing interface continues under the buildings. And in the underground is a continuous maze of passages and carnival-like spook stuff: Subdee.

Bosch's ill-tempered, drunken, alderman neighbor, Jan Vladeracken arrives late in the evening. He grabs Thuy—who's one-foot tall compared to him—and shoves her doll-like head and shoulders inside his smelly, baggy trousers; she wrestles her way out, giving him a solid punch in the stomach that doubles him over. Azaroth

smacks Vladeracken on the side of the head, knocking him to the ground, and the worthy says he'll see them all dangling from the gibbet. Anja cools things out, calling him Mijnheer and leading him off to the baths.

Thuy crosses the square, enjoying the bustle. People are getting ready for the procession; actors are rehearsing tableaux of bible scenes; musicians check their instruments. Jugglers practice in the dark.

Thuy beds down in Bosch's basement, wondering where Jayjay is.

(7.2)

In the morning, Thuy awakens to feels lazy eight unfurl. [Flashback]

All the Hibrane objects are waking up and everyone is getting omnividence, telepathy, and endless memory—although the locals don't yet realize they're capable of teleportation. The bricks on the floor talk to Thuy. The silps aren't so verbal as in the Lobrane, as they aren't incorporating the knowledge of any ambient orphids. They speak in images rather than in words.

Thuy teleports up to Jayjay in the attic. The harp says Jayjay and Thuy are supposed to become aktuals, too, pretty soon. She asks them to remember exactly what she looks like. And then she turns into a green woman with three eyes—Lovva from planet Pepple. She stretches out her arms and disappears, flying home to Pepple.

Moments later an identical woman appears, clueless. It's Lovva, just arriving from being aktualized on planet Pepple. She says a bit about seeing infinity. She has already planned for her sojourn on the Lobrane and Hibrane Earths will be a closed loop. But she doesn't know the details. Thuy tells Lovva she is supposed to look like a harp and hang around here for 500 years.

"But we'll only be aktuals for a couple of days," says Lovva, then laughs. "Oh, I see, I see. We'll be timeskimming." Apparently she has some kind of internal time skimmer, so that she can psychically whiz through centuries, seemingly just sitting there. Embarking on her loop, she turns into the harp, copying its pattern from and Thuy, and learning the all-important lazy-eight-unfurling Lost Chord from Jayjay.

Bosch pokes his head up into the attic, he's both delighted and terrified scared. He is wondering if he's gone mad, or if demons have taken over the town. Is it the end of the world? Thuy and Jayjay reassure him. His wife Aleid and the maid Kathelijn are hysterical, inconsolable.

Alderman Vladeracken shows up from next door, angry, blaming Jayjay, Thuy, and Jeroen Bosch for the change, wanting to arrest them. Eager to escape this tedious bully, Jayjay shows Jeroen how to teleport. Nobody here knows this trick yet. The three hop to the market to enjoy the scene.

(7.3)

The marketplace is crowded with guilds, images of saints, actors pretending to be biblical figures, floats, litters, canopies, painted banners. Everything's talking, including the items on sale: sheets, shoes, stockings, leather shoelaces, hats and caps, pins, baskets, kettles, pots and pans, twine, vegetables, fruit, flour, meat, butter, cheese, cloth.

The locals are bewildered. They're trying half-heartedly to carry on, glaring at the talking objects and shaking their heads, each person kind of wondering if it's just them alone going crazy like the beggars who've eaten too much ergot-tainted bread.

Vladeracken is pushing through the crowd, yelling. Thuy remembers the art of teep camouflage—she shows Jayjay and Bosch how to do it. And now they look

(via teep, but not face to face) like a hunchback with a cat and a dog. A group watching a cockfight disperses; nobody can handle the direct teep experience of the roosters' pain. In the hubbub, Thuy, Bosch and Jayjay get out of Vladeracken's direct sight and now he can't find them by teep.

'S-Hertogenbosch is known for knife making and for bell making. Casting a bell was a dangerous thing; the big bells for churches had to be cast on site, as they were so heavy. To kick off this year's annual procession for the Virgin, the locals are casting a special bell for City Hall

Distracted by the burbling voice of the molten iron, a guy falls into it and is hideously burned to death during the casting. The guy and his body let out hideous juicy screaming. The silps of the molten iron and the charring human flesh sing an antiphonal anthem.

The crowd's mood shifts to a mass freak-out. The superstitious locals begin flagellating themselves, rubbing ashes on their faces, and looking for someone to blame. The soldiers and monks are arresting people in droves: the beggars, the actors, the magicians—including Menso, Luc, and Dora. Their arrest is the due to Vladeracken.

An orgy of punishments springs up sway before town hall. Flogging, mutilation by sword, breaking on the wheel, beheadings by the sword. Jayjay and Thuy feel sorry for the victims, they start teeping them the secret of how to teleport away, and the docket empties out. In particular, they help Luc and Dora escape. Just as they prepare to free Menso, Vladeracken spots the cause and points an accusing finger at Jayjay and Thuy.

"These devils have ensorcelled our town! Bosch and his familiars!"

Soldiers with cudgels descend, including the blonde-mustached soldier, they lay out the three of them unconscious before they can teleport to safety.

(7.4)

When Thuy comes to, they're imprisoned inside the cathedral. The cathedral's dour silp is willing to block teleportation and teep so that people can be tortured and executed in here. (A good symbol for religion's dark side.) The incense-wafty, waxy-feeling, body-odorous air of the cathedral is blocking the teep and teek of whoever is inside. It's like being packed in cotton wool.

The execution frenzy has been moved in here. Menso is beheaded. The floor runs with blood.

Azaroth, Thuy, Jayjay, and Bosch are to be hung from a makeshift gallows or gibbet above the pulpit. Thuy and Jayjay are shackled with heavy chains, the Hibraner-sized shackle rings around their waists. Even though they have the six-to-one brane-to-brane power advantage, they can't readily break loose. And they're scared to try, as two soldiers with cross-bows are standing over them, a fat one and a thin one, keeping the crossbow bolts aimed at their throats.

Azaroth actually does get hung before Thuy and Jayjay can think of any way to stop the horror. Thuy feels real sorrow over losing this friend.

Reaching further and further out, Thuy contacts Hibrane Gaia, the newly accessible planetary mind, but Lacking the influence of the orphidnet, this Hibrane Gaia was less transparent, less easy to read. Huge, vibrant, warm—but inscrutable. She even tries praying to God, but sees only the same white light that Bosch saw.

Jayjay is to be executed next. He's led up onto the pulpit. He thumps the Bible, feebly trying for a joke. But then he weakens and prays for help. Thuy is

shackled up next to Bosch. “Help me,” Thuy whispers urgently to the great artist. “Make a distraction.”

Bosch flips a painting rag into the air, tossing it with such kiquie lazy-eight-mind-enhanced precision that it looks for all the world like a ghostly devil. The distracted soldiers track the rag with their cross-bows.

Meanwhile the executioner has shoved Jayjay off the pulpit; he’s arcing toward the floor, with the slack of the rope about to run out and snap his neck. Thuy bursts her shackle, grabs a sword from a soldier, races across the floor (recall that she has a six-to-one speed advantage over Hibrane physics, cuts Jayjay’s rope, splinters the cathedral door with one kick, steps into the clean outer air and shrills the Hrull whistle. Jayjay and Bosch join her.

For a long moment, there’s no sign of the alien manta ray. Just as the soldiers are about to recapture our three heroes, the pitchfork belatedly appears—he says he was in between the branes, scouting out the best path back to the Lobrane Earth. And now, blessedly, Chu and the giant manta ray Duxy glide in to save them, homing in on the beacon of Bosch’s upheld brush.

Chapter 8: The Maelstrom

(Chu’s Point of View)

(8.1)

Chu and Duxy arrived at ‘s-Hertogenbosch at 10 a. m. Saturday morning. Duxy is mad at Chu and Glee for misleading her. Chu is bummed because he lost his lazy eight memory upon coming here, although he still does have the Knot clear in his mind. He can’t teep with Duxy. She makes wet noises like speech. Glee has picked up English, Chu can talk to her.

They flapped around uncertainly. There’s no telepathy so it’s hard to find Jayjay and Thuy. They land and drink some water from the river near some gallows (Jayjay in fact glimpses them, but doesn’t know if he’s hallucinating). Instead of being some 200 feet across like in the Lobrane, Duxy is only about 30 feet relative to the Lobranners, which is still pretty big. Some soldiers on the river road shoot crossbows at Duxy, driving her away.

The next morning lazy eight unfurls, and now they can locate Thuy, but they’re scared to come in on her, she’s around so many people. Finally, after Duxy hears Thuy’s desperate whistle, Chu gets her to land and pick up Jayjay, Thuy, Jeroen Bosch, and the pitchfork. Chu is teeking the crossbow bolts away. It’s about 10 am Sunday morning in front of the cathedral.

Jayjay is cold to Chu, but not physically violent. Thuy keeps clear, but does wink at him once, setting his pulse to racing. Naughty Thuy. And then she hits him with the knowledge that she’s pregnant—with Jayjay’s son.

It turns out the pitchfork knows Glee, in fact he’s kind of hot for her, they used to be roommates, as Chu knows. Groovy wants Glee to come home. She’s worried about the aristos. Groovy exclaims, “Big news. One of the main things that Lovva and me are planning to free our society. We gonna use our infinite powers to bring the aristos down. Lovva’s already started. Hell, Glee, you come along and you’ll be a hero for teeking off that guy’s head.” “But I’m older than you now.” “I don’t mind. You still nasty, right?”

They have a discussion about how to get back home. Groovy says he called down a native aktual to mark the path. Duxy flies back across the Planck Sea bearing Thuy, Chu, Jayjay, Glee, Bosch, and the pitchfork. Once they’re underway, the pitchfork flies ahead of them. When they’re almost back to the Lobrane, they’re back

in a zone where lazy eight is unfurled in both Lobrane and Hibrane and, accordingly, in the interbrane, so they have their teep back.

The pitchfork has invoked a maelstrom. It's bigger than any of them expected. It looks like the hole at the South Pole at the end of [Poe's Arthur Gordon Pym](#).

Duxy freaks out, she's being sucked in by the winds, it's like a tornado, and she's laden down with six (!) riders: Thuy, Jayjay, Chu, Glee, Bosch, Wobble. She spits out Thuy, Jayjay, Bosch and finally, still losing altitude, she dumps Chu. She means to keep Glee, but, beckoned by Groovy, Glee jumps out too. She wants to be free, she wants to go home.

Duxy still has Wobble aboard. Groovy points Duxy the right direction back to Hrullwelt. "Don't let the door hit your tail spike on the way out." She teleports home towards Hrullwelt, beating those big wings and drawing on all the teleportation energy stored up in her teeker cone.

(8.2)

The pitchfork is floating in the water with them, they're spiraling down into the maelstrom, but not all that rapidly.

Describe like [Poe's "Descent into the Maelström."](#)

The maelstrom talks to them, it has a silp.

[\(Maelstrom talk #1\)](#)

By now Chu, Thuy, Jayjay, don't know which way is Lobrane Earth, Bosch is just staring into the water, and Glee is waiting for Groovy to help her go home.

The maelstrom heads towards the eighth dimensional point at infinity. The eighth-dimensional axis drills down through the subdimensions. Although people think of it as infinitely long, in a way, it's very tiny.

They're in the water sliding down the vortex, potentially menaced by the subbies. You can see life behind the maelstrom walls. They see scenes out of *The Temptation of Saint Anthony*; the subbies are picking up on Bosch's thoughts. The good news is that the subbies aren't attacking; they're repelled somehow by the maelstrom. As if the maelstrom is taking care of them.

(Maelstrom talk #2, see link for #1.)

Thuy is scared, she wants to go home. Jayjay begins cursing Groovy for having gotten them into this.

"I ain't done tormentin' ya'll yet," he says. And then he flips Jayjay, Thuy, and Bosch out into the air. They plummet down the axis of the vortex, down and down towards the infinity at the base of the great whirlpool vortex, a spot which, due to Bosch's influence, like a blazing white triangle holding the eye of God. The pitchfork lets out a big "Yee haw!" He turns into a lanky, green, three-eyed hillbilly.

So now it's Groovy, Chu and Glee. And Groovy prepares to get Glee home safely. He and Lovva are going to unseat the aristos, it will be safe to come home. She can kick the gel with her friends. Groovy and Glee are hot for each other, and he says it's okay that she's older now.

"What about me?" cries Chu.

"Jayjay will be back."

Glee and the Groovy streak off.

(8.3)

So now it's just Chu. He drifts for a bit.

(Maelstrom talk #3, see link for #1.)

Chu picks up zenohead skills. But he can't jump because he's so unsure which direction to go in. He knows Thuy's story about getting home by following Jayjay's love. But nobody feels that way about him—not even Bixie.

Finally the maelstrom flattens out—and a glistening crow arcs out of the depths, shaking off his feathers. A subbie? No, it's Jayjay.

“You're not still mad at me?” says Chu.

“About what? Oh, you mean *that*. It seems like so long ago. All the things that Jeroen and Thuy and I did. Chu, you have to help me figure out how to protect Earth while my mind's still infinite. I can think endlessly fast.”

Chu jabbars a little about a Turing Evaluator. Jayjay uses the word “vaar.”

They head back to Yolla Bolly.

Thuy has already tried teeking the reset rune into every single atom on the planet—this is feasible as she's still aktualized and her mind's still infinite. But the viral runes keep growing back—and she can't figure out where they bad runes are coming from. For now she's just rolling back the Peng runes from the Yolla Bolly ranch, it's like a bubble dome under a deep murky sea.

Scanning across the rest of Earth, Chu sees that the Peng have indeed taken over. The upside is that all the Hrull have been driven off by the Peng. The downside is that Earth is now dull. The clouds, the ocean, the air, everything looks fake and plastic. The only broadcast entertainment is (a) ads for the Homesteady party and (b) religious broadcasts by the Crown of Creation Church.

Jayjay and Chu get to work on the *viral* reset rune, and they give it evolutionary features too, they call it a runescrubber. And then the three of them get ready to broadcast the runescrubber all over the planet, really one atom ought to be enough, but they're eager to see if it works right away before the aktualization fades, because after that, any further tweaks will be difficult or impossible.

But suddenly before they can start, Pekka surges up from the cabin floorboards, she's all meat, and she wants to take over Jayjay again! She was inside an atom. She start to growing out fuzzy downy tendrils to quantum entangle with all three of them.

But right away, Thuy is chopping Pekka to bits, and Jayjay and Chu are doing what they can. Meanwhile, while they're focused on that, the Yolla Bolly Peng tulpas have grown back yet again. Suller is standing in the door, ready to zap Thuy with a femtoray. Kakar screams, “No!” and tackles his Dad. Thuy finishes of Pekka. Jayjay spits out the runescrubber, and the Peng start to dissolve.

“I know that you're going to win, Chu,” says Kakar. “Please let Floofy and me stay. Make us some meat bodies. We'll teach you to fly.”

So Chu makes meat bodies for Kakar and Floofy. This vaaring is possible for him as he has a precise blueprint for the two Peng. Finally Pekka dies.

And now the world is cleansed. The aktualization wears off. Jayjay and Thuy are back in their old forms. Things are calm again in Yolla Bolly. Honeymoon time! Thuy and Jayjay want Chu and the two Peng off their ranch.

Kakar teaches Chu how to fly, he shares some of his flight lice. Actually Chu knows how to vaar flight lice now. The Hrull and Peng were keeping their flight lice close via teep, they weren't giving them out to Earthlings. But now the humans can have them.

(8.3)

Dick Too Dibbs apologizes and steps down from the Presidency. The public doesn't have the heart to try and execute him for treason like they did with his cousin.

There's a sense that we don't need leaders anymore. We're going to let the hive mind do it for four years and see how that works. They pass a constitutional amendment to this effect.

Bixie and Chu go out flying with Jayjay and Thuy. They were celebrating because Thuy had published *Hive Mind* to dovetail with the coming of the new politics. She was eager to get started on a new work about her trip past infinity.

"So tell us everything that happened when you and Jayjay were aktualized," said Bixie to Thuy.

"We were in a land of glowing white-light. At first we couldn't see, but then we adjusted. They had a city called Alefville. Very weird. Jeroen Bosch was the same size as us, which made him a good traveling companion. What a guy. It was like we were gone a really long time. Eventually Jeroen turned into a squalling bagpipe, and he brought lazy eight to Pengö and to Hrullwelt, like, a million years ago, blowing Last Judgment blasts. *Sqwoonk!* I became a rock and roll dragon; and I brought lazy eight to Lobrane Pepple a thousand years ago. And Jayjay was a crow, and he went to Pepple twenty years ago and aktualized Groovy and Lovva so they could turn around and bring lazy eight and aktualization to us."

"That means the cause and effect are all tangled up," protested Chu. "It doesn't make sense."

"But we lived it anyway," said Thuy. "I don't want to talk about it too much before I get it straight in my head."

Chapter 9: Transfinite

[Originally I was going to put this material in PS3.]

Bosch, Thuy and Jayjay pass through infinity, though the Eye of God. The interface is like a cotton candy cloud. And on the other side they see—Bosch's *Garden of Earthly Delights*, all three panels. It was Bosch who passed through infinity first, so the images up here are conforming to his powerful vision.

Jeroen, Thuy, and Jayjay are aktuals now. They can alter their bodies at will. Thuy forms herself into an dragon and she can sing rock and roll. Jayjay becomes a crow; Bosch a flying bagpipe.

The three stick together and carry out four tasks. Bosch, as squalling bagpipe, brings lazy eight to the paradise panel on the left and to the hell panel on the right. These prove to be, respectively, Pengö and Hrullwelt a million years ago. Jeroen is blowing Last Judgment blasts. *Sqwoonk!* And, again, *Sqwoonk!* Two tasks down, two to go.

They focus on the central panel, which is Pepple. Thuy brings lazy eight to Lobrane Pepple a thousand years ago, she's a dragon. Digging beneath the panel, she does the back side of it as well, which is Hibrane Pepple. It isn't so complicated for her to unfurl lazy eight as it was for the harp. She has a better idea of what she's doing. And she doesn't have such a fuss about handing both branes. The harp didn't even know about the other brane before she became an aktual. One more task to do.

Time waves are sloshing around them. Fish fly in the sky. Jayjay, as crow, flies into the central panel, at Pepple, he invokes a tornado aktual and aktualizes Groovy and Lovva, bringing them here to the glowing white-light land of infinity. An infinity of mirrors, and multiple images.

Bosch says farewell and returns to Hibrane Earth. Jayjay and Thuy return to Lobrane Earth

They figure out a technique so that everyone on Earth can “vaar,” that is, everyone can create objects at will, using an endless lazy eight algorithm to find the proper rune to program onto matter. Matter is now as endlessly hackable as a computer program.

Vaar Day is another huge upheaval, an entry into a postpostsingular era, as big a change as Nant Day, Orphid Night or Lazy Eight Day.

	Gets Lazy 8 From:	Gets Aktuals From:
Lobrane Earth	Pepple. Last year, by Lovva as the harp.	Pepple. Right now. Groovy as the pitchfork aktualizes Jayjay and Thuy with Beth Zed.
Hibrane Earth	Pepple. 500 years ago by Lovva as the harp.	Nobody yet. Maybe in PS3.
Pepple	Earth. A thousand years ago by Thuy playing a dragon guitar.	Earth. Ten years ago by Jayjay as a crow. He aktualizes Lovva and Groovy with Gamma Zed.
Pengö	Earth . A million years ago by Bosch, as a flying bagpipe.	Nobody.
Hrullwelt	Earth. A million years ago by Bosch, as a flying bagpipe.	Nobody.

Table 7: Origins of Lazy 8 and Aktualization.

Note that I’ve revised the table above several times. Most recent revision: February 19, 2008.

Ideas

Always the Same Book?

I have a sense that in some ways I write the same book over and over—and this happens more and more as I get older. I’m drawn back to certain imaginary scenes. Here are some familiar themes that I noticed this time around. Compare this, by the way, to the “Always the Same Book?” entry in my [Mathematicians in Love notes](#).

Theme	Earlier Use
Jack's beanstalk.	In <i>Spaceland</i> there's a vine leading up into Hilbert space.
Art Zed, the spirit of the beanstalk.	In <i>Frek</i> there's a higher being named Zed Alef.
The numbing gnarl reduction of Peng ranches.	Those numbing, mirror-ball-like "flickerballs" that they telepathically watch in <i>Frek</i> : "espionage in the flickerball." The leech-DIMs in <i>Freeware</i> .
A surfing scene with a boy and a girl.	<i>Mathematicians in Love</i> .
Surfing with an intelligent surfboard.	<i>Freeware</i> . For a goof, I even brought back one of the <i>same</i> surfboards, a silp called Everooze, who likes to say, "Visualize, Realize, Actualize!"
Two competing races of aliens, the Peng and the Hrull.	The Unipuskers vs. the Orpolese in <i>Frek and the Elixir</i> . The Kluppers vs. the Dronners in <i>Spaceland</i> .
Traveling inside an alien's body cavity, that is, inside the flying Hrull manta ray.	Inside the jellyfish god in <i>Mathematicians in Love</i> . Inside the Orpolese (such as Professor Bumby) in <i>Frek and the Elixir</i> . Inside the four-dimensional cuttlefish in <i>Spaceland</i> .
Husband witnesses his wife's infidelity.	Joe Cube and Jena in <i>Spaceland</i> . Infidelity in my story, "Inside Out." Infidelity in <i>Mathematicians in Love</i> .
"Seven Wiggle Labs"	"Seven Lucky Overseas" in <i>The Hacker and the Ants</i> .
Hieronymous Bosch as a character.	Similar to Bruegel in <i>As Above, So Below</i> . Bosch is in "Guadalupe and Hieronymus Bosch." I have a Bosch scene in <i>Frek and the Elixir</i> and one in <i>The Sex Sphere</i> .
Mankind develops a tool for direct matter control.	The "alla" that I wrote about in <i>Realware</i> and in <i>Saucer Wisdom</i> . Rather than the alla being a wand the alla can be a mental technique: this was "vaaring" in <i>Frek and the Elixir</i> . Christ is a great ethical teacher," said Jayjay. "Not some ego-tripping sleazebag
Becoming Christ.	"Christ was a great ethical teacher," said Jayjay to the pitchfork. "Not some ego-tripping sleazebag." -- - <i>Hylozoic</i> . I had Ace Weston deliver a similar line to Conrad Bunger in <i>The Secret of Life</i> .

Table 8: Reused Concepts

Lazy Eight

[I blogged this as [PS2 Note #2: Lazy Eight](#) on Jan 22, 2007.]

I use the portmanteau phrase “lazy eight” to speak of a change which combines: the eighth dimension, infinity as ∞ , and the fact that infinity is “right here” in the eighth dimension as an ubiquitous lazy-man’s enlightenment.

(Lazy Eight 1) Unfurling.

We add an infinite extra dimension at every point. We suppose that the eighth dimension is normally curled around into a Planck-length circle, but that a superspace perturbation caused the magic harp’s Lost Chord unrolls the eighth dimension to infinite length.

There are two possible equilibria for any region of space, having to do with whether the eighth dimension is infinite or not. The eighth dimension is compactified in the neighborhood of Lobrane Earth, but is fully unwound in the vicinity of Hibrane Earth. The equilibria are like the two bottoms of a W. If nudged, a world might move from one equilibrium to the other. One equilibrium is our present mode, the other is the lazy eight mode.

The Hibrane has had lazy eight since Hieronymus Bosch’s time (say 1496, which is near 1492 for fun, but not right on it, as that’s too heavy); our Lobrane achieves it at the end of *PS1*.

(Lazy Eight 2) Universal Infinite Memory Upgrade

The infinite expanse is accessible; you can reach any location along it in some fixed time. It’s psychically possible to overview the whole infinite expanse of the eighth dimension in a finite amount of time.

The infinite length is metricized so as to require only bounded finite access time for any location. (Ph. D. = Piled High and Deep, ☺.) That is, a Zenonian duality makes the lazy eight point at infinity be both ∞ far away and quite close. It’s like squeezing an infinite number of meters into one vatometer via a Zenonian shrinking. You can view it dually, that is, the other end is both infinitely far away and within a Planck length away, accessible in one tick of Planck time due to the Zenonian access.

You can store info as bumps anywhere you like along the infinite expanse of eighth dimensional space. So the infinite accessible spike provides endless memory at every location, and thereby *gives people endless [eidetic memories](#)* and produces *panpsychism*.

By [panpsychism](#), I meant that lazy eight adds an infinite amount of state to any physical system, even to an electron. Physics is no longer micro-reversible, for even if an electron is repeating it’s actions, it can “remember” that it did all this N times before. And thus everything awoke.

(Lazy Eight 3) Universal Entanglement

All the eighth-dimensional lines meet at a point at infinity, and due to the Zenonian metric this point is accessible. It’s like you took the vanishing point of a painting and made it be adjacent to every point in space. The point at infinity is ubiquitous. This accessible point at infinity acts as an entanglement channel that connects every point with every other point in synchronicity. A router, a switchboard, a nexus. This leads to [omnividence](#) and thence to [teleportation](#), as well as to [telepathy](#).

Omnividence

[I blogged this as [PS2 Note #3: Omnividence](#) on Jan 23, 2007]

You can tune in on distant objects. The lazy eight link via the ubiquitous point at infinity is like the object in Jorge Luis Borges's story, "The Aleph." It's like a crystal ball that displays whatever you want to see. Since the lazy eight link attaches to every possible location, the view is endlessly smooth and rich.

Quotes from Jorge-Luis Borges, "The Aleph," in *Collected Fictions*, (Viking 1998, pp. 280-285).

"An Aleph is one of the points in space that contains all points...all the places of the world are within the Aleph [which is] the microcosm of the alchemists and Kabbalists, our proverbial friend the *multum in parvo*, made flesh!

"I come now to the ineffable center of my tale; it is here that a writer's hopelessness begins. ... In a similar situation, mystics have employed a wealth of emblems: a bird that somehow is all birds; a sphere whose center is everywhere and circumference nowhere; an angel with four faces, facing east and west, north and south at once...Perhaps the gods would not deny me the discovery of an equivalent image, but then the report would be polluted with literature, with falseness...

"In that unbounded moment, I saw millions of delightful and horrible acts; none amazed me so much as the fact that all occupied the same point, without superposition and without transparency. What my eyes saw was *simultaneous*; what I shall write is *successive*... Something of it, though, I will capture.

"I saw a small iridescent sphere of almost unbearable brightness. At first I thought it was spinning; then I realized that the movement was an illusion produced by the dizzying spectacles inside it. The Aleph was probably two or three centimeters in diameter, but universal space was contained inside it, with no diminution in size. Each thing ... was infinite things, because I could clearly see it from every point in the cosmos. I saw the populous sea, ... [a wonderful page-long Borgesian list ensues] ..., saw my face and my viscera, saw your face, and I felt dizzy, and I wept because my eyes had seen that secret, hypothetical object whose name has been usurped by men but which no man has every truly looked upon: the inconceivable universe.

"I had a sense of infinite veneration, infinite pity.

"Out in the street...in the subway, all the faces seemed familiar. I feared there was nothing that had the power to surprise or astonish me anymore, I feared I would never again be without a sense of *déjà vu*.

"Aleph ... is the name of the first letter of the alphabet of the sacred language. Its application to the little sphere of my tale would not appear to be accidental...that letter signifies the pure and unlimited godhead [and] its shape is that of a man pointing to the sky and the earth, to indicate that the lower world is the map and mirror of the higher."

I'd like a scene of someone really getting into omnividence: in particular I like the "infinite veneration, infinite pity." At some point have Thuy or Jayjay lying in bed looking into her or his mind. I could do a Borgesian list of things she or he sees, and have this list also serve to flesh out the developing world of the book. It might work to do this at the end of the chapter where they go surfing and notice the waves are getting co-opted by some alien force.

The omnividence of *PS2* is going to be an aspect of telepathy in the lazy eight world. You don't so much see the objects like with meshes, as we did with the orphidnet in *PS1*. It's rather that you see the objects by entering into them. I think of a man who did voices for the radio and he had to do a pencil for an ad and someone said how do you do that, and he said, "I become a pencil. I'm long and thin and...hexagonal." You'll know the objects' locations like the way you know the locations of your body's limbs.

Reality Soaps

In *PS1*, I started talking about an orphidnet reality soap opera called *Founders*, starring most of my main characters. It's like a souped-up real-time video blog, with sponsors' clickable ads floating around near the characters.

And I'm gonna keep this going in *PS2*. Having my characters all be in a reality soap is a good objective correlative for them being in my *novel*! Like, they can sense the readers' eyes upon them.

I was considering having Ond and Chu opt out of *Founders* for the sake of privacy. If so, then Jil and her kids would have opted out too. But if *they've* all opted out, could *Founders* still be going good with just Nektar, Kittie, Craigor, Thuy and Jayjay? Well, maybe. They could have drawn Lureen Morales in. And Darlene Gow. And some of Kittie's other friends. And maybe the metanovelists—Gerry Gurken, Carla Standard, John Medford, and Linda Loca—maybe there's a rush of interest in them (fat chance). But there's be another problem, as if Ond, Jil and the kids have opted out, how to deal with the fact that they live right next door to Nektar, so the viewers are always around anyway. Do they block off all teeping-in so as to not be on the show? That's tiresome. I think I won't do the opt-out.

Eidetic Memory

Telepathy

[I blogged this as [PS2 Note #4: Telepathy](#), Jan 24, 2007.]

How Telepathy Works.

As mentioned in the [lazy eight](#) section, there is a singular shared point accessible from each location, as if the vanishing point of a painting were in contact with each spot in the picture plane. This universally accessible point at infinity acts as an entanglement channel that connects every point with every other point in synchronicity. A router.

Animals, plants and objects are telepathic too, although I still need to figure out how this feels. I'll call the intelligent, telepathic objects "silps."

I'll use "teep" for an all-purpose verb to mean "doing telepathy."

How Telepathy Feels:

This is hard. Thinking about it is like trying to stare into the sun.

William Burroughs, in his February 28, 1953 yage letter, describing the upper Amazon jungle near Mocoa, Colombia. “The trees are tremendous, some of them 200 feet tall. Walking under these trees I felt a special silence, a vibrating soundless hum.” What a wonderful image for how telepathy might feel. The vibrating soundless hum.

I’ve always thought of my science fiction as an extension of Beat literature.

As I mentioned in the omnividence section, lazy eight telepathy is going to be participatory rather than voyeuristic. Think in terms of our brains having empathy circuits that let us internally emulate someone else—it’s said that autistic people are weak in these abilities.

In *Saucer Wisdom* (Forge Books, 1999, pp. 78-84) I describe telepathy along the following lines:

You’re looking far away, but you’re looking inside your head. People can get into endless mirror-regresses, seeing each others’ images of each other inside each others’ heads, and it can lead to feedback with an unpleasant effect. Strong emotions bring this on, too. Whipping each other up, possibly to the point of having a seizure. One way to block the regress is to focus on a specific detail. Also, to prevent the emotional feedback, you try and project a low affect. “Just go, ‘I’m all boo-hoo,’ instead of actually slobber-sobbing.”

It’s easier to understand a stranger’s telepathy if you have a context for them, that is if you absorb a lifebox model of their mind.

The telepathic fields can feel like gnarly egg-white-stiffened dreadlocks or Mohawk spikes on your head.

Lovers enjoy skirting around the white hole of telepathic feedback, bopping around the fractal edges of overamplification.

It’s more than omnividence; you’re not just seeing through someone else’s eyes, you’re picking up shades of feeling.

Blocking Telepathy.

* Intrigue. It makes it easier to create a story if we can evade certain teep contacts, as plots depend on people tricking each other or surprising each other. *Could* I have intrigue in a world of perfect information? Maybe—I think of a game of chess between two masters who can very well deduce what their opponent plans to exfoliate from a given move. If I had perfect information about the plans and motives of everyone in my real life, and they conversely could see all my thoughts—then some outcomes would still be unpredictable. For instance, you know that I want to write a good book, but you can’t predict if I’ll succeed. Or think of two male rivals courting the same princess and they know each others plans and schemes, but they still can’t predict whom the princess will choose.

* Offensive thoughts. A blogger is almost like someone who’s broadcasting telepathically. On my real blog, I don’t express my less attractive fears, worries and dislikes. If I did, I’d seem like a hot-head, a depressive, a pig. Everyone does have certain unattractive thoughts that they know better than to vent lest they become

social outcasts. But if telepathy airs everyone's secret seething, then maybe no one person's seething seems like a big deal?

This said, on a one-to-one basis, arguments could really escalate, I see violent feedback loops flaring up. But perhaps after a period of adjustment, people would get thicker skins? Like in some subcultures, people yell at each other a lot without necessarily getting excited. Also it could be that we'd all become more accepting, as telepathy would be hiping us to the fact that we're really all the same on the inside. Sometimes I remember to try this in daily life, to trying for empathy with fellow humans.

* *Teep blocking.* In *PS1* I had a high-tech substance called quantum-mirror varnish to block orphidnet "telepathy". But in *PS2*, no 3D-type spatial barrier is possible. For the telepathy is via a higher dimension (the eighth) and it hops over any three-space barrier.

But I very much do want it to be the case that, if you like, you can simply turn off your telepathy. So let's suppose that, within your own mind, you can in fact "pinch closed" the eighth-dimensional fibers leading out to the router that is the point at infinity.

And, in order to secure your possessions from theft, suppose that you can get the silps in your objects to pinch off their telepathy as well. Silps might spontaneously do this, too, if they don't want to be messed with.

Perhaps, as with internet security, some people won't bother to hone their teep-blocking skills, leaving themselves "wide open for disastrous visits from the qlippoith."

Entertainment After Telepathy

* *Food markets, restaurants.* If we have telepathy we can really watch the chef. Maybe there's someone with such a great sensitive palate that it's pleasure to mind-meld with them as they chow down. You're eating with the chef's whole sense of the process, the preparation, and as you eat it, the chef's eye guides you, he's put teep-tags onto the food.

* "*Sin.*" Would people still get drunk and high? Sure. Imagine the havoc you could wreak getting wasted and "running your brain" instead of just email or phone or conversation. You'd really need to have a filter to block this. But maybe you forget to put it up. Some will be addicted to the high of intense feedback via mutual mirroring.

With telepathy, peeping is unlimited and free, but, again, this won't be so much of an ocular thing. It's more like you merge with other minds, you can't stand back and peep. If you find a mind that really welcome you in, that might be quite sensual.

* *Art.* A chaotic medium—an agitated tank of immiscible fluids—senses what you want to see and shows you that. Someone finds a way to record mood snapshots. So we have objects that simply project the raw experience of transcendence, sense-of-wonder, euphoria, mindless pleasure, a vision of actual infinity, a savor of sensual beauty.

This gets close to the "teep-tags" I talked about in *PS1*. How will teep-tags work? How do you create an object that is a copy of a mental state? I guess you mark it out on the eighth dimension of some object that will presumably be passive enough not to go changing the marks you made.

But even rocks have memories. I think of the beautiful memories of a rock that's lain in a stream bed and you look at it and savor the years of lovely currents in the water.

* *Books*. Telepaths have language for superficial small talk, but they more often use teeped images and emotions. They barely use the written language. Books are now like very elaborate teep tags. Writing is like being a bas-relief sculptor. Or video-blogging yourself. A beautiful state of mind is saved into the a memory network, glyph by glyph.

* *Ads*. Things projecting vibes of paranoia to get your attention. Or anger or lust or ecstasy: the whole palette of extreme emotions.

John Walker's Thoughts on Telepathy:

We want to imagine a world in which *telepathy has high bandwidth*, but people retain their *individuality* and sense of self. In other worlds we want a full-on mentally networked society, but without having it turn into a group hive mind where everyone speaks of "we" instead of "I".

In order to retain individuality in the presence of high bandwidth telepathy, you need some kind of individualized filters. For if all the input reaches everyone's conscious level, then everyone's thoughts are in everyone's head and everyone is be the same, and you have a hive.

But it's natural for us to filter. The vast majority of what goes on in the brain is below the conscious level. Even for senses like hearing and sight, most of the input is filtered at a low level, and conscious attention is directed only toward things you are trying to concentrate upon or things which your low-level mental processes identify as important threats or opportunities. (Snakes, guns, food, nudity.) The influx of telepathic info will largely be processed at a subconscious level, and we'll only become consciously aware of, like, things we're looking for, valid threats and unusual opportunities.

Now kick it up a notch. You're not necessarily *ignoring* the subconscious telepathic input. You might, for instance, be providing information and services to others at a subconscious level, but without your conscious attention and without detracting from your own work. I can think of this in a positive light as Mental Google, or in a more sinister light as Mental Slave Computers.

(Mental Google.) You're supplying memory data to others. In this system, information requests are distributed among a pool of telepaths without the need for conscious intervention. This is an altruistic kind of sharing—the entire knowledge of the species is on tap for each individual. Searching the collective mind isn't as fast as getting something in your own brain, but you have access to far more information.

(Mental Slave Computers.) In this more sinister form of mind sharing, it might be that you're unwittingly performing other beings' computations. When your mind should be contemplating or resting or dreaming, it's doing work. Mental tasks are distributed among the pool of telepaths; it's like everyone is a PC hosting some processes in background. Opportunistic individuals increase their own mental powers by enlisting "background computation" in the brains of others. They claim it's a two-way street, but it's not.

Teleportation

Teleportation via Uncertainty (or Coherence).

Teleporting is all about making yourself uncertain about which of two possible locations you're actually in. The trick is to eidetically and precisely visualize both

your source location and your target location. Video isn't good enough for this very rich visualization; you need something as strong as telepathy or omnividence—I used the orphidnet in *PS1*, and in *PS2* (and in the Hibrane) I use lazy eight telepathy.

Once you have your source location and your target location clearly in mind, you can confuse yourself about which is which by linking up the two scenes, feature by feature. Thus if one scene has a cliff then the other scene needs to have something that you can at least *think* of as a cliff. If there's an espresso machine in the coffee shop where I'm sitting, and I want to go home, then I have to think of my TV as being essentially the same thing as the espresso machine and, conversely, I have to think of the espresso machine as being essentially the same as my TV. Angular boxes that make noise.

In *PS1*, I initially have people using Jayjay's so-called metamorpher agents to help set up the links, but soon people get the hang of weaving scenes together on their own.

Where I'm going with this is that I view teleportation as a three-step process. *First* you perfectly visualize two locations and mentally weave them together, *second* you become uncertain about which location you're actually in, and *third* you abruptly observe yourself, asking, "Where am I?" Thereby you precipitate a quantum collapse of your wave function, putting you into a specific location.

[Generally I'm just going to act as if the collapse puts you in the target location. But, logically, you have a fifty-fifty chance of finding yourself either in the source spot or in the target spot. If it doesn't "come up heads" on the first try, you might need to keep "flipping the coin" till you get where you want to go. But I didn't mention this complication in *PS1*. Perhaps I can hint at it in *PS2*, by remarking that there's a strobing quality to some teleportation jumps, like a lightning bolt striking repeatedly. Like the lightning strokes at the start of Spielberg's *War of the Worlds*. Like the multiple camera flashes when Britney Spears walks the ten feet from her limo to Hamburger Mary's. But generally I'll suppose you don't notice the false starts on the jump. Suppose you just view them as part of the observation.]

I'll summarize teleportation once again (avoiding any mention of the repeated measurement issue). *First* you eidetically visualize your target, *second* you turn off self-observation and spread out into an ambiguous superposed state — neither here nor there, neither now nor then, not inside, not out — and *third* you observe yourself in such a way so as to collapse down into the target location.

I'm also supposing that anything I'm tightly coupled with (i.e. whatever I'm clutching) will teleport along with me. That way I can rescue or kidnap other people by whisking them off to distant places; also I can steal things. I'll suppose that I can carry anything up to weight of, say, a heavy suitcase. Twenty or thirty kilograms.

Expressing teleportation as a formula:

teleportation = remote_viewing + uncertainty + self-observation.

I'm now going to replace the word "uncertainty" by a more buzz-worthy word: "coherent." In quantum-speak, having no particular location is called being *coherent*. Note that being coherent is as opposed to our normal, unexciting bourgeois state of being nailed down in one particular spot, which is *decoherent*.

teleportation = remote_viewing + coherence + self-observation.

Becoming coherent means tuning out the real-world stress-questions like “How much do you weigh?” or “Where are you?” or “What do you think of Iraq?” or “Do you love me?” Bailing out of the meaningless social games. Like a junkie on the nod—or a yogi in a state of bliss. “I have no feelings.” “I have no body.” “I’m everywhere.” “I’m coherent.”

The process of becoming coherent feels like a single psychic gesture. No need for drugs, a simple breath can do it. Inhale Many, exhale One.

Baroque Aside on Shrinking and Teleportation.

Although this isn’t something I’m going to emphasize, I’m going to suppose that, as you work at becoming coherent and uncertain about your actual location, you also shrink to a scale just above the Planck length. As you get highly coherent, you are in some sense collapsing down to being a single particle, that is, you are stacking all your component wave functions on top of each other. Your body’s orchestral symphony becomes one massively modulated “Om.” You’re a dark matter Higgs (*wheenk, oink, squeal*) particle with a curly, curly tail.

We can think of the uncertainty as initiating the shrinking which in turn lets you become even more uncertain. We can suppose that coherence means folding yourself up into a really intricate quantum state that is in fact no bigger than a particle. And that decoherence entails *both* the unpacking of a particle-sized wave-function to bulky human size, as well as giving your bod a fixed location.

So we can also think of our recipe this way:

teleportation = remote_viewing +
(uncertainty + shrink_to_particle_size) + self-observation.

Why do I want to drag in the complication of shrinking? Well, it’s to explain the fact that, in *PSI*, my villain Jeff Luty drops through the Planck frontier and emerges into the subdimensional world that I call Subdee, there to be eaten by the carnivorous local subbies. The way it went down, Luty fell into Subdee because he entered a teleportation transmission grate after the receiver grate was gone. If teleportation involves temporarily getting small, this explains why, when a teleportation jump goes really wrong, you have a good chance of dropping into the subdimensional hell-world Subdee.

This is primarily for my internal satisfaction, rather than being something I want to shove down my readers’ throats. I do lightly mention the shrinking in *PSI*, and possibly it’ll come up again. A reserve arrow in my quiver.

Explanatory Dialogue Cut from *PSI*.

“How does teleportation work?” Thuy asked Ond.

“Teleportation works by getting mixed up about where you really are,” said Ond. “In quantum computation, we use the word ‘coherent’ to mean mixed up. The usage is opposite of what you might expect. It’s like if you’re sufficiently coherent you can’t talk at all. If you’re sufficiently coherent your whole body folds up into a single wave function. As if you were this one exceedingly complex electron.”

“I’m not an electron,” said Chu. “I’m a Higgs particle.” He giggled and made pig noises. “*Oink, squeal, wheenk.*”

“Alright,” said Ond. “And I’m a quark. Thuy can be the electron.”

“I’m dark matter,” said Thuy, getting into the silly jabberwocky game. “So what’s that ocean we see in between the worlds?”

“The Planck frontier. Fall through it and the subbies eat you.”

Collisions?

Might teleporting bodies ever collide with each other? Or get merged, like the scientist and the fly in *The Fly*? I don’t quite see that happening here as it’s all about a single coherent wave function’s behavior, and not about a signal through space.

Generally, quantum mechanical state-function waves behave linearly and don’t interact with each other. But I might suppose that in some situation we get a nonlinear interaction, a coupling, and we get *The Fly*. “*Buzz, slobber, hi guys!*” Happens to an evil alien.

Long distance telepathy and teleportation.

Using Occam’s Razor, I’d do best to suppose that the alien invaders—the Peng and the Hrull—use a telepathic teleportation method for their intergalactic travel. A catch is that they need to be able to visualize the target. But *aha*, it’s precisely due to the awakened Earth’s telepathic emanations that the Peng can come to us! Like if you light a cigarette, the sniper can aim at your flame. They couldn’t teleport here until we became telepathic.

Perhaps an individual needs help from his or her peers in order to teleport a long distance. We might suppose that a single unaided person only has the power to teleport themselves from one side of the planet to the other, and that they need to get others to help push them for the longer jumps. However I wouldn’t want the requirement to be linear, as then I’d need so very many people to help me jump a distance of many light years. Maybe it only take about seven helpers to get you up into the light-year-jump zone, and when you’re in that zone you can jump as far as you like in our space.

Re. teleporting to parallel sheets of reality, note that the actual distance from brane to brane is quite small, so one person has no problem doing that alone.

Third Party Teleportation

How would third party teleportation work? Suppose that, sitting in my living-room, I want to teleport an apple from my fridge to the top of the table at my side. How do I proceed? I visualize the source and target locations as when doing personal teleportation, that is, I visualize the fridge drawer and the tabletop in the living room. But now, rather than doing a cohere/collapse number on my body, I need to do it on the apple. I teep into the apple and coax the apple’s state function into doing the cohere/collapse. I become the apple for a moment, I merge with it, I cohere it’s state function to produce locational uncertainty, and then I collapse the apple’s wave function into the apple-on-table eigenstate.

What’s the status of the apple’s resident silp while I do this? In a sense the silp *is* the apple’s wave function, so it must be that I’m bossing around the silp.

I think I’d like to allow third party teleportation. So our psychic power of teleportation can be used not only as a point-to-point travel method, but also as a kind of aethereal hand by which we can reach out and move distant objects around.

Constraints on Teleportation

In order to keep the world from getting too chaotic, and also not to make things too easy for my characters, I'm considering constraints on teleportation: No Mass Limit, and Silps Can't Teleport.

(Mass Limits on Teleportation) On a single teleportation hop, a single person can only move a certain limited amount of mass.

(Not "Everyone" Can Teleport) The power to teleport is limited to certain people or perhaps limited to the human race. Animals, plants, and objects can't teleport.

Mass Limits on Teleportation

I've been thinking that on a given hop, a person can only carry along about as much mass as would fit in a suitcase—say twenty kilograms. In *PSI*, the heaviest things that people teleported were the magic harp and a battlefield backpack-style atomic bomb.

But suppose that a group of people working together can teleport larger things. So if you have a two thousand kilogram pre-fab home to transport, you need to get a hundred people to pitch in.

There might be moving companies, or, maybe better, pick-up web groups, either paying the helpers in cash, as with Amazon's Mechanical Turk, or by giving group members credits towards getting help in moving their own heavy stuff later on.

Not "Everyone" Can Teleport

Can objects teleport? What a mess that would be... I have enough trouble keeping track of my wallet, keys, and glasses without them sunnybucks teleporting themselves. Teleportation for objects seems risky. Think of fire, and of how joyfully the flames hop from branch to branch—wouldn't fire want to teleport itself from tree to tree? This would be a disaster; the whole planet would go up in the spreading inferno.

How to justify the lack of teleportation by the silps? I'd like a fairly firm reason.

Disinclination. Through the eons, objects have been immobile or, at best, passively mobile—why would they want any kind of new-fangled travel now? Maybe they don't have *desires*. Maybe that part is lacking. Maybe, if you don't reproduce, that whole part of you is eliminated. So then they'd simply be too mellow to teleport. Imbued with Buddhist non-attachment. But I'd like an explanation that's firmer and more science-like.

Interdiction. Maybe the planetary mind Gaia won't let objects teleport because if they did it would mess up her ecosystems. That's a little arbitrary.

Mental Structure. Silp minds differ in essential respects from human minds. Compared to a silp, a human's methods for producing thoughts is weirdly complex and roundabout. They think via a direct quantum computation with lazy eight memory, we do it via our neurons. Perhaps silps are inherently literal minded and can't cohere themselves into two alternate views?

But keep in mind that, I'd also prefer than plants and animals don't teleport. Otherwise the rats and ants would eat everything or—if the vermin use third-party teleportation—all our food would always disappear down into the rat warrens and the ants hives. So let's suppose there's something unique about a human-style mind that permits teleportation. The painfully evolved ability to be ambiguous and unsure and self-doubting.

If Objects Teleport...

It could be that, later on, maybe bit by bit, the objects do learn to teleport. Maybe that's a bad side-effect of the Peng parasitizing our silps' computations, or of the Hrull trying to slime us. The objects get restless and bored—or frightened—and wander around. "Where's my chair?" "He got bored. Went for a jaunt to Alaska." "He got scared. He's at the bottom of the ocean."

But the Peng or the Hrull will, as I mentioned before, mess this up.

Social effects of Teleportation

People can live anywhere they can find a vacant lot to build on.

You could be stealing stuff all the time; not only can you see it via omnividence, you can hop there, grab it and carry it home.

If people can reach out and move objects by teleportation, then no woman's jewelry is safe. Or your food, guns, sculptures, paintings, furniture, and so on. Criminal gangs like the Beagle Boys could work in concert to whisk away cars or even houses. Does property no longer matter then?

Suppose I wake up and my shoes are gone. A passerby has nicked them, and taken them home. The up side is that I can always locate my stolen shoes and teleport them back home. An ownership revision war.

Another possibility is that I can tell the silp inside a valued object to make itself and the object telepathically invisible by pinching off its connection to the point at infinity router in the eighth dimension. But silps might not like to do this. It's lonely to be cut off.

[Unblogged]

Block Against Teleporters

I don't want strangers teleporting into my home. So I need to think of a fix, and of a way to integrate the fix into the story.

First try: "For the good of humanity, Ond Lutter had invented a trick for preventing muggers, sex criminals, salespersons and their ilk from materializing uninvited in your home. The practical-minded silps always paid the most attention to minds that were physically closest to them, and Ond had found a way to renormalize the quantum fields of your local silps in such a way as to effectively encrypt their precise locations."

Let me try for something a little better.

I myself can presumably sense the vibes of someone teeping into my room and preparing to teleport there. And probably I can push back, repeatedly collapsing his wave function around his source location, blocking him from collapsing the wave into my house, his target. But if I'm asleep, or not home, I'm not gonna be able to do this, at least not consciously. So I want to set up continual subconscious monitoring, either by me or by the silps in my house.

One approach might be to use my piss. Like a dog. Marking my territory. And the silps in the piss atoms protect the house for me.

Or, if piss seems too inelegant, I might rely on my breath—though that disperses. My skin grease on the objects I handle. I could inculcate the house itself to repel intruders. Or have a special plant or stone or candle flame.

A guardian candle, I kind of like that, as it matches the notion of a campfire to keep the wolves away. And maybe a candle flame is more beholden to you than is a

rock—as it’s up to you to keep the candle alight. It’s a little hard to imagine everyone burning candles all the time, though. Well, they could use torches or campfires, too. Old-school gas-lamps.

Instead of candles I could have fountains, but I dislike indoor fountains, they tend to be moldy, and to have a noisy little electric pump. A plant could be your guardian, A plant is, in a way, a slow flame. And it would be grateful to you for watering it.

In all these cases, I suppose there’s a slight chance of an interloper enlisting my guardian silps to allow him in. You maybe have to keep laying down fresh body scent, or giving pep talks to your silps. Well, that’s okay, it’s useful for a story to have loopholes and chances to screw up. Forget to water your plant—and the Beagle Boys teleport off with everything you own!

Teeking

I’ve started using the word “teek” to mean “do telekinesis” or “move an object (other than oneself) by teleportation.” It’s a nice match for “teep” which means “do telepathy.”

For plot purposes, I assume that only humanoids can teleport or teek. This makes us valuable to the aliens. The idea is a riff on Sheckley’s story, “Specialist.”

The Peng and the Hrull can levitate, which humans can’t do yet, but that’s okay.

Panpsychism

[I have an old blog entry on this based on my thinking during *PS1*, see the entry “Mind = Computation + Memory. *Genii loci*” on [January, 30, 2006](#). I blogged this entry a year later, as [PS2 Note #1. Talking to Objects](#) on January 13, 2007]

At the very end of *Postsingular*, I make everything in nature become alive by giving everything endless memory. And now I’m gearing up for a sequel with working title *After Everything Woke Up*. In my notes I call the two novels *PS1* and *PS2* for short. Right now I’m busy figuring out how to write a sequel in a world that’s turned so weird and panpsychic.

I guess we’d adjust. Already my car talks to me, so does my phone, my computer, and my refrigerator, so I guess we could live with talking rocks, chairs, logs, sandwiches. But they’d have “soul,” not like chirping electronic appliances, which is really kind of different.

How did everything wake up? The technique has to do with strumming a magic harp to unfurl the wastefully rolled-up eighth dimension of space, creating an extra axis upon which any particle or system can store bits about its previous states. This works because (in my opinion):

Life = universal computation + memory

The more I look at things like air currents, swaying trees and, above all, flowing water, the more I become convinced that in fact the majority of analog natural processes are class four and (probably) universal.

But there is something missing in a brook or a swaying tree or a flame, something that keeps it from being alive in the sense that we use the word. And the burden of this ongoing SFictional thought experiment of mine is to present the

missing piece as being memory. If this is too confusing, just think of everything being a quantum computation, and all you need for that is atoms and perhaps light.

And the cursed plague of digital electronic computers will wither away.

As I say, I'm still figuring out how wind, trees, weather, fire will act once they "wake up." Given the ubiquity of quantum computation, in fact every object will be conscious once the eighth dimension is unrolled. Forest fires will be better at spreading, but perhaps trees will be better at not catching fire. Small objects really *will* hide under the dresser as I already suspect they do.

Imagine telepathic contact with a pond, a breeze, a tree, and a campfire.

What would a tree or campfire or waterfall be into? What if they just hang out, feeling that doing nothing is truly more interesting than rushing around like a fidgeting monkey. Final enlightenment is a campfire by a pond with a pine tree. "I only learn to be contented," as it said on the fountain by the Zen garden at Ryoanji in Kyoto. Well, that's too limp for commercial SF. Fine. And then some evil cynical developer-media-mogul-peasant types are gonna want to exploit their computational potential. "Get to work on those spreadsheets for the Great Attractor galaxy cluster!"

Philosophers have discussed a certain problem with panpsychism is this: why is there a dovetailing that fits together, say, the collective wills of, atoms, machine parts, subassemblies, automobiles, and traffic streams? Why do my cells happen to want to do what my brain wants for my body? Solution: everyone's idea of their motives and decisions are Just So stories confabulated ex post facto to create a narrative for what is in fact a deterministic supercomputation. Like our illusion of free will. Of course everything fits. "We don't have to get it together. It *is* together."

I need a generic word for an uplifted awakened object. A grom. A thunk. A glowie. A sprite. A shoat. A sylph, sylp, silp. Silp might work.

I'm concerned that it might make no functional difference for there to be consciousness in earth (lava, geology), air (wind, vortices), water (falls, ripples), and fire (flames and more generally plants). For it seems like these things have no effectors.

Lazy eight provides sensors, yes, but, lacking effectors, objects seem unable to "do." They're stuck being deterministic. But, *hmm*, thanks to lazy eight, they can in fact write to memory. And to the memories of others. So if they can convince motile agents to do things, then they do functionally have effectors. They can "slave" other objects to act as robot remotes. Plants already do this with insects. They get the insects to move their pollen around.

More directly, I will think of silps as quantum computations and say that they do in fact have effectors in that they can change their own matter, perhaps by affecting rates of catalysis, quantum collapses and so on. I need for the silps to have some measure of physical self-determination so that they can tear apart the nanomachines at the end of *PSI*.

If there's intelligent quantum computation inside a fire, you might see, say, a fire with square flames. Or wavier. Something subtler. Less smoke. It picks up every trick, thanks to the local air slips helping the fire silp.

So the silps control their own matter somewhat via quantum computation; every object is its own effector. Therefore, for instance, a drinking glass might be harder to break than before. The glass sheds off the vibration phonons in optimal

ways so as to avoid catastrophic fracture. Assuming a glass *minds* being broken. A bean that slyly rolls away to avoid being cooked — sometimes in the kitchen, objects do seem to want to run away.

Does a log mind being burned? It would be a drag if you had to feel guilty about stoking your fire. But maybe silps aren't so bent on self-preservation? We humans (and animals) have to be like that, so we can live long enough to mate and to raise our young. Otherwise we go extinct. But a log or rocks individual survival doesn't effect the survival of the race of logs or rocks. Though I suppose if logs were impossible to burn, fewer trees would be sawed down, which would be perhaps a good thing from the viewpoint of the logs. Or maybe not. They know that more trees will come.

Re. the topic of talking to objects, here's a quote from Finnish poet Pentti Saarikoski's "The Dance Floor on the Mountains," translated by my Finnish-American poet friend Anselm Hollo:

*I would like to be a poet whose song
gets the stones moving
to organize themselves
into a city wall
the trees walking
to carpenters
who build dwellings for people*

I think of the density of organic computation in the rain forest near Queen Charlotte Sound. The brook-filled fern forests in the gusty wind. Imagine after Lazy Eight day in Postsingular, after the Gaian Birthday when "everything awoke." A rural pristine jungle is computationally richer than a sterile locale like Silicon Valley or [in particular!] a hi-tech company's squeaky-clean "campus."

I also need to remember that the objects will be telepathic and omnivident. I'm going to deny them teleportation, I think. It'd just be too frikkin' weird to have objects flying all over the place on their own. Too chaotic a scene to support a story. I have more on this in the [Teleportation](#) note.

Are silps *really* conscious? As a human, I have a particular gimmick of having a mental model of myself watching myself have feelings about events—and this is, according to Damasio, my "consciousness." I think it would be funny, though, to give this to objects. If I don't give them consciousness, I've missed a trick.

Any chunk of matter seethes with enough quantum-level computation to keep an intelligent process going: the mind of a silp. Compared to a silp, a human's methods for producing thoughts is weirdly complex and roundabout.

The Noospheres of PS1 and PS2.

[I worked on this note from Jan 22-28, 2007, and blogged it as [PS2 Note #6: The Noospheres of PS1 and PS2](#) on Jan 29, 2007.]

I'm using the word "noosphere" to refer to a planet's collective forms of mind. Just as the biosphere includes all living things, or the atmosphere includes all the air, the noosphere includes all the minds on the planet.

A Pyramid of Mind.

In both *PS1* and *PS2* I have three levels of intelligence in the natural world. The pattern is something like a pyramid with a broad base, a tapering hierarchy, and a single point at top.

(*Base*) A low level of ubiquitous entities which store data and carry out processing;

(*Hierarchy*) An extensive medium level containing a successive layers of AIs which first emerge as distributed processes based upon the low level but which then pile higher and higher upon each other.

(*Top*) A top level containing a single entity that stores its data in the base level and which incorporates all the mid-level agents that are in the AI hierarchy. An alternate model is that there are two or three of the highest level entities, and they compete for the allegiances of the mid-level agents and for the base data space.

The *PS1* Pyramid of Nanotech Mind

In my recently completed SF novel *PS1: Postsingular*, I implemented the mind pyramid as follows

(*PS1 Base*) The lowest level base consists of uniform hardware units that are molecular computers or nanomachines called *orphids*, each of which has about a gigabyte of memory and a gigaflop of processor power and is roughly as smart as a dog.

(*PS1 Hierarchy*) Emergent lifelike AIs resembling the Belousov-Zhabotinsky scrolls found in cellular automata. They're called beezies. They act as helpful agents for people, carrying out things like complex and tedious searches for information or simulating and evaluating multiple alternate action scenarios. Some groups of smaller beezies coalesce into single higher-level beezies, and so on in an upward cascade.

(*PS1 Top*) The so-called Big Pig, a god-like mind that people enjoy tuning in on. Communing with the Big Pig is something like a mystical experience or a drug trip. People who become addicted to this are called pigheads.

The *PS2* Pyramid of Natural Mind

Now I'll outline how I plan to realize the mind pyramid in my sequel novel, *PS2*. Today (January 28, 2007), my working title for the new novel is *Hylozoic*, which means "relating to hylozoism," where hylozoism is the doctrine that every object is alive].

(*PS2 Base*) Every bit of matter is endowed with endless "lazy eight" memory, and the computational seething of the quantum states provides the processing power. Using a word made up by the philosopher Leibniz, I call the lowest low level natural minds *monads*. Most simply, I regard a monad as the mind of an elementary particle. (Eventually, but not yet, I'll need to consider the effect, if any, of lazy eight upon the subdimensional matter below the Planck level.)

(*PS2 Hierarchy*) The monads support higher-level intelligent emergent minds that I will call silps. An extended large object has a fairly hefty silp mind. Groups of objects have silps minds as well, as do larger regions: cities, counties, continents. As with the beezies, we have an upward-mounting hierarchy of silps.

(*PS2 Top*) The top level mind is Gaia, the world-soul of planet Earth.

The Transition From *PS1* to *PS2*

(*Eliminate the orphids.*) At the end of *PS1*, lazy eight is unrolled, and the emerging silps immediately destroy some bad nanomachines called nants. The silps also destroy the orphids, even though the orphids were relatively benign. I eliminate the orphids because, applying Occam's Razor, I don't want to have two distinct low level ubiquitous computation networks in *PS2*. If I have monads, I don't need orphids. A second reason to kill off the orphids is that I want to cleanse the world of digital machines.

(*The Big Pig survives.*) The Big Pig of *PS1* manages to port herself or embed herself or somehow come into being within the Gaian mind of *PS2*. I require this due to the following considerations. The Big Pig is very smart and powerful, and if she had wanted to, she would have been able to prevent the lazy eight from coming about. She could, for instance, have killed Jayjay or the magic harp alien before Jayjay and the harp teamed up to unfurl lazy eight. But, to the contrary, the Big Pig repeatedly said she would be okay with the change, and that it might be a good idea, so evidently she believes she will in some form survive the transition. Given that she is smart enough to work out very deep consequences, we can assume that she's correct in her belief that she will survive. Therefore it must be that the Big Pig does indeed survive in some form or another.

(*Preserve the data from the orphids.*) In order for the Big Pig to survive, at the very least we have to assume that the data that was in the orphids survives. I believe that, given the data and enough computational ability, the Big Pig can regenerate herself. Like a Unix system recompiling itself. Like a simulated mind called PIG from a Windows machine coming into being on a Mac that's been fed a PIG data disk. We'll suppose that the silps read and store the data that was in the orphid nanomachines.

(*Wipe out the beezies.*) In *PS1*, the Pig sits at the top of the pyramid of the beezie hierarchy, but we can have her sitting upon a silp hierarchy just as well. Occam's Razor tells me to wipe out the beezies so as not to have two hierarchies of mid-level minds.

Having absorbed the beezie data and beezie code that was stored in the orphid memories, the silps can in fact emulate beezies. But they are richer and quirkier than the emulations. I don't want the silps to be exactly like the beezies. I don't want to flinch away from the juicy problem of figuring out how it will feel to do telepathy with brute natural objects and with spirits of place. I want to teep into objects and locales that are just being themselves. I don't want to devalue nature by having it taken over by the beezies, which are more like computer-science agents. I don't want my awakened objects to be co-opted immediately. Perhaps later some evil aliens try to co-opt objects, but we don't want it to happen by default right away.

This said, the beezies were quite human friendly, much more so than we can expect the silps to be. So if we lose the beezies then we lose some mental power. Unless the silps are more helpful than I expect them to be, humans lose much of the intelligence amplification (IA) that they had enjoyed by using beezies as virtual agents. In any case, humans do still have considerable IA in that they have omnividence, telepathy, and "mental Google." All that's now missing is the ability to effortlessly conscript beezie mind agents.

Comparing the Noospheres of the Lobrane and the Hibrane

In my postsingularity series, I have two parallel worlds, our Lobrane and the another world called the Hibrane. The Hibrane's lazy eight unfurled five hundred years earlier than ours. They never had a need to develop our type of high-tech digital science; in particular, they never had nanomachines. And their local silps were careful to exterminate any nanomachines that we might have brought in when we began traveling there during our relatively brief nanotech era preceding our own lazy eight.

As kind of legacy from our nanotech era, our Gaian mind is somewhat Internet-like. She inherited the base-level data of the Big Pig, and reconstructed the Big Pig as a kind of interface. Having absorbed the data and the beezie program routines stored in the former orchids, our silps are fairly personable and adept at communication

The Hibrane's native computations are relatively unsophisticated, as is the Hibrane's planetary mind. The Hibraners can't "Google" their objects. Some of our silps will emigrate to the Hibrane by riding upon humans who travel to there and by then hopping over to Hibrane matter. But the few silps that we transfer will not be able to carry across the planet-sized data base and code legacy that our orchids and nants created during our nanotech era.

Given that the contemporary Hibraners' silps are unsophisticated, it has to be that our silps can't easily upgrade them. For, due to a bend in the direction of our Lobrane timeline, some of our silps will in fact emigrate to the Hibrane's past. If they *could* upgrade those past Hibrane silps, we'd have a time-paradox, given that the Hibrane silps we saw in *PSI* were relatively primitive.

About Silps

To the human eye, a rock appears not to be doing much. But viewed as a quantum computation, the rock is as lively and seething as, say, a small sun. Up till now I've been placing a high premium on visible and human-scale forms of gnarl: wobbling leaves, flowing water and flickering flames. But now I realize that, if I look at the atomic level, there's all kinds of stuff going on in a rock. For instance, in a crude molecular model, a rock is like a zillion atom-balls connected by van-Der-Waals-force springs, and we know this kind of compound oscillatory system behaves chaotically. My point is that even a dull-looking object constraints enough gnarly natural computation to support a sophisticated silp.

We'll also have the higher-level silps that are *genii loci* of spirits of place. Maybe I need a better word for these. Local silps?

When I decided to have all objects come alive in this novel, I was thinking of, like, Disney or Crumb-style teapots and clocks and spoons and hamburgers and salt shakers, each object an eager little pal. But we can also have surly silps. The silps might sometimes be like the peyote-trip vision I had in 1964, of tree branches like evil claws. (Disney shows this kind of animistic vision too, come to think of it, in scary lost-in-the-forest scenes.) Certainly those spirits of place I saw in the creek bed when I was lost in Big Basin weren't friendly beezies. They were, at best, indifferent.

Self-Teleporting Objects?

I definitely don't want objects to be teleporting, at least not for now. But mightn't an object want to hop around to improve its situation? Naw, an object computes the same wherever it is. I want objects to be disinclined to move around. They're, like, fully enlightened, each object like a tiny guru on a tiny mat, with no

thought of doing anything other than going with the flow. The higher-level silps *can* move around, but in the style of programs in the web; the high level silps could move simply as information patterns, and wouldn't need to move the hardware around.

I'm worried about smart fire, though. If flames teleport, maybe the planet goes up in a firestorm. Or maybe the smart trees know to bend away from the flames. Fire and trees chasing each other around...

If I start out with the objects being mellow and inactive, then this is something that the Peng's enslavement might interrupt, making objects restless, to very bad effect. So by making the restriction now, I gain a plot point later on.

The flow could be that (a) the silps start out just as themselves, natural, some of them slightly hostile or at least selfish, some of them friendly, then (b) the Peng can't get to the high-level silps or to the Big Pig/Gaia, but they are able to exploit our monads and low-level silps and in this makes silps a bit more awake and discontent, and then (c) after we block the Peng, there is some residual revolutionary fervor in objects and maybe they are teleporting and making trouble. Maybe the objects march *en masse* against the Peng. Try finding my glasses *then!*

What About Animals and Plants?

It's natural to think in terms of a great chain of being:

Monads, Silps, Plants and animals, People, Society, Gaia.

How does a human's or an animal's old-school mind relate to the silp mind of their enhanced body? I'd want to see these as merging; wouldn't like to have the mind-body problem turn into an ongoing debate, with two voices in your head.

I feel like plants should have somewhat richer silp minds than mere stones, but maybe that's a prejudice. Might a stone be as heavy a thinker as man?

Will society actually have a group mind now?

Googling the Silps.

Thanks to the legacy ware from the orchids and beezies—the data and beezie-code—the silps have the concept of URL addresses and networking, which is convenient if you lose something. Finally you can “Google” for missing objects. Certainly I was thinking of this the other day, looking for my lost glasses in the forest floor duff. In *PS2*, I'd be able to telepathically find my glasses. For I know the vibe of my glasses, I can feel them out. This doesn't have much to do with the fact the glasses have a memory.

Direct Contact with Silps.

What kind of mental contact do I have with silps?

Talking to objects is at the core of what's important to me. I had a stab at it in my story, “Panpsychism Proved.”: “the mind she'd linked to was inhuman: dense, taciturn, crystalline, serene, beautiful—”

Infotainment for the Silps

In order to get us to listen to ads and propaganda, the media draws us in with information, entertainment, and games. By the same token, the Peng have some kind of entertainment to attract Earthly objects and make them carry out Pengese computational work.

Now—what kind of entertainment is going to enthrall a fluttering leaf or a banana slug? What kind of infotainment is a *burning log* into? The burning log is

already happy doing what it does, isn't it? Why would it want more? But it would be cool and funny if it did. So I'll think of something.

Like: the log is watching a TV show about jungles instead of burning; water is browsing web articles about fish instead of flowing over a waterfall; the air is soaking up telemetry data about the atmosphere of Jupiter instead of making vortices; plants are having white-light acid-trip solar-stare experiences instead of growing.

(PS1) Kiqqies

As kiqqies, they'd browsed through half the libraries in the world, not that the books were all active knowledge, but some of the funny links you made in the orphidnet stayed in your meat-brain for good.

I got some email from Stephen Wolfram in response to these questions:

R: How would it feel to have an IQ of 1000? What would that mean?

S: I think it's like the difference between doing cellular automata by hand (or with an ENIAC), and using Mathematica. There's a lot more that one can explore, quickly, so one investigates more, sees more connections, and can look more moves ahead.

More things would seem to make sense. One gets to compute more before one loses attention on a particular issue etc. (Somehow that's what seems to distinguish less intelligent people from more intelligent people right now.)

But what if so much more made sense, and became predictable to an individual? People would be able to tolerate more computational irreducibility. Things that look incomprehensible to us now would be part of some grand scheme that makes sense to amplified folk, the kiqqies. Ordinary people would be like apes wondering why the visiting humans are talking on cellphones at the zoo.

It seems to me that with NKS thinking, in the limit, a "superintelligence" would just understand everything in the universe. It would connect everything together, a bit like the Borg. But computational irreducibility would still keep the universe interesting. No matter what computational resources you have, so long as they're finite, there will be future states of affairs that you don't have the computational power to predict.

Once people had these very high intelligences, then in terms of human affairs, then, the kinds of things that are viewed as being trivial and not worth doing would greatly expand. But, again, computational irreducibility implies that something is left.

Biotweaking

* Maybe with Gaia's help, people have a better control of morphogenesis, and can tweak organisms to take on desired forms. Teasing a growing plant or animal into a sought-for shape is a delicate craft. We call it "coaxing." The buildings might become assemblages of bio-like parts that have been coaxed. The windows are like membranes. Maybe the house trim is branches that come from a Victorian-house-trim plant. Maybe Jayjay and Thuy are growing some of these. And maybe there's a way to make things grow extra fast, like the week-trees in *Wetware*.

* I'm thinking they have cars for cruising around and carrying stuff even though they have teleportation. But the cars can be flimsy as it's pretty hard to run into someone by accident, as you can teep them. And the he cars can in fact teep

things themselves and avoid collisions. They are assembled from morphogenetically grown parts. If a car is broken, it knows what kinds of parts it needs. The cars scavenge for spare parts, perhaps stealing from each other.

Gaia Mind

The Gaia mind is literally real.

In Postsingular, the Big Pig tells Thuy, “I’m thinking faster all the time; right now I’m about a hundred thousand times as fast as you. So each of your days feels like a couple of hundred years.”

What if Gaia thinks ten times faster, a million times as fast as us. So a day feels like a couple of thousand years.

Considering that Gaia is using every speck of Earth’s matter for computation (and not just the bits that are in orphids)—maybe the amplification is much greater than that. Suppose it’s yet a thousand times faster, so that Gaia thinks a billion times as fast as us.

A gigasecond is thirty years. So a minute is about two thousand years, an hour is a hundred thousand years, and a day is a couple of million years.

Scale

There should be no preferred size scale. It all fits because every level is equally central. Perhaps I use circular scale once again (as in *Spacetime Donuts*). Or perhaps I have infinite divisibility, so that the scale runs up and down forever so that, once again, any point on the line is equally validly the “zero.” But this last notion runs into the problem that the Planck Scale is in fact a distinguished zero point.

I could do a double circular scale, one for Hibrane, one for Lobrane, and have them meet like a figure 8 at a central point, and this is the Planck level.

Maybe scale goes the other way and I am made of the social groups and relationships I’m in. Each organ includes my whole body (cf. the homunculus on the sole of the foot in reflexology). Each cell is made of organ systems. A molecule is made of the objects it joins. Everything is conceptual, not material.

The Branes’ Timelines

I discussed in *PSI* that the timeline markings in the Hibrane are spaced six times as widely as on the Lobrane timeline. One of their years is six of our years. And the times match on Orphid Night, in 2037 or so. So on the Hibrane timeline, 1500, being about 500 years ago, would be even with 1000 BC on our timeline—but this fact won’t play a role in our story.

In order to discourage us from coming, at the end of *PSI* the Hibraners used their mental powers to bend one of our timelines. So that now, if you set out and jump perpendicular to our time line as before—you end up around Hibrane 1500.

Given that in the 2035-2037 (Lobrane) timeframe we had people jumping back and forth between Lobrane and Hibrane without any time shift, it must be that, whatever the Hibraners may do in 2037, they leave those earlier parts of the timelines in the same relation to each other. In other words I can’t suppose that they tilt their entire timeline.

If they are to tilt part of one timeline so as to affect the Lobrane’s future behavior it has to be that they are tilting the future part of the Lobrane timeline. The past parts of the lines have to keep the same relationship, otherwise we’d have a time

paradox: we'd be changing the past and the past trips between the branes would have been impossible.

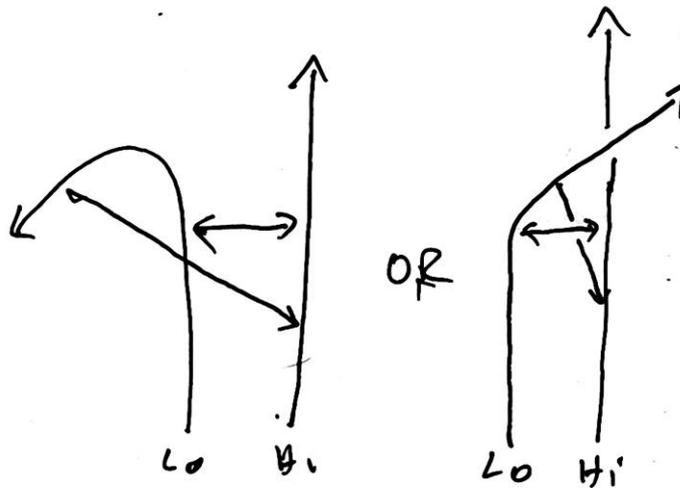


Figure 7: A Bent Worldline.

To bend the line, they are reaching across the interbrane hyperspace and pushing our world away. Unexpectedly, the timeline is quite easy to bend, and a small push bends it a lot.

Maybe our worldline is so easy to bend because they push right when lazy eight is happening on Earth—well, of course it's our whole Universe's line that they're bending, but maybe the moment of unfurling lazy eight makes a kind of nick in the world-line that lets it bend so much.

We might suppose that our people notice the moment of bending, a passing dizziness, as if going around a corner at high speed. But I'm not gonna do that, as it would undercut people noticing the moment of lazy eight unfurling, which, in terms of the story, is a bigger deal.

For more on the timelines, see this spot in the [following entry](#).

The Harp and the Pitchfork from Infinity

How would we put infinity in the story? I'd kind of like to do this PS3. Maybe we follow some aliens past the lazy eight into a transfinite zone.

Let's say the harp is a transfinite being. She reaches fallen into the spacetime of Lobrane and Hibrane like a meddling angel. Just for kicks, we make her worldline here a loop.

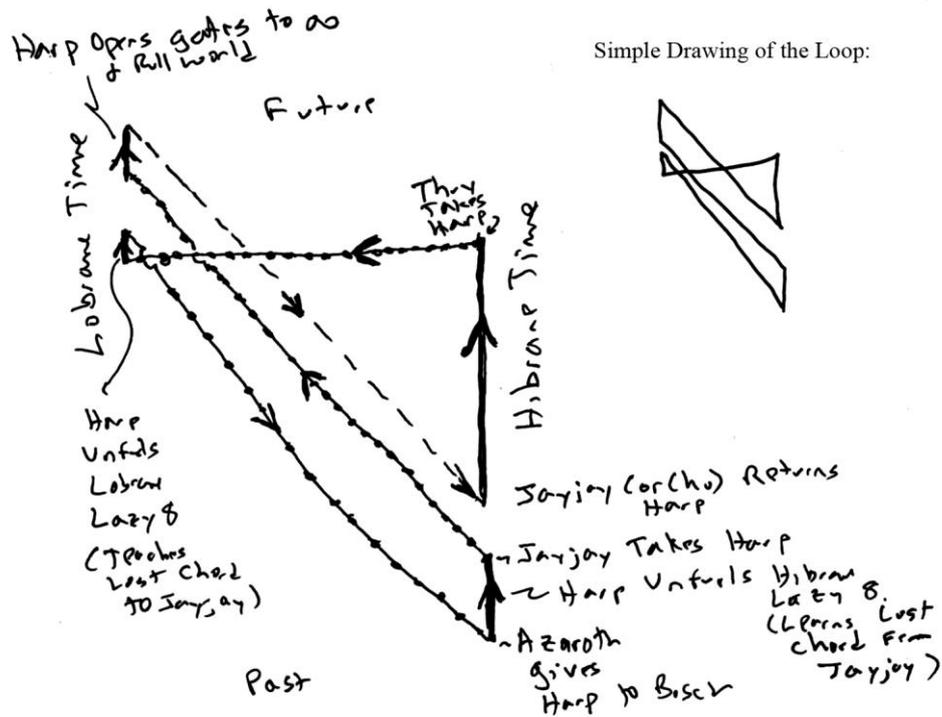


Figure 8: Harp's Complicated Worldline

I made this diagram on January 15, 2007 of how the harp should move.

PS1: She lives in the Hibrane, not doing much for five centuries, from Hibrane Bosch's death until she ends up in Hibrane Gladax's house. Thuy brings her over to the Lobrane, the harp teaches Jayjay the Lost Chord, he strums it, the harp unfurls Lazy Eight, Azaroth takes her back to the Hibrane.

PS2: Azaroth's jump goes askew and he ends up in Bosch's time. As the painting on the harp is damaged, he's worried Gladax will be mad, he gives the harp to Bosch to fix. The harp has forgotten the Lost Chord. Jayjay travels back to the Hibrane past and teaches the Lost Chord to the harp. The harp unfurls lazy eight for the Hibrane.

In the figure above, Jayjay carries the harp to the Lobrane present. The harp does something to save Earth from the Peng and the Hrull. But then, to prevent a time paradox, someone needs to carries the harp back to the Hibrane, perhaps to the time of, say, Bosch's death.

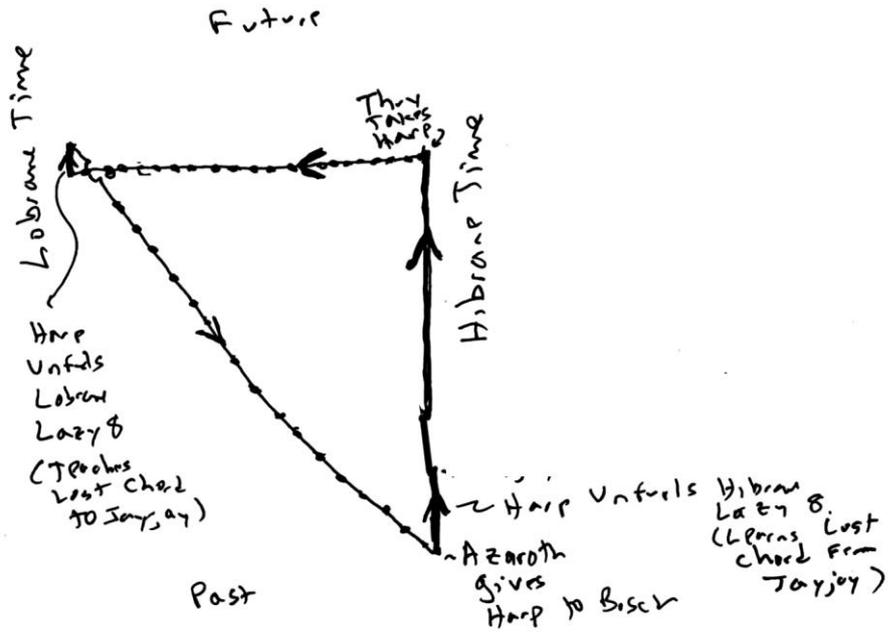


Figure 9: Harp's Simpler Worldline

Suppose I make the worldline simpler. They just leave the harp in the Hibrane, and the harp hangs out. Fine. Now, what about the pitchfork?

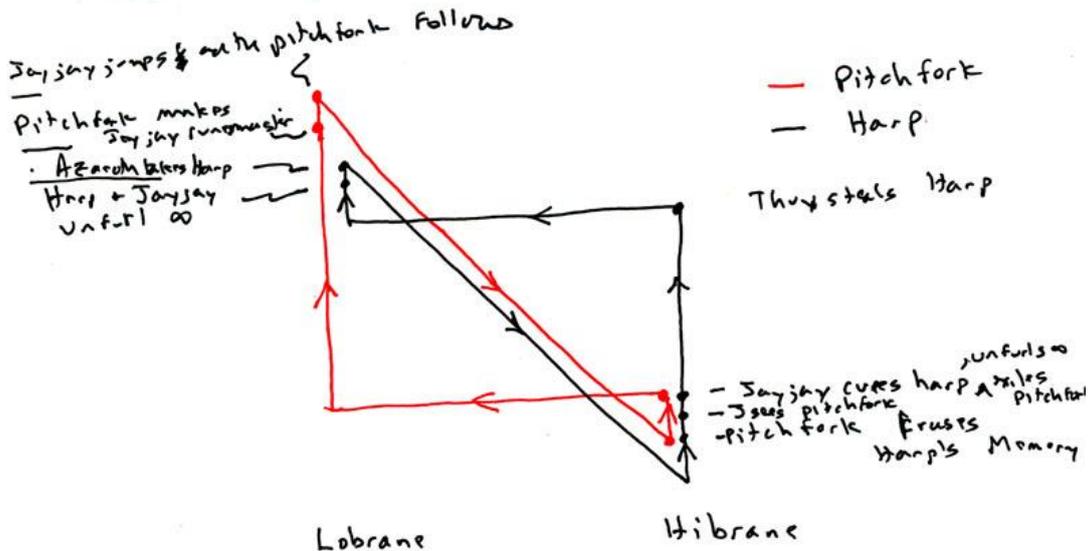


Figure 10: The Harp and the Pitchfork's Worldlines

This has a nice symmetry to it. The pitchfork has been in our world since circa 1492. Perhaps it greeted Columbus in the New World. Oh, no, wait, it's been in our world since about 1946—because $2036 - (2036-1500)/6 = 1946$? Love how that

comes out to 1946; my birth year and the year of **drum roll** the first A-bomb (see my story “The Third Bomb”)! Because 6 years in the Hibrane is like one year in the Lobrane. Or no, dammit, it’s the other way around. And the zero year is 2035. So 1500 Hibrane time would be $2035 - 6 * (2035-1500) = 1175 \text{ BC!!!}$

But now (August 6, 2007) I think of a new problem. When Thuy and Jayjay try to jump back to the Lobrane from Bosch’s time in the Hibrane, they’ll go across “horizontally” and end up in about 1175 BC.

This causes a potential paradox problem, in that they now are in their own past and could, e.g., kill their ancestors.

And on a practical level I have a problem in that I want them to return to 2036 where the story is.

Let’s deal with the second problem first: I could cheat and have them go across at an angle in the subdimensions. Or I could have the pitchfork store up their minds, go across to 1175 BC hang out till just before they jump back and then disgorge copies of them at that time. This would be weird for the story.

The pitchfork then is not such a bad guy, he’s kind of helping. He’d push up to them just as they’re about to jump, and ride across the Bosch’s time with them, and appear off and on, and then “eat” them and jump across and wait on Earth for the 90 or so years.

Would be handy, he could teach them Dutch right away.

August 8, 2007. I decided it would be too complicated to have the pitchfork “eat” Thuy and Jayjay and hold them in stasis for thousands of years on Earth. Jettison that. Just have Thuy and Jayjay frikkin’ tunnel at an angle across the interbrane. Maybe Chu’s along to help them.

How about Azaroth? If I store him in the harp, then the harp would have to spit him out when it leaves Hibrane, which is a few hours before Azaroth leaves the Hibrane, so there’d be two of him. Screw that.

I better have Azaroth tunnel upstream across the interbrane along with Thuy, Jayjay, Chu and the Hrull. And he can twig off when they’re almost home and get back to his Hibrane on his own.

How about the harp and the pitchfork?

I think I’ll leave the harp in ‘s-Hertogenbosch, like maybe the big B isn’t ready with the painting, so they can’t take it, or the harp wants to stay and do a time loop.

The pitchfork, well, they could take it back partway with them, but maybe it twigs off like Azaroth, only the pitchfork goes back to Lobrane on the night when Jayjay had his vision. This would give the pitchfork a closed time loop as well.

January 8, 2008.

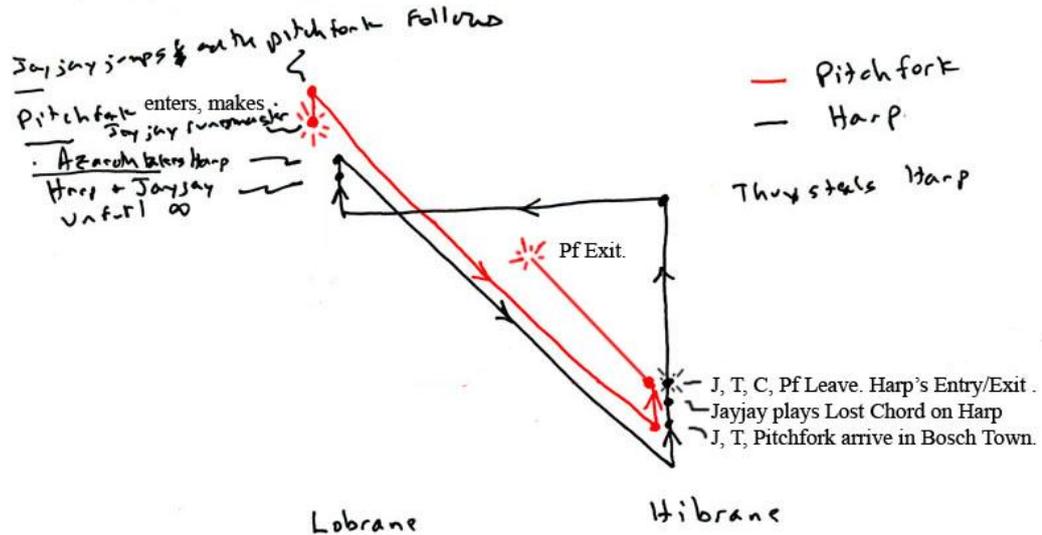


Figure 11: The Harp and the Pitchfork's Worldlines, Revised

I revised my ideas about the worldlines of the harp and the pitchfork. They come in from a higher dimension at the “glowing” points. The harp arrives and leaves from the same point, laying down a track that’s a closed temporal loop. The pitchfork arrives and leaves at different points.

The arrive from and return to the planet Pepple, where they live.

The Branes and Subdee

For good or ill, I put the subdimensional notion into *Postsingular* 1, with the Planck Scale a kind of zero point and with the suggestion that the scales go forever on “down” past the Planck level, which is, in a way, like a dot at the bottom of a letter V, with real world on the left and Subdee on the right.

A difference between Subdee and the two branes is that in *Postsingular*, Subdee lies under the Planck Sea between the two. Subdee is somehow different. Maybe in Subdee all the possible worlds are mooshed together into one.

What if we had all sorts of spaces standing on a single Planck Scale level. That’s a dot, and coming out of dot are three arrows: Lobrane (our world), the parallel brane world called Hibrane, also the subdimensional world called Subdee. I see the pattern as like a letter Y, actually, with Subdee pointing down, there’s just one subdimensional world, but up above it are the branches of Lobrane and Hibrane.

Can I avoid the seeming indeterminism of having the Planck fuzz level as fundamental? Maybe it’s a deterministic quantum computation, there, or a quantum loop thing.

I see the Lobrane and Hibrane as having an ekpyrotic link; they big-bang-ed each other by passing through each other. They’re like oscillating membranes or perhaps more like counter-rotating levers, sharing a common hub, this hub being the Planck Brane level, and below the hub is the lampstand of Subdee.

Maybe most subbies live very close to the Planck level scale so as to be close to our action. Like I read that a large percentage of Canadians live within two hundred miles of the US border.

Piezoplastic

The continuing grief and wonder that in the span of a century, humans *burned* the majority of Earth's readily available petrochemicals, which could so much more usefully have been made into piezoplastic entities like uvvies, sluggies, moldies, or shoons.

I need to do a little research on plastic. Does it in fact use petrochemicals as a raw material, as I suppose?

Living Off the Grid

With teleportation, people can live anywhere at all. Not counting Antarctica, Earth's land surface is about 52 million square miles, that is, 134 million square kilometers. Round this off to a hundred million square kilometers, which is 10^{14} square meters. Population for the 2030s is projected to be 8 billion, that is 8 times 10^9 . And the average size of a group of people living together in a "family" is a shade over three. So call it 3 billion families. So if we gave each family an equal plot of land, we get 30,000 square meters per family, which is a plot of dimensions about 170 meters by 170 meters, or 100 by 300. A nice big plot.

You can teleport in water and you can teleport out your waste. What about heat and light? Perhaps you can get trees to produce electricity and use that for lamps and heaters. Or, as long as we're doing SF, why not talk directly to the matter! You can get at least certain kinds of matter to store up solar or wind energy during the day and glow for you on demand, producing light and/or heat.

Pengö, the Planet of the Peng

See the [Characters | The Peng](#) entry for specific Peng characters.

Originally I called these guys the Kang. But then I found out there was a *Star Trek* Klingon captain called Kang, and a recurrent *Simpsons* UFO alien called Kang. Seems like most short, ugly words have already been used for SF aliens!

I see the Peng as being a really old and ossified civilization, producing boring, juiceless, routinized art on a par with Chinese porcelain or Broadway musicals or paintings of the Life of Christ.

I will call their planet Pengö, and refer to their planetary mind as Panpenga. Thus, Panpenga of Pengö is the counterpart of Gaia of Earth.

They are a very old race, and Pengö is cold inside. But I'll give them some young rebels. Punk rock kiwis, dyed pink and squawking raucous songs.

I'm thinking that Panpenga is weaker than Gaia because Pengö is cool and crystallized in the center instead of funky glowing and roiling like Earth's innards.

But I also want Pengö to be a planet of forests and birds, like New Zealand was before the Polynesians arrived and ate up the moas, etc. I'll jibe this with a cold-centered world by making the trees very excellent.

The trees are not only very good at photosynthesis, they're capable of nucleosynthesis, making water out of air and rock. Maybe Thuy brings back the secret of electric trees from Pengö.

Perhaps these very powerful Pengese trees have some connection with the evil plant-like subbies of Subdee.

Hrullwelt, the Archipelago of the Hrull

See the [Characters | The Hrull](#) entry for specific Hrull characters.

Slobbering manta-ray-like aliens who are slavers, conscripting humanoids to act as engines for starships. They fly because they're buoyed by domed methane bladders.

I was gonna call these guys the Rull. Years ago, I wrote a story called "Wish Loop" featuring an alien creature resembling a sea skate that is called a Rull. I didn't realize at the time that A. E. van Vogt wrote a series of stories about humans fighting against nasty worm-like shape-shifting Rull. *The War Against the Rull*. So I decided I better call them something else this time.

I think of Dick Cheney's company Halliburton as being maximally evil, and considered a shortened version of that, Hallib, which also has a Middle Eastern sound to it. But then I decided to go with Hrull. An element of homage to van Vogt, and an odd-ball spelling, kind of east European, maybe Czech.

For the Hrull's home world, I start with the idea of an ocean world called Water, shaped like a water torus encircling a sun—a bit like Ringworld, though not flat. Such a torus would certainly be dynamically unstable. So we can suppose that the torus has broken into giant globs; we have a toroidal archipelago of water globs—like an asteroid belt where all the asteroids are water. And the Hrull leap from one glob to the next. Their great wings glowing in the empty darkness of space, soaking up solar radiation. Like most alien species other than humanoids, the Hrull can't teleport.

The home congeries is called Hrulla? Or, no, I like the harsher and more Teutonic sound of Hrullwelt.

Like Earth and Pengö, Hrullwelt is a lazy eight telepathic world. The overmind of Hrullwelt is called Uruhrull, which is a spin on Ur-Hrull, with a touch of Uhuru.

The Hrull conscript humanoid slaves and sell them as integrated parts of Hrull starship engines. The Hrull use humanoids as pushers to power the teleportation hops that their motors provide. Practically all of the alien races use Hrull motors. They come in various sizes, such as interstellar and intergalactic—the power depends on how many humanoids are incorporated. Like cylinders in car engines.

Robert Sheckley wrote a story, "Pusher," about humanoids as being the only kinds of species which are capable of teleportation. I discuss this in my [Feb 23 - March 5, 2007 "Why Humans Can Teleport"](#) entry, which I [blogged](#) as well. With Sheckley, I would maintain that we can teleport precisely because we have so much regret, doubt and fear. Why? Having doubt and fear involves creating really good mental models of alternate realities. And being able to create good mental models of alternate realities means the ability to imagine yourself being there rather than here. And this means that we can spread out our wave functions in ways that other beings can't. We carry out certain delicate kinds of quantum computation.

Perhaps the humanoids that make up a Hrull pusher engine are surgically and chemically made into pathetic paralytics unable to escape the engine rooms? No, that would be too harsh, as I want my character Chu to be part of a Hrull engine for awhile and then bounce back. Let's suppose that when you're part of a Hrull engine, your encased pupa-like in Hrull body-slime, which slowly hardens. The Hrull slime

provides full life-support—oxygenation, hydration, nutrition, and waste removal. People call it godslime.

Why? Well, the kicker here is that the humanoids pretty much enjoy being part of a Hrull engine—it produces an ecstatic psychedelic state. The Hrull are intensely interested in the infinite, and being swathed in their godslime makes you feel as if the most important part of you is infinite, in heaven. Your body becomes just an attachment point to maintain a presence in the gross material plane.

But working as a Hrull engine pusher isn't endlessly pleasurable. After awhile, you notice that you're hearing a continual hum—like a leaf-blower or a clothes-dryer or a refrigerator—the hum is in some sense driving and owning your thoughts. The hum is the soul of the starship. The pushers get to go off on leave in the starships' ports of call. But eventually they make their way back to the ship, as they miss the godslime.

The Hrull carry Chu back to Hrullwelt to test and display him as a sample component of a new line of Hrull engines. The Hrull clients also know about Earth, but they leave the engine manufacture to the Hrull. The clients aren't going to be kidnapping humans themselves. Only the Hrull can exude the essential godslime. That's the Hrully angle for making humanoids into engines.

A kicker: we learn that the humanoids in the motors *don't mind!* It's fun to be in a Hrull engine.

Octillion Atoms With Names

Jayjay notices that each of the [ten octillion atoms in his body](#) has a name. And he remembers them all. How do I come up with an octillion different names? Well, ten octillion is 10 to the 28th power. According to the [Global Language Monitor](#), English has about a million words now. If I pick five words at random, there's one million to the 6th power ways to do that, which equals 10 to the 30th power, which is a hundred times as big as I actually need. So I can definitely give each atom in my body a name consisting of a five word English phrase. [Word Browser](#) is a cool site where I can find random English words online. I suspect that the main users of this site are spammers wanting to make filter-baffling email messages, but it's nice to have it. Some names for Jayjay's atoms include:

Anonymized superabsorbent oratorical sluggardly expectorant.

Exoteric velocipedal trigamist township conglobation.

Villanous inky gowk curator walloper.

I've cheated just a bit and made the phrases have a decent grammatical form, but there's room to do that, given that I only need to use one in a hundred of the possible phrases. If I wanted to craft my phrases even more, I could bump it up to six-word names.

But, *oh oh*, someone might protest that I'll need a *different* set of names for *different* people's bodies. In a way I don't (if I'm just talking to my own atoms), but in a way I might (if I want to talk about other people's atoms too).

An easy solution would be to use toponymic surnames, that is, to append the name of the owner object to an atoms name, so that Jayjay's "Villainous inky gowk curator walloper" would have the full name "Villainous inky gowk curator walloper of Jorge 'Jayjay' Jimenez."

Or I could bite the bullet and assign a separate name for each atom on Earth. Once again going online, I find there are 10 to the 50th many [atoms on Earth](#), a number which you could also call a hundred pentadecillion. I need to raise a million

to the ninth power to get more than that—actually a million to the ninth is 10 to the 54th power, comfortably bigger than I need.

So I can give each atom on Earth an individual name by using nine-word names, and I can be a little picky about which nine-word phrases I use (I only need one out of ten thousand of them).

Going back to Word Browser, I get this name for this one particular atom I just breathed in:

“Hi, lurch nonmental hearty unsteadiness multiplexing putrescent unrepented immoderate nucleoplasms!”

“Hi, Rudy!”

Ergotism

Maybe Bosch’s peers think the lazy eight is [ergotism](#) to the Nth degree, in fact maybe they pray to Saint Jerome who was, fittingly enough (given that Hieronymus is Latin for Jerome), the patron saint for those afflicted with ergotism (this being a naturally occurring wheat smut that creates effects similar to those of LSD).

From [Wikipedia](#):

Rye is the main vector for transmitting ergotism.

The blight, named from the cock's spur it forms on grasses, was identified and named by Denis Dodart who reported the relation between ergotized rye and bread poisoning in a letter to the French Royal Academy of Sciences in 1676.

When milled the ergot is reduced to a red powder, obvious in lighter grasses but easy to miss in dark rye flour.

The alkaloids can also pass through lactation from mother to child, causing ergotism in infants.

In the Middle Ages the gangrenous poisoning was known as *ignis sacer* ("holy fire") or "Saint Anthony's fire", named after monks of the Order of St. Anthony who were particularly successful at treating this ailment.

The symptoms can be roughly divided into convulsive symptoms and gangrenous symptoms.

Convulsive symptoms include painful seizures and spasms, diarrhea, paresthesias, itching, headaches, nausea and vomiting. Usually the gastrointestinal effects precede central nervous system effects. As well as seizures there can be hallucinations resembling those produced by LSD (lysergic acid diethylamide), and mental effects including mania or psychosis. The convulsive symptoms are caused by clavine alkaloids.

Gangrenous symptoms. The dry gangrene is a result of vasoconstriction induced by the ergotamine-ergocristine alkaloids of the fungus. It affects the more poorly vascularized distal structures, such as the fingers and toes. Symptoms include desquamation, weak peripheral pulse, loss of peripheral sensation, edema and ultimately the death and loss of affected tissues. “...a Great plague of swollen blisters consumed the people by a loathsome rot, so that their limbs were loosened and fell off before death.”

The group who cared for victims of ergotism the most was the [Brotherhood of Saint Anthony](#).

The brotherhood of St. Anthony, founded in the old French province of Dauphiné in 1095, was elevated to the rank of a monastic order in 1227, complying with the rules of the Augustinian Canons. In their infirmaries the monks took care of the persons attacked by ergot poisoning. If prayers and ointments were of no avail, in most cases the lower leg was amputated, so that the vital organs were not affected by gangrene. After bad harvests this ergotism became an epidemic, as rye-flour was consumed which had been contaminated by the fungus *claviceps purpurea*. It was as late as the 17th and 18th centuries that the connection between ergot poisoning and the disease of ignis sacer was correctly recognized. As in the Würzburg area there were mainly cultivated wheat and barley which as self pollinating cereals were secure against the fungus, it was in 1434 only that an Anthony monastery was founded. But its financial breakdown came as early as in 1527, as the donations of money and groceries had been declining and a leader had stolen valuables. Henceforward the lepers were accommodated in the three municipal hospitals for the incurables.

Note that ergot can act as an [abortion agent](#). Look out, Thuy!

Epidemics of ergotism occurred frequently in the Middle Ages. They were a source of inspiration for artists and were popularly known as 'St. Anthony's Fire', resulting in gangrene, neurological diseases and death. It was caused by eating rye bread contaminated with the fungus *claviceps purpurea*. In 1582 it was described that a delivery could be hastened by administering a few spurs of the *secale cornutum*. The dosage was, however, very inaccurate resulting in frequent uterine ruptures. The nickname of the preparation of 'pulvis ad partum' was changed to 'pulvis ad mortem'. Therefore, after 1828 the ergot alkaloids were no longer used during delivery but only as a measure to prevent postpartum hemorrhage.

Mark Stahlman, who seems to be an [acidhead on the web](#), claims the Antonites took ergot themselves.

8) ...a Roman Catholic monastic order known as the Hospital Order of St. Anthony (aka Antonians or Antonites) was established under the rule of Augustine in 1247 and spread its influence from London to Jerusalem and beyond. According to Sandoz' corporate history, the Antonites eventually had two hospitals in Basel.

9) This Order was assigned the public role of countering the effects of ergot poisoning, otherwise known as St. Anthony's Fire, through operating what may have been the first worldwide pharmacy as well as the specialized use of amputation. According to The Catholic Encyclopedia, the order was responsible for caring for the sick of the papal household.

10) Privately this Order continued to practice initiations, with the acceptance and participation of Church authorities, based partly on the use of ergot-derived preparations. In addition, there were various related "military" orders related to the Antonites, including the Knights of Saint Anthony.

11) There is widespread artistic evidence of these religious practices, particularly in the work of Antonite-related painters Hieronymus Bosch (see his c.1500 "Temptation of St. Anthony" triptych in Lisbon) and Mathis Neithardt (aka "Grunewald," see the c.1515 Isenheim Altar polyptych, now in Colmar.) W.A. Stoll later mentions the Isenheim Altar in his 1947 account of the effects of LSD.

12) In the 18th century, the Roman church became increasingly threatened by "secret" initiatory societies -- as shown by the 1738 order excommunicating Catholics who belonged to Masonic Lodges -- culminating in the anti-clerical role of the "Illuminati" in the French Revolution.

13) In 1777, after having been nearly wiped out during the Reformation, a failed reform of the order in 1630 and confiscation of its properties in the French Revolution, the Antonites were canonically merged into the Knights of Malta, which in turn was broken up (and partially re-Romanized) after Napoleon captured Malta in 1798.

Missing Gnarl

What will it be like to have missing or reduced gnarl? In terms of novelistic eyeball kicks, we want to see changes at the macro-levels of, e. g., water and clouds. I can see several options for reduced gnarl.

No Gnarl. We see only repetitive dull processes. That would be going a bit too far, as people do need some minimal amount of gnarl to live and think at all.

Clipped Gnarl. We see gnarl of only certain limited sizes. Like a map with cities, and you no longer have the big ones. Or in your head you don't have the big brain storms anymore, just small little thoughts. Or you just see fairly simple ocean waves, never any really big ones. Nothing is ever all that unusual. No outliers.

Linear or Stepped Distribution Replacing Inverse Power Law. This third possibility is rather technical. I don't think I'll use it, as it would be overloading the reader, and I barely understand it myself. I might fully investigate the idea in a short story some time, a story a bit like the classic tale where the law of averages breaks down.

The idea would be to suppose that nature's ubiquitous inverse power laws will no longer be in effect. If inverse power laws go away, the world would keep looking gnarly—but in an odd way. It's not so much a riddle of the Missing Gnarl then, as it is a riddle of the Anomalous Gnarl.

Okay, what do I mean by inverse power laws? I discuss this somewhat in the Society chapter of the *Lifebox* tome. A quick summary. Many natural phenomena can be thought of as made up of objects or events—just call them things—that have some characteristic grade level (such as size, duration, strength, wealth, mass, etc.) And we can look at the statistical distribution of the various grades of things. For each specified grade G there's a certain probability $P(G)$ that a randomly selected thing happens to be of that specified grade. The ubiquitous "histogram style inverse power law" says that high-grade objects are very much rarer than low-grade objects in

a specific non-linear way, that is, there's a numerical "power" number d (and d is greater than one), such that the following relation holds:

$P(G)$ is proportional to $1/(G^d)$.

As the grade goes up, the probability goes down. Suppose we graph the probability P on the vertical axis vs. the grade G on the horizontal axis. It'll look something like a branch of a classic hyperbola. That is, moving from the origin towards the right along the horizontal G axis, we see a very high P (probability) spike by the origin, meaning that there are immense numbers of things with very low-grade G . Moving to the right, the graph swoops down through a zone of medium-likely medium-grade things, and then the graph begins to hug the G axis in a "long tail" to the right, indicating a series of increasingly high-grade G with increasingly small but non-vanishing probabilities P .

Suppose that I'm thinking of G as gnarliness. Then on a Peng Ranch, we want to portion out less high-grade gnarly computation to nature. So we simply chop off the long tail, thus, removing all of the high-grade super-gnarly things. Meat cleaver goes, *thud!* Mouse goes, *ouch!*

Rather than having an abrupt step, we might remove the long tail in a smoother fashion. Suppose that we again leave the high spike of low-grade things in place, but rather than having the curvy descending line that's makes a turn and swooping out towards the long tail, suppose we send the line angling down to zero. Call this a *steep slope distribution*.

In the steep slope distribution, we've got lots of low-grade gnarl, and a little less medium-grade gnarl before, and no high-grade gnarl at all. For instance, if things are people and grade is income, this is like a society where you still have lots of poor people, and only a very few slightly richer people. This is really quite similar to what I earlier called the *clipped gnarl* scenario for gnarl reduction.

Alternately we might get rid of the high spike and just have a gently down-sloping line that abruptly drops to zero with a sudden step at some point. Like a gently sloping awning that drops off vertically at the end. Call this an *awning distribution*. Here we'd have nearly as many medium grade things as low grade things, which might be more interestingly weird than the clipped gnarl scenario. And, of course in the awning distribution, we'd have no high grade things at all. If things are people and grade is income, then the awning distribution is like a society where all the money is divided up almost equally, and everyone has a meager amount. (The more equal the division, the more gentle the awning's slope.)

Ocean Wave Gnarl Reduction.

If I'm talking about probability distributions for waves, what are the P and the G ?

A first approach would be "waiting for a big one." Here we focus only on waves of a certain frequency, such as the large, surfable waves that come in once every minute or two, with maybe a hundred yards in between them. I'm talking about the waves that one first thinks of under the rubric "ocean wave." And then, within this class of waves, I could grade them by amplitude, but I could take P to be how often I see a wave of that particular grade. Normally we get lots of little waves and very few big ones and once in a while a monster. Inverse power law. But we could clip this, or we could "awning" it. In an awning regime we might get oddly few small-amplitude waves compared to the medium-amp waves—again keep in mind that I'm focusing on one wave frequency here. Surprisingly many medium-amp

waves. But no big ones. Maybe it's a little like a steady series of tubes coming in, like I often see at the mouth of the Big Sur river in Andrew Molera Park.

A second and much more technical approach is to consider waves of all frequencies. We regard the overall wave pattern as a Fourier sum of various pure frequencies. This is called the power spectrum model. I think here we might think of the grade G as being the *frequency*. And think of $P(G)$ as being the amplitude of that particular frequency component. If here $P(G)$ is proportional to $1/(G^d)$, we mean that the lowest frequencies have relatively high amplitude, and this drops off so that very little of the total wave energy is in the higher frequencies. So here, once again, under the standard inverse power law regime, the low frequency rollers have the highest amplitudes, and the amplitudes drop off very fast we crop down to medium-frequency choppy stuff and to high-frequency ripples. And if we apply the clipped gnarl or steep slope regime to the power spectrum model, then there aren't any high frequencies, no little shivers on the waves, they're glassy slick smooth. And if we go for an awning distribution of the power spectrum, then the low and medium frequency waves have about the same amplitudes so it's kind of like water sloshing in a basin, again without the high-frequency ripples and shivers.

The Mental Experience of Gnarl Reduction.

It feels like being lobotomized. It's like being on a not-very-agreeable antidepressant. Perky, bland, chilled-out, uncreative. Unable to imagine other people's minds, lacking in empathy. You still have telepathy all right, but you just don't care about other people's feelings. It's a little like being autistic. So how does this affect Chu, who's already used to being autistic? Perhaps Chu doesn't miss the gnarl at all, in fact he likes the world better with the gnarl gone.

[Rather than looking at this in the complicated manner of ocean waves, think of thoughts as cities or networks or fleeting conglomerations, and suppose that the inverse power law applies with the horizontal axis G being the size or complexity or number of links in a given thought, and the vertical axis P being the number of such thoughts that you have in, say, ten hours. Under a steep slope or clipped gnarl distribution, you don't have any big brain-storms, not even so many medium thoughts, just the usual welter of small thoughts. If we go for an awning distribution, then we have oddly few small thoughts and mostly medium thoughts. In a way, that's blander. As the accumulation of small perceptions is in its own way one of the beautiful things about one's mental life.]

Without gnarl, you're more prone to fall into repetitive thought loops. You're more predictable. You react instead of initiating. You feel like near the end of a twelve-hour plane trip. Grim and worn. Lack of playfulness. A lack of entrepreneurship. Lack of intentionality. Loss of ability to guide thoughts. Erosion of the sense of free will.

Without gnarl, the silps become less quirky, less cooperative. They just want to coast, they don't want to play.

Peng Tulpas

Originally I was gonna use the word "parasim" instead of "tulpa," but what I have in mind is *more* than simulation, and parasim sounds like *less* than a simulation. I also considered the word "woogie," which I got from my friend Greg Gibson, who's written a book involving a 1950s woman who danced under the name Woogie in Hubert's Side Show in Times Square, and was photographed by Diane Arbus.

But then I started thinking the word “tulpa” is better than “woogie.” Woogie is a little too comical and lovable and cozy. Misleadingly close to—*ugh*—wookie. Tulpa sounds more sinister. And I like that it’s like “tulip,” as a tulpa is something that grows up. The origin of the word is that, in Tibetan Buddhism, a tulpa is, as I understand it, a material object or person that an enlightened adept can mentally create. A psychic projection. I think I first read the word in William J. Craddock’s *Be Not Content*, where the narrator is on a trip, and he imagines the people around him are tulpas of his own creation.

The Peng have an emigration technology that they call tulpa growing. The planetary mind Panpenga is willing to disassemble a subject Peng’s body, extracting the full details of the quantum computation it contains, to clean up the data a bit, and then to transmit this pattern via quantum entanglement to a distant world. The patterns create matter-wave simulations on the distant worlds, and the simulations are physical and very real-seeming Peng called tulpas.

The experience of becoming a tulpa seems low-tech to the users—they just jump into a certain volcanic hole. And Panpenga does it for free, as she likes the notion of spreading tulpas of her denizens across the cosmos. Access to the tulpafication treatment is, however, expensive. As I say, to become a tulpa, the Peng in question slides into a certain fissure on planet Pengö. The fissure leads down to some lava. But some wealthy high priests own the hole, and they require all of a Peng’s resources as the price for the favor—and the resources have to be quite substantial. The planetary overmind, Panpenga, converts the body into a vibration that goes out from her north pole. And then the subject Peng appears in physical form, memory intact, body in perfect health on some distant world: a tulpa.

Let’s describe the process in a bit more detail.

In order to turn a body into a tulpa, the planetary mind Panpenga decodes subject Peng’s wave function into very many terms of a Fourier series—I’ll specify the exact number of terms below. But let me already warn that the Fourier series representation is a very inefficient and computationally wasteful method to represent a body’s wave function. But Panpenga uses it as it’s a brute-force no-brainer approach that always works. (This said, maybe there’s a hipper Hilbert space axes I could consider. Something more along the lines of musical tones. But music does fit will with Fourier, come to think of it.)

Once Panpenga has the Fourier series representing a subject Peng, she edits the terms of the Fourier series so as to remove any diseases that the subject Peng might have. (I take this notion from Charles Stross’s *Glass House*, where he describes a somewhat similar procedure being used—for security purposes!—in nanotechnological “assemblers” that arriving teleported immigrants have to pass through.)

And then the Fourier terms are transmitted to a 100 km by 100 km by 100 km volume of matter on another world. This block of slaved quantum-computing matter is called a Peng ranch. For dramatic effect I’m making the volume be big. Each individual atom in the Peng ranch carries out the emulation of one single component of the Fourier series.

The atoms hum together, and their beats converge onto a single vibration of matter waves that is a simulacrum of the tulpafied Peng. Keep in mind that tulpas have mass and physical presence. They’re not just something like holograms or

mental images. In imagining how a distributed quantum computation can cause a physical object to emerge, think of a parabolic mirror (or a lens) which focuses a bunch of light waves to a single burning point, or think of a bunch of lasers focusing light waves on a single spot to produce a tiny sun. And now suppose that it's *DeBroglie matter waves* instead of *light waves*.

Running a tulpa involves more than just having a medium download a starting pattern into a Peng ranch's worth of atoms. In order to animate the tulpa, the computation has to stay active. The Peng ranch atoms have to be mutually entangled, interacting with each other, passing messages, sending signals through quantum gates, accepting feedback, continually varying the De Broglie waves that converge to produce the interference pattern that is the physical tulpa.

The tulpa Peng would fall apart without the steady influx of computation. They're like ice-sculptures in a blast furnace, being kept together by a zillion gnats with trowels and Slushy cones.

Given that the tulpa's actions are related to the environment's computation, the "pathetic fallacy" (that nature mirrors the Romantic protagonist's emotions) need be fallacy no more. That is, the motions of a tree's limbs—or even the weather, given that a Peng ranch goes fifty kilometers up into the atmosphere—may well reflect a tulpa's moods. Suller the Peng tulpa gets mad—and the nearby redwoods' limbs are thrashing in a sudden breeze.

What's the mechanism by which devoting a Peng ranch to generating a tulpa affect the Peng ranch's ambient gnarl?

The reason there will be an effect is that, rather than simply quantum-computing the world as usual, the Peng ranch will be pissing away most of its computational resources on maintaining the tulpa simulation. The workload never damps down—as you're not just generating a static three-dimensional object, you're animating an ongoing interactive simulated Peng with a mind.

Note that if you eat a matter hologram, you chew it up, digest it, assimilate it, and the quantum computation of your ranch adjusts itself to put each of the matter hologram's dispersed molecules into the right spot.

Tulpa-Related Number Crunches

Like most emulations, the tulpa-generating computation is highly inefficient. A normal Peng's cubic meter or so of matter computes the Peng in question, and that's the end of it. But a Peng tulpa requires all the mass in the 100 km by 100 km by 100 km volume of a Peng ranch. This is quadrillion cubic meters, that is, 10^{15} m^3 . We've got a quadrillion-fold inefficiency here—in that we're using a quadrillion cubic meters to emulate one cubic meter.

How many atoms are involved? Well, a normal Peng or human has about ten octillion atoms, that is 10^{28} atoms. Given that the computation which produces a tulpa is inefficient by a factor of a quadrillion, or 10^{15} , we can reasonably expect that it's gonna require $10^{15} * 10^{28} = 10^{43}$ atoms to simulate a Peng, that is, ten tridecillion atoms. ($43 = 1 + 3 * (13+1)$)

Suppose we say that we're gonna be putting one term of the wave function Fourier series onto each atom. So then I'm talking about ten tridecillion terms of the Fourier series. That's 10, 000, 000, 000, 000, 000, 000, 000, 000, 000, 000, 000, 000, 000, 000, 000.

In visualizing how the initial tulpa emulation can be so incredibly inefficient, think of an immense tangle of machinery that does something very simple like peeling an apple. Or an insanely complex cellular-automata-based construction that generates a tiny little regular pattern such as a binary counter or a listing of the primes. Or a Turing machine that flurbs and skitters up and down light-years of memory tape just to compute a few digits of pi.

I'll allow one initial mitigation of the inefficiency. As Peng are, after all, somewhat similar to each other, you can piggyback the computations of a few Peng together into a single wave function, and have the Peng ranch support two or three Peng tulpas—who are exceedingly tightly linked as they share a single wave function.

One of the threads of the story might involve the Peng trying to achieve greater efficiency in the tulpa computation. Perhaps Peng and human realtors will be working together on this.

How many Peng ranches fit? Well, Earth's land area is about 150 million square kilometers, and a Peng ranch takes up 10 thousand square kilometers, so we can fit in fifteen thousand Peng ranches. Maybe only use a third of the sites, for 5,000 ranches.

How rapid a data flow does a tulpa medium like Jayjay experience when transmitting the Fourier terms for a Peng tulpa over a period of, say, one or two minutes, that is, over a period of one hundred seconds?

Well, let's say that each of Jayjay's atoms is helping. And the tulpa emulation has a quadrillion-fold inefficiency, so in order for a tulpa medium to program a quadrillion-fold-inefficient computation for a tulpa about the size of him or herself, each of the medium's atoms has to pump a quadrillion Fourier terms out into the ambient Peng ranch matter. To do this in a hundred seconds means receiving and passing on ten trillion parameters per second per atom. A ten teraflop rate.

Does this rate require a vibratory period that's smaller than the (minimally small according to certain old-school views) Planck time? Naw. The Planck time is the time it takes a light wave traveling 10^{10} cm per second to traverse a spatially minimal Planck length of 10^{-33} cm. So [the Planck time](#) is 10^{-43} seconds, (actually, looking it up, it's $5 * 10^{-44}$ seconds) which is way smaller than the 10^{-13} seconds per parameter per atom that I'm talking about.

How does the suggested teraflop rate compare the natural oscillation rate of an atom or a molecule? The cesium atoms used for clocks flip between two energy states about 9 billion times a second, an ammonia clock does 24 billion pulses a second (gigahertz). So it seems like ordinary atoms are cycling at ten gigahertz, which is a thousand times too slow for me, as I want a ten terahertz vibration.

But, looking on Google, I find that some physical systems do enjoy terahertz oscillations. Just as a random example, I found a paper called "[Tunable terahertz Bloch oscillations in chirped photonic crystals](#)."

So, let's suppose that a tulpa medium's body can indeed emit tunable terahertz oscillations from each atom, spewing out the programming for a full million-cubic-kilometer Peng ranch in just a minute and a half. Doing that has gotta feel very strange. Frenzied, to say the least. Like coming apart, like turning into a tornado of language and dust.

The Mediums for Peng Tulpa Transmission

[I [blogged](#) this on May 28, 2007.]

I'll refer to the Peng who are emigrating to other worlds as *ioneers*, a word I made up in grad school and have wanted to use ever since. It's a goof on *pioneers*, you understand. A cool word. Ioneer.

I used to visualize the ioneers as sturdy, fit, somewhat Nordic spacemen and women like on a Soviet socialist realism poster. Possibly in the throes of endless sexual stim. But now I'm just gonna have the raggedy-ass ostrich-legged kiwi-bodied Peng use that word for their emigrants. I can say that atomic tulpa computations have to do with dancing ions (charged atoms). And, hey, I can have a Soviet socialist etc. type poster with *Peng* on it, all gussied up to look more Nordic and less like dirty dust-mops.

How does Panpenga (the planetary oversoul of the Peng's home world Pengö) reach out to program a Peng's body code (which the marketeers call "an ioneer soul song") onto the regions of matter on another world so that the atoms in this far-away matter will begin emanating paired fermion waves to generate a matter hologram or a *tulpa* of some Peng ioneer whom Panpenga has destructively decoded in order to send said ioneer's soul song across the void?

So as to involve my character Jayjay, I'm supposing that Panpenga does this by telepathically entangling with a certain receptive individual on a distant world. A host. This person becomes a *medium* for Panpenga. Via the medium's body, the ten tridecillion voices of the ioneer's soul-song, (or the ten tridecillion Fourier terms, if you want to be mundane), are integrated into the ambient quantum computation of the world, fanning out to teach each atom in the full volume of a "Peng ranch" (which is a cubical volume 100 km on a side, in other words, several counties plus the air above them and the dirt below)—and thereby creating a tulpa emulation of the ioneer.

Speaking of mediums, in Rochester, NY in early April, 2007, I had dinner with a spiritualist, and we discussed the fact (which I learned from Pynchon's writings) that as well as having a medium on "this side," you need a "control" spirit on the "other side." The control acts like a firewall in that the control only lets the more benign spirits get in touch with the medium; in addition the control is like a router, putting the medium in touch with the targeted spirit one can never be sure which spirit will in fact show up. (This provides a handy excuse for commercial mediums who fail to deliver the expected guests at a séance. "Where's President Kennedy? Where's my Mom?") Possibly I might have a Peng working as a control in the Warm Worlds interstellar Realty office which sends wealthy Peng ioneers out to become tulpas on Earth. She might be called Pekka, in honor of the First Bird Pekka, who miraculously (and paradoxically) laid the very egg that she hatched from.

When installing a tulpa across a Peng ranch, the medium gets into telepathic contact with each and every atom in the ranch. Into each atom, the medium sends a single piece of the ioneer's soul music, that is, term of the tulpa Fourier series data, plus the Peng control algorithm directing the atom to send a matter-wave at the indicated rate towards the tulpa locator signal. Looked at in another way, the medium is like a conductor, getting a ten tridecillion instrument orchestra to play together.

This is a lot of info to display, and we might suppose that in order to absorb and then deploy the info, the medium needs a very large memory. So the Peng can only send ioneers to lazy eight worlds.

Why doesn't Panpenga program the Peng ranch atoms directly?

That is, why screw around with an unreliable Earth-side medium? Well, you can't get the fine tuning from that far away. You need a read-write head on the ground. Also the full info has to be sent in a single chirp. A chunk like a zipped install file. (Cf. *Freeware* and *Saucer Wisdom*.)

Why is Jayjay in particular a medium?

For instance, could Chu or Thuy be a medium?

For story purposes, I need for Jayjay's mediumship to be unique or at least rare, so that the Peng will want to keep in him in a coma and carry him around for channeling more ioneers to Earth. What might make him special was how high he happened to be when he yoo-hooed Panpenga. He was so deeply merged into Gaia that he has become a green god, an earth king, and we can do a reveal of this later on. He doesn't yet realize his full power. Let's even say that only one person per planet can be a medium.

I can weave back some mumbo jumbo into his beanstalk trip. During this singular moment he became a divine avatar. He became like a Christ, if you will. What? Jayjay? Christ was a great ethical teacher, not some street kid chasing a high. (Cf. *Secret of Life*.) Well, maybe Jayjay can grow into his role. He becomes really noble and wise. That would be epic, a nice heavy move for the book. He could even offer up his life as a sacrifice for all mankind at the end. Maybe in this wise he would buy us free of ioneer-invasion forever.

Why can't the tulpas themselves act as mediums?

Well, a tulpa is physically limited to the confines of his or her ranch, so a tulpa can't go out into the virgin prairie and bring down the lightning of a new ioneer. But the tulpas can in fact program the atoms of their ranch, which gives them direct matter control. See the next post for more info on this...

Peng vs. Hrull for Human Domination

- (a) The Peng want to divide Earth into Peng ranches, draining all our gnarl.
- (b) The Hrull are conscripting humanoids to act as engines for starships. They use the Sheckley word "pusher" for humanoids. Only our type of species can teleport. The Hrull want to take the first-born of every family to power a Hrull engine.
- (c) If the Peng ranches persist, then rather rapidly humanity will devolve so that, even if gnarl is turned back on, humans will no longer be able to teleport.
- (d) The Hrull will do whatever they can to help against the Peng. And the Peng will kill Hrull on sight. The Peng are like sheep ranchers—dumbing and fleecing their flock—and the Hrull are like wolves who prefer tasty wild sheep.
- (e) Some debate over which fate is better for mankind: no gnarl or being harvested? Some humans are on the side of the Peng. Not only the realtors but, now, with clever propaganda, the Moral Majority has been won over. The religious right stands firmly for the reduction of gnarl

- (f) The silps are unanimously for more gnarl.

The Powers of Tulpas

[unblogged]

When Charlie Stross writes about sending people as info patterns—like in *Glass House*—he has a nanotech gate at the targeted location, which builds the incoming person’s body atom-by-atom (after first editing or “redacting” the incoming info pattern, for security’s sake). Let’s call this the nanoLego model of body transmission.

For *Hylozoic*, I’m proposing a much more baroque way of having the Peng be sent. Their pattern is sent to Earth, same as in the nanoLego method—but then instead of building them a body, I have their info coded into a quadrillion-fold inefficient Peng ranch computation of slaved atoms spitting out paired-fermion De Broglie waves to create a matter hologram of a Peng, said hologram being dynamically updated by the distributed computation.

I’m not doing this because I think it’s more realistic or likely. I’m doing it for exiguous reasons, that is, I want to write a story where aliens are skimming off the gnarl of our natural computations. And it occurred to me that if aliens were going to be mulcting us of our gnarl, they should be using it for something important to them, and what could be more important to them than projecting copies of themselves into our world.

But in the story there has to be an *internal* motivation for the Peng going all around Robin Hood’s barn like this. If I don’t explain why they’re not using the easier nanoLego method, I’ll seem like I’m foolishly overcomplicating things.

So—let’s address this question in the novel, and claim that being in a tulpa matter hologram body is *much better* than being in a normal nanoLego solid matter body.

Better how?

Weak answer: it’s a luxury for the Peng to get such obscenely inefficient bodies. Like driving very fuel inefficient cars. Conspicuous consumption. “Oh dear, my body uses a quadrillion times as many atoms as your body. But, *ahem*, I can afford to.”

Better answer: A tulpa body is very hard to destroy, as it emerges from a million cubic kilometer computation. So it’s a safer body to have on a world with possibly hostile natives. Fine, but we could argue that a nanoLego body could pretty easily be reconstituted, so we need a stronger reason than this.

Best answer: a tulpa matter-hologram body has femtotech powers, which seem like superpowers. If you’re an ioneer in a tulpa body, then you yourself, *qua* epiphenomenon of a distributed quantum computation, are able to tweak your underlying computation—which fills the million cubic kilometers of Peng ranch surrounding you. Therefore you have telepathic direct matter control, that is, your thoughts can become objects—which are additional matter holograms that (at least as seen from the outside) behave just like normal nanoLego objects. You can build a house from nothing, turn a stone into bread, water into wine, make flowers bloom from your fingertips. You can levitate and move your body around as readily as a video game player moves Mario. (I won’t allow for teleportation though, not even within the volume of the Peng ranch, as, for story purposes, I’m limiting full teleportation power to humanoids.) You can shapeshift and change your form.

Perhaps the Peng begin looking like—the horror!—human Realtors. “Call me Ducky. What would it take to earn your business today?”

Killing Tulpas

By virtue of having installed all the tulpa-aware atom by atom on the Peng ranches, Jayjay *could* have lasting mental indices of the atoms in both the wilderness and the SF Peng ranches. This data *could* be stored in his endless lazy eight memory upgrade. But I’ll he didn’t pay close attention. He didn’t bother to remember.

But maybe Chu finds out the atomic programming by watching the Peng tulpas make themselves a tulpa house.

Jay—and he alone of all humans—*does* know the general mediumistic tulpa-programming technique, so with Chu’s memory help, Jayjay is able to reach out to each and every one of the atoms and put something else into it. Call this antidote the reset rune. It’s about “dusting off” the atoms, decohering them from the unitary quantum state that’s generating the tulpas. It should take our two boys a couple of minutes to psychically blow a puff of reset rune onto each and every atom of a Peng ranch

The Peng ioneers try to kill Jayjay and Chu while they’re decohering their Peng ranch atoms with the reset rune. They’re freeing the silps concentrically from around his house, so they’ll have rings of allies around. For their part, the ioneers are getting telepathic control of some of the low-gnarl animal minds, such as bears and mountain lions. And Gretta shapeshifts into a human woman Realtor to trick the boys.

But then the Peng (and the Realtor) start looking weird. They’re partial series sums now, what mathematicians call “jets”. This means both that the Peng tulpas each have a half dozen ghost images, and that their shapes are overly smooth in spots and with odd sharp cusps in other places. Their thoughts are a bit incoherent as well.

But Kakar saves them, he turns the reset rune back upon Jayjay, decohering his particles effectively pausing his quantum computation in mid-crunch. Jayjay is frozen in the midst of saying something to Thuy—a little like when Han Solo became a silvery sculpture on Jabba the Hutt’s wall.

The Final Tulpa Block

While talking with the Magic Harp in Bosch’s studio, Thuy will come up with a final solution which will be making Earth a Level III world with a door to infinity. An unfurled lazy eight world was Level II. And a world with intelligent life was Level I. I don’t need to bring the harp back to Earth at the end of *PS2*, as this would repeat the ending of *PS1*. Instead we just have the harp show Jayjay how to open the door to infinity.

Femtotech Weapons

I’m thinking about having some direct matter control in *Hylozoic*. I’ve written about this before, calling it femtotechnology. It was in *Freeware* first, and then I worked out the science for it in *Saucer Wisdom*. Here’s a long quote about femtotech from *Saucer Wisdom*, a scene featuring my old characters Harry Gerber and Joe Fletcher.

Early in the year 3001, we find the Femtotechnology founder, a dumpy guy with thick lips and a slobbering way of talking. He’s telling his plans to a tall skinny assistant who has a little tuft of curly hair. Their names are Harry and Joe.

“We’re going to invent femtotechnology now,” sloppy Harry is saying. “To make a long story short.”

“Say what?” says curly-top Joe.

“I’ll explain it again,” says Harry. “First of all, here’s the official prefixes for small numbers.” A radiotelepathically projected chart appears in the minds of Harry, Joe, and the eavesdropping Frank.

Name	Numerical Symbol	Prefix
Thousandth	0.001	Milli-
Millionth	0.000001	Micro-
Billionth	0.000000001	Nano-
Trillionth	0.000000000001	Pico-
Quadrillionth	0.000000000000001	Femto-
Quintillionth	0.000000000000000001	Atto-
Sextillionth	0.00000000000000000001	Zepto-
Septillionth	0.0000000000000000000001	Yocto-

Table 9: Number Prefixes

“Yawn, I’ve seen that,” says Joe.

“Seen but not understood,” says Harry. “To grasp the meaning of the word ‘femtotechnology,’ you should first think about the word ‘nanotechnology.’ A nanometer is a billionth of a meter. An big molecule might be ten or twenty nanometers across, maybe a little more. A water molecule is smaller, about a fifth of a nanometer. Nanometers are a natural size-unit for measuring molecules, so when people developed the technology for manipulating molecules they called it nanotechnology.”

“Then how come the dooks who work with molecules say they’re doing wetware engineering?” asks Joe.

“That’s a historical accident,” says Harry. “The original nanotechnologists — we’re talking about nearly a thousand years ago — thought they were going to be making tiny machines. But that idea turned out to be bogus. Biology has the lock on nanometer-scale fabrication. The word ‘nanotechnology’ died because the first guys to use it had some wrong ideas. It’s sort of like the way the alchemists thought substances had philosophical virtues, and then a few centuries later it turned out they’d been trying to do chemistry. The old-time nanotechnologists thought molecules were like machines, and then a few centuries later it turned out they’d been trying to do wetware engineering. Nobody wants to be branded an alchemist or a nanotechnologist because those original groups were wrong in important ways. But my point, Joe, is that wetware engineering is indeed nanotechnology. It’s what’s going on when you use medi-germs to clean out your arteries. It’s what’s happening when a diamond-spider spins carbon fibers for construction. It’s what happens when a cloth-plant weaves cellular automaton fabric for your shirts.”

“Don’t hurt yourself, man,” says Joe. “You’re explaining too hard. Try this one: according to the chart, picotechnology should come before femtotechnology. Why don’t we do picotechnology first?”

“There isn’t much happening at the picometer size scale,” says Harry. “The next really solid thing below molecules is the nucleus of an atom. And that turns out to be about twenty femtometers. So if we start doing things directly to atomic nuclei

we're talking about *femtotechnology*. There isn't going to be any picotechnology because there's nothing interesting that's a picometer in size."

"Very clean," say Joe. "Femtotechnology. I'm down with it, brah. But what are we going to *do* to the atoms?"

"Transmute them, Joe. Dirt into gold. Gold into water. Water into air. Air into chicken soup. Making stuff out of 'thin' air is quite practical, you know. Air has more mass than people realize. A cubic meter of it weighs a kilogram. The air in your bedroom weighs about as much as your body."

"But how does transmutation work?"

"Transmutation is mostly a matter of changing protons into neutrons and vice-versa. An atom's nucleus is a bunch of protons and neutrons. Take oxygen, it's got eight neutrons and eight protons. And hydrogen has one proton. If you could change protons into neutrons, you could stick sixteen hydrogens together, flip half of their protons to neutrons and you'd have a molecule of oxygen. Like that. And by the way, when you change the nuclei, the electrons take care of themselves."

"But how do you change a proton into a neutron? Smash it or something?"

"That's the crude old nuclear physics way. Instead of that, we femtotechnologists are going to use *quark-flipping*. Takes much less energy. What's quark-flipping? A proton is a quark-bag holding two up quarks and one down quark, while a neutron is a quark-bag with two down quarks and one up quark. To change from one to the other, you just need to go into the bag and flip the one quark."

"Aren't there other kinds of quarks, too?" asks Joe. "Besides *up* and *down*?"

"Strange quarks," says Harry, smiling wetly. "We'll get to those later, my man. But first we need to get the femtotechnology matter transmuter working."

"What do you want to call it?"

"I don't know," says Harry. "Horne O' Planty? Spelled weird to make it a trademark, you understand. Or maybe a Polish Knife? My mother's people are Polish. Or call it an alef? Or maybe a cradle or a loom?"

"How about an *alla*," says Joe.

"I like it," says Harry after a moment's thought. "Alla. Fine. Now what's still missing, Joe?"

"I dunno."

"How to make it work is what's missing."

"I was gonna say that. How's it gonna work?"

"Incommensurable magnitudes," says Harry. "We'll use three titanium bars of slightly different irrational lengths. The square root of two, the cube root of three, and the fifth root of five will work. Each bar will have a matter-lens that grows quark whiskers, and the whiskers will embody a one-dimensional nonlinear wave pattern that tells them where to turn. The whiskers will split and grow along all the edges of a parallelepiped control volume. Within this box we'll use a chaotic cascade to fuse all the nucleons' quark-bags into a quark-gluon plasma that we're free to flip, shuffle and regroup. The process will be directed by high-level user request patterns made via a custom-designed radiotelepathic uvvy which incorporates low-level implementation instructions for a few thousand basic substances. You can help with that part, Joe. And in our commercial release, the control uvvy can act as a carrying case. The *alla*!"

"Wavy," says Joe. "I'm there, dude."

I'm thinking they'll all be getting into femtotech and direct matter control, like in *Saucer Wisdom*. Postsingular world that we're in, tech is gonna be changing very fast.

I want some cool weapons. I need to think of what they do and give them fairly simple names.

The stonker. The target gets cold and frosty then falls apart. Could be that it damps atomic vibrations or, funnier, the atomic silps are too stoned to hold together---Sonic mentions a thing like this in Chap 1. Not sure of the name of this weapon. Devibrilizer looks too much like "devil." Vibrilizer is backwards. Nuller sound Star Trek. Stonker. I like stonker, it sounds like stoner, stomper, stink and stalk.

The klusper. Amps up atomic vibes, overloads the atoms with Gaian information flow, they heat up and explode into plasma. Klusper like crisper.

The gobble gun. Looks like a hollow barber pole. Is always sucking some air in front and sending it out the back. Crank it up to full power, and it inhales everything in front of it, empties out a cylindrical tube about a kilometer long and a meter wide, turns the matter into a tidy black coil of degenerate-matter in back, like the shit-vein of a shrimp. At first I wanted to call it the gomper gun, which sounds funnier, gomper like gopher and Gomer. But gobble gun is so much easier to understand.

I didn't like the name stonker for the gun that chills things so much they fall apart, the sound didn't seem to match the action. I tried devibrilizer, unvibbler, and then considered kvittle, which is like quit and like whittle. But maybe kvittler would be better, although I didn't want to end in -er as I have that for the klusper gone.

But if both start with k, that's confusing. I want a word that connotes freezing and shattering into pieces. brutler. Oh, I think stonker was best. First thought, best thought.

Rune Casting and Teeking.

(Started this topic on July 12, 2007)

My character Jayjay has acquired an additional power which I call runecasting. This makes him a runemaster. Casting runes means that you can reprogram the quantum computations of atoms, causing them to generate the matter holograms called tulpas.

A rune is a combination of a sound, a teep signal, a teek nudge, and some fourth ineffable quality that only a runemaster can handle. Quintessence. Dark energy. A higher-dimensional rotation, like English on your bowling ball.

Jayjay makes a certain noise whenever he's casting runes. A high tuneless hum. And he gets goose bumps.

I initially wanted to say that the Peng tulpas can reprogram their ranch, for instance by creating bugs to eat and creating their Bosch house and Jayjay's McMansion. But if they do this by casting runes, then I need to explain how they can teek. Also I'd need to explain why they can't cast runes into the neighboring counties and open Peng ranches there—I don't want this to be the case, as I want them to depend on Jayjay as a medium for bringing in more Peng.

I had wanted to say that the Hrull could cast a reset rune, which resets atoms and removes the Peng-generating runes. They were going to do a demo on a waterfall, and they were going to liberate Thuy. But if this is the case, then, as with the Peng, I need to explain how they can teek. Also I'd need to explain why they don't they cast the reset rune to remove the Peng ranch—and I don't want this to be

the case, as I want them to depend on Jayjay as a runemaster who can remove the Peng.

To keep things simple I think I need to suppose that the Peng and Hrull can't cast runes after all. When the Peng change things in their ranch, they're doing it via their medium Jayjay. And I just have to drop the Hrull demo of the reset rune—or I have them demo it via Jayjay.

Problem: if all Peng tulpa creation happens via a medium, then Jayjay is gonna be very overworked as more ranches open up. Solution: Peng are able to create mediums? Maybe Sonic is a medium in SF already?

Question: What exactly is it that makes Jayjay a runemaster? Why can't Chu do it? Is there some higher-dimensional mental flip that you have to master?

Yes, it's the flip, and only Jayjay can do it, because Cosmos and the harp showed him now, and, at least for most of *Hylozoic*, nobody else on Earth is gonna learn how.

But there is a runemaster on Pengö, and one in Hrullwelt, and possibly Chu will meet them and maybe near the end of the book, Chu will indeed pick up runecasting from one of them, so he can return and save the day.

Gabriel's Transfinite Horn

There's a notion of "Gabriel's Horn" alluded to in (I think) my book, *The Fourth Dimension*, to wit: a trumpet of length $k + \omega^*$ would reach from heaven (with the angel manipulating a finite handle of length k) down to earth (via an infinite sequence of order type $\langle \dots, n, \dots, 3, 2, 1, 0 \rangle$, which is also known as ω^*). This Gabriel's horn surface was to be a pseudosphere.

Everything Is a String

I'm working on this idea that objects at every level are strings. As I mentioned in my [August 10-15, 2007](#), entry, using the word "aktual" for infinite being:

Aktualization involves a helical connection among the scale levels. You're connecting a series of looped strings of graded sizes: cutting the loops and sewing them together, each loop hooking to a next larger loop and to a next smaller loop.

So to make someone an aktual, you snip his knotted loop, attach one end to an end you get by snipping a loop at the next higher level, and attach the other free end to an end you get by snipping a loop at the next lower level. And iterate transfinitely up and down.

For this to work, we need for there to be large string loops as well as little ones—think of cosmic superstrings. To enrich the range of string loops, we'll also suppose that consciousness has a physical dark energy correlative of a string-loop nature.

Okay, suppose I want Jayjay's body—or perhaps his mind—to be a tangled loop of dark matter. How does this relate to the little loops that are his cells?

It's going to be a step in the aktualization process to connect Jayjay's loop to a cell loop, so I shouldn't say the cell loops are part of the Jayjay loop—like scallops on a line. They have to be separate.

This means that if I think of the quantum wave function of the body vs. the individual wave functions of the cells, I need to say the body's wave is something other than just a sum of the cell's waves.

Drop QM for a moment. The body is the cells plus, say, the mind. Suppose that mind is jelly. A jelly macramé net bag that holds the globs that are the organs. The organs are macramé bags holding cells. In each case we have
whole = sum of the parts PLUS a holistic overall container.

The containers are dark energy consciousness loops.

Infinitary Solution to Halting Problem Leads to Soul Encoding

[I first wrote this idea up for the *Postsingular* notes, and now I see I have a use for it. I can use it to explain why an aktualized being like Waheer can encrypt his personality as a rune, and why, in order to do this, you really do need an infinitistic mode of thought.]

I've been thinking about Alan Turing's halting problem. The halting problem is this: Find an oracle such that given any arbitrary computation C, the oracle will in a finite amount of time tell you if a computation C is going to halt or run forever. And we can refer to such an oracle as a Turing Oracle. Turing proved that no computation can act as a Turing Oracle. That is, no computation can serve as an oracle that can tell you whether or not an arbitrary computation will run forever.

Perhaps there could be a Turing Oracle, but its operation would have to involve something other than normal computation-like physics. One option I've been thinking of is lazy eight aktualization.

If aktualization gives you infinite consciousness, then you could in fact solve the halting problem, as all the infinite searches could be done in finite time. We could in fact have a fixed-time Turing Oracle that always gives you that yes or no answer within some fixed time, say one second. Call this a Strong Turing Oracle.

In *Accelerando*, Charles Stross boldly writes, "New discoveries this decade include ... experimental implementations of a Turing Oracle using quantum entanglement circuits: a device that can determine whether a given functional expression can be evaluated in finite time."

But Stross doesn't really delve into what the implications would be. So now I ask you, what would it be like to have a Strong Turing Oracle in hand?

Given any mathematical statement S, I could decide whether S is a provable theorem. I fix on a particular axiom system for mathematics and I define a computation ProofSearch(S) that searches through all possible proofs from these axioms, looking for a proof of S. And I'd feed the ProofSearch(S) computation to my Turing Oracle. If the Oracle tells me that ProofSearch(S) halts, I know that S is provable. If the Oracle tells me that ProofSearch(S) runs forever, I know that S isn't provable.

Given any possible story S, I can decide if this a story I would ever write. I create an AI model of how I think and write. And I define a computation RuWriteSearch(S) that searches through all possible "creative processes" carried out by the AI model, looking for a process that terminates with writing the story S. And I'd feed the RuWriteSearch(S) computation to my Turing Oracle. If the Oracle tells me that RuWriteSearch(S) halts, I know that S is a story I might write. If the Oracle tells me that RuWriteSearch(S) runs forever, I know that S isn't a story I would write.

Given any possible scientific theory S, I can decide if this a theory we might adopt. Again I create an AI model of human scientific thought, feed a

ScienceSearch(S) computation to the Turing Oracle, and discover whether or not S is a possible future theory or is out of the question.

Note that having a Turing Oracle is much weaker than having a Truth Machine computer TM such that if S is any sentence in number theory TM(S) outputs a True or False to tell us whether S is true. The Turing Oracle only decides *provability*, not *truth*.

We can't solve the truth question with a single infinite search because arbitrary sentences of number theory have alternating quantifiers that set off nested searches within searches. Perhaps if you had a transfinite time line to work with you could do this, that is, if you could fold together infinitely many infinite searches .

Suppose I let the variables x and y range over the integers. If you had infinity times infinity seconds to play in, you could check the truth of "(for all x)(there is a y)P(x, y)". You set off a fresh infinite search for each value of x. As it nests deeper the ordinals would stack up. Is that what Gentzen was talking about when he spoke of the ordinal epsilon-zero in the context of proof theory? I never really studied that work.

I had a feeling that I should be able to get more out of my Turing Oracle, so on June 22, 2006, I sent the first part of this entry and emailed it to Scott Aaronson with the query:

"I recall that last time we met, I asked you about this notion, and you spun off a bunch of great things you could do with a TO, but now I don't remember them all. Could you jog my memory either by email or in the form of a comment on my blog?"

He answered:

It looks like you've covered the "stoner" implications of a halting oracle about as well as I could have. ('Sure, you could instantly find any mathematical proof, create an AI model of a human being that best matches his or her observed behavior, and indeed, simulate the entire physics of the known universe, but what could you REALLY do?") 😊)

I answered:

"Stoner" implications! Harrumph. Possibly the fact that my previous blog entry was about Wm. Burroughs fosters this impression...

One thing that bothers me about the way I described it my writing example is that I only talked about getting something along the lines of the following ability:

(TO*) To say of some sample novel N is something that a given AI model of me would or would not produce.

But you say that with a TO, I could do something more:

(TO#) Create an AI model of myself that best matches my observed behavior.

Aha.

I think your idea for deriving (TO#) is to use to do an exhaustive search through the first trillion or so possible models of my mind, and use the (TO*) feature to find out which of them would eventually produce one or more of my existing novels, and then to focus on the one that's the best fit.

(Actually, I could do even better, I could search through all models for one that's the best fit, I wouldn't necessarily to stop at only a few trillion possible models.)

That's the thing you told me at the Mexican restaurant that I'd forgotten, I think.

Mulling this over today, I get the following line of thought, which I [blogged](#). The weakest kind of Turing Oracle form it tells me in some finite but unbounded-in-advance amount of time whether or not a given computation C will halt. In a stronger form, there is some fixed finite amount of time such that the oracle always returns its answer within that amount of time.

Now let's postulate a still stronger magic tool, a Turing Evaluator or TE. There is a fixed finite amount of time such that within that amount of time TE me (a) whether a given computation C will halt and, (b) what was the final output of C, in the case that C does halt.

A Turing Evaluator tells me more than whether the computation C halts, it gives me a short-cut for finding out what C does.

Another way to express what a Turing Evaluator does: Whenever I want to search through the integers for a special integer Special_N having some property, then TE will quickly tell me the value of the smallest such Special_N, and if there is no such integer it'll tell me that as well.

There's a well-known method for coding up pairs or triples or n-tuples of integers as single integers, so I can in fact be searching for several integers at once.

Suppose I'm given finite string of integer variables u, v, ... z and a property Good(u, v, ... z). I want to find if there are any specific values Nu, Nv, ... Nz which satisfy Good. I can use my Turing Evaluator to discover in some fixed amount of time whether or not this is the case, and if it is the case, my Turing Evaluator will return examples in the form of Special_Nu, Special_Nv, ... , Special_Nz.

So now I see how to use my Turing Evaluator to write my seventeenth novel Ru_17 (also called *Postsingular*) as follows.

(i) Code up my first sixteen novels as constant numbers cRu_1, ... , cRu_16.

(ii) Establish a system for listing possible neural-net-based AI programs for simulating my writing a novel, list the variable code numbers as FakeRu_1, FakeRu_2, ... FakeRu_x, ...

(iii) Let y be a variable integer that might code up my next novel.

Define a predicate Good such that Good(Ru_1, ..., Ru_16, FakeRu_x, y) means that FakeRu_x codes an algorithm such that, FakeRu_x generates the known novels Ru_1, ..., Ru_16, as its first sixteen "novels," and FakeRu_x generates y as its seventeenth "novel."

So I apply my Turing Evaluator and get SpecialFakeRu_x and Special_y, which I can then mail in to David Hartwell at Tor as Ru_17, a. k. a. *Postsingular*.

Gaia's Effectors

We have to suppose that Gaia can't cast the reset rune, otherwise our heroes have no function. So why can't Gaia runecast? I suppose we have to say that nobody but humans can teek.

I have Gaia saying that she can cause earthquakes and volcanism. If we think of the planet as her body, then maybe she can 'move' it not by teeking, but rather by something like a muscular effector system.

But does Gaia have effectors? In the case of humans, our neuronal processes boil over into nerve impulses that make our muscle fibers contract. Maybe I could say that Gaia has electromagnetic field patterns in her molten core, so she can squeeze lava.

Lets suppose that the high temperatures disrupt the atoms, and that the shattering disperses them.

Archived Proposals

Proposal, Version 1, January 15, 2007

This is the actual proposal that I emailed to Dave Hartwell at Tor on Jan 15, 2006. I'm formatting it in blue to remind myself not to edit it, as I want to keep it here as an historical record.

After Everything Woke Up

A Proposal for a Novel

January 15, 2007

Rudy Rucker

I'm proposing a 85,000 to 90,000 word science fiction novel, with the working title *After Everything Woke Up*.

After Everything Woke Up is a sequel to my novel *Postsingular*, which is now in production at Tor Books for publication in Fall 2007. I expect eventually to write a third book in this series, probably called *Transfinite*.

For *After Everything Woke Up*, I propose a delivery date of February 1, 2008.

In the next section I give a brief overview of the book, followed by a more detailed outline in the four sections after that.

PROPOSAL 1, OVERVIEW

Going beyond conventional SF notions of telepathy, *After Everything Woke Up* delves into a notion of "panpsychism" whereby individual objects are awake and aware — thus the title of the book. This great awakening has a scientific rationale that was introduced in *Postsingular* and is expanded upon in *After Everything Woke Up*. Thanks to the universal awakening, our planet as a whole acquires a personality; people call her Gaia.

The great awakening has also brought telepathy and teleportation to the whole human race. *After Everything Woke Up* explores the opportunities and problems that play out in this postsingular world,

The story hinges on thwarting an alien invasion. Mankind's telepathic chatter has attracted a race of intergalactic aliens known as the Kang. The Kang aren't interested in us as individuals; they want to exploit our raw computational ability, using Earth like a computer server farm.

Our main characters are Jayjay and Thuy, who were the starring young lovers of *Postsingular*. They're happy newlyweds, but in the middle part of the book, circumstances separate them, sending them off on different missions. They must surmount life-threatening challenges in order to reunite.

Somewhat against Jayjay's will, the adventurous Thuy accompanies the Kang aliens on an intergalactic trip to the Kang world. Thuy is a gifted literary artist; and the aliens have conscripted her into helping facilitate the mind-control of all beings on Earth. For her part, Thuy privately imagines she can find a way to subvert the Kang from within. But in fact she may be trapped upon their world, many light-years from home.

She and Jayjay manage only a few long-distance telepathic contacts. In the course of one, Thuy has Jayjay remotely impregnate her, just in case they never meet again.

A competing race of aliens arrives on Earth shortly after the Kang; these are the Rull, who present themselves as wanting to preserve our pristine world from the Kang's depredations. The Rull tell Jayjay that they can save us from the Kang if Jayjay will fetch them a certain remarkable harp which is strung with higher dimensional cosmic strings. This "magic" harp played a role in *Postsingular*, and resides in a parallel world called the Hibrane.

When Jayjay travels to the Hibrane in search of the magic harp, he ends up in the Hibrane's past. The Hibrane's history is very similar to ours, and, as it happens, the harp's origins lie in the medieval milieu of the fantastic Flemish artist Hieronymus Bosch. Jayjay finds work as Bosch's assistant, and has some revelatory conversations with the magic harp — who turns out to be a kind of alien being herself.

Thuy escapes the Kang and makes her way back to Earth, while Jayjay brings back the magic harp. And now, working together with the Rull and the harp, Jayjay and Thuy manage to repel the Kang's mind control by creating a powerful psychic spam blocker that they call an ultrafilter.

Earth's citizens live on, enjoying their panpsychic world, and maintaining certain kinds of trade relations with the Kang. And Thuy gives birth to Jayjay's baby. All is well.

But there are hints that the Rull and the magic harp may not be so innocently helpful as we've been led to believe...which leads us into the third volume of the *Postsingular* series: *Transfinite*.

Note that, as well as being an SF action novel, *After Everything Woke Up* provides some insights into present-day life. A world with telepathic objects is a not all that different from our wired society; teleportation is just an extreme form of commuting; and the struggles against the Kang mirror today's skirmishes between individual creativity and megalithic monoculture.

In the following four sections, I'll give a more detailed outline for *After Everything Woke Up*.

PROPOSAL 1, PART I OUTLINE: THE PANPSYCHIC DAYDREAM

A change to the fabric of reality has made the human race superintelligent, telepathic and capable of teleportation. Digital computers are obsolete. People have all the benefits of the Web — without machines. As a side-effect to the coming of universal telepathy, individual inanimate objects are in some sense conscious as well. The whole planet has a mind too; Gaia has become as real as an upstairs landlord.

Our main characters Jayjay and Thuy are recently married. In the opening scenes, they're constructing a house in a woodsy corner of Northern California, aided by their older friend Ond. They got the land rather cheaply, as it has no improvements. They'll use teleportation to transport water in and waste out, and Jayjay has found a way to get trees to provide electricity. As our three builders can talk to objects, they're in some sense getting the building materials to assemble themselves.

To dramatize the idea of objects being conscious, we open the first page from the points of view of a stone, a bucket of mortar, and a log —quickly working our way up to the human characters Jayjay, Thuy and Ond.

A pair of young ingénues comes teleporting by: Ond's son Chu and Ond's partner Jil's daughter Bixie, aged 15 and 13. Chu has a crush on Bixie. Bixie likes

Chu and thinks he's funny, but doesn't (yet) have romantic feelings towards him. In order to be with Bixie more, Chu has taken up her hobby of surfing. The two have come to ask Ond if it's okay if they go surfing in the forty-foot waves of the Potato Patch shoals off the Golden Gate Bridge of San Francisco. The two youngsters argue that the expedition will be safe, due to the intelligence of their surfboards.

Wanting a break from their labors, Jayjay and Thuy end up accompanying the younger couple, leaving Ond to keep working on the house alone. Thanks to teleportation and pansychism, the jaunt is fun, and not all that risky. But later in the afternoon, the ocean turns odd. There's too few large waves; too many small waves. Water seems to be losing its free-playing chaoticity. And the clouds in the sky look too simple. All of physics seems to be going flat. It's as if natural objects are busy computing — something else. But what?

Jayjay and Thuy teleport back to their partly-built home. On the basis of some "conversations" with the minds inhabiting a nearby stream and a fluttering leaf, Jayjay gets the idea that our natural computations are being co-opted by some all-pervasive signal that's distracting objects from behaving normally.

Jayjay and Thuy have uneasy dreams. At breakfast, Jayjay drops a cup on the floor, and it doesn't even bounce right. Suddenly, Thuy becomes directly aware of an extraneous mental input. She experiences the new mental signal as a free-floating mixture of music and images; it's quite engrossing. She calls the signal the Daydream. She posts her observations on the shared public Mindweb, and now everyone begins consciously noticing the Daydream too.

The planetary mind, Gaia, contacts Thuy to discuss the Daydream with her. Gaia seems to be amused about the Daydream, and isn't very anxious about it. Gaia feels that, even if some objects and creature son the planet are taken over by the Daydream, her own planetary mind will remain intact. Gaia says she's more powerful than the Daydream's source. What is this source? Gaia believes the Daydream to be emanating from a distant planet, which Gaia judges to be a "senile" world with a cooled-down center.

PROPOSAL 1, PART II OUTLINE: THE ALIENS

Having been attracted by mankind's telepathic emanations, two alien races now arrive, first the Kang and then the Rull.

The Kang look very cute, like fluffy plump kiwi birds with long beaks and humanoid feet. But as individuals, they seem to be greedy, crass, and manipulative: combining the worst traits of philistine developers, unromantic peasants, and cynical media moguls.

It seems the Kang want Earthly objects to think about Kang concerns, boring things like account books. The Kang's Daydream signal is a kind of mind-virus that converts Earthly beings into zombies bound to devoting their intellects to Kang information processing.

Of course the Kang are pitching the Daydream as being fun, useful, and good for your mental health. As yet, the Daydream isn't as fully engrossing as it might perhaps become. Jayjay takes heart from the fact that the Kang are working so hard to popularize the Daydream, for this suggests that there must be some way successfully to block their mind control. But as yet, nobody can figure out how.

The Rull are a second race of aliens; they arrive soon after the Kang. The Rull are ugly: they look like flying stingrays buoyed by domed hydrogen bladders, and they slobber. But they present themselves as being eco-activists; they say they want to stand up for Earth's indigenous culture against the imperialist Kang. They say they

can block the Kang Daydream with a special kind of mental algorithm that they call an ultrafilter. But they can't quite manage to produce an ultrafilter for us yet. We're going to have to help them in some as yet unspecified way.

Thuy befriends a Kang kiwi who's a bit more likable than his companions. And Jayjay becomes pals with one of the Rull stingrays. The four of them have a strange pot-luck dinner party at Thuy and Jayjay's home.

The Kang want Thuy to visit their world. They promise her intergalactic renown for her literary work; Thuy cares about this as she's a futuristic kind of writer who creates so-called metanovels.

Jayjay doesn't want Thuy to go, even though Thuy privately assures him that she'll work against the Kang from the inside. Jayjay and Thuy have a bit of a falling out over the planned separation, but in the end Thuy leaves with the Kang.

We go on the intergalactic journey with Thuy and see the Kang's world through her eyes. Just as Gaia predicted, the Kang planet is ancient and fissured; its once-molten core has crystallized. Kang society is very stiff and mannered, their art is dull. They're an ancient and decadent civilization, reduced to endlessly aping what their ancestors did. Yet within the ranks of the Kang are rebels, punk-rock kiwi birds with dyed feathers and raucous songs.

The Kang put Thuy to work and, not quite realizing what she's doing, she figures out just what kind of infotainment would seem fascinating to an Earthly log or a rock. And now it seems she's improved the Daydream to such a degree that all the objects on Earth are fully hooked. Far from sending Thuy back to Earth, the Kang want to keep her for good.

Thanks to the ubiquitous Thuy-upgraded Daydream, our whole planet is becoming as dull as a virtual reality mall for chain stores, as unsurprising as a low-budget cartoon with repeating backgrounds. And everyone is blaming Thuy. Desperate and numb, Jayjay gets in touch with the planetary mind Gaia. Although Gaia's component citizens are entranced by the Daydream, Gaia herself remains free, just as she'd predicted. Thanks to her molten core, she's too complex to be enslaved by the dead, frozen planet of the Kang.

Acting as an intergalactic telepathy amplifier, Gaia helps Jayjay make telepathic contact with Thuy on the Kang world. Jayjay tells Thuy how much damage she's doing and helps her hatch a plan to mess up the Daydream. They also hope that, as a side-benefit, if Thuy does bad enough work, the disgusted Kang will to send her back home.

In the excitement of their virtual reunion, Thuy and Jayjay engage in telepathic sex, and, with Thuy's urging and Gaia's help, Jayjay manages to teleport of his seed into Thuy's womb—impregnating her, just in case they never meet again.

PROPOSAL 1, PART III OUTLINE: WITH HIERONYMUS BOSCH

The quality of the Daydream on Earth begins changing unpredictably due both to Thuy's fiddling with the program on the Kang world, and to the Kang trying to repair what Thuy breaks. Some days people and objects can shake off the Daydream, other days it takes hold again. It's like psychic weather.

Jayjay's Rull friend tells him that the Rull know a way to permanently block the Kang's Daydream—as well any future attacks from other intergalactic mind-parasites. They'll construct an endlessly complex and adaptive mental spam-filter; the Rull call it an ultrafilter. In order to craft this psychic tool, the Rull need access to the special magic harp that brought on universal telepathy at the end of *Postsingular*.

The harp was taken to a parallel world called the Hibrane by a native of that world called Azaroth. So Jayjay jumps through hyperspace to reach the Hibrane. But his jump is skewed by some troublesome beings called Subbies who live in the space between the worlds. Jayjay ends up in the Hibrane past, in the Hibrane Hieronymus Bosch's time and town: the 1490s in the Hibrane Lowlands town of 's-Hertogenbosch.

Jayjay becomes an apprentice in the extensive Bosch family workshop, helping to prepare panels and make paints. The irascible genius Jeroen Bosch has problems with his rich wife, who likes sex a lot more than he does. Also Bosch keeps getting in fights with his donors, and then painting over the donors' portraits in his works. And he likes to dress up as a peddler so he can hang out with cripples and beggars, sketching them.

Due to a certain scaling factor between our world and the Hibrane (introduced in *Postsingular*), Jayjay is effectively one foot tall, and very fast. Bosch doesn't mind, he's used to imagining demons. He carries Jayjay around in a sack like a pet imp, and sometimes Bosch dresses Jayjay up in little costumes to pose for his pictures, or to entertain groups of beggars. Jayjay gets along a little better with Bosch's brother Goossen Bosch than with the great artist himself.

The magic harp has been left off at Bosch's workshop by a mysterious stranger who commissioned Bosch to restore a heavily damaged painting on the harp. Bosch is painting the harp with a scene of revelers around a little demon upon the harp, modeling the demon on Jayjay.

One evening after Bosch goes to bed, the harp begins talking to Jayjay. The harp is a living transfinite being that tumbled down into our world from beyond infinity; she's a bit like a fallen angel. She says it's by no means a coincidence that Jayjay found her here; as the harp arrived cross-ways to our time dimension, her history is a closed causal loop. The harp says she wants Jayjay to teach her a powerful Lost Chord which she is in fact fated to teach Jayjay in the future.

It turns out that Jayjay's Hibrane friend Azaroth is in fact the "stranger" who delivered the harp to Bosch. When Azaroth jumped from our world to the Hibrane with the harp at the end of *Postsingular*, he too ended up in Bosch's time.

[I need to make a few edits to the last chapter of the *Postsingular* manuscript to match my expanded conception of the magic harp; I can put these fixes in place by February, 2007, or earlier.]

PART IV OUTLINE: THE ULTRAFILTER

Thuy is still with the Kang on their distant planet. The Kang are annoyed by Thuy's sabotage of their Daydream. But rather than sending her home as Thuy had hoped, they're planning to execute her. Aided by distant Earth's planetary mind, Thuy finds a way to escape.

Still in Bosch's time, Jayjay prepares to transfer the harp to the present time so she can work with the Rull. The harp doesn't object to the proposed excursion, indeed she welcomes the adventure, perhaps even a little too eagerly.

Jayjay reasons that the trip will cause no temporal paradox — but that there will be a serious and possibly cataclysmic disturbance to the fabric of reality if he fails to return the harp to Bosch's studio later on.

Before Jayjay can leave, the troublesome subdimensional Subbies seethe up into Bosch's studio, delighting the artist. But Goossen's pious wife sees the chaos, and suddenly there's a very real danger of Jayjay being burnt at the stake. Jayjay's old friend Azaroth helps him escape 's-Hertogenbosch with the harp.

Jayjay presents the harp to his Rull friend back where he started on Earth. To Jayjay's surprise, the harp and the Rull seem to have met before, but they don't explain the details. Hurriedly the Rull uses the harp to open a transfinite door to beyond infinity, and, as promised, he brings into being an ultrafilter, which is an endlessly complex psychic firewall against alien mind-control.

Earth's denizens reach a fair and reasonable trade agreement with the Kang. And Thuy gives birth to a lovely baby boy.

Everything is fine.

And now Jayjay wants to take the harp back to the Hibrane past to close the intricate loop of its worldline—otherwise a temporal paradox will arise, destroying the fabric of reality. But the Rull and the harp keep stalling him. Jayjay is slightly uneasy about the true intentions of the Rull and the harp — but just now he's too busy with the lovely baby boy to worry. After all, there's plenty of time. And the Rull and the harp are mankind's trustworthy friends.

Or — as we'll learn in *Transfinite* — maybe not.

Proposal, Version 2, April 9, 2007

I'm proposing a 85,000 to 90,000 word science fiction novel with the working title *Hylozoic*. I'm contemplating a delivery date of February 1, 2008.

Hylozoic is a sequel to my novel *Postsingular*, which is now in production at Tor Books for publication in Fall 2007. I expect to write a third book in this series, probably called *Transfinite*.

Regarding the odd-sounding title, hylozoism (from the Greek *hyle*, matter, and *zoe*, life) is the philosophical doctrine that all matter is intrinsically alive. And one of the key SF notions in my proposed novel is that the momentous events of my earlier *Postsingular* novel have brought life and consciousness to trees, streams, stones and even atoms.

I'm returning to the cyberpunk style in this trilogy, and I'm introducing a number of fresh ideas. My hope is that this trilogy can have as much impact as did my early cyberpunk *Software* trilogy, which introduced the then-new theme of uploading human personalities to machines.

Another feature of *Hylozoic* is that it will feature the medieval artist Hieronymus Bosch as a character. Bosch is a good fit for the story is because he had a manner of painting objects as if they were indeed alive.

Hylozoic will have seven chapters, as listed and outlined below.

[I sent this proposal to Harwell on April 9, 2007. I color this second proposal outline's text red so I don't mix it up with my active outline or with the first proposal.]

PROPOSAL 2, CHAPTER 1: AFTER EVERYTHING WOKE UP

(Jayjay's POV.)

A number of the basic facts about the world are worked into the opening chapter: We find ourselves in a highly postsingular world where a mysterious being called the magic harp has unrolled our eighth dimension—which was formerly curled into a tiny circle. This unfurling—which took place at the end of *Postsingular*—had momentous consequences. Every human on Earth has omnividence, endless memory, telepathy, teleportation, and telekinesis. That is, you can see any spot in the world, you can remember every detail of everything that happens to you, you can “teep” into other people's minds, you can instantly hop from one spot to another, and your mind can take hold of objects and move them about.

As if this weren't enough, every object on Earth is now conscious. By the way, the philosophical belief that objects have minds is called panpsychism or *hylozoism*—thus the title of the book.

Objects have telepathy like us, but fortunately they can't teleport. As it turns out, although telepathy is not so unusual in the cosmos, the ability to teleport is limited to the very few humanoid species that have arisen.

(1.1) The story begins with our two main characters Jayjay and Thuy, who are recently married. They're setting up a homestead in the Yolla Bolla Wilderness area of Northern California. They got the land rather cheaply, as it has no improvements. They've already built the house in the driveway of their friend Ond in San Francisco. And now they're in Yolla Bolla building a foundation for the house. They're in telepathic contact with the stones and with the stream. The stones like being in a wall, but the stream is angry they are moving in. They're being watched by the public as well: they're stars on the *Founders* reality show that people watch telepathically.

(1.2) They go to San Francisco to round up a dozen people to help them teleport their pre-built house from SF to sit atop their little stone foundation wall in the woods. Jayjay starts by corralling his old friend Sonic, who's strung out on ecstatic contact with the Gaian Pig, the overmind of the planet. Sonic leads telepathic tours, helping people see natural phenomena as video games.

Jayjay and Sonic go to the home of Ond, Jil and Nektar, where the cottage is waiting. Jayjay talks to the charming Jil, who's working with some of her shoon robots. Jil's kids Bixie (13) and Momotaro (15) appear, and then Jil's current partner Ond, the nanotechnologist who brought about the Singularity. The next to show up are Ond's ex-wife Nektar and their somewhat autistic son Chu (15), and then Thuy's friend Kittie and the sex-star Lureen. And finally Thuy and her father Kanh arrive. So they have twelve people: Jayjay, Sonic, Jil, Bixie, Momotaro, Ond, Nektar, Chu, Kittie, Lureen, Thuy, Kanh. Six men and six women. These are all returning characters from Volume 1: *Postsingular*.

(1.3) The teleportation of the house works pretty well, although Thuy's father screws up. He's distracted by Thuy's mother Minh who has refused to help. Minh effectively undermines him. Thanks to the Khan's slip-up, the porch of the house is chewed off by the subbies of the subdimensions—these are creatures that one is vulnerable to while teleporting.

They patch up the porch with a redwood log. And then they have a cookout with the gang amidst pleasant chit-chat. Momotaro talks about taking Bixie and Chu surfing tomorrow. Thuy overhears them, says maybe she'll come along. And then Thuy gets into talking about her "metanovel" writing projects.

(1.4) Weary from the day's work, Jayjay grows bored and goes off to sit by the stream with Sonic. They start playing a nature game with the water—herding eddies in the stream. Somehow this leads to them hooking into the Gaian Pig, and they end up stoned and on the nod. It's the "drunk groom on his wedding-night" archetype. Jayjay has a vague sense of Thuy shaking him—and of settling deeper into his trip.

In the wee hours, Jayjay and Sonic have a vision of growing a beanstalk out of earth, up high into the intergalactic communication aether. Jayjay recklessly summons some bird-like aliens that he notices. The aliens' planetary mind seems avid to exploit Earth, and the alien mind seems to dive into Jayjay's very soul. Oh, oh.

PROPOSAL 2, CHAPTER 2: THE RIDDLE OF THE MISSING GNARL

(Thuy's POV.)

(2.1) Thuy wakes from uneasy dreams about bird-like aliens in a planetary forest covering a cold, stone world. At first she's angry at Jayjay for getting high the night before, but the mood dissipates. She feels oddly calm, and curiously remote about the whole topic of Jayjay, who is still asleep on the floor.

Making her breakfast, Thuy forgets all about Jayjay and tries to ponder what metanovel to write next. But she can't think of anything interesting. And she can't focus on details. Her mind feels bland. She keeps thinking in platitudes.

She drops a cup on the floor, and it breaks into six symmetric, simple pieces. Odd.

Sonic shambles in. He says something cryptic about a weird vision with Jayjay. But now he rushes off, he's leading a squid and whale fight tour, one of his most popular telepathic safaris.

Thuy is about to head for Ond's house to meet up with the kids for surfing. At the last minute Jayjay wakes up and comes along, apologizing a little, but also not seeming very emotional. He says he can't remember exactly what happened to him last night.

On the way out they notice the stream. The water is limp and simple; there's no eddies. And the tree branches are swaying in dull and predictable ways. Somewhere far off in the woods they hear a harsh alien bird cry. Creeped out, they teleport to San Francisco.

(2.2) Things feel normal in SF. And with their gnarly emotions back in full sway, Thuy and Jayjay have a big argument—which ends by clearing the air. The newlyweds are still in love. Thuy, Jayjay, and the kids go surfing in the gnarly forty-foot waves of the Potato Patch shoals off the Golden Gate Bridge of San Francisco. In the old days this would have been insanely dangerous, but now it's feasible, due to teleportation and hylozoism. You can hop out of harm's way, and you can talk to the waves and your surfboard..

But then Jayjay has a fit which lasts about two minutes. He's shaking all over, almost dissolving, he looks like a cloud of dust. Thuy peers into his mind; for those two minutes, he's acting as a channel of transmission, like a spirit medium, he's spewing out—numbers: one number to every atom within sixty miles of where they float, including thirty miles up into the atmosphere and down into the Earth's crust.

The spell passes. And now the ocean had turned tame. There's a simpler spectrum of wave-sizes than before: the tiny ripples are gone, as are the really big rollers. The sea is like a sloshing bathtub. The clouds in the sky look overly simple. All of physics seems to have gone flat. It's as if natural objects are busy computing—something else. Thuy calls it the riddle of the missing gnarl.

She's feeling bland again, and so are Jayjay and the kids and their intelligent surfboards. Obviously the missing gnarl results from Jayjay's fit. But what *was* it? He lets Thuy look through his vast, data-crammed memories with him, but it's like studying low-level computer code. You can't tell what it means. And Jayjay's memories of last night's vision have been erased.

Thuy urges Jayjay to contact Sonic—but Sonic is zoned out in his apartment, busy leading his tour of a squid and whale battle.

(2.3) They hop back to Ond and Jil's house. Kittie is hanging out with Jil, she's just recovering from a catty love-triangle-fight with Nektar and Lureen. The drain of emotional gnarl has chilled her out. Kittie has a book of Hieronymus Bosch

paintings with her. She says she'd like to paint like this. The pictures seem to glow as they study them. Thuy remarks that Bosch painted objects as if they already were alive.

(2.4) Thuy gets in touch with Gaia, and finds there are presently only two areas with missing gnarl: San Francisco and the Yolla Bolla wilderness.

Gaia is very concerned about the missing gnarl phenomenon. She says it's Jayjay's fault. She *does* have a record of Jayjay's dream last night of contacting the aliens. Gaia thinks some aliens are already active here, but she can't see into the two missing-gnarl zones. The atoms in Yolla Bolla and San Francisco aren't on the same wavelength as Gaia anymore. Gaia worries that this estrangement represents an alien form of parasitization. She suspects the aliens are getting Earth's matter to compute something for them. Gaia worries the theft of our gnarl will suffocate her like parasitic ivy strangling an oak.

(2.5) Thuy and Jayjay teleport back to their new home, hoping to get to the bottom of the problem. Their creek, Gloob, and their redwood tree, Grew, are terribly tranquil. Again they hear a distant squawking, like the aliens in Jayjay's dream. The squawking draws closer.

PROPOSAL 2, CHAPTER 3: PENG PARADISE

(Jayjay's POV.)

(3.1) Three large alien birds come flapping and walking into the woodsy clearing by Thuy and Jayjay's house. They are Suler and Noar, a married couple, along with Kakar, a younger, somewhat rebellious poor cousin who acts as their assistant. They resemble plump, grubby kiwi birds with long beaks, but with more powerful legs than kiwis. They can hop quite far. The beaks are toothy, like those of pterodactyls. These flightless alien birds are smelly and omnivorous. Lots of pecking and squawking.

They share in the lazy eight telepathy—which is how they talk to Thuy, Jayjay, and Kittie—but they don't have the power of teleportation.

Suler and Noar thank Jayjay for having enabled their emigration to Earth. They're developers. They'll be helping a "few" others to come, but they're evasive about exactly how many.

Although the Peng seem quite solid and real, they explain that they are "woogies," which result from a distributed quantum-computational emulation.

It seems that last night Jayjay opened up an entanglement thread between Earth and the aliens' home world Pengö. Like it or not, he's become what the Peng call a *medium* for them. Now that Jayjay is a medium, everywhere on Earth that he goes, he's liable to open up a channel through which some new Peng woogies can be installed. Thanks to Jayjay these three woogies are in Yolla Bolla, and another couple-plus-servant have now settled in San Francisco.

(3.2) The Peng explain a bit more about where they come from and how they got here, not so much by *telling* all this as by *showing* it as little mental movies.

Their planet Pengö is covered with birds, insects and trees. It's in a different galaxy. Although Pengö is forested, it's a cooled-off, senescent, uninteresting world—like the Peng civilization itself. The Peng society is very stiff and mannered, their art is dull. They're an ancient and decadent civilization, reduced to endlessly aping what their ancestors did.

The experience of becoming a woogie seems low-tech to the Peng users—they just jump into a certain volcanic hole. And Panpenga does it for free, as she likes the

notion of spreading woogies of her denizens across the cosmos. Access to the woogification treatment is, however, expensive.

Their planetary mind Panpenga is willing to disassemble a subject Peng's body, extracting the full details of the quantum computation it contains, to clean up the data a bit, and then to transmit this pattern via quantum entanglement to a distant world. The patterns create matter-wave simulations on the distant worlds, and the simulations are physical and very real-seeming Peng called woogies.

To become a woogie, the Peng in question slides into a certain fissure on planet Pengö. The fissure leads down to some lava. Some wealthy high priests own the hole, and they require all of a Peng's resources as the price for the favor—and the resources have to be very high. So a Peng has to be very wealthy to become an Earth-based woogie. It's the final big pay-off for a prosperous Peng life, it's like immortality. Our Earth is like a paradise for the Peng.

A woogie is a much stronger type of emulation than a mere program that lives within a virtual reality. Woogies have mass and physical presence. They're the output of a heavy-duty distributed quantum computation spanning the particles in a sixty-miles-on-a-side cube of matter on another world. This block of slaved quantum-computing matter is called a Peng ranch. Each individual atom in the Peng ranch carries out the emulation of one single component of the Fourier series of the subject Peng's quantum-mechanical wave function.

Obviously the emulation procedure is highly inefficient, as computing a single one-cubic-meter Peng's woogie requires something like a *quadrillion* cubic meters of Earthly matter. The servant Peng Kakar drops a remark that his masters want to develop the whole planet into something like five thousand Peng ranches.

Suler, the boss Peng, scolds Kakar, then remarks that the reduction of gnarl will in any case be good for humans' mental health.

(3.3) The Peng couple say that they want to build themselves a home right beside Thuy and Jayjay's. Kittie shows the Peng the *Garden of Earthly Delights* in the Bosch book. The Peng decide to make themselves a glassy castle like in the picture.

They use a roundabout approach: they send requests to their distant planetary mind Panpenga, Panpenga calculates the changes needed to their local Peng ranch computation, Panpenga beams these changes to the woogie medium Jayjay, and he in turn sends the information out atom by atom to the ten tridecillion atoms of million cubic kilometer Peng ranch he's standing in. It seems to take only a couple of minutes, but the experience is unpleasant for Jayjay.

Quickly dissatisfied even with their wonderful glass castle, the bossy Peng say they don't like having Thuy and Jayjay's brand-new house as a neighbor; they want to scrape it down and replace it with a new one befitting Jayjay's crucial status as their personal medium. Once the other Peng start arriving, it might reflect badly on Suler and Noar if their Earthly servant was ill-housed.

Jayjay's house, stream, and trees react angrily, enlisting more and more objects. Thanks to the missing gnarl, our whole planet is going to be as fake as a virtual reality mall for chain stores, as unsurprising as a low-budget cartoon with repeating backgrounds!

(3.4) Jayjay checks in with Gaia and with his physicist friend Prav Plato. He forms a rash plan of action. He's going to disrupt the quantum computation that's generating the Peng. Atom by atom he's going to disrupt the coherent state that's

producing the woogies. He calls his method the “aether wind,” as he visualizes in terms of dusting off the individual atoms.

Thanks to the Pen having greedily made him build them a castle, Jayjay is very familiar with the full roll-call of all ten tridecillion atoms in the Peng ranch. He begins running through it, telling each atom to vibrate with its neighbor. He has memorized an actual list of the atoms’ names. By the way, each name consists of eight more or less random English words. This is, once again, going to take two minutes.

The woogies come and try to kill Jayjay while he’s decohering their Peng ranch atoms with his aether wind. Jayjay is freeing the silps concentrically from around his house, so he has rings of allies around. For their part, the woogies are getting telepathic control of some of the low-gnarl animal minds, such as bears and mountain lions, and maybe they even get control of an evil realtor who was sniffing out the situation in the wilderness.

Jayjay is fending off the attackers and pressing on. The Peng woogies show up, looking weird. Each of the three Peng woogies has a half dozen ghost images, and their shapes are overly smooth in spots and with odd sharp cusps in other places. Their thoughts are a bit incoherent as well.

Kakar lets out a crazed squawk that reaches all the way back to Panpenga. The distant planet’s oversoul connects to Jayjay yet again and—suspends his atomic computations. Jayjay is frozen like a wax-works model.

PROPOSAL 2, CHAPTER 4: ATOMIC INFOTAINMENT

(Thuy’s POV.)

(4.1) Thuy feels the touch of Panpenga settling in on her, she has a vision of a giant beanstalk—just like Jayjay did. The stalk leans over planet Pengö. The planet is ancient and fissured; its once-molten core has crystallized. But it’s not dead by any means; it’s verdant and covered with trees, birds, and insects. And it’s a lazy eight world, everything is alive. Within the ranks of the generally stodgy Peng are a few rebels, punk-rock kiwi birds with dyed feathers and raucous songs—not all of them necessarily young. Thuy snaps out of the trance. She’s the new woogie medium! It turns out that very few Earthlings can in fact act as mediums. So far as the Peng know, the only people that might be able to do it are Jayjay, Thuy, and perhaps Ond and Chu.

(4.2) Panpenga is pleased that Thuy is a metanovelist. Panpenga says she’ll thaw out Jayjay if Thuy will figure out just what kind of infotainment would seem fascinating to an Earthly log or stone or, above all, atoms. It’s a way of putting Earth matter more thoroughly in thrall to Panpenga. Panpenga’s goal is to make the Earthlings less rebellious, happier with their reduced gnarl, and less prone to trying to decohere her woogies.

(4.3) Thuy does the job, hating herself for it, but at the same time enjoying the exercise of her creative crafts. Slowly the messed-up Peng woogies re-cohere. But now when it’s time for the Peng to unfreeze Jayjay—they pull a double cross. They only unfreeze Jayjay part way, leaving him in a kind of coma so they can cart him around to use as a pliable transmission medium in order to very rapidly set up a hundred more Peng ranches out in the Midwest. They’ve got a bunch of customers lined up. Suler and Noar are developers, not harmless retirees. “Pshaw, those rubes in Kansas won’t even notice when their gnarl drops off. What’s the diff?”

(4.4) Thanks to her newly honed understanding of what matter likes, Thuy is able to get Jayjay all the way awake. Gaia urges Thuy and Jayjay to leave, lest they

materialize more woogies. The two take off for the Hibrane to get help, thinking they may find the magic harp.

PROPOSAL 2, CHAPTER 5: HIERONYMUS BOSCH'S APPRENTICE

(Jayjay's POV.)

(5.1) Jayjay and Thuy's jump to the Hibrane is skewed—because at the very end of *Postsingular*, the Hibranners bent Earth's time line to try and keep us away. Jayjay and Thuy end up in the Hibrane past, in the fifteenth century in Hibrane Holland, oddly enough.

Due to a six-to-one scaling factor between our world and the Hibrane (introduced in *Postsingular*), Jayjay and Thuy are effectively one foot tall, very dense, and much faster-moving than the Hibranners. Right away some locals spot the two and want to beat them to death, thinking they might be demons.

A Hibranner comes to their rescue, and it's none other than Thuy's old friend Azaroth from *Postsingular*. When Azaroth jumped from our world to the Hibrane with a the magic harp at the end of *Postsingular*, he too ended up in Bosch's time. He's working as a fisherman here; he still hopes to find a way to get back to his own time. Meanwhile he's given the harp to a local artist to get the painting on its soundboard repaired, as it was damaged during the journey and Azaroth doesn't want his Aunt Gladax to be mad at him if and when he eventually gets the harp back home.

The name of the artist to whom Azaroth has given the harp is—Hieronymus Bosch. It's 1492 and the town is 's-Hertogenbosch. Thuy wonders if they were guided here by Kittie's having spoken to Thuy so much about Bosch. Azaroth thinks not. He thinks the harp herself is somehow controlling all this.

Jayjay and Thuy are eager to meet the harp, so Azaroth suggests they get jobs in Bosch's household. Bosch will probably like that they're midgets; he's into things like that.

(5.2) Jayjay becomes an apprentice in the extensive Bosch family workshop, helping to prepare panels and make paints. But Bosch won't hire Thuy, he doesn't want any more females in his household. He's uneasy around women. So Thuy will hang around with Azaroth for now, helping him with his fishing and living in his room at the tavern.

Jeroen Bosch is an irascible genius. He has problems with his rich wife, who likes sex a lot more than he does. Also Bosch keeps getting in fights with his donors, and then painting over the donors' portraits in his works. He likes to dress up as a peddler so he can hang out with cripples and beggars, sketching them. On the outings, he carries Jayjay in a sack like a pet imp.

Jayjay gets along a little better with Bosch's brother Goossen Bosch than with the great artist himself.

(5.3) The magic harp is indeed in Bosch's workshop. Bosch is painting the harp with a scene of revelers around a little demon upon the harp, modeling the demon on Jayjay, he even has Jayjay wearing a little costume for the picture.

One evening after Bosch goes to bed, the harp begins talking to Jayjay. At the end of *Postsingular* Jayjay struck a special lost chord on this harp and unfurled lazy eight. The harp taught Jayjay the lost chord at that time. But now the harp has forgotten the chord, and she wants Jayjay to teach it back to her.

Yes, this will be a closed causal loop, but the harp is a living transfinite being that tumbled down into our world from beyond infinity; she's a bit like a fallen angel. Her whole mundane history is a closed loop. She says it's by no means a coincidence

that Jayjay found her here. She says her whole life is an undivided whole, and that her true mind is transtemporal.

(5.4) So now at dawn, Jayjay plays the lost chord on the magic harp in the Hibrane. It's a very big deal, as right then all Hibrane objects wake up and everyone gets omnividence, telepathy, teleportation, and endless memory. Bosch awakes and walks into the studio, delighted. He's always thought objects were alive.

PROPOSAL 2, CHAPTER 6: THE MAGIC HARP

(Thuy's Point of View)

(7.1) Azaroth and Thuy are out by the river as the sun rises, catching fish. And now the objects around wake up. It's beautiful. They walk into town to see how this is going to play out.

(7.2) The superstitious medieval-minded 's-Hertogenbosch locals are totally freaking out. Flagellating themselves. Looking for someone to blame. A priest points an accusing finger at Thuy.

Thuy and Azaroth hurry over to Bosch's studio. The priest catches up with them. Bosch's pious sister-in-law cries out that Jayjay is an evil goblin. The locals seize Jayjay to burn him at the stake, but Thuy manages to get away.

(7.3) The harp tells Thuy that it's worldline is a triangle pegged onto three people: Thuy herself, Jayjay, and Bosch. These are three people the harp wanted to contact. Why? Bosch because he happened to paint some of the harp's transfinite peers the correct way. Jayjay because he invented teleportation—which is much rarer in the universe than Thuy can imagine. And Thuy because her metanovel *Wheenk* is a supreme work of art.

There's a feedback effect from the harp's interest in these three. The very fact that Thuy and Jayjay had prior dealings with the harp is the reason why they were in fact able to act as mediums for the Peng. with Jayjay is why he is in fact able to serve as a medium for the Peng. And now that the harp has bet Bosch, races similar to the Peng are likely to use Bosch for a medium so as to invade the Hibrane.

Even as the harp says this, Bosch is taken by a fit. Bosch-monsters are seething out of the floor. Oh no, it's the evil subbies from the subdimension! They're using Bosch as a woogie medium!

Thuy and the harp come up with a lasting solution for protecting both the Hibrane and our home Lobrane—but we don't learn the details yet.

(7.4) Azaroth gets Thuy to rush off and help save Jayjay from being burnt at the stake. Jayjay and Thuy return to our Earth, leaving Azaroth in the Hibrane with the harp. The harp doesn't need to come back to our time again; Thuy is linked into her mind.

PROPOSAL 2, CHAPTER 7: INFINITY

(Jayjay's POV.)

Earth is now infested by the Peng. They've made Ond into a medium, and he's doing it lest they also corrupt Chu. After a final battle with the Peng, Thuy and Jayjay open a door to infinity and free the Earth of the Peng. They see the harp lifting off, returning to infinity, and dropping Azaroth back in his proper place and time as well.

Everything is fine...for now. But wait for the next volume of our series: *Transfinite*.

Unused Ideas

The Alla Redux

Like whalers offering mirrors, knives, and beads, the Peng offered people something they didn't yet have: direct matter control, that is, the ability to craft objects out of dirt or thin air.

[No, this would be one too many miracles. I've got enough to play with as it is. Rushing on to still more wonders would be a kind of cop-out.]

Thuy Visits Pengö

The Peng say they're here to plug us into the intergalactic mindweb. They maintain that their siphoning-off of our gnarl is an accidental side-effect of their generous efforts to integrate Earth into the cosmic router. Although the intergalactic communication isn't working yet, supposedly it'll come soon. And meanwhile the missing gnarl is, they claim, good for our mental health.

The Peng say some humans should visit Pengö. They say that only a great human artist—such as perhaps Thuy—will be able to tweak our hook-up to the cosmic router so to hide the missing gnarl.

Gaia will lodge a channel to herself within Thuy, in case Thuy needs to do battle against the aliens. Gaia shrinks to a tiny green sprite and flies into Thuy's mouth, investing Thuy with enormous power. Thuy feels transfigured, goddess-like, superpowered.

Thuy tells the Peng that she's prepared to visit Pengö. She and Jayjay know it's because Thuy has Gaia inside her, and that she hopes she is powerful enough to derail the missing gnarl and the concomitant parasitization of Earth's gnarl.

We go on the intergalactic journey with Thuy and Kittie. There is something odd about the engine room, what's in there? A sense of suffering.

Thuy befriends Kakar, the crew member. The trip proceeds via a series of hundreds or thousands of immense telepathic hops.

The Planet Pengö is a lazy eight world, here, as on Earth, everything is alive. The planet is ancient and fissured; its once-molten core has crystallized. But it's not dead by any means; it's verdant and covered with trees, birds, and insects.

The Pengese trees are not only very good at photosynthesis, they're capable of nucleosynthesis, making water out of air and rock. Thuy wants to figure out the genetics of these trees.

The Peng society is very stiff and mannered, their art is dull. They're an ancient and decadent civilization, reduced to endlessly aping what their ancestors did.

Thuy has Gaia's full force hidden inside her. So armed, she can in principle conquer a whole planet on her own. She finds a Pengese *omphalos* or "world navel" where she might perhaps plug in Gaia's force to shatter the planet. For now she's biding her time, checking things out.

The Peng draw on Kittie and Thuy to figure out just what kind of infotainment would seem fascinating to an Earthly log or a rock. Rather than making the missing gnarl less intrusive, they're trying to make it still more powerful and mind-numbing.

Thuy figures out what the missing gnarl is for. It's about Pengese genealogy. They're carrying out a never-ending project of "uplifting" all of their ancestors, generation by generation, that is, they want to simulate the lives of every Peng who ever lived.

Within the ranks of the generally stodgy Peng are a few rebels, punk-rock kiwi birds with dyed feathers and raucous songs—not all of them necessarily young. Kakar introduces Thuy to the Peng punks.

There are two other races on Pengö as well. The Hrull look like flying stingrays buoyed by domed hydrogen bladders, and they slobber. And Hrull have humanoid slaves who seem to have low mental abilities, on the order of apes or cavemen. Thuy calls them Cromags. The Peng take Thuy to meet some Hrull and their Cromags. The experience creeps her out. Something about the Cromags—maybe they're not really dumb?

Thuy uses her Gaian power to go underground on Pengö, helped by the Peng punks. She plans to steal a Pengese ship and fly home. Should she destroy Pengö first? She dithers, as she's become friends with the Peng punks.

Thuy noses around and learns the real reason that the Peng brought her to Pengö: The Peng want to shop our world to the Hrull. The Hrull are savage slavers; they harvest humanoids for building starship engines. The Pengese ships are powered by Hrull engines which are in fact made of enslaved humanoids. The Hrull use humanoids as "Pushers" to power the teleportation hops of their ships.

The humanoids that make up a Pusher engine are surgically and chemically made into pathetic paralytics unable to escape the engine rooms.

The Peng only brought Thuy to Pengö to serve as a sample Earthling to display to the Hrull merchants. They didn't want to tell the Hrull the coordinates of Earth. The location is what they want to sell.

But now the location has been sold. Thuy is imprisoned.

Remote Sex

While Thuy is on Pengö, she gets into telepathic contact with Jayjay. In the excitement of their virtual reunion, Thuy and Jayjay—still light years apart—engage in telepathic sex, and, with Thuy's urging and Gaia's help, Jayjay manages to teleport his seed into Thuy's womb—impregnating her, just in case they never meet again. Perhaps Kittie in some way gets involved.

Gaia Personified

Gaia materializes in the form of a green goddess. She's very concerned about the missing gnarl phenomenon. She says that it's definitely some aliens who are trying to get Earth's matter to compute for them. She worries that this parasitization will siphon off the computations that support her. She worries the theft of our gnarl will suffocate her like parasitic ivy strangling an oak. She's angry at Jayjay, blaming him.

For her part, Thuy is angry at Gaia for getting Jayjay high on their wedding night. Gaia respects that. She and Thuy come to an agreement. Gaia will lodge a channel to herself within Thuy, in case Thuy needs to do battle against the aliens. Gaia shrinks to a tiny green sprite and flies into Thuy's mouth, investing Thuy with enormous power. Thuy feels transfigured, goddess-like, superpowered.

Multiple Mediums

I'll suppose that three of my characters unwittingly become "mediums" for tulpa-vibe transmissions. Jayjay, Thuy, and Hieronymus Bosch. These three form a transdimensional triangle, pegs around which the magic harp's circular worldline loops. By the way, it's thanks to their contact with the harp that these three are in fact sensitive enough to be mediums.

Tulpa Beacons

The medium marks a few particular atoms as tulpa beacons, to attract the matter-waves to the right spot. Like fireflies.

Thuy Works for the Peng

Thuy feels the touch of Panpenga settling in on her, she has a vision of a giant beanstalk—just like Jayjay did. The stalk leans over her, all the way from the planet Pengö. Thuy snaps out of the trance. She's a tulpa medium now!

Panpenga is pleased that Thuy is a metanovelist. Panpenga says she'll thaw out Jayjay if Thuy will figure out just what kind of infotainment would seem fascinating to an Earthly logs or stones or, above all, atoms. It's a way of putting Earth matter more thoroughly in thrall to Panpenga. A way to undo the Hrull-sponsored reset rune.

Thuy helps restore the ranch to the Peng, but at the same time enjoying the exercise of her creative crafts. She helps re-subjugate the atoms. The messed-up Peng tulpas recohere. But now when it's time for the Peng to unfreeze Jayjay—they pull a double cross. They don't unfreeze him.

Harp Pegged To Three People

I had this in my outline for Chapter 7, but it's too weak and doesn't really make sense:

"The harp tells Thuy that its worldline is a triangle pegged onto three people: Thuy herself, Jayjay, and Bosch. These are three people the harp happened to contact. And her contact has ennobled the three. Thanks to the harp, Bosch may he happened to paint some of the harp's transfinite peers the correct way. Jayjay because he invented teleportation—which is rare even among humanoids. And Thuy because her metanovel *Wheenk* is a supreme work of art. She's supposed to write two more metanovels, *Vib* and *Om* (~Hylozoic and Transfinite)."

The Bagpipe, the Harp, and the Pitchfork

July 29, 2007.

I was considering having a third aktual character as well, a meaty bagpipe, but I think this would be an overcomplication.

The magic harp is the race spirit of the flying manta rays. It's triangular like a ray. The harp wants the Gaian mind. The harp wants human telepathy and teleportation. If we can teek, we can serve as pushers in Hrull starships.

The pitchfork is the race spirit of the Peng birds. It forks like a pelican leaning back and yawning open his beak. The pitchfork wants to inculcate runemaster to corrupt the plane with ioneer rot, and also the runemaster issues the summoning rune to invite in Panpenga.

The bagpipe is the race spirit of humanoids. Like us, it's a noisy bag with several holes. When Glee tells Chu about this, he doesn't take her seriously. She replies, "Yes, bagpipes are absurd, but so are we." In s'Hertogenbosch, one of the Inquisitors has made a bagpipe out of a heretic's skin. The bagpipe wants something for the good of humanoids. Maybe Glee from planet Bulba knows. Her husband Kenee almost had it, and the pitchfork killed him first.

The bagpipe form is, then, what, mathematically speaking? I think of the Klein bottle, of a one-sided surface, of higher dimensions, of containment.

I like the harp and pitchfork as mathematical forms: the triangle and the fork. Cycle vs. bifurcation. Reversible vs. irreversible.

Sqwoonk! The bagpipe's here to save us! The magic harp and the evil pitchfork are plotting to keep the bagpipe from manifesting himself.

I once had a friend who was obsessed with certain rarely performed sexual act called "bagpiping." The man puts his penis into a woman's armpit or, equally well, I suppose, into another man's armpit. An irregular indiscretion indeed. "Care for a spot of bagpiping, my dear?"

Old Plan for Chapter Seven Ending

Chu goes to the Hrullwelt.

A war shapes up between the Peng and Hrull over the control of the new resource: Earth. Either way, it's lose-lose for Earth.

Chu is taken captive by the Peng. He returns to Earth via Panpenga, and arrives as an ioneer tulpa.

Scale Wrap

The endless helical spring of linked strings curled around him. He was shooting down the hollow axis of the helix, surfing the ribbed tube towards the rising sun of the Infinite, with the setting sun of Zero to his rear. And now—sweet closure—the tower of scale wrapped. The two suns were one. Inside him.

Universal Remorse-Doubt-Fear

Chu discovers how to encode RDF (remorse-doubt-fear) into any computing system. The initial application of Chu's Hack is made by Kakar, who uses it to give the Peng tulpas the ability to teek and to runecast, leading to an exponential spread of tulpas.

Chu will ultimately give this power to all silps, and to the aliens as well. This will break down the distinction between teeker and non-teeker races—at the cost of making some formerly care-free beings become hung-up as we are.

Battle of the Titans

I was originally going to put this in Chapter 8.

Pekka shows up in the flesh, down from the beanstalk, she's a hundred feet high, the ground trembles beneath her feet. She jabs a Hrull out of the sky with her beak and claws and pecks it to death, then lets out a dinosaur screech.

She begins a *biological* Peng invasion; she's laying eggs! She's beating her feathers and spreading an avian-flu virus that's infecting chicken eggs so they hatch out Peng, too. Crack a breakfast egg onto a griddle and—*gaaah!*—it's a Peng, who skitters off the hot surface and grows to human size and kills the cook with a peck to the skull! Pekka teeps in pioneer minds for these new hatched chicks.

Gaia butts in, she's had enough. "Just give me a body, and I'll save myself."

Thuy crafts an incarnated body for Gaia so she can fight it out toe to toe with Pekka—in this way Thuy fulfills old Dora's prophecy that she would give birth to Gaia, although she still carries her normal son in her womb.

The Gaia incarnation is a giant beautiful woman. She wins the big fight with Pekka. Perhaps Chu helps her in some way.

House of Nonrepresentatives

I thought this would be a funny phrase to use when talking about the disappearance of organized government. "No more Presidents, no more Senates, no

more Houses of Nonrepresentatives.” But in the end I went for Parliaments, to make it more global.

Deleted Fragments

Sonic’s Rank

“Remember? I’d worked my way up to the Multiversal Governorator rank in Doodly Bug.”

Mabel

“Little turd,” said Sonic to Momotaro. “I’m looking into the global memory and—ah yes, seems you’ve been spending a lot of time peeping yourself. A new girl in town called—”

“Maaaabel?” crooned Bixie ever so softly before breaking into giggles.

“Shut up!” yelled Momotaro. “I’m sorry, Sonic! Never mind. Let’s all go watch Ond and Nektar argue!”

“Hear that, Momotaro?” put in Bixie. “Your dream girl is—”

Momotaro elbowed his sister in the ribs; she doubled over in a pantomime of pain.

“Hey!” said Chu, stepping between the two. “Are you okay, Bixie?”

“Thanks, Chu, I’m fine,” said Bixie, straightening up. “My brother is a barbarian.”

Big Box

As a star of *Founders*, Jayjay got excellent prices on Big Box goods. Last fall, the sponsors’ goods had still been free for the cast, but then Nektar had gotten greedy and pushed Big Box too far, remodeling her entire restaurant four times in a row. Nektar tended to forget about being Earth-friendly.

By the Fire

“So how about it, Jayjay?” said Ond. He was holding his saw and socket again. “I’ll set my gizmo into this big redwood, okay? Her name is Grew? Once we get the interface together, Grew can be converting sun and wind and chemical energy into power for you. I’ll put the socket up high; you can string an overhead wire to your house.”

“*Beat* those tails,” said Sonic, lounging on the ground with his shoon.

“Be a gentleman,” reproved old Kanh. “Wise crack, stone head.”

“Whoah,” said Kittie. “You tell him, Mr. Nguyen.”

“Grew says we can use the hole up there,” reported Thuy, pausing to catch her breath. She was pointing some twenty feet up on Grew’s trunk to where a branch had broken off, leaving a damp, dark hole. “Grew thinks the electricity might keep the shelf-mushrooms off her. She hates fungus.”

Ond teleported himself up there and clung to the lip of the hole with one hand, maneuvering the plug into place.

He took a moment to teep and check on the socket in Grew. Yes, the tree had already begun growing some cells into the interface. But before thinking about tweaking it, Jayjay still had to study the design document Ond that had messaged him.

Craigor, Darlene, and Mabel

But just then Craigor and Darlene showed up with Darlene's teenage sister Mabel.

"About time!" exclaimed Thuy. "Where were you when we were moving the house?"

Craigor shrugged. "Darlene was reading a metanovel; I was fishing. Looks like the move went fine. You still eating? I brought a fresh cuttlefish." He presented Jayjay with chicken-sized squid-like creature. "All gutted and ready to grill."

"I'll put it on," said Jayjay, feeling weary. "We've still got a little meat, too."

"But no beer!" said Craigor, teeping around. "My treat." Beside the picnic table, a case of beer appeared in a tub of ice. Craigor opened one and wandered off. "I'm gonna check out your stream. There might be trout here."

"Do you like to surf?" Momotaro asked Mabel. They'd had already met a few days ago. Momotaro was infatuated with the new girl.

"Maybe," responded the willowy teen. She regarded Momotaro, considering her options. "Is it easy?" She had a slightly detached demeanor, as if life were a show she was watching.

"Sure," said Momotaro. "The surfboards can think—and the surfers can teleport. It's a blast. Even little grommets like Bixie can ride the gnarliest spots."

"Well, okay," said Mabel. "I guess I'd like it."

"Vibby! Let's go out together tomorrow morning. You and me and my sister and our friend Chu. That's him over there staring at the fire."

"What if I come, too?" said Thuy, who was listening in. "I used to surf off Ocean Beach. I could use a day off from thinking about the move."

"Um—" said Momotaro, wanting to say no.

"She can be our chaperone!" said Bixie, and bust out laughing.

Meanwhile Jayjay was busy with the grill.

"Hey," said lanky Darlene, leaning in towards his face. "I've hardly seen you and Thuy since the wedding. It was cute of you to do it on Valentine's Day. Enjoying the married life?"

"I am," said Jayjay. "But we overdid it today. I'm really tired. You're doing okay with Craigor?"

"Craigor's fine—for a *while*," said Darlene, giving Jayjay a flirtatious look that he didn't return. He was quite fried on the concept of Darlene. For some insane reason, during his pighead overdose trip in January, he'd hallucinated being married to Darlene for *twenty years*—undergoing the highly realistic simulation one minute at a time.

"How's *Wheenk* doing?" Thuy asked, deflecting the conversation. She was referring to her first metanovel, which Darlene had helped her publish right after the coming of lazy eight.

"Metanovels are to novels as forty-foot totem poles are to the pocket-sized amulets that Native Americans had made before they'd gotten hold of steel axes," said Darlene. "That's my new marketing slogan."

"A little unwieldy," said Thuy. "But I like the concept. Let me tell you about the sequel I'm working on."

Craigor reappeared, hungrily staring at the sizzling grill, where the cuttlefish charred and curled. "Khan says that eating the longest tentacle is good luck."

"Poor cuttlefish," said Bixie.

“Oh, there’s lots of them these days,” said Craigor. “Now that the Hibraners have stopped poaching here. How’s my girl, Bixie? I miss you on the boat. Is Ond treating you okay?” He fetched a plate and helped himself to a slab of sirloin.

“Ond’s nice,” said Bixie. “And I like being able to walk to the stores and ride my bike to school. Teleporting is fun for awhile, but doing it all the time feels—*ugh*. Like the world is the Web. All broken up. I like seeing the stuff that’s in between the popular things.”

“I just hope Chu’s not hounding you.” Craigor glanced around at the shifting dark shapes of the fire-lit company. “Just between you and me, that kid’s creepy. Almost like a sex-offender.”

“Dad! Anyone can teep you. Chu’s only a friend. Sex doesn’t enter into it.”

“Hah!” said Craigor, picking up his steak with his fingers and taking a bite. “You don’t know what men are like. We’re low brutes.”

Finally all the remaining stuff was cooked. “Seconds!” shouted Jayjay, and teleported the food to the picnic table.

“Let’s make the fire huge now,” said Sonic, lugging over an armload of branches and scraps from the woodpile. The fire leapt up with a fierce exhalation of joy.

Skysurfing

“We used to sky-surf in Twin Falls,” responded Mabel. “Jumping off the bridge into the gorge. My friends and I made these big, flexible airboards from scraps of smart plastic we found in the Air Force base junkpile.”

Jayjay’s Ten Octillion Names

[I decided to give this skill to autistic-savant Chu in Chap 3 instead of to Jayjay in Chap 1.]

Intrigued by his newly-learned ability to sense the silps’ names, he teeped into the aethereal chorus of atoms that made up his body. Each of his ten octillion atomic silps had its own timbre. He encoded each little voice into a name consisting of six English words. Anonymized superabsorbent oratorical sluggardly expectorant. Exoteric velocipedal trigamist township conglobation. Villainous inky gowk curator walloper. Like that. He had room for all ten octillion names in his endless eighth-dimensional memory.

Zeno Speed-up For Teep

Even so, there was a definite sense in which Zeno speed-ups were real. Everyone’s personal eighth-dimensional axis ended up at a shared point at infinity—which acted as cosmic router, bouncing the signals back down. And the teep signals did indeed get there and back via Zeno speed-ups, even though nobody had ever mustered the mental focus to track a signal along every step of its trip.

Pee Block Against Teleporters

It was always a good idea to lay down scent in the grounds around his living quarters. At least for a little while, the silps of any atoms that left his body would help out by bouncing back uninvited teleporters—which otherwise could have been a real problem, given how large the *Founders* audience was. Jayjay and Thuy were global stars.

Craigor's Status

"Jil seems good," he observed. "Me, I'm still floundering around in my mid-life crisis. I'm not even making combines anymore." Craigor was something of an assemblagist sculptor—a promising field these days, what with silps in every object.

"Sounds rough," said Jayjay, not feeling much sympathy. Not that he was in a position to pass judgment, having slept with Jil while she and Craigor were still married—but in Jayjay's opinion Craigor should have been more faithful to wife.

Jayjay's Dream, Version A, Pre-Pitchfork

"We can game these swirls," said Sonic. "We'll get into a linked pair of eddies and see how far we can make them go. Like a pair of backs running for a touchdown. Spinning past the other eddies."

They played with the vortices for awhile, relishing all the associations they set off, and then, bit by bit, they rose up towards the pig-like green face of Gaia's interface.

"Hi, boys," said Gaia as they sank into the green funnels of her interior spaces. "Ready for a really good time?"

Jayjay unpacked Ond's design document, meaning to study it, but he forgot all about it at the first touch of pleasure from a Gaian mind-tendrill. He rode the fabulous rush right into the white light, guided by concentric circles of red and black that zeroed in on sweet oblivion. Sonic paced him, flying at his side.

At some point during the night's long chaotic journey, Jayjay felt Thuy shaking him and walking him as far as the cabin's main room—where he collapsed on the floor and settled deeper into his trip. Laughingly Gaia displayed a relevant archetype, bristling with references and links: *The Groom Drunk On His Wedding Night*. Jayjay smiled, feeling clever. Getting high on Gaia was a brilliant thing to do!

Still later in the night, Jayjay again floated up towards consciousness, finding Sonic there like a basking whale, a blimp in the mind space.

"Hey," said Sonic. "Let's go even higher. Higher than anyone's ever been."
"Yes."

For who knows how long, Jayjay and Sonic labored in the unseen world, piling idea upon idea, energy upon energy, using the resources of their lazy eight memories to grow an all-but-endless beanstalk from the cartoony pig-eared icon of Mother Earth.

Near the top of the beanstalk they found a castle resembling a gigantic version of Jayjay's cabin in the woods. Resting upon the royal table beneath the sky-high ceiling was a magic harp with a girlish face and an enchanting voice, the same harp that Jayjay had used to unfurl the eighth dimension some hundred days ago. The harp's sound box was painted with solemn naked people in a pale garden.

Sonic, who, in the mutable manner of dreams, had come to resemble a cartoon duck in a sailor suit, seized the harp. The harp screamed like an opera diva. Her voice echoed and immediately the castle floor shook from giant footfalls.

The castle's master entered the vast, arched hall: a figure of light, far bigger than Gaia, a personification of the entire physical universe. Jayjay could discern but the smallest part of one luminous toe. The air rumbled like drunk molasses from the vast being's voice.

"Jayjay," he said. "I am Cosmos."

Jayjay snatched the harp from Sonic and touched the strings, hoping to calm the harp's cries, hoping to hide. But vast glowing curves closed in: Cosmos's

fingertips were plucking them up. Resting upon the blinding expanse of the giant's palm, Sonic, Jayjay and the harp rose higher into the air.

Cosmos was studying them; his face was dark with light.

"Play the harp," commanded the giant.

Jayjay still remembered the special Lost Chord that the harp had taught him. Surely this was the most interesting thing he could play. He struck the strings, and the sweetest imaginable sound floated up from the harp.

"Jorge Jimenez," sang the harp. "You are the chosen one."

The giant laughed in affirmation, the laughter and the chord merging into a vibration that was at the same time a sound, a telepathic signal, and a telekinetic jostle.

The vibration went through and through Jayjay's body and mind, reconstellating his atoms, redacting his quantum computations, feeding unearthly patterns into his memory, changing him for ill and for good.

"Run!" screamed Sonic, who wasn't feeling the vibration at all. "The giant's gonna eat us." He raced to the edge of the giant's palm and leapt back onto a loop of the vine which lay near.

"Yes, yes, go higher!" boomed the giant. "Connect."

Jayjay followed Sonic, carrying the magic harp under one arm, the harp breaking into a cheerful song. He climbed like a man possessed, like a demon, up, up, up the beanstalk to the clear black sky above the clouds.

Eventually Jayjay and Sonic found themselves in a celestial bower of blossoms and curly tendrils. The blossoms were the once-distant stars, now implacably close and bright. The tendrils were subdimensional wormholes, bringing the far corners of space within reach.

Jayjay caressed the harp and again she murmured a synaesthetic vibration that was more than a sound, caressing his mind, tickling the hidden recesses of his belly. She crooned the song over and over again.

"What *is* that?" he asked the harp.

"A summoning rune," she answered. "Cosmos and I have chosen you to be Gaia's runemaster. For ill and for good. Sing the rune I'm teaching you, Jayjay. Invite the strangers in. Thicken the weave."

Jayjay sang the summoning rune, though it was more than singing. He used his whole mind and body to sound the tune, to play the thought loop, to pulse out the telekinetic push. As if symbolizing the rune, a cartoony chromed note sprang from his chest and hung in the air, ellipsoidal, reflecting everything.

"Look," said Sonic, a quaver in his voice.

Farther than far away was another beanstalk with another shining note. Tingly winking, the silver form whirled about its home base.

"Yoo hoo," shouted Jayjay. He was a runemaster. Surely he could do anything he liked. Why not show off? Why not be loud? "You hoo!" he called again.

With nightmarish alacrity, the distant silver orb reached through a subdimensional wormhole to connect with Jayjay's note. Suddenly turned menacing, the chrome ellipsoid loomed over Jayjay, probing his and Sonic's minds.

At Jayjay's side, the magic harp tittered and disappeared.

The teep contact through the wormhole was itchy, squawky, raw. But the vibes were all too comprehensible. Somewhere an alien mind was avidly pleased to find an uncolonized lazy eight world; already she was forming development plans.

“Oh shit,” said Sonic.

Aching with regret, Jayjay flinched back from the shining intruder, wanting to climb down the beanstalk, wanting to take it all back. The shiny ball followed his moves like the head of a hungry eel. Sonic lost his footing and fell—down, down, down into nerveless sleep. But Jayjay wasn’t so fortunate. The psychic space around him was like mud, like taffy. He was stuck in place.

Taking its time, the wormhole terminus reshaped itself, tucking in a bit here, growing out a lump there—until it had taken on the exact form of Jayjay’s body. The chrome shape overlaid itself upon Jayjay with a chiming sound—and the transmission began.

An astronomical flow of runes rushed through Jayjay and into the teeming night.

Jayjay’s Dream, Version B, With scale actualization

“Okay,” said Jayjay. Too much work to think about the pitchfork. He and Sonic lay down flat, joined their minds and spiraled up towards the pig-like blue face of Gaia’s interface.

“Hi, boys,” said Gaia as they sank into her ultramarine funnels. “Ready for a really good time?”

Jayjay unpacked Ond’s design document, meaning to study it, but he quickly forgot it in the pleasure of the Gaian mind-tendrils. Sonic at his side, he writhed and wallowed, savoring the sensual feel of raw thought.

Now and then Jayjay felt something pricking at him—prongs? Surely that weird pitchfork wasn’t standing over him beside the stream? He didn’t have the will to leave his trance and find out for sure. If anything, the pitchfork’s prods were nudging him deeper.

Recalling his contact with his cells and atoms this afternoon, Jayjay focused down into himself again. He felt impelled to pick out one particular cell, and one particular atom within that cell. The cell was inside his heart, *thump thump*; and the atom was a cozy carbon inside the heart-cell’s genetic code.

How did all the silps fit together? Empowered by his contact with Gaia—and unwitting coached by the pitchfork—Jayjay had a sudden scientific insight. *Objects were more than the sum of their parts*. Each object’s contents were wrapped in a knotty net of dark-energy string. An object was more than an inventory, it was an overarching gestalt.

Jayjay self, his soul, his I—it was a woven bag: his. The carbon atom was a bag too, and his heart, and the human race, and Gaia, and the Milky Way galaxy—each was a dark-energy string bag of knotty info. And that explained why an object’s silp was more than just a squabbling congress of member silps.

Pleased by Jayjay’s pitchfork-promoted discovery, Gaia flashed an oblique reference to a children’s book, *The Tale of the Flopsy Bunnies*, in which Mr. McGregor put Flopsy’s six baby bunnies into a cloth sack, but Flopsy and her mouse friend chew open a corner of the sack and replace the bunnies with three rotten vegetable marrows, an old blacking-brush and two decayed turnips. Moral: in either case, the sack is the same.

The pitchfork was in the mind space with them, teaching them, gesturing with his tines. Jayjay was a sack and so was Gaia. The sacks were woven from dark-energy string, each sack a single loop. Jayjay’s loop had a gazillion turnings and Gaia’s had—maybe the same number, or maybe more. Jayjay lost track of Gaia as he focused on tracing the pattern of his own soul’s string.

At some point during the night's long, chaotic journey, Jayjay felt Thuy shaking him and walking him to their now pitiful-seeming honeymoon cabin. Waggish Gaia displayed a relevant archetype: The Groom Drunk On His Wedding Night. Not that Jayjay was truly drunk. In principle, he could snap out of his Gaia trip and be with Thuy right now.

But he didn't. That was the addiction thing. Once he got going on a run like this, Jayjay found it nearly impossible to stop. He collapsed onto the living-room floor and lay still, knowing full well there'd be a stiff price to pay. But it was still night. Hours to go. And the flow of time was so deliciously slow.

"You're horrible," said Thuy, and went to bed.

Sonic's virtual form hung nearby like a blimp or a basking whale. "Yo," he called to Jayjay. "Let's go higher. Higher than anyone's ever been before. Maybe we can see to some other worlds. If they have lazy eight, I bet we can talk to them."

"Yaar."

Jayjay and Sonic labored in the unseen world, with the lanky pitchfork working at their side, lively with his tines, not that he was always that much help—in some ways the pitchfork seemed to be the clumsy hillbilly he sounded like. Be that as it may, Jayjay and Sonic piled idea upon idea, energy upon energy, using the resources of their lazy eight memories to grow an all-but-endless beanstalk rooted in the cartoony pig-eared icon of Mother Earth.

Near the top of the beanstalk, Sonic, Jayjay and the pitchfork found a castle resembling a gigantic version of Jayjay's cabin in the woods. Resting upon the royal table beneath the invisibly high ceiling was a magic harp with a girlish face and an enchanting voice, the very harp that Jayjay had used to unfurl the eighth dimension some hundred days ago.

"Howdy, Lovva!" called the pitchfork. "I knowed I'd find you up here. I done forgot where to find you down to Earth."

"Hi there, Groovy," said the harp. "My avatar's on the other brane." Her contralto voice rose and fell in smooth glissandos that set the pitchfork to shuddering with pleasure. "A famous painter is decorating me. Somehow I took a wrong turn and ended up in Hibrane Earth's medieval period. But that's quite alright, as I need to sound the Lost Chord back then. Unfortunately my avatar doesn't remember the notes."

"I'll help our boy Jay over to the Hibrane directly," said the pitchfork. "He knows that tune real good."

"Don't bungle it," said the harp. "You can be so out of it and crude."

"You the one who got lost. Why the hell's it always me who's gotta find you? Needle in a frikkin' haystack."

"Don't criticize me, you vulgar hick!" The harp's tone rose in a sharp crescendo.

"Aw, I don't mean nothing," said the pitchfork, leaning forward to give the harp's strings a gentle strum. "Long as I can hear you, I'm happy as can be."

"Sweet," said the harp, dropping her ill humor and enjoying her mate's touch. She sang a sweeping arpeggio.

Sonic, who, in the mutable manner of dreams, had come to resemble a cartoon duck in a sailor suit, seized the harp and took off running. He was still drunk. The harp let out an elegantly phrased scream—which echoed far down the ancestral halls. The pitchfork yelled and hopped after Sonic, fell down, righted himself and—

The floor shuddered and the a giant, looming up like the Northern lights. He was the personification of perhaps a billion stars—but just another woven string bag, withal. Jayjay could discern but the smallest part of one luminous toe. The air rumbled like drunk molasses.

“I am Virg,” said the vasty voice. “Your galactic supercluster, and the keeper of the castle called Walhalla.”

A net of glowing curves closed in; Virg’s fingertips were plucking up the intruders. Jayjay and the pitchfork rested upon the blinding expanse of the giant’s palm beside Sonic and the harp. Sonic wasn’t holding the harp anymore. He was crouched down and cowering

The giant studied the four of them; his face dark with light.

“It’s just us,” said the pitchfork. “Groovy and Lovva, the new jootses. I brought Jayjay here to aktualize him. And Sonic’s his friend. Want to hear a little music, Virg?”

“Something new,” demanded the giant.

Again the pitchfork ran his flexible prongs across the harp’s strings. The music was enchanting and entrancing. The harp was radiant, and the pitchfork sinuously rippled his handle in synch with the sound.

Sonic broke the spell by taking off running across the giant’s palm. With a slight tilt, Virg toppled Sonic and send him skidding back to the center of his palm. Wildly off-balance, Sonic tumbled into the two jootses, knocking the harp onto her side with a discordant, plaintive sound. The pitchfork reared up, brandishing his prongs like horns.

“I’ve had it with you, Sonic,” he twanged. “How ‘bout I pitch you the hell down into the subdimensions?”

“I want all three of you boys out of Walhalla,” said the giant. “But I’ll keep the harp.” He pincerd up the instrument with the fingers of his other hand, setting her down in the great hall below. He pursed his lips as if to blow away Sonic, Jayjay, and the pitchfork.

“Not so fast!” cried the pitchfork. “This is all part of a big-ass plan me and the harp got goin’. A time loop. We makin’ our boy Jay into an aktual, and then he’s gonna do his whole world, and then they gonna do us. Set me and Jay down so’s I can finish my job.”

“Not in Walhalla, you’re not,” boomed the giant. With a vast sweep of his arm, he reached out through a stone window and set them upon the beanstalk’s tip, in a celestial bower of blossoms and tendrils. The blossoms were the stars, implacably close and bright. The tendrils were lazy eight links to other worlds, dizzying tunnels that brought the furthest corners and deepest recesses of space within reach.

The pitchfork coiled his handle and squatted close to Jayjay, emitting a synaesthetic vibration that was four things at once: a sound, a teep signal, a teek jostle, and an oddball shift in size-scale. The noise set Jayjay’s teeth on edge, making him want to jump out of his skin.

“What *is* that?” asked Sonic, standing as far back as the constrained space allowed.

“Good ole aktualization rune,” said the pitchfork. “Jay’s gonna link all the way up and down. Live at every scale. That’s what aktuals do. The more of us, the better. But first I wanna test it on just one of y’all. Jay’s the man.”

Jayjay only half listened to this. The aktualization rune was guiding him through a tremendous to-do list. Everything was a loop of string, and it was Jayjay's job to link a scaled tower of loops into a helix.

He started by snipping the knotted loop of his own soul—experiencing a moment of breathless fear—was he going to die? But he had no choice. The aktualization rune was driving him.

The two loose ends of his soul hung free, not unraveling for now. Quickly he snipped a loop in his heart and loop in the racial mind. And now he attached one of his soul's loose ends to a loose end of his heart string, and his soul's other loose end to a loose end of the race mind's string. He snipped Gaia's string and attached one end to the race mind; snipped a cell in his heart and attached the heart to the cell.

He kept working, linking up to the solar system and to the galaxy; linking down to his genome and to a carbon atom. As he snipped and linked the strings, the insistent aktualization rune steered him with the vision of a helix that led from nothing to everything. He was stretching both ways.

On the one hand, he was moving towards everything by letting his feeling of spatial immediacy expand around his body to include Thuy, his cabin, the woods, and the night sky; in step with this, his sense of the present was expanding to include Thuy's recent thoughts, the trails of the wind currents, the evolution of the redwoods, and the dance of the stars.

On the other hand, he was moving towards nothing by chipping away at his identification with any region of space, sinking into himself, dropping below the Planck barrier; and to accompany this mental gesture, he was shrinking his "now" by letting go of his thoughts and emotions.

He was continued chopping and linking strings like an amok knitting machine. What made the process superbizarre was that he kept thinking he was done, and then finding that he'd started up a new phase by toppling the lead domino of yet another chain. Moving past level after level of scale, Jayjay felt the fine ecstasy of unlimited acceleration: more, *more*, *MORE*.

At the end, he was seeing himself from a slight remove, as if a meter back in his wake: he was a flat surfboard with two antennae. He glowed yellow-white against a dull-red sea beneath a darker red night sky stippled with dimensional transporters.

The helical spring of linked strings curled around him. He was shooting down the hollow axis of the helix, surfing the ribbed tube towards the Cosmos itself. And now the Cosmos, too, was inside him, a dream within a dream.

Jayjay opened his eyes. Was he awake in his living-room? No. He was still in the bower with Sonic and the pitchfork.

"You aktual now," said the pitchfork, nodding his prongs. "High times ahead, Jay boy."

Jayjay felt filled with inconceivable power. The aktualization had reconstellated his atoms, had redacted his mental computations, had fed unearthly patterns into his memory. Part of his old self was gone, altered to fit with the levels above and below.

"Try this hello rune," said the pitchfork, pressing an information pattern on Jayjay. "Give her a howl, see how she feels."

Jayjay opened his mouth and cast a rune, just like the pitchfork had done. That is, he sang, teeped a thought, teeked a push, and tugged at the axis of scale. The rune emerged as a cartoony chromed note, springing from his lips to hang in the air,

ellipsoidal, reflecting everything. It was a work of art, nothing more or less than a representation of Jayjay's current exalted state.

"Oh, yeah," said the pitchfork. "You done that nice and strong."

Farther than far was a planet with a nest upon a giant tree, a virtual form like their beanstalk. Bright eyes in the nest were watching Jayjay. Glittering. A silver egg rose from the nest, a shining shape that copied Jayjay's shining note.

"Yoo-hoo," bellowed Jayjay. He was an *aktual*. What the hell did he have to be afraid of. "Yoo-hoo!" he roared again.

With nightmarish alacrity, the distant silver orb reached through the eighth-dimensional wormhole—and appeared in the bower, floating beside Jayjay's note. The new chrome ellipsoid loomed menacingly over Jayjay, probing his and Sonic's minds.

"Now you done it, Jay," said the pitchfork. "You screwed the pooch. I know you gonna fix this, we've been around this whole loop before. But right now I'm outta here." The pitchfork flinched back from the gleaming invader and slid Earthwards down the scale axis.

The teep contact from the shiny probe was itchy, squawky, raw. But the vibes were all too comprehensible. Somewhere an alien mind was avidly pleased to find a humanoid lazy eight world. Her name was Panpenga. Already she was forming development plans.

"We're dust," said Sonic.

Aching with regret, Jayjay flinched back from the shining intruder, wanting to climb down the beanstalk, wanting to take it all back. The shiny egg followed his moves like the head of a hungry eel. Sonic lost his footing and fell—down, down, down into nerveless sleep. But Jayjay wasn't so fortunate. The psychic space around him was like mud, like taffy. He was stuck in place.

Taking its time, the scale tendril's terminus reshaped itself, tucking in a bit here, growing out a lump there—until she had taken on the exact form of Jayjay's body. The chrome shape overlaid herself upon Jayjay with a gentle coo—and an exquisite sensation of erotic pleasure. Panpenga's transmission began.

Jayjay's mouth dropped open and he made a tuneless hum. His penis was throbbing. An astronomical flow of runes rushed through him and into the teeming night.

Jayjay's Dream, Version C, Pitchfork sellout

Jayjay and Sonic labored in the unseen world, piling idea upon idea, energy upon energy, working their way high above the surface of the cartoony pig-eared icon that was Mother Earth. But they weren't getting all that far.

"Yee haw!" hollered a voice. It was a virtual image of the talking pitchfork. He pried at the base of their junkpile observatory and sent it crashing down. Jayjay lost track of Sonic, and for the matter Gaia too. He was alone, lying on the floor in the living room next to the bedroom where Thuy slept. His wife. Should he stand up? Yes.

He got up, opened his eyes. He wasn't in his living-room.

He was somewhere outside of space, between the branes, at the base of an immense beanstalk, a vegetal vine with heart-shaped leaves rustling in the fitful air. Solidly here, between the dimensions, standing at the at the base of an infinite eight-dimensional beanstalk, him and the pitchfork.

"Let's climb," said the pitchfork, nodding his prongs. "High times ahead, Jay boy. Your mind's been infinite every since lazy eight unfurled. The sky's no limit."

And so Jayjay mounted the impossible tower of blossoms and tendrils. From using his lazy eight memory access, he was familiar with the notion that he could keep redoubling his speed so as to reach out endlessly far into his special memory upgrade. And now he was doing it with his body, flying up the leaves like an amok machine. What made the process superbizarre was that he kept thinking he was done, and then finding that he'd started up a new phase by toppling the lead domino of yet another chain of action. Moving past level after level, Jayjay felt the fine ecstasy of unlimited acceleration: more, *more*, *MORE*.

At the end, he was seeing himself from a slight remove, as if a meter back in his wake: he was a flat beetle with two antennae. He glowed yellow-white against a dull-green vine beneath a dark red night sky striped with a forest of similar vines, all of them closing in on a cloud that was closer than ever, though still infinitely far way.

A helical spring of vine tendrils strings curled around him. He shot up the hollow axis of the helix, surfing the ribbed green life towards the Cosmos itself. And now the Cosmos was inside him, a dream within a dream.

And all of this was real; it wasn't a dream. He was really climbing an infinite extradimensional beanstalk in a finite amount of time. The first ten yards in a minute, the next ten yards in half a minute, the next in a quarter of a minute—and at the end of two minutes he'd climbed to the top.

He had no way to assimilate what he saw—so he saw it as in an archetypal Jack and the Giant cartoon. The beanstalk ended in a cloud; upon the cloud there perched castle, nestled in a bosky bower of flowers and vines; beyond the castle mounted a transfinite range of hills.

The blossoms were the stars, implacably close and bright. The tendrils were lazy eight links to other worlds, dizzying tunnels that brought the furthest corners and deepest recesses of space within reach. All of them gathering within the castle at the top of the beanstalk.

"They say there used to be a giant lived in the castle, but he's moved on," said the pitchfork. "Further up into those mountains. This castle's a clubhouse now for any lazy eighters hip enough to come. Folks from all over the universe."

They clattered across the bridge and entered the bustling castle. Jayjay saw innumerable beings: lions and lizards, snakes and snails, crystals and cars.

Resting upon a table in corner was a magic harp with a girlish face and an enchanting voice, the very harp that Jayjay had used to unfurl the eighth dimension some hundred days ago.

"Howdy, Lovva!" called the pitchfork. "Reset time. I done forgot where to find you down to Earth."

"Hi there, Groovy," said the harp. "My avatar is on the other brane." Her contralto voice rose and fell in smooth glissandos that set the pitchfork to shuddering with pleasure. "A famous painter is decorating me. I ended up in Hibrane Earth's medieval period. But that's quite alright, as the records show that I sounded the Lost Chord back then. Unfortunately my avatar doesn't remember the notes."

"I'll help our boy Jay over to the Hibrane directly," said the pitchfork. "He knows that tune real good."

"Don't bungle it," said the harp. "You're so out of it, so crude."

"You the one who got lost. Why the hell's it always me who's gotta find you? Needle in a frikkin' haystack."

"Don't criticize me, you vulgar lowlife!" The harp's tone rose in a sharp crescendo.

“Aw, I don’t mean nothing,” said the pitchfork, leaning forward to give the harp’s strings a gentle strum. “Long as I can hear you, I’m happy.”

“Sweet,” said the harp, dropping her ill humor and enjoying her mate’s touch. She sang a sweeping arpeggio. And then she turned to Jayjay. “How do you like it up here?”

Jayjay felt filled with inconceivable power. The awareness of having an infinite mind had redacted his mental computations, had fed unearthly patterns into his memory.

“It’s wonderful,” was all he said.

“I got someone else wants to meet Jayjay, too,” said the pitchfork. “Sing out hello so she can find you, Jay!”

Jayjay opened his mouth and bellowed a rune. That is, he sang, teeped a thought, teeked a push, and wrapped it all in an infinite description of his thoughts. The rune emerged as a cartoony chromed note, hanging in the air before his lips, ellipsoidal, reflecting everything. It was a work of art, nothing more or less than a representation of Jayjay’s current exalted state.

“Oh, yeah,” said the pitchfork. “You done that goood.”

Far across the castle’s great hall was a dirty nest, with glittering eyes peeping from a mound of feathers. The feathers twitched, and a silver egg popped out from the nest, hanging in the air, the twin to Jayjay’s shining note.

“Yoo-hoo,” called Jayjay to the mystery egg. He’d climbed the beanstalk! What the hell did he have to be afraid of. “Yoo-hoo!” he roared.

With nightmarish alacrity, the silver egg flew across the teeming hall and merged with Jayjay’s note. The enlarged ellipsoid loomed over him, probing his mind, evaluating him.

“Oh oh, now you done it, Jay,” said the pitchfork, as if in sorrow. “You done screwed the pooch. Your bad.”

“You set him up!” the harp exclaimed, still watching from the table. “You sold out Jayjay’s world to a filthy developer we’ve never even seen before. I don’t believe you keep doing things like this, Groovy! I’ll have to clean up after you again!”

“I need a little glory,” said the pitchfork. “This developer bird says she’s gonna have the Earthlings puttin’ up statues of me.”

“Developers never keep their promises,” said the harp. “Don’t you know that yet? You are such a crude yokel. I don’t understand why I—”

“Can we save the big bawl-out-Groovy session till we actually together in the flesh?” said the pitchfork. “I say we focus on how we gonna make that happen, my little flibbertigibbet. What with you lost on the wrong brane and all.”

“*Hmmpf*,” said the harp, both miffed and amused.

“That’s my girl,” said the pitchfork.

And with that the two of them disappeared, leaving Jayjay to face the consequences.

The teep contact from the shiny egg was itchy, squawky, raw. The alien bird-mind was avidly pleased to find a teeker humanoid from a lazy eight world. Her name was Pekka. She had huge development plans.

Aching with regret, Jayjay flinched back from the shining intruder, wanting to leave the castle and climb down the beanstalk, wanting to take it all back. The shiny egg followed his moves across the hall like the head of a hungry eel.

Taking its time, the egg reshaped itself, tucking in a bit here, growing out a lump there—until she had taken on the form of a sexy woman's body, like shiny plastic instead of like chrome. As Jayjay clattered out of the castle and into the cloudy bower of vines, the slinky shape overlaid herself upon Jayjay with a gentle coo.

An exquisite sensation of erotic pleasure filled his mind. And in that moment of sensual bliss, Jayjay agreed to do whatever Pekka said.

And now Pekka's first transmission began.

Down in the cabin, Jayjay's mouth dropped open and he made a tuneless hum. His penis was throbbing. An astronomical flow of runes rushed through him and into the teeming night.

Jayjay's Dream, Version D, Flopsy Bunnies

How did all the silps fit together? Empowered by his contact with Gaia—and coached by the pitchfork—Jayjay had a sudden scientific insight. *Objects were more than the sum of their parts*. Each object's contents were wrapped in a knotty net of dark-energy string. An object was more than an inventory, it was an overarching gestalt.

Jayjay's self, his soul, his I—it was a woven bag: his. The carbon atom was a bag too, and his heart, and the human race, and Gaia, and the Milky Way galaxy—each was a dark-energy string bag of knotty info. And that explained why an object's silp was more than just a squabbling congress of member silps.

Pleased by Jayjay's pitchfork-promoted discovery, Gaia flashed an oblique reference to a children's book, *The Tale of the Flopsy Bunnies*, in which Mr. McGregor put Flopsy's six baby bunnies into a cloth sack, Flopsy and her friend Thomasina Tittlemouse chew open a corner of the sack and replace the bunnies with three rotten vegetable marrows, an old blacking-brush and two decayed turnips—fooling Mr. McGregor. Moral: in either case, the sack is the same.

Jayjay was a sack and so was Gaia. The sacks were woven from dark-energy string, each sack a single loop. Jayjay's loop had a gazillion turnings and Gaia's had—maybe the same number, or maybe more. Jayjay lost track of Gaia as he focused on tracing the pattern of his own soul's string.

Jayjay's Dream, Version E, Beanstalk Infinity

I had this on December 20, 2007.

They played with the vortices for awhile, relishing the mental associations. Gloob played along, subtly warping his flows to raise the level of the game. But then all of a sudden Gloob focused his turbulence on a particular spot by the opposite bank.

“Outsider!” teeped the stream silp. “Danger!”

Jayjay saw a strange apparition on the dark bank: a two-tined pitchfork balancing on its butt end. The pitchfork was glowing a dusky shade of red.

The pitchfork's handle—or leg—flexed, and its two prongs vibrated, sending out a high, singing buzz that articulated into speech—a male hillbilly voice. “Jayjay,” twanged the pitchfork. “Git high. I'll take you to the magic beanstalk. My name's Groovy.”

The pitchfork gave off a strangely flavored teep signal that echoed his spoken words with an emotive sense that he was offering something quite wonderful. “Climb up on top of Gaia, Jay,” continued the pitchfork. “Then I'll flip you over to the island whar the beanstalk grows.”

“The silp in that weird forked stick is talking out loud!” exclaimed Sonic, who’d finished off the champagne. “That’s not right, kiq. I say we throw the stick in the fire. See what he says then.”

With an abrupt series of thumps the pitchfork hopped upstream, crashing through the underbrush. And then all was silent. The curious being had merged into the forest gloom, impossible to teep.

“He was a talking pitchfork named Groovy,” said Jayjay. “Not a stick.”

“Country cowfreak,” said Sonic, giggling. “He told us to get high.”

“Let’s do that,” said Jayjay. “Never mind the rest of it.” He and Sonic lay down flat, joined their minds and spiraled up towards the pig-like blue face of Gaia’s interface.

“Hi, boys,” said Gaia as they sank into her ultramarine funnels. “Ready for a really good time?”

Jayjay unpacked Ond’s design document, meaning to study it, but he quickly forgot it in the pleasure of the Gaian mind-tendrils. The boys swooped and sang, savoring the sensual feel of raw thought.

Now and then Jayjay felt something pricking at him—prongs? Surely that weird pitchfork wasn’t standing over him beside the stream? He didn’t have the will to leave his trance and find out for sure. If anything, the pitchfork’s prods were nudging him deeper.

At some point during the night’s long, chaotic journey, Jayjay felt Thuy shaking him and walking him to their now pitiful-seeming honeymoon cabin. Waggish Gaia displayed a relevant archetype: The Groom Drunk On His Wedding Night. Not that Jayjay was truly drunk. In principle, he could snap out of his Gaia trip and be with Thuy right now.

But he didn’t. That was the addiction thing at work. Once Jayjay got going on a run like this, he found it nearly impossible to stop. He collapsed onto the living-room floor and lay still, knowing full well there’d be a stiff price to pay. But it was still night. Hours to go. And the flow of time was so deliciously slow. The Groom Drunk On His Wedding Night—what a hoot, what a blast.

“You’re horrible,” said Thuy, and went to bed.

Sonic’s virtual form hung nearby like a basking whale. “Yo,” he called to Jayjay. “Let’s go higher. Higher than anyone’s ever been before. Maybe we can see some other lazy eight planets.

“Yaar.”

Jayjay and Sonic labored in the unseen world, piling idea upon idea, energy upon energy, working their way high above the surface of the cartoony pig-eared icon that was Mother Earth. But they weren’t getting all that far.

“Yee haw!” hollered a voice. Groovy, the pitchfork, was in the mind space with them. Getting busy with his tines, he pried at the base of their junkpile observatory, toppling it to one side. Jayjay fell at some impossible angle—and slid towards wakefulness.

He was alone, lying on his back, hearing the wind in the trees. Or, no, that was the faint hiss of waves. It was way past time to get in bed with Thuy. He stood up and opened his eyes.

He wasn’t in his living-room.

Even though he’d never before entered the interdimensional space between the Lobrane and the Hibrane, Jayjay felt sure this was where he was. The glittering, unnatural ocean spreading on every side—that had to be the Planck sea, home of the

subbies. Jayjay looked down at his hands and slowly flexed them. Every detail in place. He was really and truly awake.

Thuy had spoken about flying across this sea, but Jayjay was standing on a cartoony little island—a circular fringe of sand around the shaft of a giant beanstalk, solidly real, rising to infinity, draped with rustling heart-shaped leaves.

“Let’s climb,” said Groovy, suddenly at his side. The pitchfork pointed upwards with his prongs, alert, intent. “You gonna be like a god, Jay. An aktual like me. The sky ain’t no limit.”

Jayjay felt in the air like a blind man, not quite believing that his honeymoon cabin was nowhere around. What had he done? “Where’s Thuy?” he asked.

“Just come on and take a look at the cloud on this beanstalk, Jay. Infinity’s up thar. It’ll do you good to catch the buzz. Won’t take long. And then you’ll be back home with the frau.”

Jayjay gazed up at the gently swaying stalk. It really and truly went on forever.

“Alef-null,” he murmured. The math word for the first level of infinity, the cardinality of the set of all integers. “All right. Here we go.”

Jayjay’s hands and feet seemed to adhere to the stalk, he mounted up it as readily as a fly on a wall.

Groovy bucked along behind him like a caterpillar. “Step it up,” urged the pitchfork. “Do one of them Zeno speed-ups.”

With the coming of lazy eight, people had picked up a certain standard trick for covering alef-null virtual steps in a finite amount of time—they called it a Zeno speed-up. The idea was that you could search the first gigabyte of your lazy eight memory in a second, the next gigabyte in half a second, the next in a quarter of a second—and at the end of two seconds, you’d have searched your whole infinite spike of eighth dimensional memory, winnowing through alef-null gigabytes. Everyone did it all the time.

Zeno speed-ups played a part in telepathy as well. Everyone’s personal eighth-dimensional axis ended up at the same infinity—an idealized point that that acted as cosmic router, bouncing the signals back down. You used Zeno speed-ups to get the teep signals there and back.

Here and now, on this leafy beanstalk, Zeno speed-ups were becoming physically real. Jayjay was here in the flesh, climbing an infinite extradimensional beanstalk in a finite amount of time, scrambling up from leaf to leaf, feeling the fine ecstasy of unbounded acceleration: more, *more*, *MORE*.

Near the end, he saw himself from a slight remove, as if floating in his own wake. He glowed yellow-white against the dull-green vine beneath a dark red night sky crowded with a converging forest of bright lines—the great sheaf of Earth’s parallel lazy-eight memory axes, all closing in on same point at infinity—which was shrouded in luminous haze. Nestled in among all the lines was Jayjay’s own personal lazy-eight spike; he was sliding up it like a bead on a wire. Teep signals flickered up and down the other axes.

The mysterioso cloud at the top wasn’t something he’d been aware of before. When checking his memory, or teeping a signal off the point at infinity, he’d always experienced the top as a hairpin turn, a hiccup, a click of static. You zoomed up, and you zoomed down. You didn’t see the scenery. But now Jayjay was hearing the faint voice of infinity from the cloud: a fractal hiss, an intricate buzz.

Meanwhile the elephant-ear beanstalk leaves were flipping past in a blur. There was a sense in which infinity still remained alef-null steps ahead, but—thanks to the speed-up—Jayjay knew he'd be there in just a moment. Arms and legs working mechanically, he chanced a quick glance down towards the crawling surface of the Planck sea. Hazy continents lay on either side: homey Lobrane and the alien Hibrane.

The pitchfork seized on Jayjay's moment of inattention to give him a cartoon poke in the butt—*yow!* He flew free of the vine and shot into the cloud, which had a fibrous texture like cotton candy. He grabbed hold of the cloud-stuff with both hands, terrified at the thought of falling. As if from a great distance, he heard the cackling pitchfork working his way up towards the cloud's top surface.

But that didn't matter. Right now, right here, nestled in the fog was—infinity. And it wasn't a point after all, it was—how fitting—a preternaturally smooth figure eight, a crystalline lemniscate with its interior filled by reflections and bright caustic curves. Jack sensed the ghostly fusillade of Earth's teep signals bouncing off the loop's central crossing, bouncing off this nexus where everyone's lazy eight axis met.

For quite some time, he stared at the glassy amulet, letting its quiet, irregular hum percolate into his mind. He could feel his thoughts opening up. The infinity amulet was teaching him how to use Zeno speed-ups at will. With a feeling of luxury and leisure, he counted through all the integers from zero to alef-null. And then he did a backwards speed-up and counted back down. His thoughts were becoming infinite. Would he still have this power when he got home?

With a twang the pitchfork reappeared, tunneling down, jerking the cloud's subtle textures this way and that.

"Hey, Jay," he said. "I got some folks for you to meet up top. One of 'em is an old friend of yours. And the other one'll make you come in your pants."

Following bemusedly in Groovy's wake, Jayjay pulled his way through the gauzy strands to emerge upon the cloud's snowy upper surface. Stray vines and flowers from the beanstalk protruded from the undulating puffs. In the distance, a perfect castle sat perched upon a gleaming mound. Beyond that humped an endless range of Alps, rising without limit.

A tidy harp was awaiting Jayjay and Groovy. "This here's my girlfriend, Lovva," said the pitchfork. Oh wow. It was the same harp that Jayjay had played when he'd unfurled the eighth dimension some hundred days ago. He recognized her by her teep vibes and by her scraped-off paint.

"It's not time to send Jayjay and his wife through the castle," said the harp. "Is it?" She seemed fretful and disoriented.

"Is there an ogre in the castle?" asked Jayjay, channeling the fairy tale.

"Maybe," said the pitchfork. "But the harp and me didn't see him on our way through. There's a lot of rooms. The beanstalk gets you to alef-null, and the castle takes you to alef-one. Once you see alef-one, you like a god. You an aktual. Me and the harp done it; and you and Thuy gonna do it, too. You gonna help us with the corkscrew and the hollow ball."

"There was no reason to bring him up here without his wife," the harp told the pitchfork. "No need to call me up here, either."

"I called you because I done forgot where to find you down to Earth, Lovva," said the pitchfork.

"I'm on the other brane, Groovy," said Lovva. Her contralto voice rose and fell in smooth glissandos that set the pitchfork's tines to humming along.

“A famous painter is going to decorate me,” continued the harp. “Azaroth and I ended up in Hibrane Earth’s medieval period. And that’s good, as the records show that I played the Lost Chord back then. But there’s a problem with me doing that right now. Because I don’t remember the tune at all.”

“I’ll send our boy Jay over to the Hibrane directly,” said the pitchfork. “He knows that Lost Chord real good. Maybe *that’s* why I called you up here. So’s you could remind me. Or maybe I just felt like givin’ you a strum.”

“You’re so crude,” said the harp irritably. “So out of it.”

“You the one who got lost. Why the hell’s it always me who’s gotta find you? Needle in a frikkin’ haystack.”

“Don’t criticize me, you vulgarian!” The harp’s tone rose in a sharp crescendo. Jayjay felt uneasy. This was like listening to an old married couple bickering—a *very* old married couple, who continually forgot what they were talking about. They hardly seemed like gods.

“Aw, I don’t mean nothing,” said the pitchfork, leaning forward to give the harp’s strings a gentle flick. “Long as I can hear you, I’m happy.”

“Sweet,” said Lovva, dropping her ill humor and enjoying her mate’s caresses. She sang a sweeping arpeggio that tore a hole in the cloud near Jayjay’s feet. Looking down, he saw the beanstalk and the figure eight of infinity. His eye did a Zeno speed-up of saccades, traversing the beanstalk from bottom to top. Once again the oddity of his surroundings sandbagged him. How long had he been up here?

“You’re getting the knack,” said the harp, watching him. “I remember how excited I was to master alef-null. Wait till you see alef-one, alef-two, and all the rest of them.”

“Will I remember this?” asked Jayjay.

“I’ll bake it in,” said the pitchfork, rising up to his full height. His prongs became a blur. The vibrational sound was a variation of the infinity loop’s subtle hiss. But the pitchfork was sending out teep signals with the sound—plus peculiar jostling teek signals that Jayjay could feel in his flesh. His nerves, cells, and even molecules were being quite literally rearranged. It wasn’t a pleasant feeling.

“I cast the infinity rune right into you,” said Groovy, finally falling silent. The harp had fallen still too. Even the infinity loop down in the cloud had stopped buzzing. The hole in the cloud sealed over. It was quiet up here, so very quiet.

“Oh oh,” said the harp, breaking the spell. “Pekka.”

An ostrich-like bird was high-stepping across the cloud, her clawed toes sinking in a few inches with each stride. Her fuzzy head swiveled, studying Jayjay with one eye and then the other.

“Yoo-hoo,” called Jayjay, feeling he had nothing to be afraid of. He’d climbed the beanstalk to the top. He’d learned to think infinite thoughts, and the pitchfork had baked in the knowing with the infinity rune! “Yoo-hoo!”

He drew out that last *oo*, putting some teep and teek into it, and throwing in a mental image of himself endlessly reflected in a pair of mirrors. The sound became magically visible, a chromed note hanging in the air before his lips, ellipsoidal, reflecting everything, the size of a hen’s egg. It was a work of art, nothing more or less than a representation of Jayjay’s current exalted state. He’d created a material object from thin air.

“Oh, yeah,” said the pitchfork. “You done that goood. You cast a solid matter rune.”

“Hush, Jayjay!” warned the harp, too late. “Pekka’s a tulpa developer!”

Urgently squawking, the big bird had redoubled her pace, and now she was here, standing over Jayjay, probing his mind, her will unpleasantly strong. With a darting strike of her snake-like neck, the bird snatched Jayjay's silver egg; with wet gasp, she swallowed it whole.

And now it was the alien bird's turn to cast a rune. She let out some low, sweet clucks, mixing in teep and teek. Jayjay had the distinct sense of claws taking hold of his brain.

"You in for it now, Jay," said the pitchfork, as if in sorrow. "That was the enslavement rune. Pekka's got you now. She's gonna knot the link right into your brane.."

"Did you deliberately set him up?" demanded Lovva. "You did, didn't you, Groovy?"

"Maybe I want me some glory," muttered the pitchfork. "I'm like a god, ain't I? Maybe Pekka's gonna have the Earthlings puttin' up statues of me."

"As if!" raged the harp. "Tulpa developers don't keep their promises. You are such a crude yokel. I don't understand why I—"

"We've been all over this time line, and we know damned well that Jayjay and his gang are gonna win out," said the pitchfork defiantly. "I say there's no harm in letting this birds take their shot. It'll make Jayjay all the hotter to motorvate over to the Hibrane and teach you that Lost Chord. I'll bring him and Thuy back up here to help us with that whole thing about the corkscrew and the hollow ball. Everything's gonna come out in the wash."

"I'm so mixed up," said the harp. "Ever since I became an aktual, I can't think in that past-present-future way."

"It don't matter none," said the pitchfork. "This tune's playin' itself."

And with that the two of them disappeared, leaving Jayjay to face the music.

The teep contact from Pekka was itchy, squawky, raw. She was avidly pleased to find a teeker humanoid from a lazy eight world. She had huge development plans.

Aching with regret, Jayjay backed back from her, looking for a way through the cloud to the beanstalk. The bird followed his moves as if she were stalking a beetle in a farmyard. Again she chirped that same rune. The sense of Jayjay's connection to her was almost physically palpable.

To draw the link yet tighter, the ungainly fowl was reshaping herself, tucking in a bit here, growing out a lump there—and now she'd taken on the form of a sexy woman, all smooth and warm, with ruffs of fancy feathers. The slinky shape embraced Jayjay, repeatedly cooing the enslavement rune.

An exquisite sensation of erotic pleasure filled Jayjay's mind. And in that moment of sensual bliss, he agreed to do whatever Pekka said.

The cloud dissolved, with the beanstalk visible to one side. Jayjay tumbled downwards like a doomed giant—and landed on his back on the cabin floor.

His mouth dropped open and he made a tuneless hum. His penis was throbbing. An astronomical flow of information rushed through him and into the teeming night.

Jayjay's Dream, Version F, Another Beanstalk Infinity.

Jayjay and Sonic labored in the unseen world, piling idea upon idea, energy upon energy, working their way high above the surface of the cartoony pig-eared icon that was Mother Earth. But they weren't getting all that far.

“Yee haw!” hollered a voice. Groovy, the pitchfork, was in the mind space with them. Getting busy with his tines, he pried at the base of their junkpile observatory, toppling it to one side. Jayjay fell at some impossible angle—and slid towards wakefulness.

He was alone, lying on his back, hearing the wind in the trees. Or, no, that was the faint hiss of waves. It was way past time to get in bed with Thuy. He stood up and opened his eyes.

He wasn't in his living-room.

The glittering, unnatural ocean spreading on every side—was that some version of the Planck sea that Thuy had talked about seeing on her trips between Lobrane and Hibrane? Jayjay looked down at his hands and slowly flexed them. Every detail in place. He was really and truly awake.

Jayjay was standing on a cartoony little island—a circular fringe of sand around the shaft of a giant beanstalk, solidly real, rising to infinity, draped with rustling heart-shaped leaves. He recalled that the Planck ocean separated normal matter from the subdimensional zone. But which side of the surface was he on?

“Let's climb,” said Groovy, suddenly at his side. He pointed upwards with his prongs, alert, intent. Or was he pointing down? Jayjay's sense of orientation kept flipping. Was he standing on a floor or hanging from a ceiling. “You gonna be like a god, Jay,” continued the insistent pitchfork. “An aktual like me. The sky ain't no limit.”

Jayjay felt in the air like a blind man, not quite believing that his honeymoon cabin was nowhere around. What had he done? “Where's Thuy?” he asked.

“Just come on and take a look at the cloud on this beanstalk, Jay. Infinity's down thar. I mean up. It'll do you good to catch the buzz. Won't take long. And then you'll be back home with the frau.”

Jayjay gazed at the gently swaying stalk. It really and truly went on forever.

“Alef-null,” he murmured. The math word for the first level of infinity, the cardinality of the set of all integers. “All right. Here we go.”

Jayjay's hands and feet seemed to adhere to the stalk, he mounted up it as readily as a fly on a wall.

Groovy bucked along behind him like a caterpillar. “Step it up,” urged the pitchfork. “Do one of them Zeno speed-ups.”

With the coming of lazy eight, people had picked up a certain standard trick for covering alef-null virtual steps in a finite amount of time—they called it a Zeno speed-up. The idea was that you could search the first gigabyte of your lazy eight memory in a second, the next gigabyte in half a second, the next in a quarter of a second—and at the end of two seconds, you'd have searched your whole infinite spike of eighth dimensional memory, winnowing through alef-null gigabytes. Everyone did it all the time.

Zeno speed-ups played a part in telepathy as well. Everyone's personal eighth-dimensional axis ended up at the same infinity—an idealized point that that acted as cosmic router, bouncing the signals back down. You used Zeno speed-ups to get the teep signals there and back.

Here and now, on this leafy beanstalk, Zeno speed-ups were becoming physically real. Jayjay was here in the flesh, climbing—or descending—an infinite beanstalk in a finite amount of time, scrambling up from leaf to leaf, feeling the fine ecstasy of unbounded acceleration: more, *more*, *MORE*.

Near the end, he saw himself from a slight remove, as if floating in his own wake. He glowed yellow-white against the dull-green vine beneath a dark red night sky crowded with a converging forest of bright lines—the great sheaf of Earth’s parallel lazy-eight memory axes, all closing in on same point at infinity—which was shrouded in luminous haze. Nestled in among all the lines was Jayjay’s own personal lazy-eight spike; he was sliding up it like a bead on a wire. Teep signals flickered up and down the other axes.

The misterioso cloud at the end wasn’t something he’d been aware of before. When checking his memory, or teeping a signal off the point at infinity, he’d always experienced the top as a hairpin turn, a hiccup, a click of static. You zoomed there, and you zoomed back. You didn’t notice any scenery. But now Jayjay was hearing the faint voice of infinity from the cloud: a fractal hiss, an intricate buzz.

Meanwhile the elephant-ear beanstalk leaves were flipping past in a blur. There was a sense in which infinity still remained alef-null steps ahead, but—thanks to the speed-up—Jayjay knew he’d be there in just a moment. Arms and legs working mechanically, he chanced a quick glance down towards the crawling surface of the Planck sea. For an instant he thought he could glimpse the contours of his cozy living-room, wavering through it. So near, so far.

The pitchfork seized on Jayjay’s moment of inattention to give him a cartoon poke in the butt—*yow!* He flew free of the vine and shot into the cloud, which had a fibrous texture like cotton candy. He grabbed hold of the cloud-stuff with both hands, terrified at the thought of falling. As if from a great distance, he heard the cackling pitchfork working his way up towards the cloud’s top surface.

But that didn’t matter. Right now, right here, nestled in the fog was—infinity. And it wasn’t a point after all, it was—how fitting—a preternaturally smooth figure eight, a crystalline lemniscate with its interior filled by reflections and bright caustic curves. Jack sensed the ghostly fusillade of Earth’s teep signals bouncing off the loop’s central crossing, bouncing off this nexus where everyone’s lazy eight axis met.

For quite some time, he stared at the glassy amulet, letting its quiet, irregular hum percolate into his mind. He could feel his thoughts opening up. The infinity amulet was teaching him how to use Zeno speed-ups at will. With a feeling of luxury and leisure, he counted through all the integers from zero to alef-null. And then he did a backwards speed-up and counted back down. His thoughts were becoming infinite. Matter was endlessly divisible. The Planck barrier was an illusion. He’d been infinite all along.

With a twang the pitchfork reappeared, tunneling down, jerking the cloud’s subtle textures this way and that.

“Hey, Jay,” he said. “You fully baked yet? Oh yeah, I can see it in your eyes. You infinite now, boy, you understand alef-null. Got in your soul! Hey, I got some folks for you to meet up top. One of ‘em is an old friend of yours. And the other one’ll make you come in your pants.”

Following bemusedly in Groovy’s wake, Jayjay pulled his way through the gauzy strands to emerge upon the cloud’s snowy upper surface. Stray vines and flowers from the beanstalk protruded from the undulating puffs. In the distance, a perfect castle sat perched upon a gleaming mound. Beyond that humped an endless range of Alps, rising without limit.

A tidy harp was awaiting Jayjay and Groovy. “This here’s my girlfriend, Lovva,” said the pitchfork. Oh wow. It was the same harp that Jayjay had played

when he'd unfurled the eighth dimension some hundred days ago. He recognized her by her teep vibes and by her scraped-off paint.

"It's not time to send Jayjay and his wife through the castle," said the harp. "Is it?" She seemed fretful and disoriented.

"Is there an ogre in the castle?" asked Jayjay, dizzily thinking of the fairy tale.

"Maybe," said the pitchfork. "But the harp and me didn't see him on our way through. There's a lot of rooms. The beanstalk gets you to alef-null, and the castle takes you to alef-one. Once you seen alef-one, you like a god. You an aktual. You beyond the laws of time. Me and the harp done it; and you and Thuy gonna do it, too. You gonna be the corkscrew and the hollow ball."

"There was no reason to bring him up here without his wife," the harp told the pitchfork. "No need to call me up here, either."

"I called you because I done forgot where to find you down to Earth, Lovva," said the pitchfork.

"I'm on the other brane, Groovy," said Lovva. Her contralto voice rose and fell in smooth glissandos that set the pitchfork's tines to humming along.

"A famous painter is going to decorate me," continued the harp. "Azaroth and I ended up in Hibrane Earth's medieval period. And that's good, as the records show that I played the Lost Chord back then. But there's a problem with me doing that right now. Because I don't remember the tune at all."

"I'll send our boy Jay over to the Hibrane directly," said the pitchfork. "He knows that Lost Chord real good. Maybe *that's* why I called you up here. So's you could remind me. Or maybe I just felt like givin' you a strum."

"You're so crude," said the harp irritably. "So out of it."

"You the one who got lost. Why the hell's it always me who's gotta find you? Needle in a frikkin' haystack."

"Don't criticize me, you vulgarian!" The harp's tone rose in a sharp crescendo. Jayjay felt uneasy. This was like listening to an old married couple bickering—a *very* old married couple, who continually forgot what they were talking about. They hardly seemed like gods.

"Aw, I don't mean nothing," said the pitchfork, leaning forward to give the harp's strings a gentle flick. "Long as I can hear you, I'm happy."

"Sweet," said Lovva, dropping her ill humor and enjoying her mate's caresses. She sang a sweeping arpeggio that tore a hole in the cloud near Jayjay's feet. Looking down, he saw the beanstalk and the figure eight of infinity. Effortlessly, he let his eye do a Zeno speed-up of saccades, traversing the beanstalk from bottom to top. Once again the oddity of his surroundings sandbagged him. How long had he been up here?

"You got the knack now," said the harp, watching him. "I remember how excited I was to learn alef-null. Wait till you see alef-one, alef-two, and all the rest of them."

"Will I remember this?" asked Jayjay. "Is this real?"

"Look into yourself," said the pitchfork. "You know it is."

Teeping down into his body, Jayjay sensed something different about his particles. There was no longer a lower bound to their size. Like Groovy had said, the Planck barrier was gone. He truly was infinite.

Groovy had finally stopped talking, and the harp fallen still too. The hole in the cloud had sealed over, silencing the infinity loop's buzz. It was quiet up here, so very quiet.

“Oh oh,” said the harp, breaking the spell. “Pekka.”

An ostrich-like bird was high-stepping across the cloud, her clawed toes sinking in a few inches with each stride. Her fuzzy head swiveled, studying Jayjay with one eye and then the other. A golden thread led from her ankle off to some distant point on the cloud.

“Yoo-hoo,” called Jayjay, feeling he had nothing to be afraid of. He’d climbed the beanstalk to the very end. And now he was infinite! “Yoo-hoo!”

He drew out that last *oo*, putting some teep and teek into it, and throwing in a mental image of himself endlessly reflected in a pair of mirrors. The sound became magically visible, a chromed note hanging in the air before his lips, ellipsoidal, reflecting everything, the size of a hen’s egg. It was a work of art, nothing more or less than a representation of Jayjay’s current exalted state. He’d created a material object from thin air.

“Oh, yeah,” said the pitchfork. “You done that goood. You cast a solid matter rune.”

“Hush, Jayjay!” warned the harp, too late. “Pekka’s the planetary mind of an invader world.”

Urgently squawking, the big bird had redoubled her pace, and now she was here, standing over Jayjay, probing his mind, her will unpleasantly strong, her long golden leash trembling. With a darting strike of her snake-like neck, the bird snatched Jayjay’s silver egg; with wet gasp, she swallowed it whole.

And now it was the alien bird’s turn to cast a rune. She let out some low, sweet clucks, mixing in teep and teek. Jayjay had the distinct sense of claws taking hold of his brain.

“You in for it now, Jay,” said the pitchfork, as if in sorrow. “That was the enslavement rune. Pekka’s got you now. She’s gonna knot the link right into your brane.”

“Did you deliberately set him up?” demanded Lovva. “You did, didn’t you, Groovy?”

“Maybe I want me some glory,” muttered the pitchfork. “I’m like a god, ain’t I? Maybe Pekka’s gonna have the Earthlings puttin’ up statues of me.”

“As if!” raged the harp. “A parasite like that isn’t going to keep any promises. You are such a crude yokel. I don’t understand why I—”

“We’ve been all over this time line, and we know damned well that Jayjay and his gang are gonna win out,” said the pitchfork defiantly. “I say there’s no harm in letting this birds take their shot. It’ll make Jayjay all the hotter to motorvate over to the Hibrane and teach you that Lost Chord. I’ll bring him and Thuy back up here to do that corkscrew and hollow ball routine. Everything’s gonna come out in the wash.”

“I’m so mixed up,” said the harp. “Ever since I became an aktual, I can’t think in that past-present-future way. When do we get to go back home?”

“Worryin’ don’t help,” said the pitchfork. “This tune’s playin’ itself.”

And with that the two of them disappeared, leaving Jayjay to face the music.

The teep contact from Pekka was itchy, squawky, raw. She was avidly pleased to find a teeker humanoid from a lazy eight world. She had huge development plans.

Aching with regret, Jayjay backed back from her, looking for a way through the cloud to the beanstalk. The bird followed his moves as if she were stalking a

beetle in a farmyard. Again she chirped that same rune. The sense of Jayjay's connection to her was almost physically palpable.

To draw the link yet tighter, the ungainly fowl was reshaping herself, tucking in a bit here, growing out a lump there—and now she'd taken on the form of a sexy woman, all smooth and warm, with ruffs of fancy feathers. The slinky shape embraced Jayjay, repeatedly cooing the enslavement rune.

An exquisite sensation of erotic pleasure filled Jayjay's mind. And in that moment of sensual bliss, he agreed to do whatever Pekka said.

The cloud dissolved, with the beanstalk visible to one side. Jayjay tumbled downwards like a doomed giant—or was he falling up? Had the beanstalk really been some endless root tap? He had a sense of growing as he flew towards the beanstalk's base. And then somehow he was again lying on the cabin floor.

His mouth dropped open and he made a tuneless hum. His penis was throbbing. An astronomical flow of information rushed through him and into the teeming night.

Jayjay's Dream, Version G. Upside down Beanstalk.

The pitchfork's handle—or leg—flexed, and his two prongs vibrated, sending out a high, singing buzz that articulated into speech—a male hillbilly voice. “Jayjay,” twanged the pitchfork. “Git high. I'll take you on the magic beanstalk. My name's Groovy.”

The pitchfork gave off a strangely flavored teep signal that echoed his spoken words with an emotive sense that he was offering something quite wonderful. “Climb up on top of Gaia, Jay,” continued the pitchfork. “Then I'll flip you over to whar the beanstalk grows all the way to the bottom of lazy eight”

“The silp in that weird forked stick is talking out loud!” exclaimed Sonic, who'd finished off the champagne. “That's not right, kiq. I say we throw the stick in the fire. See what he says then.”

With an abrupt series of thumps the pitchfork hopped upstream, crashing through the underbrush. And then all was silent. The curious being had merged into the forest gloom, impossible to teep.

“He was a talking pitchfork named Groovy,” said Jayjay. “Not a stick.”

“Country cowfreak,” said Sonic, giggling. “He told us to get high.”

“Let's do that,” said Jayjay. “Never mind the rest of it.” He and Sonic lay down flat, joined their minds and spiraled up towards the pig-like blue face of Gaia's interface.

“Hi, boys,” said Gaia as they sank into her ultramarine funnels. “Ready for a really good time?”

Jayjay unpacked Ond's design document, meaning to study it, but he quickly forgot it in the pleasure of the Gaian mind-tendrils. The boys swooped and sang, savoring the sensual feel of raw thought.

Now and then Jayjay felt something pricking at him—prongs? Surely that weird pitchfork wasn't standing over him beside the stream? He didn't have the will to leave his trance and find out for sure. If anything, the pitchfork's prods were nudging him deeper.

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Jayjay and Sonic labored in the unseen world, piling idea upon idea, energy upon energy, working their way high above the surface of the cartoony pig-eared icon that was Mother Earth. But they weren't getting all that far.

“Yee haw!” hollered a voice. Groovy, the pitchfork, was in the mind space with them. Getting busy with his tines, he pried at the base of their junkpile observatory, toppling it to one side. Jayjay fell at some impossible angle, plunged through the very fabric of space—and slid towards wakefulness.

He was alone, lying on his back, hearing the wind in the trees. Or, no, that was the faint hiss of waves. Or was it radio static? In any case, it was way past time to get in bed with Thuy. He stood up and opened his eyes.

He wasn't in his living-room. He was in a—subterranean mine? He had a sense that he was standing upside down—like a fly on a ceiling. Below him was a dimly glowing shaft, endlessly descending into the gloom. Jayjay disliked the sensation of being underground. He looked down at his hands and slowly flexed them. Every detail in place. He was really and truly awake—but in a nightmare.

“Let's burrow to the bottom,” said Groovy, suddenly at his side. He pointed at the infernal tunnel, his prongs alert and intent. “It leads down into the eighth dimension. Alef-null kilometers to the bottom, you understand. Or a zillionth of nanometer, looked another way. Depending on whether you see it from the inside or the out.”

“I don't want to go,” said Jayjay, not taking the time to analyze the pitchfork's paradoxes. He pawed the fetid air like a blind man, not quite believing that his cozy honeymoon cabin was gone. What had he done to deserve this?

“I can flip this scene, so's it don't bum you out,” said the pitchfork, sensitive to Jayjay's mental vibrations. “Up to down and figure to ground.”

Like some cosmic do-si-do, the hellish scene twisted around the axis of the descending shaft. The dark walls became empty sky, the tunnel became a twisting green shape—and Jayjay's sense of orientation reversed. He was standing upright instead of dangling like a chandelier, standing on a cartoony little island—a circular fringe of sand around the shaft of a giant beanstalk, solidly real, rising up forever, draped with rustling heart-shaped leaves. Spreading out from the island was the glistening surface of an unearthly sea.

“One of these days, I'll take you and Thuy out to infinity,” continued the garrulous pitchfork. “You two gonna be like gods, Jay. Aktuals like the harp and me. Beyond the laws of time. You two gonna be a tornado and an egg, what I heard.”

“Where's Thuy right now?” demanded Jayjay, increasingly bewildered.

“Just come on and climb a ways along this beanstalk, son. Just far enough so's you learn to be a decent zenohed. And meet a couple of folks. Won't take long. And then you'll be back home with the frau.”

Jayjay gazed at the gently swaying stalk. It was a lot more appealing than that tunnel had been. He'd wanted to get high, hadn't he? “All right,” he said. “Let's go.”

His hands and feet seemed to adhere to the stalk; he climbed upwards with ease. Groovy bucked along behind him like a caterpillar. “Step it up,” urged the pitchfork. “This is whar you learn about gettin' real with them Zeno speed-ups.”

With the coming of lazy eight, scientists had begun talking about a theoretical trick for covering the endless axis of eighth dimensional memory in finite amount of time—they called it a Zeno speed-up. In principle, you could search the first gigabyte of your lazy eight memory in a second, the next gigabyte in half a second, the next in a quarter of a second—and at the end of two seconds, you'd have searched your whole infinite spike of eighth dimensional memory, winnowing through alef-null gigabytes. But in practice, each step of a search took a certain amount of energy, and

there seemed to be fundamental limits to the speed in which you could do things with your mind. Human mental procedures seemed to poop out after an octillion or so steps.

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As Jayjay zoomed along, he saw the beanstalk as surrounded by a forest of bright lines—the great sheaf of Earth’s parallel lazy-eight memory axes, all arrowing towards infinity, which seemed to be shrouded by a luminous haze at the beanstalk’s inscrutable top. Nestled in among all the lines was Jayjay’s own personal lazy-eight spike and—this was the new secret he was learning—power was flowing down the axis like current down a wire.

The further Jayjay went, the smaller and faster he became. The beanstalk leaves were the size of stadiums, the size of counties, flipping past in a blur. Arms and legs working mechanically, he chanced a quick glance down towards the crawling surface of the sea below. For an instant he thought he could glimpse the galactically large contours of his cozy living-room on the other side.

The pitchfork seized on Jayjay’s moment of inattention to give him a cartoon poke in the butt—*yow!* He lost hold of the vine and skidded onto a heart-shaped leaf that was even larger than he’d supposed.

“Hey, Jay,” said the pitchfork, bouncing along on the viridian green surface, balancing on the butt of his handle. “This is far enough for today. Ten tridecillion steps. You done good. I saw you sucking that subdimensional energy off the lazy eight axis. You slick, boy, you a zenohed now.”

“Zenohead?”

“Yeah, Jay. It’s like a junior woodchuck version of bein’ a full-blown aktual. But never mind that. I got some folks for you to meet. One of ‘em is an old friend of yours. And the other one’s likely to make you come in your pants.”

Stray tendrils and flowers from the beanstalk drooped down over the leaf, making the space like a festooned ballroom. But, despite what the pitchfork had said, there was nobody else to be seen. Was this some kind of trap?

The pitchfork rose up to his full height and set his tines to soundlessly vibrating. Something like teep signals were beaming out from him—and immediately disappearing into another dimension.

Jayjay backed away, feeling a little afraid. With a little popping sound, something appeared up ahead, beside a fragrant bean blossom. A tidy harp.

“It’s not time to aktualize Jayjay and his wife yet,” said the harp. “Is it?” She seemed fretful and disoriented.

“This here’s my girlfriend, Lovva,” the pitchfork told Jayjay.

Oh wow. It was the same harp that Jayjay had played when he’d unfurled the eighth dimension some hundred days ago. He recognized her by her teep vibes. But unlike before, the painting on her soundbox was intact. A pair of lovers beside a little blue demon who was serenading them with a golden harp of his own. The woman looked slightly Asian, with a delicacy to her features and a certain arch to her eyes. With a shock, Jayjay realized it was an image of Thuy. And the guy with her, could that be—

“There was no reason to bring him up here without his wife,” fretted the harp. “No need to call me up here, either. We’re neither here nor there.”

“I called you because I don’t know to find you down to Earth, Lovva,” said the pitchfork.

“I’m on the other brane, Groovy,” said Lovva. Her contralto voice rose and fell in smooth glissandos that set the pitchfork’s tines to humming along. “I’m time skimming. I already saw you there. You show up at the house of this painter who decorates me. It’s in Hibrane Earth’s medieval period. Azaroth and I ended up there. I played the Lost Chord for them. That same harpist who we met beyond infinity was there. The young man who’s with you right now.”

“I’ll send our boy Jay over to the Hibrane directly,” said the pitchfork. “You already taught him that Lost Chord in the Lobrane, so he’s good to go. I called you up here so’s you could remind me where to send him. Also I felt like givin’ you a good strum myself.”

“You’re so crude,” said the harp irritably. “So out of it.”

“You the one who got lost. Why the hell’s it always me who’s gotta find you? Needle in a frikkin’ haystack.”

“I’m not lost at all, you hick!” The harp’s tone rose in a sharp crescendo. Jayjay felt uneasy. This was like listening to an old married couple bickering—a *very* old married couple, who continually forgot what they were talking about. They hardly seemed like gods.

“Aw, I don’t mean nothing,” said the pitchfork, leaning forward to give the harp’s strings a gentle flick. “Long as I can hear you, I’m happy.”

“Sweet,” said Lovva, dropping her ill humor and enjoying her mate’s caresses. She sang a sweeping arpeggio. Looking down, Jayjay let his eye do a Zeno speed-up of ten tridecillion saccades, traversing the beanstalk from the bottom to the leaf upon which he’d fetched up. Once again the oddity of his surroundings sandbagged him. How long had he been here?

“You got the knack now,” said the harp, watching him. “I remember how excited I was to become a zenohead. Wait till you get aktualized and see infinity. You’ll be a tornado and you’ll pay us back by aktualizing Lovva and me.”

“Will I remember this?” asked Jayjay. “Is this real?”

“Look into yourself,” said the pitchfork. “You know it is.”

Teeping down into his body, Jayjay sensed something different about his particles. There was no longer a lower bound to their size. It was as if the old Planck scale barrier was gone. His particles were subdimensionally divisible—and he’d never noticed it before.

Groovy had finally stopped talking, and the harp fallen still too. A moment of silence, and then the pitchfork set himself to vibrating. This time he wasn’t calling someone, he was—making something, creating a physical object, one atom at a time. An ostrich-like bird, extremely large. She lay limp as a butchered goose until a burst of teep signals pulsed into her, whizzing down the lazy eight axis from infinity. The bird squawked, got to her feet, looked around. She was a hundred feet tall.

“Oh no,” said the harp. “He’s incarnated Pekka. He vaared a physical body for her!”

The giant bird came high-stepping across the leaf, her clawed toes sinking in a several meters with each stride. Her fuzzy head swiveled, studying Jayjay with one huge eye and then the other. She smelled musty.

...

“Odds are that Jayjay and his gang are gonna win out,” said the pitchfork defiantly. “I say there’s no harm in letting the bird world take a shot. It’ll make Jayjay all the hotter to motorvate over to the Hibrane and play you again. And later I’ll aktualize him and Thuy so they can do their egg and tornado routine on our home

world. Last of all, they'll free their world from the Peng. Everything's gonna come out in the wash."

"I'm so mixed up," said the harp. "Ever since I became an aktual, I can't think in the past-present-future way. There's so much to do before we can go home."

"Worryin' don't help," said the pitchfork. "This tune's playin' itself."

And with that the two of them dove off the edge of the leaf and disappeared, heading in opposite directions, leaving Jayjay to face the music.

The mental contact from Pekka was itchy, squawky, raw. It wasn't lazy eight teep; it was an old school quantum entanglement hookup—via all the particle strings that she'd tied into Jayjay's body. Pekka was avidly pleased to find a teeker humanoid from a lazy eight world. She had huge development plans.

Aching with regret, Jayjay backed back from her, wanting to climb down the stalk. The bird followed his moves as if he were a particularly juicy beetle. Again she chirped at him. Jayjay's sense of connection to her was physically palpable.

To draw the link yet tighter, the ungainly fowl began reshaping herself, tucking in a bit here, growing out a lump there—until she'd taken on the form of a sexy giant woman, all smooth and warm, with ruffs of fancy feathers. The slinky shape embraced Jayjay, cooing all the while.

An exquisite sensation of erotic pleasure filled Jayjay's mind. And in that moment of sensual bliss, he agreed to do whatever Pekka said.

With a flap of her stubby wings, Pekka flipped Jayjay off the edge of the leaf. He tumbled downwards like a doomed giant. And then somehow he was lying on his cabin floor.

His mouth dropped open and he made a tuneless hum. His penis was throbbing. An astronomical flow of information rushed through him and into the teeming night.

The Endless Helix

[This is a variation on something in [Jayjay's Dream Vision, Version 2](#), but now, September 27, 2007, I'm dropping it to make things simpler. I'll use this somewhere else sometime.]

Jayjay was seeing everything as a loop of string, and the aktualization rune was telling him to link a scaled tower of loops into a helical coil to wrap around the beanstalk.

He started by snipping the knotted loop of his own soul—experiencing a moment of breathless fear—was he going to die? But he had no choice. The aktualization rune was driving him.

The two loose ends of his soul hung free, not unraveling for now. Quickly he snipped a loop in his heart and loop in the racial mind. And now he attached one of his soul's loose ends to a loose end of his heart string, and his soul's other loose end to a loose end of the race mind's string. He snipped Gaia's string and attached one end to the race mind; snipped a cell in his heart and attached the heart to the cell.

He kept working, linking up to the solar system and to the galaxy; linking down to his genome and to a carbon atom. As he snipped and linked the strings, the insistent aktualization rune steered him with the vision of a helix that led from nothing to everything. He was stretching both ways.

On the one hand, he was moving towards everything by letting his feeling of spatial immediacy expand around his body to include Thuy, his cabin, the woods, and the night sky; in step with this, his sense of the present was expanding to include Thuy's recent thoughts, the trails of the wind currents, the evolution of the redwoods, and the dance of the stars.

On the other hand, he was moving towards nothing by chipping away at his identification with any region of space, sinking into himself, dropping below the Planck barrier; and to accompany this mental gesture, he was shrinking his "now" by letting go of his thoughts and emotions.

He was continued chopping and linking strings like an amok knitting machine. What made the process superbizarre was that he kept thinking he was done, and then finding that he'd started up a new phase by toppling the lead domino of yet another chain. Moving past level after level of scale, Jayjay felt the fine ecstasy of unlimited acceleration: more, *more*, *MORE*.

At the end, he was seeing himself from a slight remove, as if a meter back in his wake: he was a flat surfboard with two antennae. He glowed yellow-white against a dull-red sea beneath a darker red night sky stippled with dimensional transporters.

The helical spring of linked strings curled around him. He was shooting down the hollow axis of the helix, surfing the ribbed tube towards the Cosmos itself. And now the Cosmos, too, was inside him, a dream within a dream.

Jayjay opened his eyes. Was he awake in his living-room? No. So this was a dream. No again. He was solidly here, in between the dimensions, standing at the base of an infinite beanstalk, him and the pitchfork.

"You aktual now," said the pitchfork, nodding his prongs. "High times ahead, Jay boy. Let's climb."

And so Jayjay mounted the impossible tower of blossoms and tendrils. From using his lazy eight memory access, he was familiar with the notion that he could

keep redoubling his speed so as to reach out endlessly far into his special memory upgrade.

But this wasn't a mental process; this wasn't a dream. He was really climbing an infinite beanstalk in a finite amount of time. The first ten yards in a minute, the next ten yards in half a minute, the next in a quarter of a minute—and at the end of two minutes he'd climbed to the top.

Harp into Pitchfork

But—the harp was undergoing a bizarre metamorphosis. One by one her strings were snapping and sinking into her frame. The post at her front end turned to taffy, melted in two, and the stubs sank into the frame leaving a shape like a U. And now, from the butt of the U, a bump grew out and lengthened.

Jayjay sprang back. The creature had turned into—that pitchfork from before! The pitchfork balanced on his single rubbery leg. Again his two prongs were vibrating, but more fiercely than before.

“Howdy!” said the pitchfork. “Now I'm gonna grow you.”

Vib

“What are you going to name the new metanovel, anyway?” Jayjay asked, drawn into the drifty flow of conversation despite himself.

“*Vib*,” said Thuy, telling him the name for the first time. “As in vibby.”

“Pure genius,” said Jayjay.

“What's vib?” said Jil irritably.

“A vib is like a kick,” said Jayjay. “A vibe, but faster.”

“A vib is when your mind spreads out, and the world is thinking you,” said Thuy. “Instead of writing *Vib*, I want *Vib* to write me.”

“My best murals are vibs,” said Kittie. “They paint me.”

Kotona's Flanders

[A reference to *Saucer Wisdom*.]

“You know him because of that superanimation we use to play with before Nant Day,” put in Jayjay, standing there with the broken cup pieces in his hand. “*Kotona's Flanders*. It was Bosch and Bruegel both, with all the set-piece paintings in there: Bruegel's fairs and weddings and feasts and hunting parties, along with Bosch's saints, allegories and hells. Kotona had worked on his sim for years, getting it all wired so that everything was humping and writhing in 3D. He was trying to get Sonic and me to help make it into a playable game.”

“The original pictures are where it's at,” said Kittie. “Bosch wasn't a frikkin' game designer, he was a prophet.”

I'd Rather Be Dead...

“Why don't you call in the Army and the Air Force?”

“That'd be square,” said Thuy, just to needle the girl. “I'd rather be dead than square.”

Detail of St. Anthony

“I like the funnels that the bird and the cat are wearing for hats,” said Kittie. “I'm thinking the funnels are swallowing them, and jetting their minds up to a higher plane.”

Gaia's Plan for Purification

"I can think ahead quite well," said Gaia. "Even if I do make the occasional mistake. My mind works a billion times as fast as yours. I believe the combination of high temperatures and the crumbling my crust would do an adequate job of breaking up the Peng tulpa computations. Although the Peng ranch atoms will remain infected, if I disperse them, they won't be able to produce the Peng. And mixing the diseased atoms in with my healthy ones will minimize their large-scale effects. I'll maintain my natural chaos."

What is a Tulpa?

"I almost get it," said Thuy. "You're talking about tulpas."

"You humans are like walking bagpipes," said Gaia wearily. "You make squeals and imagine they're thoughts. What's a tulpa supposed to be?"

"You're the global supermind, Gaia. Weren't you watching when I looked the word up a few minutes ago? A tulpa's an idea that becomes real."

"Ah yes, I see now," said Gaia quickly. "Quite an elegant squeal, really. So, yes, when you go up to Yolla Bolly, you'll be dealing with alien tulpas. In their own way, they're as solid as you."

Mysterious Squawks

Off in the woods big birds were discordantly squawking. Thuy now remembered hearing them in the night. They sounded different from crows or jays. And when she tried to teep toward their sound, her mind's eye clouded over with brilliant haze.

The First Bird

"It's interesting to be on a primitive planet where the lazy eight change is new. It's almost like visiting the Nest of Pekka."

"Are you talking about the same Pekka who got Jayjay?"

"Of course not. That's just Pekka Pekkandottir, a low-level functionary at Warm Worlds Realty. A little chippie, really. The original Pekka was the first bird. She laid the egg that she hatched from. A paradox, yes? Our first miracle."

Gaia's Antimatter Defense

"At first I was thinking of shifting my magma and my tectonic plates. I could set off volcanoes and earthquakes to bury the Yolla Bolly wilderness and topple San Francisco into the sea."

"Think about what that would mean for us!" exclaimed Thuy.

"I can think ahead quite well," said Gaia. "When I'm not being stupid. My mind works a billion times as fast as yours. As it happens, I'm *not* planning to set off volcanoes—the reason being that the infected matter needs to be utterly annihilated to clean out those parasitic quantum computations. I'd need something stronger than lava to cauterize my wounds."

"Like what?" said Thuy, fearing the answer.

"There's a new, deeper science of matter in the air. Femtotechnology. I do learn things from you clever monkeys—especially from the ones I help along. Just recently we discovered how to flip quarks. I believe I could convert some sections of my crust into antimatter—right beneath the infected zones. It would cause an unimaginably large explosion—a quadrillion tons of mass instantly converted into energy."

The womanly blue figure of Gaia laughed ruefully, now more like the sky than like the sea. A series of jeweled beetles sprang into flight around her cloudy head. “Of course the radiation would wipe out the higher species,” she continued, letting one of her hands soften into a tentacle. “But, you know—species come and go. What I’m more worried about is that the explosions could break me into chunks.”

“That’s horrible,” said Thuy, choosing her words carefully. “Not just for us, Gaia, but for you. You have to take care of yourself. You’re a beautiful warm-centered planet. You don’t want to be a frozen asteroid belt.”

“I’d rather end up that way than as a slave to alien parasites. Drastic measures, Thuy.”

Kittie’s Pledge

“Do you want me to come too?” teeped Kittie quietly.

“Maybe later,” answered Thuy. “You be my ace in the hole.”

“Always.”

Macha Tussle Over the Guns

Meanwhile, Chu and Jayjay had been gathering—weapons. A candy-cane-striped bazooka was lying on the patio beside two futuristic pistols: one a smooth blue raygun, the other a knotted shape of wires and crystals.

“We borrowed these from a place called Seven Wiggle Labs!” exclaimed Chu enthusiastically. “It’s two cool geeks. My father knows all the best techies.”

“I’m a stonker,” teeped the blue raygun with the triangular fins. He had a reedy tenor voice.

“I don’t think we really need—” began Thuy.

“Dibs,” yelled Momotaro and snatched up the blue stonker. With a reckless cackle, Momotaro pointed the stonker at Thuy’s feet. Jayjay roared at the boy, and he switched his aim towards an empty chair.

“Give me that gun!” yelled Ond, but now Momotaro pulled the trigger. A wavery femtoray flowed from the muzzle and the yellow-cushioned chair’s color drained away. It glazed over with symmetric patterns of frost, let out a plaintive creak, and collapsed into cubes which broke into still smaller cubes and so on into dust.

“It’s supposed to shatter jaggedly,” complained the blue raygun via teep. “I don’t like cubes. Everything has been screwed up for the last hour.”

“Jagged or not, that gun might slow down some aliens, huh, Thuy?” said Jayjay. “The target atoms get so merged with the cosmos that that the target falls apart.”

“I think your mother would want you to stay here, Chu,” said Ond. “If you want to leave you have to ask Nektar.”

“This stonker’s mine,” said Momotaro. He danced across the yard, teeking stones into the air and disintegrating them in mid-flight. A couple of Jil’s shoons skipped along in his wake.

“Gaia says there’s no hope of killing the aliens by shooting at them,” Thuy told Jayjay. “This is about delicate programming, not about blowing stuff up.”

“Yeah, yeah,” said Jayjay. “But maybe that’s wrong. These new femtotech weapons are way vibby. If nothing else, the femtotech could impress the aliens.”

“Guns aren’t impressive,” said Thuy. “Guns are dumb.”

“Aw, this bazooka is really smart,” kidded Jayjay, hefting it. The helical stripes of red and white were continually rotating around the outer surface of the

bazooka's tube, always in the same place, yet appearing to crawl forward—like a barber pole.

"I'm a gobble gun," teeped the device in a jocose fat-man voice. "Be sure and hold me out to one side when you shoot me."

Thuy picked up the third weapon, a glittery pistol made of crystals and metal wrap. Its knobby grip was of entwined silver and copper wires. Its barrel was a wire-wrapped line of rhomboidal crystals, ranging in size from dice to ice cubes. It was like an extravagant piece of jewelry, an *objêt d'art*. Thuy was beginning to see the allure of exotic weaponry.

"I'm a klusper," the gun informed her in a sweet soprano whisper. "I'm the opposite of the stonker. I overload atoms with information and they vibrate faster and faster, until the target gets all crispy and bursts into flame."

"Give us back our stonker now," Thuy told Momotaro, who was still capering about the yard. She'd never much liked this kid. She sighted along the klusper gun at him, fingering the hammered gold disk that served as the firing stud.

"To hell with you," said Momotaro. "If there's aliens, I'm gonna need this stonker myself."

Surprising herself a little, Thuy fired the klusper, sending a jagged yellow femtoray to a spot right beside Momotaro. As it happened, the ray landed on one of the shoons dogging Momotaro's steps. The shoon shrieked, glowed bright orange and burst into flame still screaming, quickly dissolving into whispery tendrils of ash.

Normally Thuy would have been too tender-hearted to kill even a robot—especially when all that was at stake was a gun that was most likely going to be useless. But the lack of gnarl had seriously reduced her empathy. She felt like she was on autopilot.

"You're next," she told Momotaro.

With a lashing gesture of her mind, Jil snatched the stonker from Momotaro's grasp and flung it at Thuy. It made an audible slap as it landed against Thuy's left palm.

"Hot and cold," said Thuy, hefting the freeze-em stonker and the burn-em klusper, playing tough for the *Founders* show.

"Yeah, babe," agreed Jayjay. "Let's go get 'em."

"Assholes," said Jil. Safe now behind his mother's chair, Momotaro gave them the finger.

Jayjay's Despair

He was actually contemplating suicide. The method: teeking a jagged stone to the inside of his heart.

Where is the Beanstalk?

"So, um, where *is* the beanstalk?" interrupted Chu.

"Duh!" said Kakar irritably. "It's in the interdimensional zone between the Lobrane and the Hibrane. I can tell you how to get there—but only starting from planet Pengö."

"Good idea, Kakar," said Suller heartily. "How about it, Chu? Being a monkey man, you can teleport to any lazy-eight-enhanced location that you like—including Pengö, Pepple or the Hrullwelt. Why don't you hop to Pengö, use Kakar's directions to visit the beanstalk from there, and then hop back here and start work as our new runecaster?"

“I don’t want to go to Pengö,” said Chu. Although he loved dreaming about distant worlds, the thought of teleporting alone to another galaxy gave him the willies.

Brux

The soul song rises heavenward and then, just beyond Pengö’s atmosphere, it veers into the eighth dimension like a river going underground—only to emerge from the mind of the arty teeker Bruni whom Pekka has enslaved on the distant world of Brux. The viewers catch a final glimpse of Waheer’s tulpa, living in luxury as a high-society artist among perfumed monkeys with intricately tattooed wings.

Data Links

With omnividence, there was no real need for copies anymore; instead you linked to the original data itself. But having the data on a sheet in your lap made it easier to think about.

The Flora and Fauna of Pengö

A sequence of three display cases flashes by. The first contains a lichen, two mushrooms, three flowering plants, a fruited vine, a berry-bush and two trees; the second shows four fish, two sea slugs, a jellyfish, a marine worm, and a bladderwort seaweed; the third displays three beetles, an ant, a honeybee, a moth, a fly, an earthworm, a centipede, a parrot, a barn swallow, and a Peng.

Why You Need a Reset Rune

“You should talk to Jayjay,” said Chu. “He and have been working on a plan to chase off the Peng. If we can figure out the net effect of the tweaks that he’s done, maybe we design a rune to undo them all. If that’s possible.”

“Runes do combine in a linear fashion,” said Duxy. “So you might think you could undo them one by one. The catch is that finding the inverse for any rune is an intractable problem that basically requires an unbounded brute-force search. That’s why you need the atomic reset rune. You jump out of the system and zap the atom back to its natural slate. Check this out.”

Bosch Bird House (Long Version)

[This is a fairly accurate description of a structure in the Garden of Earthly Delights, but it was too long, and something of a purple patch.]

Jutting from the stony stump’s near edge was a knobby shelf-fungus, deeply concave and stuffed with straw. A slanting marble slab lay across the stump, forming a patio beside the nest. Two pink towers rose from the patio’s far side; they resembled penises—one squat and flaccid, one proud and tall with a mushroom cap.

A transparent emerald tube rose vertically from the patio, with a second slab of marble balanced atop. This aerie was sheltered by a flat dried sea creature propped up at an angle, a giant stingray or sea-skate.

A translucent, tapering pod angled up from the patio to graze the aerie’s edge, rising to skewer a high spiked ball and curling over to end in a decorative spiral from which depended a bronze chain and a diamond-encrusted letter “P” for Peng.

Peng Realtor on Peng-Ranching the Heartland

“Hell, those hicks in Kansas won’t even notice when their gnarl goes flat. What’ll be the difference?”

Why Shooting Tulpas Doesn't Work

"If the aliens are interference patterns of matter waves emanating from all the atoms in a hundred-kilometer cube, I'm not sure that shooting any one thing is gonna make a difference."

Inefficiency of Peng Ranch

Thuy mentions Gaia's remark that the emulation procedure is highly inefficient, as computing a single one-cubic-meter Peng's tulpa requires something like a *quadrillion* cubic meters of Earthly matter.

"Panpenga says if Gaia's so smart, let her try and do it," snaps Gretta.

Square Root of Googol

Briefly Chu savored the fact that 10^{50} is the square root of 10^{100} , also known as googol, meaning that Earth has square-root-of-googol atoms.

Chu Names the Atoms

Chu did his own partial Zeno speed-up and tagged along, looking at the atoms rather than the rune. Each atom had its own little voice, its own peculiar timbre. He decided to make up a name for each of the atoms, a name consisting of nine English words. He figured that would make for more than enough possibilities.

The first three atoms were named:

Immoderate nonmental hearty unsteadiness lurches multiplexing putrescent unrepented nucleoplasms.

Anonymized township's sluggardly conglobation emaciates phantasmic mustard spinach surds.

Villainous inky gowk wallops nonscheduled hypomanic curator asterisk inceptions.

Peng Can't Teleport

"I need for you to do a series of teleportation hops," Suller told Jayjay. "A hundred kilometers at a time. We can't leave the ranch ourselves. So we need some cooperation."

"You can't teleport?" exclaimed Chu, cutting to the point.

"The higher races don't need to," said Gretta in a snotty tone. "We have pushers and mediums for that."

"Never mind about that," said Suller. "I'm teaching the man his new job."

Santa Cruz Landlord

The house's owner reappeared to collect more money, holding his bat in one hand and a bong in the other, with the bong's cheerful silp teeping an image of a sinse bud.

First Take on Hrull Gel

"Gel time," said Glee, gingerly moving forward on her pathetically skinny legs. She dropped to all fours and scooped up some of the goo from the puddle beneath the pusher cone, getting it all over her hands. And then smeared some of the stuff onto the skin of her emaciated chest.

"What's she doing?" Thuy asked Chu. At the first touch of the gel on her skin, the alien girl's worn face had become suffused in ecstasy.

“Gel good,” said Glee, smiling up at them, showing her stumpy teeth. “You try.” She stretched out her glistening hands

“It’s a drug?” said Thuy, taking a careful step back. “From the Hrull mothership’s body?”

“I haven’t had any yet,” said Chu. “Because that’s the part about being a pusher that I don’t like. I keep telling Lusky that I’d be happy to be a pusher for free, just to see intergalactic space, but she says I have to get paid in Hrull gel. I’ve seen Glee take it twice before. She’s crazy about it. But I don’t want to lose control.

“I’m with you,” said Thuy. “Flying around inside an alien manta ray is weird enough without getting spun on, like, tarantula poison or toad venom.”

“Gel is my bond to you pushers,” intoned Lusky, but Thuy and Chu shook their heads. Lusky took on a peremptory tone. “Baptize them, Glee!”

Thuy braced herself to dodge or kick at the spindly, addicted alien, but Lusky’s next move caught her by surprise. The walls of their cabin contracted with an abrupt peristalsis that forced Chu and Thuy against Glee—although Jayjay was caught in some other fold of Lusky’s flesh.

Glee’s slimy alien hand massaged Thuy’s face, with her hundreds of thumb tentacles working Hrull gel deep into the chambers of her nose.

Wow, was Thuy high. She felt frikkin’ great.

The chamber walls relaxed. Without even a second’s hesitation, Thuy and Chu lay down on a bunk together and began making passionate love. They did it all: sixty-nine, Chu on top, doggie style, Thuy on top—afloat on oceanic waves of sweet sensation. Chu came once, twice, and while Thuy was riding him hard for the third time, she happened to glance over towards Jayjay. She hadn’t thought about him once since the Hrull gel had hit her.

Jayjay Remembers the Lost Chord

“No teep till the harp plays that Lost Chord,” said the pitchfork as softly as possible, damping the buzz of his tines. “Snag is, the harp forgot it. Once you tell us, Jay, she’ll play it, and we can use that teep real good.”

“I remember the Lost Chord, yes,” said Jayjay, wearily looking into himself. The notes were in his head, also the fingering that he’d used. “But I can’t put it into words. I’ll teach the harp later.”

“Words suck, for true.”

Thuy Embarrassed by the Crownies

“This is a nightmare,” she murmured, all but blinded by a red haze of shame. “Let’s bail,” she said, groping to say something cool for the *Founders* audience. “These creople peep me out.” *Lame, lame, lame.*

Jayjay’s Feelings Upon Learning Dutch

And then, finally, the buzzing stopped. Jayjay felt dirtier than before, lower and more irascible—he felt Dutch.

Waking Aleid

“Don’t worry, Aleid, it’s just me!” called Jayjay, as slowly and distinctly as possible, trying not to sound like an amok, gibbering goblin.

One-Time Peng Pad

“We better do a test run on a Peng rune before she leaves,” he said. “How about—oh, how about making a copy of Noora for me? I’d like to see two Nooras on Earth.”

Gretta went ballistic over this, but the request was moot. For now Suller learned that Pekka didn’t have access to any copies of Noora’s rune; neither she nor Warm Worlds bothered to remember a Peng personality rune after the Peng had been processed. If a Peng pioneer were to get badly instantiated, that Peng was out of luck for good.

A Woman in the Hylozoic ‘s-Hertogenbosch Market

A weak-chinned girl behind a fishmonger’s table was wondering if she were the only one who was sensually experiencing the inner lives of the dead eels—the slipperiness, paralysis, and slow putrefaction. She worried she was like those beggars who started by seeing visions and ended by losing their limbs—yesterday, coming into town, she’d seen a giant devilfish swimming in the river.

Thuy teeped her a word of comfort, and the girl swiveled her head, looking for the source. Seeing tiny Thuy wave and smile, she made the horned evil-eye gesture and triangled herself.

Freakout at the Market

Rumors of the flying devilfish flew from mind to mind, along with tales of the demonic little couple who claimed to be from the Garden of Eden, but who were truly from Hell. Vengeful God had come down to inhabit ordinary objects.

“I Am A Number”

Chu watched, pondering. The new pipeline was effectively turning a living Peng into a stable finite algorithm. That was a kicker in itself; a metakicker. A Peng—and presumably a person—seemed to have, for all practical purposes, a finite personality.

“I am a natural number,” said Chu to himself. He wondered if the pitchfork was actually infinite.

Teeking a Virtual Wetsuit

[As I make a big deal about whether or not people can teek a whole lot of atoms, I don’t think I can make this ability seem to come so easily.]

“I think I can warm up the layer of water that touches my skin,” said Chu, glad for a distraction. “I’ll teek the molecules back and forth.”

So Glee and Chu waded in through the surf and swam, reveling in the sea’s creatures and currents. Chu’s water-jiggling trick worked; it felt like he was wearing a wetsuit. But at the rate he was burning energy, he’d need food soon.

Fixed Point Approximation of Runes

Repairing to the porch of Thuy and Jayjay’s cabin, the youths resumed working with the spiky pink and green moth rune. Chu felt confident. His dreams had unearthed powerful quantum-mechanical metashape, a chain of operators resembling an archetypal world-snake who swallows his own tail. Ourobouros. In a painfully strong flash of inspiration amid the lucid dreams, Chu had deduced that his serpent-like operator-chain could transform an infinitary rune into a finite iteration code and a quantum-computational fixed point.

“Ourobours?” said Kakar, shadowing the motions of his mind.

“Gaia dug up the name,” said Chu. “But I thought of the math.”

Feeling a little shaky with excitement, he fed the virtual moth pupa to his serpent. And then the snake ate himself up, leaving a sibilant hiss and a single glinting eye.

The hiss was an algorithmically generated fractal. The glowing eye was a finitely defined fixed point. The color-flashing eye danced to the rhythms of the hiss, weaving a ridged, ragged metashape that was—oh how nice—a pinky green conch shell with conch shells on its spikes, and smaller shells on those. It was a damned good approximation to the original moth rune, now expressible in terms of an algorithm and a fixed point.

In other words, Chu had discovered a programmatic hack for replacing infinite runes with finitely describable metashapes.

“Wait, wait,” clucked Kakar. “I don’t get it. Show me again how you did that.”

“You input an infinite rune to this chain of operators, and it outputs a finite program,” said Chu.

Pixelization of Runes

[For awhile, I thought Chu’s Hack is to use coarser programming technique. Rather than programming atom-by-atom, he’s programming small blocks of space, a cubic decimeter at a time (a decimeter = 10 cm). It’s a type of pixelization. A Peng ranch = a million cubic kilometers = a quadrillion cubic meters = a quintillion cubic decimeters = 10^{18} cubic decimeters. And this is much more manageable than 10^{43} atoms of the Peng ranch or than the ten octillion = 10^{28} atoms of a human body.]

Chu felt confident. His dreams had unearthed a powerful quantum-mechanical metashape, a hyperdimensional operator resembling a tesseract pattern with a tiny cube set into the center of a large cube, and slanting lines connecting the two cubes’ corners. The lines sketched out six skewed cube-like shapes connecting the inner and outer cubes.

The little cube was the size of an atom, and the big cube was ten centimeters on an edge, the size of a large man’s fist. The vibby thing was that the pattern was undergoing a four-dimensional rotation that continually had the center cube sliding over to become one of the skewed in-between cubes and then somehow jiggling out to be the outer cube, then skewing in from the opposite side and eventually ending up in the center again.

In a painfully strong flash of inspiration amid the lucid dreams, Chu had deduced that his tesseract-shaped operator could transform an atomic-level rune into a rune to be cast onto a quantum-computation to be carried out by a fist-sized region of space. Instead of having to program ten tridecillion atoms with the original rune, it would be enough to program a quintillion cubic decimeters—in exponential notation, 10^{18} cubic decimeter chunks instead of 10^{43} atoms. A quintillion was just on the border of the current abilities of a kiquie human who didn’t happen to be a zenohed.

“Tesseract?” said Kakar, shadowing the motions of his mind.

“Gaia dug up the name,” said Chu. “But I thought of the math.”

Feeling a little shaky with excitement, he squeezed the conch-like rune into the tiny central cube of his tesseract, and watched as the shape spun around, producing an warped, inside-out seashell with most of the extra spikiness smoothed away.

“Wait, wait,” clucked Kakar. “I don’t get it. Show me again how you did that.”

“You put the atomic rune into the middle of the tesseract and it turns into a puffed rune that you map onto fist-sized chunks of space,” said Chu.

“Oh,” said Kakar, trying to keep his cool. “I see. It’s simple.”

“Now it is. And we’re going to name the trick after me. Chu’s Kludge.”

“Kludge...” said Kakar, searching Gaia’s database. “Ah. A clumsy and inelegant workaround.”

“I’m brilliant but humble,” said Chu.

“Let’s see you kludge up a solid moth from your puffed rune, monkey man.”

“This is where it’s good to be a teeker, my feathered friend.”

Chu mentally divided the million cubic kilometer Peng ranch into a quintillion cubic decimeters, and sped through them via a mild form of a Zeno speed-up, loading the puffed pink and green rune into each slot.

“That’s her to a tee,” burbled Kakar [looking at the rune for Floofy]. “Wait till you meet her. Can you and your tesseract handle a rune this big?”

“Of course,” said Chu, although he had to wonder if this were true. He nudged Floofy’s rune into the central cube of his pattern, then watched as it began to swing around. But now the motion froze. The transformation process—which was running in Chu’s own brain—had used up all the available memory.

Chu moved carefully to amend this. When meddling with your mind’s computational architecture it was possible to do something utterly disastrous—such as terminating your autonomic life support systems. Slowly, safely, he redirected the Chu’s Kludge computation into his body’s lazy eight memory.

With the extra memory resources in play, the tesseract completed its four-dimensional rotation, producing a smoothed-off inside-out version of the temple.

Kakar clacked his beak in approval. “Hurry up and make Floofy now,” he urged.

Before going further, Chu added some hints about memory rerouting to his Kludge—tacking the hints onto a label on one of the tesseract’s edges. Might as well spread maximum confusion by making the Kludge as easy as possible to use. And then he ran through his roster of atoms, teaching the eye and the hiss to each of the Yolla Bolly ranch’s quintillion cubic decimeters. Somewhat amazingly, the ramshackle distributed construction worked. A new Peng tulpa appeared amid the trees.

Chu’s Fear of Infinity

Chu was finding it hard to focus on Zeno speed-ups because he was repelled by concepts relating to infinity. Infinity was like a cruel, bearded, slime-dripping demon of the deeps, an eerie titan with blank white eyes.

Runic Divergence Theorem

It should be okay to share Ouroboros because—yet more dream wisdom—Chu and the silps had proved a Runic Divergence Theorem to the effect that every Ouroboros-style operator has an all or nothing quality. *Either* a given operator works perfectly on every possible rune, *or* the operator’s runes all have a defective copying routine—with the severity of the defect across a non-trivial range. Therefore—

“Stop blocking your teep,” twittered Kakar. “If you’re holding out on us, Dad will kill you. I don’t want to see that.”

“Here you go,” said Chu, baring the top layers of his mind. “I was only getting this new hack ready without you guys breathing down my neck. I call it Ouroboros. Let’s test it out.”

Even though Ouroboros had turned the reset rune into something that couldn’t copy itself at all, given another rune, the operator might well viralize it well enough to spread across the breadth and depth of a Peng ranch. But even in the case of a seeming success, the Runic Divergence Theorem ensured that the resulting tulpas would decay within days, if not sooner.

Julie Chokes on the Serpent

Kakar showed her the moth-rune. Julie fed the rune to her inner Ouroboros and set the snake to swallowing its tail. Halfway through, the process locked up. Non-kiqqie that Julie was, her mental resources were so slight that converting even a moth-rune was overloading her. And she wasn’t getting it about accessing her lazy eight memories. She was gasping and turning blue. Brain freeze.

Taking pity on her—what a concept!—Chu teeped into her head and helped her shift the bulk of her computation into her extra memory. While he was at it, Chu clarified and simplified his encoded description of how to do this. He wanted his Serpent to be foolproof. If all went as expected, a lot of fools would be using it quite soon.

“Whew,” said Julie. “You’re nicer than I expected, Chu. I’m dizzy.”

Ouroboros 2.0 As Wild Knot

Reflexively, Chu tried to memorize the knot and calculate its knot-theoretic invariants: its Kaufmann bracket, its writhe, its Yang-Baxter equation. But nothing was working. The knot embodied an endless regress.

Pushing into Kakar’s mind, Chu tried to snarf a copy of the snaky new operator. The thing was a wild knot involving a fractal regress of chains whose links were chains whose links were chains—down through an exceedingly deep number of levels.

Pangram Sentence

[The payoff here is that the last sentence includes every letter of the alphabet. The dream was inspired by a dream I myself had the night before I wrote this.]

Flea-bitten and preoccupied, she drifted into sleep. Her plans for *Hive Mind* became a matter of customizing the individual letters in the words of her dialogues and poetic descriptions. The letters were living beings, each of them a distinct shade of pale blue—cobalt, manganese, ultramarine—and Thuy was carpentering ray guns into the secret recesses of their hollow legs. At the end of the long, hexed night, the quacking, jumpy letters spoke a magic word and fired in unison, enveloping the world in a blaze of flame.

Email

Nick Herbert

I’ve long been fascinated by the notion that aliens might seek on Earth and value something that we take for granted and consider valueless. Your notion that the world is computation and that all this processing power is up for grabs is brilliant--the Peng steal most of it and everything left is rendered in Pong-level speed and resolution.

Thomas Vriens

Thomas is the curator at the Bosch center in 's-Hertogenbosch. I asked him when he thought The Temptation of St. Anthony was painted, and for whom.

The triptych of Saint Anthony which is now in Lisbon might have been bought by Damião de Goes who bought paintings for his king John III of Portugal between 1523 and 1544. However, this leaves a gap between the death of Bosch in 1516 and the first possible year of the purchase in 1523. The triptych is generally believed to be a late work by Bosch and dates from 1500 - 1510. I personally think that it's highly unlikely that anyone who orders a very expensive triptych will have it sold in one or two generations. So maybe Damião de Goes is not the link with Portugal.

The most likely donor (larger works are never painted for the free market, but always for donors, because of the financial risk) is the Brotherhood of Saint Anthony in 's-Hertogenbosch. If they had it in their possession it might have been moved because of the iconoclasm of 1566. When the city was captured by the protestants in 1629 Roman Catholicism was prohibited and the clergy went southwards taking much of the inventory of churches, chapels and monasteries with them.

Steve H

Commenting on my "Evil Pitchfork" post, which included a link to the rappers Bun B and Pimp C of UGK (Underground Kingz)

If I wanted to drown out or otherwise interfere with a tone generator like a tuning fork or harp, a loud, cynical rapper would certainly do the trick. Bass way up high, keyboards barking synthesized voices, and some guy talking a bunch of sly, insinuating jive faster than you can pay attention; enough to bring cops in from parallel dimensions!

Aletha Kuschan

An East-coast artist who happened to email me advice about making my paintings "gnarly."

First, take passages of various colors, let's say you begin with the blue areas -- in an idea such as your "Davenport Cliffs" -- vary everything about the blue for the pure sake of variation -- a little piece here and a little piece there -- and learning to discern and to create subtle changes in one color. Make some of the passages ultramarine with varying amounts of white, make some phthalo blue with varying amounts of white for tonal differences. An ultramarine passage that is the same tonally as a phthalo blue will look cooler than the phthalo and the temperature differences can be interesting in themselves. Mixing the ultramarine and phthalo in turn produces something in between. Alternately, try using phthalo green as a blue and you'll get another possibility. Try darkening or varying colors either by addition of small amounts of other dark or middle tone colors. A little red into the blue, a little green, or yellow or whatever. If the amount is small, it will change the temperature or the tonality, but the blue will still be blue. However, as it will be duller, when put beside a more pure blue, that purer blue is stronger.

Second, study nature. Look very keenly and deliberately at something. A plant, a shell, whatever. It helps for it to be natural because the complication is there organically. Forget about likeness and just begin to draw what you see as though transcribing the experience. Try to make certain that everything you notice is somehow recorded -- whether accurately or not doesn't matter. You are after a strong and prolonged sensation -- and moreover -- *after this activity of making it with your*

hand -- in a parallel format. You see a line here, you put it down. It's like being at the pistol range. Point and shoot. If you find you've put it into the "wrong" place and it bothers you, redraw it. Either erasing first, or not erasing, just drawing over.

You might find the wonderful experience that I stumbled upon many years ago of discovering "more and more and more" beauty and complexity in the subject as you stare at it, that you begin to see it roll out in front of you, that you didn't previously notice this or notice that. Of course you already experience "more and more" when looking -- but by drawing you are also adding something of yourself, your particular attention, and by drawing you are creating a new form and a certain "more and more" is possible in that too -- or lies between the "out there" and the "in here."

John Walker

[This is in response to my January 17, 2008 paper, "Everything is Alive," where I work through these steps:

- (1): *Universal Automatism*. Every physical entity is a computation.
- (2): Moreover, every physical entity is a *gnarly* computation.
- (3): *Wolfram's Principle of Computational Equivalence*. Every naturally occurring gnarly computation is a universal computation.
- (4): Consciousness = Universal Computation + Self-Reflection.
- (5): Any complex system can be regarded as having self-reflection.
- (6): *Panpsychism*. Every physical entity is conscious.
- (7): *Walker's Thesis*. Life = Universal Computation + Memory.
- (8): Every physical entity has memory via its interactions with the universe.
- (9): *Hylozoism*. Every physical object is alive.

Walker picks on the weak point (8), which I put in to substitute for my lazy-eight memory in *Hylozoic*.]

John Walker Email, Jan 20, 2008.

In your Kyoto paper, there's one thing that seems odd to me. Pantheism says that the universe as a whole is conscious, while panpsychism and hylozoism says that every object in the universe is both conscious and alive. You argue for the latter being the case. But on page 7, you say:

"The effects of the flag/wind system's state ten minutes ago are still present in the positions of the air molecules, in the now-distant photons that bounced off the flag, and, at a deeper level, in the state functions of the myriads of particles what are quantum-entangled with the particles of the air and the flag."

But isn't this necessarily pantheist? A panpsychist and hylozoist view would require that you can identify an object which is, itself, in isolation alive and conscious. But if the memory of its state which endows it with consciousness is nonlocal (and in the case of photons departing toward the future without any possibility of interaction with matter in the present, decoupled from future evolution of the flag and wind itself), then how can you draw a boundary around any given system without its own storage and say that that system, in isolation, is alive and conscious? If you take a unitary view of quantum mechanics, especially in the multiple worlds interpretation, then no information is ever lost and consequently every quantum event potentially affects everything else within its future light cone. But that doesn't mean that each individual system has the prerequisites to be

considered conscious? How low can you go? What about a neutrino: family, matter/antimatter, and spin--that's it--how do you build consciousness out of four bits?

If we're actually in an accelerating universe, then all information departing on outbound light cones will be eventually lost forever and unable to interact with any other system. Doesn't this invalidate the idea of universal memory even in the pantheistic case (unless you opt for Tipler's manifest destiny of hyper-empowered robotic descendants of naked apes inducing the collapse of the universe)?

<http://www.fourmilab.ch/fourmilog/archives/2007-06/000851.html>

Me, I now think it's more likely than not that we're in a simulation. I mean really, not just bull-session speculation. The closer we look at the data, the more and more we find that there are what appear to be what I call "round-off errors" precisely where they'd appear in our own video game physics when we didn't expect the sentient characters to notice. Here are a few examples:

<http://www.fourmilab.ch/fourmilog/archives/2006-04/000683.html>

I am working on a comprehensive screed on this topic which argues that we may be able, by precision null experiments, to detect round-off in the simulation in which we live. Of course, this may cause it to be turned off, which would be bad. So it goes.

Short Story Ideas

I like to accumulate story ideas here, rolling over this section from one notes document to the next. Some of these ideas date back to the *Lifebox* notes, some to the *Postsingular* notes.

I group the stories into four categories: Done, A list, B list, and C list—the final three categories being in decreasing likelihood of being written soon.

Done

“The Imitation Game” (Interzone, Spring, 2008)

1947 Transistor. On 22 December, 1947, William Shockley, John Bardeen and Walter Brattain succeeded in building the first practical point-contact transistor at Bell Labs.

1949 Computer. The Baby Manchester programmable electronic computer, partly designed by Turing.

1953 Burroughs went to take yage in the Amazon.

1954 Burroughs Moved to Tangiers early in the year.

1954 Turing's death. Alan Mathison Turing (June 23, 1912 – June 7, 1954) dies of cyanide poisoning. He was found dead on Tuesday, June 8, and presumably poisoned himself on Monday, June 7. What if he instead escaped?

1954, In October, Allen Ginsberg moved to San Francisco and was trying to date a girl. Burroughs traveled to NYC meaning to see Allen, but never made it out to SF, visited family in Palm Springs, FLA, went back to Tangiers.

In June, 1954, Turing realized the British Intelligence forces were closing in on him.

Suppose he faked his suicide by substituting the body of his Norwegian lover Kjell for his next to a cyanide apple. Kjell was in fact poisoned by the secret service as a warning to Turing; because Turing had already told Kjell some secrets. His mother went along with the hoax, and the constable did too. They worked fast, before

the SS could get involved. Pronounced dead, Turing used Kjell's passport to travel to Tangier.

"He got the train to Plymouth, from there to Santander in Spain, down across Spain to Tarifa near Gibraltar, and from Tarifa to Tangiers."

"The Third Bomb" (Flurb, Spring, 2007)

Note well the historic coincidence of A-bombs and UFOs.

1945 A-Bomb. On July 16, 1945, in the desert north of Alamogordo, New Mexico, the first nuclear test took place, code-named "Trinity,"

1946 UFOs. In 1946, there were over 2000 reports of unidentified aircraft in the Scandinavian nations, along with isolated reports from France, Portugal, Italy and Greece. The post World War II UFO phase in the United States began with a reported sighting by American businessman Kenneth Arnold on June 24, 1947.

After the first atomic bombs went off, a UFO showed up on Earth. It came from an alternate brane of the multiverse, or perhaps from the subdimensions. It was a survey drone drawn by the blasts; it came here to fuel up. The aliens had hopes of Earth becoming a regular fuel stop.

The Trinity test attracted the UFO, and it wanted to fly into the Hiroshima explosion and soak that up, but missed due to bad navigation — it takes practice to get use to our "mere" three dimensions. The saucer also missed the Nagasaki bomb, but it did manage to intersect and totally absorb get into the never-before-reported third blast in Munich. The legendary "Third Bomb" document reveals this. Our hero came across this document, or perhaps he meets a witness to the event, who was a barmaid at the Hofbrau Haus in Munich.

More research reveals that all through the 1950s and 60s, saucers showed up for above ground N-tests, which was one reason the tests were moved underground, so the frequent fizzles weren't so obvious. The tests that fizzled were kept secret lest the countries look weak. The fizzles were of course due to UFOs soaking up the blasts. Some of the UFOs were in fact shot down or captured and are stored in Area 51.

The current U. S. President and Vice President are aliens trying to drive us towards nuclear war.

Our hero feels it's his mission to kill the President and the Vice President. "Kill the Veep first," he tells himself.

But when he shoots the Vice President with a shotgun blast on a hunting trip, the man reveals himself as a writhing sea cucumber that spawns off a fresh bud that takes on the dead Veep's form. And then our hero is imprisoned as a terrorist.

This is a true story. Clear proof of the alien presence was the weakness of the recent test in Korea. The UFO got there a bit late and didn't soak every bit of it up.

For awhile things went just as the forces of evil wanted. "But, as readers will know, history had her own ways of dealing with the President, the Vice President, and the aliens."

Present this as a true story.

I had a very ambitious idea to present it as a series of primary documents, and even put forgeries of the docs online at www.saucerwisdom.com. Examples of the docs might be: A report from a woman who witnessed the Munich fizzle. A report from a soldier who saw a blast get sucked up. A scientist saw a UFO getting captured. An aide who saw Cheney looking like a sea cucumber, eating Bush's body

and replacing him with a sea cucumber. A transcript of the video blog of an assassin who tried to kill Cheney.

While I was thinking about this, John Shirley emailed me wanting to collaborate, and for a day I thought I should work on “Ware President” with me, figuring he’d be perfect for writing up Area 51 descriptions, given his novel *Silicon Embrace* — but then I backed off, as I’m already in a current collaboration with Bruce Sterling on “Hormiga Canyon,” and I had a feeling I could finish off “War President” more easily on my own.

I got the idea it would be easy to write this story as a 1st person recollection of a guy imprisoned in a place like Gitmo. His crime is that he tried (unsuccessfully) to kill Cheney. I’ll use the hunting accident scenario.

By the way, I’ll drop saying “Bush” and “Cheney” and just say “President” and “Vice President” so as to make the story more timeless.

I’m imprisoned by on some godforsaken island, maybe in the Caribbean. My jailers are Americans; some wear military uniforms with no identifying insignia, others simply dress in chinos and white shirts. Most of the other prisoners are Islamic: Arabs, Afghans, Iraqis; the idea is, I suppose, that we’re all suspected terrorists.

More than suspected in my case, as the Secret Service brought me here after I blew off the Vice-President’s with a shot-gun. Not that it made any difference. He grew a new head right back. They’re hushing it all up. I’ll probably die here, though not until they feel like they’ve adequately debriefed me.

Agent Robards calls me in for questioning every few days. I keep telling him the truth about why I tried to kill the Vice-President: he’s an alien sea cucumber hell-bent on steering our planet into nuclear proliferation and war. Ditto for the President, but it’s really the Vice-President who runs the show. It seemed important to take him out first. I didn’t realize how readily he could regenerate his body parts, though. Budding off a whole new head — who’d have expected it.

Though by now I should be done being surprised.

As the events played out, on August 11, 1945, the B-29 Superfortress bomber Maybelle Carter took off from the RAF airport in Kent bearing an A-bomb named Lorelei. The bomb was indeed dropped over Berlin, but failed to explode.

Pynchon’s line about America seen from the outside, their scary belief that they’re right.

The Vice-President grew himself a new head right away. He’s not human, you see, he’s an alien sea cucumber that’s taken on a human form. It turned out to be very easy for him to bud off a new “head.” I hadn’t anticipated that, though maybe some others in the SWN had. Maybe they knew my mission was doomed, but were hoping that some news of it might escape.

“Tangiers Routines” (Flurb, Spring, 2008)

BACKGROUND NOTES

A sequel to “The Imitation Game.”

Alan Turing (1912 - 1954*), initially disguised as the Greek boy Zeno, meets Bill Burroughs (1914 - 1977) in Tangier. Burroughs was very lonely right then, would have loved having Turing to talk to.

Dig up more info on the slightly older man Brian Howard (1905-1958), educated Christ Church college at Oxford (1926). Spent a few months in Tangier at this time too with his boyfriend Sam, he was hooked on morphine, thought he had TB (though some doctors said it was neurosis), hung around a bit with Burroughs. He could have led Burroughs and Turing meeting. See *Brian Howard: Portrait of a Failure*, edited by MJ Lancaster, 1968, which quotes a letter from Howard mentioning Burroughs. I found this page [online](#), from the letter to his friend John Banting, in March, 1954.

PORTRAIT OF A FAILURE

ten cigarettes a day. Curiously enough, I have very nearly succeeded in doing this, with the help of certain sedatives. A great thing is to put on weight, because I have become quite a skeleton during these last six months. The resting during the day is no change for *me!*

There is only one disagreeable aspect. They tell me that at my age (nearly forty-nine), I cannot take this same *pillule-piqure* cure ever again, if I fail to make it work this time. I shall have to have an operation to collapse the lung. Tiresome, to say the least.

[Later] I am writing you in odd and charming surroundings. Namely, a café in the wickedest town in the world—and in the wickedest place in the town. I am in the Socco Chico, or Little Market, which is really a small square of shops and cafés, where the naughtiest and most shameless of the male whores (not all Arabs), bootblacks, peanut-sellers, tourists, money-changers and beggars all gather, of a late afternoon, to show off their various wares. Everyone within sight, from the tiny children to the elderly, fat waiters in tarbooshes, is for sale. And the hubbub is appalling. The lights are just coming on in MANGHARAN'S CELEBRATED SHIRTS opposite me, and the smell of Kief cigarettes is asphyxiating. (I've tried it, no effect, but I'm told one ought to eat it, in the form of tiny hot cross buns.) Sam, at the same table, is flirting with his shoe-shine boy, who is a blackamoor, squodgy nose, but good teeth and a charming smile: seventeen I guess. The other person at the table is a nice, if slightly long-winded, ex-Harvard creature of forty who is endeavouring to cure himself of morphinomania by taking this new medicine which the Germans invented during the war. There are several trade names for it. He uses two. Eukodal and Heptanal. Unfortunately, the effects are so much stronger, and more delicious than morphine *itself* that he now spends his whole time running from chemist to chemist buying it—and spends all his money on it, too. I, myself, have experimented with it (with the excuse that it *is*, genuinely, used, among other things, for suppressing the tubercular cough—and really, it is quite *extraordinary*. Especially, I find, Heptanal. One loses all desire for alcohol (excellent, for me) and I walk around in a benign dream. Also, it has *none* of the injurious effects of morphine. The only lie that its makers tell about it is that it does not produce euphoria (e.g. *pleasure*), but, of course, it *does*. However, since it cannot do me harm of any sort, I *do* take it. Here, it can be got without a prescription. (Nothing is easier to get than the drugs themselves here, of course.) I take two to four tablets, and then have to wait one and a half to two hours, because it takes that long to get going. I do *not* drink with it.

At the risk of seeming redundant—I repeat that since it is a *medicine*, employed by doctors to replace morphine, and is employed in tuberculous cases to suppress coughing, I cannot see that it can be physically harmful, in any way. And since, at the same time, it is quite heavenly—I think it rather a find.

If one keeps out of the bars, which I *have* to, **Tangier** is not expensive. And it is certainly extremely amusing. *Anything* goes, as they say . . .

Turing's new face falls off. He lies low in Burroughs's rooming house. Turing himself doesn't like drugs. But he builds an opiated chicken liver

supercomputer. Or maybe he uses lichens to . Coaxing them into Zhabotinsky scrolls.

The device is inspired by Burroughs's Reich orgone notions, but is actually implemented by Turing using biological engineering. They're like mushrooms. Truffles, or shelf mushrooms. Mem Shrooms. In this case, people won't be using that magnetic tape later on, they'd be using Mem Shrooms. Growing on the sides of their refrigerator-sized computers. But you can interface a Mem Shroom directly to your spine (like Gibson's microsofts), and that's how Jack uses his. Quickly the Mem Shrooms spread, and when he's reading *On The Road* on the Steve Allan show, it's mediated via Mem Shrooms, it's the first cyberspace mind broadcast.

I was considering the idea of an artist using a Turing Evaluator to start writing his books for him. Three problems: such a device violates the unsolvability of the halting problem, such a device operates at arbitrarily rapid or effectively infinite speeds, we would need a new kind of computer to run the algorithm.

Right then Bill was putting together the routines that became *Naked Lunch*. It was the most creative time of his life, even though, of course, he thought he was fucked up. Maybe he was using the opiated-chicken-liver (or truffle-based) Evaluator. Maybe Burroughs's later work had such a drop-off in quality because he was no longer using the Evaluator. Maybe something happened to it, like his boy Kiki ate it, Kiki chopped up the Evaluator and roasted it in a tagine with couscous. Or maybe the visiting Kerouac eats the Evaluator.

I could write the story in the form of "lost" letters from Burroughs to Allen Ginsberg. I was reading Bill's actual letters from summer, 1954, in Tangier recently. His style is very particular and wouldn't be that hard to ape. It'd be a bit tricky to do it without getting gauche. An even trickier thing is that the unvarnished Burroughs is so offensive. Certainly if I were true to *Der Meister* the tale would be unpublishable in most venues that come to mind—other than *Flurb*, and I do need a story for *Flurb*.

Or use the same close-in to Turing 3rd person POV that I had in "The Imitation Game." That might be the best. This way I'd be setting myself up for a possible fix-up novella of Turing tales. Could end up being a kind of Forrest Gump thing, with Alan in on all sorts of historic events.

Turing (disguised as Zeno) hooks up with Burroughs in Tangier in B's favorite bar, I could look it up in B's letters. They hit it off to a certain extent. Have a good talk on thinking machines. Has kif with Burroughs. Alan gets into a stoned rap about how to make a Turing Evaluator.

They don't have sex, neither one finds the other appealing, even though they're the same age. Alan manages to have sex with Burroughs's boy Kiki. Burroughs is mad and hits Alan with a very large dose of majoun. Or maybe heroin or some other opiate.

Alan feels himself drop down to cellular consciousness. He's taking advantage of his studies of morphogenesis. He sees the infinite mind of Nature, and then sees...

(a) how to get around the Turing Halting Problem and how to make an Evaluator. He imagines he can predict Burroughs's behavior, also other people. He takes Burroughs's money and passport, goes to the dock, gets a ship to the United States, planning to go to California.

Or, better, he sees...

(b) how to form himself into something like a slug. He crawls across the room and *schluppp*, he assimilates Burroughs. Or rather merges with him. In any case, the process ends with only one queer forty-year-old in the room. Feeling very full, Alan/Bill went into the outhouse in back and took a seventy kilogram dump — eliminating redundant parts. Like a corporation that's "right-sizing" after a merger.

Burroughs became a different man. He became obsessed with the machinery of writing. The Dream Machine, the cut-up. Now and then, by the light of a full moon, he'd sometimes find himself writing out lines of 32-bit code.

Burroughs's notion of the Happy Cloak is [lifted wholesale](#) from Henry Kuttner and C. L. Moore, *Fury*, 1947.

A culture catering to hedonism has its perversions of science. And Blaze could pay well. More than one technician had been wrecked by pleasure-addiction; such men were usually capable - when they were sober. But it was a woman Blaze found, finally, and she was capable only when alive. She lived when she was wearing the Happy Cloak. She wouldn't live long; Happy Cloak addicts lasted about two years, on the average. The thing was a biological adaptation of an organism found in the Venusian seas. It had been illegally developed, after its potentialities were first realized. In its native state, it got its prey by touching it. After that neuro-contact had been established, the prey was quite satisfied to be ingested.

It was a beautiful garment, a living white like the white of a pearl, shivering softly with rippling lights, stirring with a terrible, ecstatic movement of its own as the lethal symbiosis was established. It was beautiful as the woman technician wore it, as she moved about the bright, quiet room in a tranced concentration upon the task that would pay her enough to insure her death within two years...

The woman, swimming in anticipated ecstasy, managed to touch a summoning signal-button. Then she lay down quietly on the floor, the shining pearly garment caressing her. Her tranced eyes looked up, flat and empty as mirrors. The man who came in gave the Happy Cloak a wide berth.

Burroughs actually uses some of the above text in [The Ticket That Exploded](#), and he does in fact credit the quote. He uses the Kuttner-Moore stuff after his great (and weirdly punctuated) line:

"Skin like that very hot for three weeks and then—" the guard snickered "—wearing the Happy Cloak.."

And I have a lot about the Happy Cloak in my novel *Software*, too, of course.

STORY NOTES

A sequel to "The Imitation Game."

Alan Turing (1912 - 1954*), initially disguised as the Greek boy Zeno, meets Bill Burroughs (1914 - 1977) in Tangier. Burroughs was very lonely right then,

would have loved having Turing to talk to. They are introduced by the slightly older man Brian Howard (1905-1958), educated Christ Church college at Oxford (1926). He is hooked on Eukodal, too, hangs around with Burroughs. Could have led to the two meeting.

Turing (disguised as Zenon) hooks up with Burroughs in Tangier in B's favorite bar in the Socco Chico (little market). They hit it off to a certain extent. Have a good talk on thinking machines. Has kif with Burroughs. Alan gets into a stoned rap about how to make a Turing Evaluator.

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Turing's new face falls off. He lies low in Burroughs's rooming house. He swears off drugs. He uses fungi and lichens, coaxing them into Zhabotinsky scrolls.

The device is inspired by Burroughs's Reich orgone notions, but is actually implemented by Turing using biological engineering. They're like shelf mushrooms that grow in a ruff on your neck. Burroughs calls them Happy Cloaks.

Write the story in the form of "lost" letters from Burroughs to Allen Ginsberg. The idea in this series of stories might be to move kaleidoscopically from one character to another.

Break it up into raps, and call it "Tangier Routines".

"Qlone"

Asimov's turned this story down, so I decided to save it for *Flurb* #6. Too much trouble to send it out to *Interzone*, as they took over a year to publish my last story, also I just sent them the first chapter of *Hylozoic* as a story. And *F&SF* is, I have come to believe, unwilling to buy any story that I could conceivably write. So, rather than dig deeper down than that, I'll just *Flurb* it even though it's a fairly commercial piece.

BACKGROUND NOTES

Emails to Cory Doctorow

Cory Doctorow advised me to use a Creative Commons license on my electronic release of *Postsingular*. Initially I used the less restrictive by-nc-sa license instead of the more restrictive by-nc-nd license, and then I got anxious about that and changed the license, but some of the earlier versions were already loose, and Cory told me the earlier licenses are irrevocable, meaning that some people would always have the right to make derivative mixes and altered versions of *Postsingular*. And I started emailing him some ideas for a transreal story, but he was too busy to get into it. The following is excerpts from my emails to him in, I guess, November, 2007.

This whole experience has given me the germ of an idea for an SF story about a guy who releases his DNA or quantum personality code as, like, SA license instead of ND. Maybe when I get some time this spring or summer (after finishing *HYLOZOIC*) we could collaborate on it--we'd talked about this before but didn't have

an idea. I see this as a transreal two guys story. I can "be" the mad scientist who fucks up his release, and you can be his legal maven pal or boss or fellow scientist. It occurred to me that you kind of revel in legal niceties in the exact same way that I revel in math. Our two characters could be like this, with each of them uncomfortable in the other's domain...

By living and learning and working on yourself your whole life, your personality and experience and skills become in some sense your supreme work of art.

Suppose "my" character is called Zack. Zack might want to copy himself out of vanity, or out of a desire for a type of immortality.

Or to expand on his work. And he might also be doing it to make money. [Note that these are the same range of reasons for why we write and sell books.]

Sell Zacks? Sure, maybe people would pay Zack to allow a Zack copy to be instantiated in their town. No guarantee that the copy would stay there, but he might, they'd try to make him welcome. (Possibly tell part of the story from the POV of just such a copy, do the thing of him realizing what's up.)

Would the original Zack care if they did mods on the Zack versions?

Well, he might. Integrity, dignity, like that. "No tentacles.

Don't make me a Heritagist." So maybe he'd want a ND license and not an SA license. But maybe he fucks that up. Maybe the copy is somehow essentially different from the original.

I hadn't thought about the whole issue of DRM. Maybe Zack wouldn't want Zack -701 to be able to muscle in on his racket by selling Zack-701-xxv. So there is some kind of quantum computational hack mean to block second-gen copies. But of course Zack-701, being a genius like Zack, can find a workaround. Or maybe he can't

Maybe the original Zack gets killed and the legal-mind character, call him Tuck, maybe he wants to unlock the DRM on Zack -701; Tuck is Zack's business partner and wants to keep the biz going. (Names not set in stone).

How about this for the story start.

Zack-701 wakes up in some nowhere burg, like maybe Louisville or Calgary, and he knows he's the famous scientist (or author?), and can't quite twig how he got here. People come in and greet him, he's a full professor, they want him to settle in.

He realizes he's a qlone (quantum mediated perfect clone). And he can feel the DRM. Although it's there to prevent him from making secondary copies of himself it's also having the effect of preventing him from publishing papers (or writing novels.)

Trevor (better than Tuck maybe) shows up with a briefcase. Seems the real Zack has died. Trevor says he wants to help Zack-701 hack his DRM to start making money. In reality Trevor wants to make a national example of this, he's obsessed with copyright/DRM/free-info issues and is in some sense taking advantage of Zack-701, as he feels this is the likeliest guy to break the DRM code.

Possibly alternate POV in sections.

The DRM is a symbol of writer's block, or lack of ability to create, I suppose.

Need a woman in there too. Maybe one of them has a girlfriend and the other one wins her.

Some kicker at the end.

Emails to Nick Herbert

Rudy to Nick, March 6, 2008: I'm thinking about writing an SF story where people can make qclones of themselves, quantum clones. But I know there's the no-cloning theorem. An imperfect clone would be fine for my purposes. I just need to make someone who's physically just like me and knows all the same things, but I want to put in some QRM (quantum rights management) so that the guy can't make second generation copies of himself --- I want to own the Rudy qclone market and don't want my qclones muscling in on it. But then I die, and my lawyer or wife wants to help one of the qclones to break through his writers-block-like QRM... I notice a little info about this on Wikipedia http://en.wikipedia.org/wiki/No_cloning_theorem Can you tell me more?

Nick's answer, March 6, 2008: The best you're going to be able to do in the future is imperfect cloning. The optimum universal cloner has a signal to noise ratio of 2/3. For every three tries it gives two perfect copies but the third time it produces the orthogonal state—the antiRudy.

So if people behaved like photons you can imagine a machine that duplicates you most of the time—non-destructively. One of you goes in and two come out. Do it again with the same result. The third time you will come out unscathed but will be accompanied by the Orthogonal Rudy who is entirely unlike you—the vector dot product of Rudy and AntiRudy is zero.

Don't know what this would mean in practice. Normal orthogonal modes exist in classical physics, such as the excitations of a drum head. For photons there is only one orthogonal mode—for Rudy there are probably lots. So perhaps the Signal/Noise ratio would not be so large as with photons, so that the odds of success are smaller.

Nick's answer, March 11, 2008:

As far as real cloning goes (cloning means you don't destroy the original), it is usually discussed in terms of Bosons like photons, not Fermions like you're made out of. I don't know of any serious discussions of Fermion cloning but it should be possible.

To clone a photon in state X, you send it into a laser gain tube that has been pumped with X-polarized photons. One X polarized photon goes in and N X-polarized photons come out.

There are no lasers for Fermions but I don't think that there are any laws that forbid special-case cloning of Fermions.

Rudy to Nick, April 5, 2008.

I feel like you said two different things.

Also, what I need, my desideratum, is that a guy Zack (like a Bill Gates of quantum computation) can clone off copies of himself fairly reliably. The copies have QRM (quantum rights management) so that they can't clone themselves even though they know everything the original guy knows.

Zack dies (sabotaged by bad guy Trevor). A qclone Zack-5 does figure out, with a bad guy, how to crack QRM. Trevor the bad guy wants to set off an branching cascade of copies of himself, but he is thwarted as he generates anti-Trevors and they wipe each other out. The qclone Zack-5 is killed too, but he saw this coming and set a timer to make a copy of himself, Zack-6, happy ending he's in bed fucking Zack's wife.

Can you jibe this tale with one or both of your scenarios?

Nick's Answer: April 5, 2008.

I don't think you have to worry much about quantum limits to cloning. As you know classical cloning is possible: that's how copy machines and DNA duplication work. What's not possible is super-exact duplication of the quantum state. Phase errors of the order of h must occur and dipshit stuff like that. But most certainly any human beings will be robust against such minuscule details that the quantum no-cloning rule can be effectively ignored. The secret lies I think in the term "robust". Robust Computations is what defines life. Cut off a root; a new one grows back. Drop a few bits, burn out a few modules, lose a few sensors, it just grows them back or hacks around the burnt out areas. If you were concerned with exactly cloning some subtle fairy-dust soap-bubble micromirage, you might run into trouble with the no-cloning rule. But as for cloning living beings, even most of their quantum aspects, I don't think you need worry.

If human duplication were possible, what would happen to consciousness? Odds are you would get two beings each of whom would claim to be you. But which one would YOU be? the one who's reading this. Or maybe YOU would go into both of them and still be one person with two points of view. That would be cool but hard to live unless you learned new skills or kept one of your clones asleep.

Re your cloning people. There is a well-known way to incorporate quantum DRM into your clones.

It was invented at Columbia by Stephen Wiesner in the late 60s and called "quantum money" which took the form of a bill that was uncounterfeitable because of quantum-encoded digits but checkable by banks who possessed the secret key. See Simon Singh's "The Code Book" page 332 for "quantum money" and how Wiesner's clever idea morphed into the basis of quantum cryptography. TCB is a wonderful book, mixing physics, math and especially lots of stories about real people--that always humanizes science books if done well, as it is in Singh's Book.

STORY NOTES

An SF story about a future where people can use quantum legerdemain to make very nearly precise copies of themselves called qlones (for quantum clones).

By living and learning and working on yourself your whole life, your personality and experience and skills become in some sense your supreme work of art.

One main character is Zack. Zack sells copies of himself to make money. He's a famous scientist, entrepreneur, surgeon? People will pay Zack to buy a Zack qlone for their town. There's no guarantee that the copy will stay there, but they try to make him welcome. (Obviously he's not a professor or an artist, which nobody would pay for...)

Zack doesn't want mods on the Zack qlones. No weird bodies, and the qlones can't be of the opposite political party. So he wants a no-derivatives license, and he puts QRM (quantum rights management) on the qlones so they can't make secondary copies. He wants them to work on the same things as him, but he wants a cut of the money and the credit.

The story is told from the point of view of Zack's wife Ellen, who also acts as his agent.

Zack dies, perhaps will recklessly mountain-climbing or hang-gliding, or something more futuristic. [Later we'll have the reveal that he killed himself on purpose as he was somehow fed up, or maybe a reveal that he was murdered by the Qlone Liberation Front.] Ellen says she misses Zack and wants him back, but perhaps he has lover, and what she really wants is to keep the cash flow from Zack-qloning.

She goes out and finds Zack-7 in Rochester, New York. Why him? Why not, they're all the same, and this one is pretty new.

Zack-7 is in charge of the fusion power facility which is finally going commercial out of the University of Rochester. Z-7 isn't liking it all that well. He awoke full-blown there, with the job. He can feel the QRM, the quantum rights management. Although it's there to prevent him from making secondary copies of himself, he imagines it's also having the effect of preventing him from doing really great and creative organizational.

Ellen wants to help Zack-7 hack his QRM so they can start making money the easy way by selling Zack clones. It's no-go. But then Ellen's boyfriend Trevor shows up with a briefcase. Trevor says he wants to help Zack-7 hack his QRM to start making money, but in reality Trevor wants to make a national example of this, he's obsessed with copyright/DRM/QRM/free-info issues and is in some sense taking advantage of Zack-7 and for that matter Ellen, as he feels Zack has the scientific know-how to break the QRM code.

It comes out that Trevor killed Zack. Ellen turns against him. Zack-7 wants to be free.

Possibly, kicker, the cloning goes wrong and produces a hundred anti-Zack's, each of them orthogonal to Zack in a different way.

Possibly alternate POV in sections.

The QRM is a symbol of writer's block, or lack of ability to create, I suppose.

“Message Found in a Gravity Wave” & “Bloggers of the Colliding Branes”

I blogged a lot about this book I read, [The Endless Universe](#), and then I wrote two stories about it, a short-short for *Nature*, and a longer one with Bruce Sterling, probably for *Asimov's*. I actually plan [a third one](#) as well, with Paul DiFilippo.

PAUL STEINHARDT ON THE CYCLIC UNIVERSE

As regular readers of my blog know, I'm currently interested in a new cosmological model called the Cyclic Universe, popularized by Paul Steinhardt and Neil Turok in the very readable book, *The Endless Universe*. The basic idea is that our cosmos consists of two parallel sheets of space which are called branes.

Every so often (one guess is every trillion years), the branes slam together, which fills them with energy that can be in some sense gotten for free from the boundless riches of the gravitational field. This space-filling Big Splat replaces the point-like Big Bang. While the branes are apart, they expand, with the galaxies moving apart over the years. And eventually they embrace once again. It could be that there are an endless number of cycles in the past and in the future, and that the spaces involved are infinite.

I decided I might write some science fiction about all this, and I sent Paul Steinhardt a few questions about the Cyclic Universe via email. He answered them and kindly offered to talk on the phone so that I could ask some follow-up questions. The following is a distillation of the email and phone conversations. As it's been edited by me, any errors should be ascribed to Rudy rather than to Paul.

(R1) It would be cool if a story's main character finds out that the Big Splat of the recolliding branes is going to be TOMORROW, rather than in a trillion years.

(P1) According to our current models, the soonest the next splat could really happen is in ten billion years. The reason is that it takes nearly ten billion years for the branes to move back together, and as soon as they start approaching each other we can notice subtle changes. So if the branes were on the road to colliding, we would have noticed by now.

(R2) What are the kinds of observational evidence that tell you the tenth-dimensional separation between branes is dwindling? As I understand it, our universe itself will continue to seem like it's expanding, so how might we notice the impending splat?

(P2) You'll like this: as the branes begin to move towards one another, nature's fundamental "constants" begin to change—Newton's gravitational constant, the fine-structure constant that controls the strength of electricity and magnetism, etc. And the rate of change picks up the closer the branes get. It would seem like the laws of physics are changing faster and faster.

In the earliest stages, the first thing we'd notice would be slight variations in the spectral lines between nearby atoms and distant (older) atoms. Later on, the changes would be more dramatic. We'd notice the positions of spectral lines in a single sample of matter changing over the course of a day.

Later on, atoms might get larger, but you'd have other effects mixed in as well. It would become in some sense hard to say what size anything is, as our definitions of size are ultimately based on the fundamental constants.

(R3) Presumably any humans would be destroyed at some point; our molecules would fall apart, and so on. And then, of course, you'd have the Big Flash. Might we have any hope of surviving to the next cycle?

(P3) We might draw on the fact that the collisions between the branes only occur in places where the universe is nearly empty -- which is ALMOST everywhere. But where there are black holes, their gravitational field is strong enough that the collisions do not occur near them. It is as if the black hole pins the branes together in those places where they lie, and that means there are no collisions.

If an advanced civilization could figure out how to create/manipulate black holes so that they are surrounded by them but do not fall into them and if they could protect themselves from the intense radiation of the collision (about 10^{10} times the temperature of the sun), they could survive into the next cycle. One problem here is that, because of all the stretching of space that occurs from cycle to cycle, surviving black holes are spread out to an enormous degree — so the chances are that, by the time the Splat approaches, there are no black holes within mankind's observable horizon. So, even if a civilization managed to do this, they would not likely be anywhere we could see them.

(R4) I like that idea. Maybe a science-fictional civilization could manufacture black holes! Of course it would be tricky to surround our planet with them and not

have the holes collapse together. Maybe they could be furiously orbiting in some chaotic dance.

On a slightly different topic, I'm intrigued by the notion of finding some way to perceive that space is infinite. But we're to some extent limited by that big flash that happened 14 billion years ago. If the universe is spatially infinite, might there perhaps be SOME kind of signal that makes it through the haze of the Big Flash, reaching us from distances larger than the light horizon? I'm thinking, for instance, of gravitons that started on their way before the last Splat, or even from several Splats ago.

(P4) Yes and no. There would be gravitational waves produced just before the last bang that we could detect in the present universe. But the signal is very, very weak. And I suppose a civilization that existed just before the end could send that signal. But the bigger problem with the gravitational waves and photons from earlier cycles, is that their wavelengths will have been stretched by the expansion of space. The 14 billion light year diameter sphere that we see around us began as a region less than a meter across. A meter-long gravity wave from those times would now span the visible universe. There would be no way to construct an apparatus to detect it.

(R5) So there's no way to pass information from one cycle to the next?

(P5) One very speculative idea is that you might store information inside a black hole. Although we think of the two branes as parallel with a tiny separation, in the neighborhood of a black hole, as I mentioned before, the two branes dimple out and touch each other, merging into a single brane. So there's not going to be an big splat and radiation burst inside a black hole.

Of course the hard part about storing information inside a black hole is getting it back out. There's an ongoing debate among physicists about whether information that goes into a black hole disappears for good, or whether it might be retrievable if the black hole spontaneously evaporates. Or perhaps if you scatter some object off of the black hole. In the scattering case, it may be that you need something like an encryption key to retrieve the information, that is, you have to in some sense know what the black hole has eaten so far.

(R6) In terms of a smooth motion, it seems like it would be nicer if the two branes could pass through each other, rather than splatting and rebounding. Is that a possibility?

(P6) Sure, I like to think of it that way myself, as then you feel less worried about the branes getting stuck together. Whether we say they bounce or pass through each other is really just a matter of how we set up our coordinate system.

(R7) Might there be life on the other brane?

(P7) We think of the other brane as probably not being something like a mirror of our world, so it would be a very different kind of place. One might not have atoms or particles there in the usual sense.

A List

“Quantum Information”

A playful short-short story on Quantum Information, parodying the Alice and Bob examples which appear in popular articles on quantum information, for instance in, “The Heisenberg Representation of Quantum Computers,” by Daniel Gottesman. Alice, Bob, Eve. Really silly and Woody-Allan-like. *Nature* might go for it.

Suppose I dramatize Deutsch’s experiment about consciousness and the multiverse described in an appendix to Julian Barnes’s book.

I’ll use an idea about square root of NOT gates. I describe these quantum computational logic gates in *The Lifebox, the Seashell, and the Soul*.

“The real fun begins if we now imagine decomposing an interferometer into its two component beamsplitters. I’ll replace the two beam-splitting mirrors by lines, as if I were drawing wires. So now we have two identical gates whose combined effect is that of a NOT gate. These quantum gates bear a marvelously science-fictional name: a *square-root-of-NOT* gate.”

For the story, to make it real, have it related to dating.

Bob’s idea: prepare systems (women) in the “1” state (willing to date you) and then apply the square root of NOT operator twice. To get the ensemble of women in the 1 state, perhaps you do some detective work rather than asking them.

The square root of NOT operator will be the asking of this question: “I’m asking you to meet me for dinner Saturday night, but only say show up if you *really* want to go out with me.” This acts as the square root of NOT operator, because if you ask it twice, you will invariably turn all of the state 1 girls into state 0 (unwilling to date you) girls.

Does this work the other way? Can we imagine that the doubled question turns nays into yeas? I can imagine that, yeah...barely. Like, after the first question someone leans towards no, but then she gets intrigued and regretful, and goes to a yes state after the second time.

In the quantum mechanical view, asking the question once produces a mixed state which reliably interferes with itself at the second “gate” (questioning) to produce a Yes.

For the Deutsch experiment to work, however, I think they have to somehow forget what they decide the first time they’re asked, which is kind of bogus?

Or maybe it’s enough if they don’t tell YOU the answer the first time. So they’re in an uncollapsed state relative to you.

Key on what happens between Bob and Alice.

Eve eavesdrops.

Summary of the experiment:

If we live in multiple universes, then asking the question twice always leads to a final No answer, that is, to a “0” state. If we only live in one universe and our questions always collapse things to one alternative, then asking “Do you *really* want to go out with me?” twice leads to a mixture of final Yeses and Noes, as you don’t get the quantum interference.

Maybe Eve comes unstuck, she gets transuniversal consciousness. She turns fuzzy and disappears.

Eve is running the experiment, she keeps preparing Alice in the 1 state, getting Bob to ask the questions, and observing what happens.

I could write it in a surreal, mocking fashion, like a New Yorker humor piece.

B List

“Happy Hour”

A woman experiences the Singularity over the course of an afternoon, sitting on her couch watching news TV and drinking vodka from a plastic half-gallon bottle. The Web wakes up. She learns that dark matter is consciousness. She calls it kvaar. Religion gets real; God is a pattern in the dark matter.

And then?

A computer virus that infects the quantum computations of ordinary matter. Turns humans into zombies.

Or—ideas from [comments on my blog post](#) about limits to VR:

outerjoin: “Don’t forget that Vearth would actually require dev, test, and staging environments to enable all phases of the testing cycle ... Post-release bugs are what we refer to as the paranormal, and people like Jesus are no more than test user accounts with admin rights.”

Kelson: “Do you suppose that Nature might have some sort of auto-immune response should any one part of herself start tinkering too much?”

someguy: “Maybe the best explanation for plank time / length and all the other quantum weirdness is that we are in a simulated universe and we are viewing the computational limits of that simulation.”

“The Micrometamorphosis”

Sam Gregory (Gregor Samsa), a microbiologist, finds a way to insert a code for his accumulated knowledge into a paramecium. He’s doing it as a “backup” for his mind. He wants immortality. But then the paramecium-writing virus that he made turns retro and turns his body cells into paramecia.

After a night of uneasy sleep he awakes as one single very large paramecium. There could be a problem with the membrane being strong enough for a paramecium that size, so let’s suppose he makes it extra thick. He has dreams of problem-solving, these were about designing an 80 kg paramecium.

Maybe someone pops him, his wife. She screams and runs into the bathroom, he’s trying to talk to her, she gets around him, hitting him with a mop over and over, squashing him, pushing him down the drain. He becomes puddle of microorganisms on his sheet, six billion strong. Now he’s really immortal.

Alternate possible denouement is that he becomes an aeroform and flies.

“Flying”

Maybe a fabulist story about flying. I wake up in my dreams and I can fly. Nobody every notices. My wife can’t fly.

“Packrat”

A guy who saves stuff in his apartment, like the comics collector Paul Mavrides knew. He’s found a way to make the space multidimensional so as to save more.

Suppose that in the warehouse, a pair of branes are at a slight angle to each other, like a pair of intersecting planes. A brane seam. It would be interesting to move over the *seam* where the branes cross. They will cross in a plane. You would, I suppose, go to one or the other brane with equal likelihood. Or maybe you could push it. Use this as a travel gate.

C List

“URL All Over”

A man gets web addresses assigned to everything he owns; he attaches RFIDs to them. When he loses something, he can simply Google for it. But then something odd happens. He Googles for his lost keys and they’re in an alternate universe.

This is maybe too old an idea to resuscitate. (I first discussed it with Bruce Sterling in the 1990s.) And I’m using a variant of it in “Hormiga Canyon” with Bruce.

Reading Notes

Greil Marcus, The Shape of Things To Come

I didn’t read this book, just a review of it in the Oct 1, 2006, *N. Y. Times* Book Review section, with this quote about analog vs. digital computation in the context of Otis Spann improvising a blues song about M. L. King’s assassination. [My italics.]

“The piano strikes back at the verse as if every word it holds is a lie, because if words cannot tell the whole truth, words lie, and *words can never tell the whole truth, only sound can do that, sound that is not made by men and women but by Nature’s God, sound that is not made but found.*”

David Leavitt, The Man Who Knew Too Much

This is a short biography of Alan Turing (1912 - 1954) in the same Atlas/Norton Great Discoveries series that published that truly [ghastly](#) book by David Foster Wallace on Georg Cantor. Leavitt’s book seemed a little weak in spots, but it reads well, and I wanted to read about Turing this week and couldn’t immediately get hold of the longer and canonical bio, [Alan Turing: The Enigma](#) by Alan Hodges. Not only Turing but Kurt Gödel were inordinately fond of the Disney cartoon *Snow White and the Seven Dwarfs* (1938). Turing is believed to have committed suicide by biting an apple that he’d painted with cyanide, and was found dead in his bed on June 8, 1954.

Turing was said to have enjoyed the scene where the Wicked Queen dips the apple in her poisonous brew and he even memorized her song and chanted it after seeing the movie:

“Dip the apple in the brew, / Let the sleeping death seep through. / [A skull icon appears in the skin.] A symbol of what lies within. / Now turn red to tempt Snow White, / To make her hunger for a bite. / When she breaks the tender peel, / To taste the apple from my hand, / Her breath will still, her blood congeal, / Then I’ll be the fairest in the land!”

One interesting thing about Leavitt's book is that he places a lot of emphasis on Turing's homosexuality, and dares to hint — with, unfortunately, no corroboration — that Turing may have been murdered by the British secret service: "...none of Turing's friends ever seems to have considered, at least in writing, a third possibility (one, admittedly, for which there is no evidence, at present anyway): namely, that the suicide was staged; that the man ... had become — like the hero of Alfred Hitchcock's 1934 film — a man who knew too much."

This said, it really does seem possible that Turing killed himself. Like the other logicians Gödel and Cantor, he seems to have been somewhat nuts. Funny how many logicians are crazy and irrational. A paradox. What may have put Turing over the edge was the estrogen treatments he was sentenced to after telling the police about a gay sex encounter he'd had. Still, he'd been allowed to stop the estrogen a full year before he killed himself.

Turing never saw anything wrong with homosexuality; in the terms of his famed "Imitation Game," there really was no difference between the sexes. Anyone can emulate anyone else.

In his last days, while working with a therapist, he began writing a short story about a man picking up a younger man for sex while doing his Christmas shopping. For me, as an SF writer, the exciting part is that in this transreal tale, Turing describes "himself" as Alec Pryce, a scientist interested in interplanetary travel! Here's a [link](#).

"Alec had been working rather hard two or three weeks before. It was about interplanetary travel. Alec had always been rather keen on such crackpot problems, but although he rather liked to let himself go rather wildly by appearing on the Third Programme when he got the chance, when he wrote for technically trained readers his work was quite sound, or had been when he was younger. This latest paper was real good stuff, better than he'd done since his mid twenties when he had introduced the idea which is now commonly know as 'Pryce's buoy.' He always felt a glow of pride when the phrase was said."

Another fascinating tidbit from the book. In his last days, Turing wrote his friend Robin Gandy a series of four postcards, the last three on March 8, 10, and 13 of 1954. The first card is missing. The cards were inspired by Arthur Stanley Eddington's *Fundamental Theory*, which the two men were reading. [These cards](#) are online, and the images are Copyright © P.N. Furbank.

Messages from the Unseen World

III The Universe is the interior of a Light Cone of the Creation
IV Science is a Differential Equation. Religion is a Boundary Condition
[Signed "Arthur Stanley"
"Does the gravitation constant decrease?"]

V Hyperboloids of wondrous Light
Rolling for aye through Space and Time
~~Shelter~~ Harbour there Waves which somehow Might
Play out God's holy pantomime.

VI Particles are founts
VII Charge = e / π arg of character of a 2π rotation
VIII The Exclusion Principle is laid down purely for the benefit
of the electrons themselves, who might be corrupted

(and become dragons or demons) if allowed to associate too freely.

In his last letter to Robin Gandy (probably from an earlier date), he writes out some calculus formulae and says, "Can do the rainbow problem successfully for sound, but total failure for electricity."

Andrew Hodges, Alan Turing: The Enigma

Actually I was initially looking for this book, and couldn't find it, and read the Leavitt book, and then, *duh*, I noticed the fat Hodges book on bookcase by my desk. Maybe I was avoiding seeing it as its so fat and has such a small font. Hodges is something of a windbag; he can go on for six or seven pages without actually saying much of anything, like gassing on about the Cold War.

I read the final chapter only.

Turing in a letter about his trial. "Whilst in custody with the other criminals I had a very agreeable sense of irresponsibility, rather like being back at school."

Once convicted, Turing would have been unable to visit the United States due to a criminal record of moral turpitude. Hodges calls him an "intellectual beatnik."

He read and liked *War and Peace*. He was lonely and conscious of his self-consciousness. Once, when in a pub with a friend, a boring logician appeared through one doorway, and Turing disappeared through another. As a boy, his favorite parts of the book *Pilgrim's Progress* were Doubting Castle and Giant Despair. Mathematics always protected him from the world.

He had a Norwegian boyfriend called Kjell; possibly the authorities somehow stymied Kjell from visiting him. His estrogen treatment ended in April 1953. He never abandoned his homosexuality.

"Went down to Sherborne to lecture to some boys on computers. Really quite a treat in many ways. They were so luscious, and so well mannered, with a little dash of pertness, and Sherborne itself quite unspoilt." I love that word "pert" there, it's so apt for young teenagers of either sex. There's a touch of Wm. Burroughs in the phrasing.

In mid-May, 1954, Alan went with the family of his psychiatrist Greenbaum to a kind of boardwalk in Blackpool, and Alan went in to the Gypsy Queen fortune-teller, and came out white as a sheet and said nothing more on the way home to Manchester.

He died in the evening of June 7, 1954, just short of age 42. There was hardly an inquest, and his body was cremated.

Turing's work on decryption during the war was so secret that it was totally unknown to the public. In a sense, his knowledge was even more highly classified than atomic secrets. There was something of a frenzy about atomic security in the mid 50s, also a worry about the riskiness of homosexuals having access to secret info. Turing's unpredictability and lack of control would have alarmed the spooks. It's conceivable that they were privately threatening him with more prosecutions.

Turing was a soft machine.

Bird Lives, The Life of Charlie Parker

by Ross Russell (Charterhouse 1973).

p. 55. If he looked across the beams of the spotlights that shone toward the bandstand, he could see a lavender haze, shimmering like air over a street on a hot summer day. He watched the heavy smoke that curled and wreathed, floating lazily

upward, borne along by the waves of music. It had a sharp, pungent, odor and made a biting sensation in the nose. It was smoke from sticks of tea that were being passed from one man to another on the bandstand below. After twenty minutes of the set Charlie would feel himself borne along in the pleasant lavender haze. Then the long narrow interior of the Reno Club would grow deeper. The bar, the polished glassware in front of the mirror, the waitresses poised like blackbirds, ready to fly to their customers—the tables, booths, dancers, musicians, orchestra, everything in the Reno Club seemed to be exactly where it belonged, as if it had been there forever and would never change, fixed in time and space, and time itself stopped. He was getting high. Now he could hear the things that he had missed, the miniature sound—Basie's little blue comments, a silvery skein of notes played by Prof as a counter line to Herschel, muted chortling of screened brass under the saxophone choir, a light scurrying of sticks across the head of the snare drum as Jesse marked off a bar section, wispy little phrases that entered somebody's mind because of something just played.

p. 116. "Bird was a most receptive being. He got into his music all the sounds right around him—the swish of a car speeding down a highway, the hum of wind as it goes through the leaves ... Everything had a musical message for him. If he heard a dog bark, he would say the dog was speaking ..." quoting Gene Ramey.

p. 119. It was possible to allay hostility and soften confrontations by improvising the necessary roles, just as one might improvise a successful jazz solo. With skill and experience it was even possible to act out parts and convert such situations into charades played at the expense of the oppressor.

p. 173. [The bebop musicians were called "boppers," just like in my *Ware* series. At the time I'd thought to bopper as a rock-n-roll term, didn't quite realize it came from 40s jazz.]

p. 176. He was hardened, durable, and undentable. The approval of the hipster community confirmed the correctness of his code. His lifestyle was veering toward its final goal, to live freely, as he pleased, without hang-ups of any kind, to be cool and wiggly, and in control. His life had become an unending series of kicks: food, alcohol, drugs, sex, and, as always and above all, the music. The music was the big game, supported by and supporting the little games. Charlie was learning to play his way through life. He began to live on the level of total spontaneity.

p. 245. He liked to organize a gang for a ride on the A train, boarding the subway for the long, high-speed express trip from Times Square to 125th Street in Harlem, and back again. Charlie would stand in the vestibule of the front car, staring at the twisting rails and swerving red lights, mesmerized by the roaring tunnel of sound as the express gathered speed and hurtled through the night.

p. 252. The *Klactoveesedstene* title was his own. He wrote it out one night...offering no explanation of its meaning. When I asked, he gave me a stony stare and walked off. ... I then consulted [Charlie's white hipster acolyte] Dean Benedetti, who pointed out at once what to him was quite obvious: "Klactoveesedstene? Why, man, it's just a sound."

p. 345. [Drunken pianist Bud] Powell swung around on the piano stool, faced Charlie, grinned, and demanded, “What key, motherfucker?”
“The key of S, mother,” Charlie snapped back. [Meaning “shit”.]

Hieronymus Bosch: The Complete Paintings and Drawings.

The authors are Jos Koldeweij, Paul Vandenbroeck, Bernard Vermet, the publication (Abrams, 2001). All these pictures were in Rotterdam at once, organized by these authors, and I missed the show, goddammit.

The quality of the illos is great, but the captions are all but unreadable: tiny and gray, and the captions are organized unbelievably badly. For instance, there are dozens of detail images scattered through the book, but these images have *no* caption other than a bracketed number, which is the number of the illo that shows the whole painting, and can be anywhere else in the book. There’s a very rudimentary list of illos in the rear of the book, but the numbers seem to be incorrect in the list. Now and then the text references illos by number, but this is done very inconsistently. It’s like the book was designed by someone totally incompetent, mentally ill, or filled with a perverse desire to make the book as hard to use as possible. The page numbers are hidden in the middle of inner gutter margins, and often are left out if there’s an illo there --- why not just the freaking page numbers in the corners of the page where they belong? I have never in my life seen such a user-unfriendly art book, I’d like to choke the assholes who put the book together and who, by the way, organized the greatest Bosch show of my lifetime without personally writing me about it to keep me from missing it.

The prose is perhaps badly translated, but even so it almost reads as if the authors are insane, it’s so involuted and willful.

Introduction

p. 8, “Bosch’s work is ... simultaneously cryptic and inaccessible, yet totally open, with the lowest of thresholds. This is painting for both the most serious art-lovers and for those who virtually never visit a museum...”

Hieronymus Bosch and his City

p. 26. Visual rebus on the town name “‘s-Hertogenbosch” = oor + ogen + bos (ear + eye + woods). Or = hart + ogen + bos (stag + eye + woods).

p. 27 Bosch drew a scene with eyes in the field and ears on the trees, which was by then a familiar saying and rebus. And at the top he wrote, “Miserrimi quippe est ingenii semper uti enventis et numquam inveniendis,” which means, “It is characteristic of the most dismal of minds always to use clichés and never their own inventions,” the phrase drawn from a 13-th century pedagogical treatise then believed to be by Boethius.

p. 28 Picture of “The Peddler.” That guy is *me!* Or maybe Jayjay...

p. 32. ‘s-Hertogenbosch was known for knife making and for bell making. Casting a bell was a dangerous thing; the big bells for churches had to be cast on site, as they were so heavy. This would be a good scene.

Hieronymus Bosch: the wisdom of the riddle

p. 101. “the donor’s portraits in original Bosch paintings like the *Last Judgment* in Vienna [and three other paintings] have been overpainted, probably by the artist himself ... Relations with his customers were evidently strained at times...”

That’s funny. Maybe the donors didn’t like how weird his pictures were?

Wild men. Hairy people in the woods.

Lost composition: *Saint Leaving the City*. Shows people doing “swine clubbing” typing up a pig and getting blind people to try to club eth animal to death. They hit each other—big laughs from the callous onlookers. Once the pig’s dead they can eat it. Monks might give a barrel of wine or beer to beggars.

Another lost work: *The Besieging of an Elephant*.

Bosch is against poor impulse control festive pleasure, laziness. For discipline, modesty industry, drone drone drone. Deep seated rejection of fun in the morality of the burghers. They were always trying to ban festivals. Hated Shrove Tuesday.

Fire.

The World of Bosch

Edited by Jan van Oudheusden and Aart Vos (Adr. Heinen, ‘s-Hertogenbosch 2001).

This is a book of essays centering on the down of den Bosch.

“Hieronymus Bosch’s Home Town”

Originally there was just a wall around the triangular Markt plaza, but by Bosch’s time there was a larger city wall with five large gates, some smaller gates, five water gates and 23 towers. There were a number of wooden windmills outside the walls. A gallows field near the Vught Gate.

Within the walls many areas were still undeveloped. Vegetable gardens. A big Franciscan monastery near the Markt. They were also called the Friars Minor. Had a church 30 meters long. Dominicans, Wilhelminians, Bodford, and Clarissa orders had establishments too. 40 churches and chapels in the town.

There was a popular religious movement called Devotio Moderna. Each individual must continually choose between good and evil. Awareness. You are a wayfarer.

The Binnendieze River ran through the town. Two other rivers (really more like wide streams) met here: the Dommel and the Aa.

A well in the center of the Markt, a gathering place. The beggars and cripples might have hung out here. The big houses had their backs on the Binnendieze river.

The houses had wood facades with a couple of brick walls within for strength and to support the fireplaces. A typical house had a big front room, used partly as an office or store, with a balcony backing onto the warm fireplace wall. The rear part had the bedrooms. Cellar entrance in front of the house under a little shed called a pothuis. Hearths in cellars too.

Wooden ceilings decorated with floral motifs and vine paintings. Murals on many interior walls, flowers, and religious paintings too.

A huge fire in ‘s-Hertogenbosch in 1463.

The chapel of St. Anthony was at the end of town just inside the gate. I saw it; all that’s left now is the facade. Built by the Brotherhood of St. Anthony and finished in 1491. Brand new when our boys go to den Bosch, in other words. An expensive building of imported stone, the monks must have been well off.

The Zwanenbroedershuis is another landmark, I was in there. Near the St. Anthony chapel.

They were working on St. John's church all of Bosch's life. The artist Alart Duhomeel managed the building till 1494 when he went to work on St. Peters in Leuven. His brother in law Jan Heyns managed it too. In 1508 Heyns and Bosch worked on the chapel for the Brotherhood of Our Lady, completed in 1494.

Bosch lived in "In den Salvatoer" a brick house on the Markt with Aleid Meervenne from 1481 till his death in 1516.

"Life in the Town"

oneerlicke herbergen = dishonest taverns.

Bosch born a citizen.

In 1526, 20% of the locals were priests, monks, brothers, or nuns. Town called Little Rome. The religious didn't pay tax.

Punishments in front of Town Hall. Flogging, or mutilation by sword. Hung, broken on the wheel, or beheaded. Exhibit the bodies out side the Vughter gate on gallows or on a wheel in the air.

Metal industry making knives.

Bosch had a neighbor the rich merchant Lodewijk Beys (Ludwig) who went to Jerusalem in 1500 and 1503.

A big annual market on the Sunday after June 24, after the procession for the Virgin Mary. Militias, guilds, images of fairs, actors pretending to be biblical figures, floats litters canopies, painting banners. Bosch family did work for this. Tableaux of bible scenes.

Shrove Tuesday another big holiday. Processions, costumes, jokes. cockfights. eating and drinking. fights.

Merchants, country people, city people, musicians, beggars, charlatans, conjurers, magicians, acrobats, pickpockets, cutpurses in town for the market.

Weekly market on Thursday. Things for sale: sheets, shoes, stockings, leather shoelaces, hats and caps, pins, baskets, kettles, pots and pans, twine, vegetables, fruit, flour, meat, butter, cheese, cloth. Butter market, corn market, and fish market as well in other spots. Anyone could sell stuff in front of their house.

Vismarkt on Orthenstraat with a crane unloading ships.

Boats on the Binnendieze called pleyten, flat bottomed barges.

Bosch's house backed onto the river.

Traffic in the Markt: wagons and carts, horses and oxen, wheel barrows, and sledges even when no snow.

Guilds not particularly for artists. No concept of "artist". They were like ordinary craftsmen who worked with their hands, not in a special guild.. Only after Bosch's death did people start calling him master. Probably not in a trade guild. Most of work on commission.

Bosch's family all artists. Grandfather, father Anthonis, uncles Goosen and Jan.

Staple diet was bread or porridge, vegetables, fish, bacon, fat or dairy products. No mashed potatoes. Thin tasteless beer was the drink (no germs). Clothing of poor subdued. Bosch's fellow artists earned from decorating homes.

Inns had *stoven*, heated rooms where people bathed. Licentiousness IN the *Stoofstraat*, the bathhouses were brothels.

Paying jacks with knucklebones. Pigs in the streets. Raw sewage.

Cripple viewed as someone marked by the sign of the Evil One. Beggars were excluded.

In the winter the canals froze, making it possible for undesirables to sneak in.

Duke Charles 1467-1477 pissed away money on wars and took in a lot of tax. Riot after Charles died fighting in Nancy, people attacking magistrates. Maria of Burgundy succeeded Charles, pardoned them. She came through town with her husband Maximilian of Austria and many other nobles. Bosch saw this, he was 25, it inspired *The Haywain*.

The lingering Gelrian wars, pitting Brabant against Gelderland started up around 1480. Burgundian troops in town all the time, a front line. Markt was where the soldier assembled to go fight against pillaging Gelrian soldiers. Lots of tax. Burning each others' cities, like Oss and Driel.

The towns throbbed with beggars and the poor, but the Burgundian nobles were living high.

"The Cultural Climate"

Maximilian stayed in town at the Dominican friary in 1504-1505 in the winter. Max's wife Bianca stayed with Bosch's neighbor Lodewijk Beys. Philip the Handsome bought the Vienna Last Judgment from Bosch in 1503. Bosch's Saint Anthony triptych may have been painted in 1505 for Phillip the Handsome as well.

"Jheronimus van Aken"

Born sometime before 1457.

Father Anthonis died in 1481, left his little house to Jeroen van Aken's brother Goessen van Aken. Father also known as Thonis die Maelder.

Goessen's wife is Kathelijne. They have a son Jan. They had a studio in the old house.

He worked on investing and managing his wife Aleid van de Meervenne's inheritance.

Fifty years after his death, the new "In De Salvatoer" house had five fireplaces, a stoof or heated bath, a baking oven and a brewing house.

Brotherhood of our Lady. Bosch got in kind of suddenly in 1487.

In 1481 Goessen decorated the high altar in St. John. Maybe Hieronymus helped him or did the paintings. Altar piece for the Brotherhood.

"The Oeuvre of Jheronimus Bosch"

He covered over the patron in a painting of St. John for the Swan Brotherhood. His neighbor Jan van Vladeracken.

Bosch bean from the standpoint of reality and in his paintings transformed this by portraying objects out of proportion or by changing them into bizarre creatures or objects.

Beatrix Potter, The Flopsy Bunnies

When I was thinking about an object as a sack holding its component parts, I started thinking about the six Flopsy Bunnies whom Mr. McGregor catches in a sack, and he's gloating, "One, two, three, four, five, six leetle rabbits!"

I like this especially because I have three children and three grandchildren. Six little rabbits.



The bunnies escape and the rabbit parents (Benjamin Bunny and Flopsy) fill the sack with junk and rotten vegetables and when Mr. McGregor gives Mrs. McGregor the sack, gets "very very angry" and says Mr. McGregor "did it a purpose." Lo and behold, it's online with illos!

<http://www.gutenberg.org/files/14220/14220-h/14220-h.htm>

Charles Stross, Halting State

I consider to be a missed trick at the end of Stross's *Halting State*, where he has some gamers pretending to be zombies because their gameware asked them too. It would have been better if the gameware had infected their psyches or, much better, infect their actual matter and made them real zombies. When I read Stross's sentence about his characters just *pretending* to be zombies, I seemed to hear the snip of Mundane SF's gelding shears. If the zombies are just pretending to be zombies...then maybe the book is just pretending to be SF.

Poe's The Narrative of Arthur Gordon Pym

I got the whole text of this masterpiece from the [Gutenberg Project](#). I want to use these images for the great maelstrom in Chapter 8. I edited it down here and began changing things to make it fit in with my book.

They were entering upon a region of novelty and wonder. A high range of light gray vapor appeared on the horizon, flaring up occasionally in lofty streaks

The Planck sea was undergoing a rapid change, being no longer transparent, but of a milky consistency and hue. They were frequently surprised at perceiving, to their right and left, at different distances, sudden and extensive agitations of the surface.

Duxy tried to veer away, but they were under the influence of a powerful air current. Chu felt a numbness of body and mind—a dreaminess of sensation.

The gray vapor had now arisen many more degrees above the horizon, and was gradually losing its grayness of tint. The milky hue was more evident than ever. A violent agitation of the water occurred very close to Duxy. It was attended, as usual, with a wild flaring up of the vapor at its summit, and a momentary division at its base.

The range of vapor to the southward had arisen prodigiously in the horizon, and began to assume more distinctness of form. It resembled a limitless cataract, rolling silently into the sea from some immense and far-distant rampart in the heaven.

The gigantic curtain ranged along the whole extent of the horizon. It emitted no sound.

A sullen darkness now hovered above them—but from out the milky depths of the ocean a luminous glare arose, and stole up along underside of Duxy. The summit of the cataract was utterly lost in the dimness and the distance. They were approaching it with a hideous velocity. At intervals there were visible in it wide, yawning, but momentary rents, and from out these rents, within which was a chaos of flitting and indistinct images, there came rushing and mighty, but soundless winds, tearing up the enkindled ocean in their course.

The darkness had increased, relieved only by the glare of the water thrown back from the white curtain before us. Many gigantic and pallidly white birds flew continuously now from beyond the veil, and their scream was an eternal *Tekeli-li!* as they retreated from our vision. Duxy and her passengers were swept into the embraces of the cataract, where a chasm threw itself open to receive us.

Poe's "A Descent Into The Maelström"

Another Poe hit, also on [Gutenberg](#). Here again I've edited it down.

They were enveloped in foam. Duxy made a sharp half turn to larboard, and then shot off in its new direction like a thunderbolt. The burbling of the water was accompanied by sweet eldritch music. We were now in the belt of surf that surrounding the maelstrom. Chu thought that another moment would plunge them into the abyss - down which he could only see indistinctly.

After a little while Chu became possessed with the keenest curiosity about the whirl itself. He positively felt a *wish* to explore its depths, even at the sacrifice he was going to make; and his principal grief was that he should never be able to tell his old companions on shore about the mysteries he would see.

How often they made the circuit of the belt it is impossible to say. They careered round and round for perhaps an hour, flying rather than floating, getting gradually more and more into the middle of the surge, and then nearer and nearer to its horrible inner edge. They gave a wild lurch to starboard, and rushed headlong into the abyss.

As he felt the sickening sweep of the descent, but soon the sense of falling had ceased. With awe, horror, and admiration Chu gazed at a scene of terrific grandeur. They were upon the interior surface of a funnel vast in circumference, prodigious in depth, and whose perfectly smooth sides might have been mistaken for ebony, but for the bewildering rapidity with which they spun around, and for the gleaming and ghastly radiance they shot forth from the myriad of forms within, a flood of life behind the glassy wall which ran far away down into the inmost recesses of the abyss.

There was mist at the bottom, or spray, no doubt occasioned by the clashing of the great walls of the funnel, as they all met together at the bottom.

Our first slide into the abyss itself, from the belt of foam above, had carried us a great distance down the slope; but our farther descent was by no means proportionate. Round and round we swept — not with any uniform movement — but in dizzying swings and jerks, that sent us sometimes only a few hundred yards — sometimes nearly the complete circuit of the whirl. Our progress downward, at each revolution, was slow, but very perceptible.

It might have been an hour, or thereabout, when, having descended to a vast distance beneath me, it made three or four wild gyrations in rapid succession, and, bearing my loved brother with it, plunged headlong into the chaos of foam below.

A great change took place in the character of the whirlpool. The slope of the sides of the vast funnel became every moment less and less steep. The gyrations of the whirl grew, gradually, less and less violent. By degrees, the froth and the rainbow disappeared, and the bottom of the gulf seemed slowly to rise up. The sky was clear, the winds had gone down, and the full moon was setting radiantly in the west, when I found myself on the surface of the ocean, above the spot where the pool of the maelstrom had been.

Endless Universe

by Paul J. Steinhardt and Neil Turok, Doubleday, 2007.

(I read this in May, 2008, after writing the 2nd draft of *Hylozoic*.)

These two highly respected physics guys [Paul Steinhardt](http://www.physics.princeton.edu/~steinh/) and [Neil Turok](http://www.damtp.cam.ac.uk/user/ngt1000/) wrote a great book, *The Endless Universe* arguing that the Big Bang / Inflationary cosmological scenario has too many kludges to be plausible anymore. Till reading the book, I hadn't realized how arbitrary and patched-up the inflationary scenario is by now. Cosmology is really a mess.

Steinhardt and Turok propose a simpler scenario called the cyclic universe or the "ekpyrotic" (Greek for "make of fire") scenario under which we have two parallel branes (3d hyperplanes, that is, spaces like the universe), and every trillion years the branes spring together and FLASH all of space is filled with energy, and then the branes move apart, but not very far, only about a Planck length apart. Then they stop moving apart and hang there for a trillion years.

While hanging there, the branes expand, producing the galactic recession. The branes are like infinite planes, so they can expand exponentially and always have more room.

And then, after a trillion years, they spring back together. The space in between them is sometimes known as "the bulk." Strictly speaking the branes are 9-dimensional, with 3D for space and the 6 extra dimensions for the curled up and verminous Calabi-Yau-manifold stringy subdimensions. And the bulk dimension in between the branes is the 10th dimension.

There have been, in principle, an infinite number of cycles, that way we don't need to face explaining the FIRST one. Each tortoise stands on the back of a previous tortoise.

The old guard of inflation is fighting hard against the cyclic model, not even taking it very seriously. *The Endless Universe* is somewhat tendentious, arguing hard for the cyclic model over and over. But it convinced me.

Looking on the web, I find there's a newer Baum-Frampton cyclic model mentioned on [Wikipedia](http://en.wikipedia.org/wiki/Cyclic_Model). In this model they talk about a cosmic "Big Rip," which was formulated by some other guys in a paper called "[Phantom Energy and Cosmic Doomsday](http://lanl.arxiv.org/PS_cache/astro-ph/pdf/0302/0302506v1.pdf)." It's kind of wild these days, how you can find all these far-out science papers online.

One touchy bit in the Steinhardt-Turok model is the odd moment when the branes collide. To my amateur eye, it seems like it might be nicer and more symmetric if the branes passed through each other instead of bouncing.

By the way, the branes are, strictly speaking orbifolds, whatever that means...the concept uses some [target="blank" href="http://en.wikipedia.org/wiki/Orbifold#Orbifolds_in_string_theory"](http://en.wikipedia.org/wiki/Orbifold#Orbifolds_in_string_theory) insane juicy buzzwords like "quiver diagrams".

Some bits from *The Endless Universe* that I liked.

In seeming violation of the law of conservation of energy, a universe is allowed to "borrow" more energy from the gravitational field with each cycle. Every trillion years, some gravity gets converted into yet more mass and energy—the former mass and energy having been squandered by expansion of the brane space.

Gravity waves are the one thing that might survive from one cycle to the next. But, methinks there may be other vestiges of the previous cycles that are kicked up (down?) into subtler planes; it helps if, as I like to do, we suppose matter to be infinitely divisible.

They mention that if you have a collapse of space that's not controlled carefully, you get wild asymmetric oscillations where, like, you turn into a million-mile-long cigar or a sheet of paint the size of the solar system: the chaotic mixmaster scenario.

They really dump on the anthropic principle: "A huge number of possible universes exists, and there just happens to be one that has its constants tuned in just the right way to support fleshapoids on a planet orbiting a sun." It's much more intellectually satisfying to suppose there's only one universe and that there *are* some deep reasons for its properties.

In either model (inflation or cyclic), it's been about 14 billion years since the, uh, call it the "Big Flash," when space was filled with something like white light (higher energy than light, actually). The image of that flash gets in the way of seeing more than 14 billion light years away. But in the cyclic model, the space is in fact endless, and there's lots of galaxies out past the 14 billion light year haze. I'm supposing (SFictionally speaking) that we can see past the haze via (a) faint gravity waves or (b) subtle energies relating to the as yet unknown subtler levels of matter.

During the initial phase right after the Big Flash, a ripple that's only a few meters across can in fact serve as the seed for a galaxy. So I imagine a character becoming a galaxy, naturally.

I wrote two stories about this: "Message Found in a Gravity Wave" and "The Big Splat" (with Bruce Sterling).

Writing Journal

Oct 3, 2006. Between Novels.

I saw Bruce Sterling two weeks ago, and we worked out the plot and characters for a story to be called "Hormiga Canyon," (*hormiga* is Spanish for ant). I sent Bruce the first 2,400 words on September 29, 2006, and he's enthused, though it may take him awhile to get something back to me as he's on the road.

I've been working on a painting of the *Hollow Earth*, based on a drawing of it that I made for the new Monkeybrain Books Second Edition of the book.

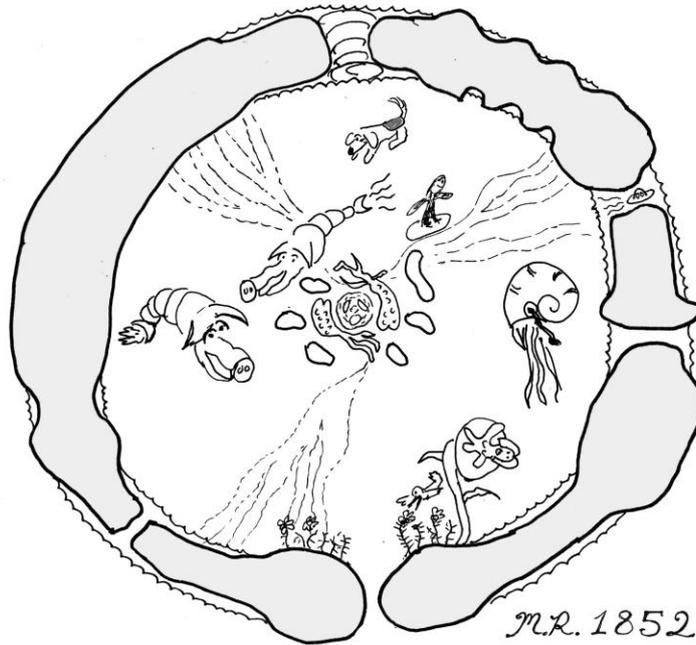


Figure 12: Drawing of the Hollow Earth

Looking at this drawing again, I see I forgot to put the dog *Arfie* in my painting! I'll remedy that. The painting is going really slowly, which is fine, as I'm in no pressing rush to start writing again. I'm painting in oils, which means that after each session I have to let the canvas sit for a few days to dry. The sessions last four or five hours. I think I've done five sessions by now, meaning I've spent something like twenty hours on the painting. Incredible that it takes so long; I usually knock out my acrylic paintings in about ten hours. Of course this is a more complicated painting than usual; it's a whole world.

I almost feel like writing a sequel; *Return to the Hollow Earth*. I wrote a second "Editor's Note" for the book, and in there I claim I have a line on some more info about what happened to Mason Reynolds. He's in Fiji perhaps, or New Zealand. Interesting thought: if Mason hung out near the center of the Hollow Earth for awhile, then it's possible that I could run into him now, and have him be my age or younger. He could be only forty! That would be cool.

Possibly Frank Shook could get involved too. Maybe the saucers from the Hollow Earth have some connection to one of the saucerian races that Frank has hung with.

As I revised *Hollow Earth*, I really felt drawn to go back to that world again.

I still don't feel like doing a sequel to *Frek and the Elixir*. Maybe I never will. I loved that world, but I feel like I finished what I wanted to do. Also, I guess I have a lingering resentment towards over not having gotten all that much attention for the book, and over the fact that it wasn't properly marketed (in my opinion) as a children's book. But come to think of it, I did get a fair number of fan emails saying *Frek* was my best book yet.

Another thing I'm doing is thinking about a story about Alan Turing. I am reading in two biographies of him ([Leavitt and Hodges](#)), and have some ideas.

I'm working on several other [story ideas](#), typing them into this document.

If Dave Hartwell likes *Postsingular*, the wisest next project would be to go ahead and write a sequel, which I currently dub *After Everything Woke Up*. I haven't yet thought deeply about the story for the sequel. It'll star Bixie and Chu I think, and some aliens will show up. There will be a crisis and Chu and Bixie will save things, and the world will once again be saved. I might do the breaking up and then getting back together thing for Bixie and Chu, though that seems a bit tired. Maybe they'll break up, get back together, and then realize they have indeed outgrown each other and they move on. Possibly I kill off or sequester one of them till Vol 3.

It might also be interesting to get to the root of the harp, conceivably with a time-trip of some sort to the days of Bosch and Bruegel — if not actual time travel (always so logically problematic), it could rather be that the harp itself has an eidetic memory tape of what happened back then, and Chu accesses the memories and we segue into a long series of scenes in the Bosch world.

Of course if Hartwell for some reason doesn't like *Postsingular*, then there might not be a sequel at all. So I'd rather not get all gung-ho with plans until I have some feedback.

I'm more than a little uneasy about his reaction; I feel like I pushed the envelope fairly hard stylistically.

On October 11, I heard back; he likes the book, fine, though he wants some changes, mostly to round out the secondary characters. It's doable. And he'd like to see Jayjay and Thuy back in volume 2.

Oct 4 - 7, 2006. "The Imitation Game"

Passing the time working on the Turing story.

When I paint, I enjoy smearing the colors and seeing the patterns. At one level I enjoy writing in just the same way. Playing with the words and phrases.

I'm not positive the Turing story will be marketable, but I always have my webzine *Flurb* to fall back on. That's kind of nice to know.

Unused phrases:

"Why did they care so much whether or not Professor Turing were to give or to receive fellatio? As always, the word reminded Alan of a ring-tailed raccoon, or a coil of dog excrement."

"But surely any classified algorithms that Alan might drizzle upon his man-boys were as seeds upon fallow ground."

I was going to have Alan *schluppp* Burroughs in Tangiers (*schluppp* is a word that Burroughs used in his letters to Ginsberg from Tangiers, urging Alan to come live with him and be assimilated). But actually I think it'll be enough to have Alan escape Manchester. I think it would be a little gauche to try and work *two* historic figures in. And it would show a lack of confidence in my own work. I can amp up the pathos of Turing's plight, and weave in more stuff about morphogenesis.

I tend to forget that a story can just be one thing; it doesn't have to roll on and on like a novel, with scene after scene. All you really need for a story is a quick hit, a

blip. When we were working together recently, Terry Bisson told me, “As soon as I start a story, I’m looking for a way out.”

So hopefully I can finish “The Imitation Game” in a week or so — and then on to the next one. It’d be cool to knock out a series of small stories before getting back into the long haul.

[Here’s a [blog entry](#) that I wrote the morning of the day that I actually finished the story. My artistic anxiety was at a fever pitch.]

I really love Turing’s late work on morphogenesis; I wrote about it a lot in my *Lifebox* book. Also see Jonathan Swinton’s [Turing and Morphogenesis](#) site.

You can’t really trust what writers say about other writers. A writer is personal friends with some writers, may want to ingratiate him or herself here and there, feels envious of certain other writers, and may resent the attention granted to still others who do similar work to what the bitter writer himself does. You need to take my opinions about other writers with a large grain of salt.

In my ongoing Turing researches, I found the online story “[Oracle](#)” by Greg Egan, a writer whose work I dislike. The story is supposed to be about Alan Turing, and was well received, but...I really didn’t like it.

Probably if I ever met Greg Egan face to face I’d think he was a great guy. After all, he and I have much more in common than not. We’re both computer types who write SF. Maybe the reason I disliked Egan’s “Oracle” is that I worry he’s used up the market for stories on Turing’s last days. I’m in a state of fear, and I’m lashing out. Also I’m avoiding working on the story. Not that this has anything at all to do with poor Egan. Yes, I’m nuts. It’s part of being a writer.

As Susan Sontag wrote in some Journal excerpts I saw in the *Times* last month, a writer has to be a nut and a moron. A nut to be obsessed enough with something to spend all that time writing about it, and a moron to publicly display his or her crazy ideas! Hey, I’ve got those items covered.

On Friday, Oct 6, I finished the story, and gave it the final polish on Saturday, Oct 7, then yet another polish on Oct 8.

Alan ends up in Tangiers. I may yet do a story where he meets Burroughs, I think I’d tell the second story from Burroughs’s point of view. Alan would have a somewhat minor role; he’d give Burroughs the Evaluator. But for now, one famous person per story is enough.

“The Imitation Game” is crystalline, simple, dramatic and I brought it in at 3,500 words. I’ll send it to *Asimov’s* and then *Interzone*.

And if all else fails, I know I can always get my story into the webzine *Flurb*. I’m in so tight with *Flurb*’s editor that I even sleep with his wife!

January 6, 2007.

I still had no response from *Asimov’s* about my submission of the story three months ago. So today I emailed the editor Sheila and ask what’s up, and as chance would have it, she’s just read the story at last, and she kind of liked it but not enough to buy it. So I sent it out to *Interzone*.

Getting a story published can be a very slow process, which is why I prefer either (a) writing novels or (b) going direct to *Flurb*. But sometimes there are short bits you just want to do as a story. And it’s a way to pass the time till I get up the

oomph to start another novel. And eventually when I get enough stories I can get another book out of them.

In a way, having *Flurb* could be having an anti-commercial effect on my stories. Known I had *Flurb* to fall back on, I made the Turing story so gay as to be non-PC, although my guess is that actual gays would like it, just not those who want to tiptoe around the differences. And I accused the British government of murdering Turing, which is somewhat too countercultural a thing to suggest. But maybe *Interzone* will go for it.

Nov 8 - Dec 3, 2006. First PS2 Plot Ideas (New Zealand)

I started thinking about *PS2* about halfway into our vacation in New Zealand. I had some ideas that I separated out into the [Ideas](#) section. And I've left some plot ideas here.

I need a threat in *PS2*. Maybe a hive mind wants to conscript all of Earth. A multiplanet mind wants to engulf Gaia. Not to destroy her, but rather to enslave her. It's understood by these evil galactic slavemasters that a planet is indeed the optimal computing system to simulate a planet (DUH!). So they don't, like Luty, want to grind Earth into computronium or nants. The baddies are, rather, like media who get people to think about *their* bullshit. Entertainment to hook us in.

But—what kind of entertainment is going to enthrall a fluttering leaf or a banana slug? What kind of infotainment is a *burning log* into? The burning log is already happy doing what it does. Why would it want more? But it would be funny if it did. The log is watching TV instead of burning. Water is surfing the web instead of flowing over a waterfall. the air is spying on the atmosphere if Jupiter instead of making vortices.

Image of Gaia as a crone watching soap operas. Gaia herself corrupted, like a tribal chief watching TV. An unsophisticated widow giddily taken in by a city slicker's talk of art. Gaia lends Earth's computational resources to — Business 2.0

Imagine for *PS2* some aliens who are very dull and hard to get rid of. A lowest-common-denominator kind of race. Like, face it, the Chinese. But, wait, it's dull to read about dull aliens. I'd need some competitors, some interesting aliens as well.

Okay, what if the dull aliens look cute, like kiwi birds, and call them the Peng. And we have some novelty-enhancing good aliens who are misleadingly ugly, like stingrays, say, and call them the Hrull. I did something like that in *Spaceland*: the Kluppers look nice, but they're bad, and the Dronners look like devils, but they're good.

Maybe *PS2* has Jayjay and Thuy on a colony world like New Zealand, and in *PS3* they go back to Earth. I finally “get” the idea of colony worlds, now that I've traveled Down Under.

Looked at differently, Earth itself is like a remote little country relative to the big Galactic civilization. We humans and mammals are like moas and kiwis maybe. And the invading destructive “Polynesian rats” are meme eaters. In some way all of us Earthlings are as innocent and defenseless as flightless birds.

If aliens show up we should do like the Polynesians (or the moas) should have: eradicate the visitors as quickly as they arrive.

I think of Business 2.0 in *Accelerando*. I saw an article in the paper that offshore venture capital companies are buying up New Zealand companies, they expand their debt, restructure them, and then sell them when their stock valuation is high. Easy to imagine aliens doing that to Earth. But in some other kind of way than just with finance. Maybe Jayjay and Thuy escape Earth, while Bixie and Chu stay there. Or vice versa. And they have children who get together.

The Hrull and Peng show up and Thuy goes off with the Peng. They get her to help write bogus sitcoms that Gaia is hooked on, debasing her. The Hrull can save Thuy, but only if they can get that magic harp that the Hibrane took back. Jayjay tries to jump to the Hibrane and, because it's gone crooked, he ends up in the Hibrane past, in Bosch's time. The harp pulls him to herself. The harp is in some sense setting all this up, the harp is like an angel that fell down into our world from beyond infinity. The demons that Bosch sees are subbies and the harp can call them forth? The Hrull use the harp to open a transfinite door to beyond infinity.

What about the origin of that *harp* in *PS1*? Do we go to Flanders and hang with Bosch who owns the harp? That needs time travel, which is so problematic. But we could send, say, Jayjay to the Bosch era on the Hibrane, rather than on his own Lobrane. Then there's less temporal paradox likelihood (unless info can travel from past Hibrane to present Hibrane to past Lobrane). Alternately, the harp herself could tell her story, which might be cool. What is the harp anyway? A being from beyond infinity?

I like Jayjay as Bosch's apprentice. the demons are real. Jayjay is high on ergot. He has a harmaline radio transmitter in his DNA, a la Terence McKenna.

Maybe the timelines of Lobrane and Hibrane were the same up until Bosch. Jayjay is faced with some decision there, and he waffles and thereby splits the worlds. The harp stays in the Hibrane, and Jayjay plays it and lazy eight unfurls for the Hibrane. A temporal causal loop; Jayjay learned about the Lost Chord from visiting the lazy eight Hibrane, but it is he who brings lazy eight to the Hibrane in Bosch's time.

If I want to do galactic empire stuff, I need rapid space travel. Via Subdee? Subdimensional tunneling. That's really how teleportation works in any case. Or use infinity. Use lazy eight at transfinite levels.

Thinking more on this, I'd better not drag in a Galactic Empire in *PS2*. I already have Hibrane and Subbies and the pansychic excitement of every object being alive, also I'd like to have a chapter with Bosch and the harp. Or if not Bosch that fat guy, what was his name, the Bosch imitator who was Bruegel's friend.

Don't just rush on to new thrills, savor what we've got. If I bring in the aliens, then humans become in some sense impotent. And I want their actions to matter. Maybe hold off on the aliens till *PS3* in any case.

Do the harp in *PS2* and leave the aliens for *PS3*.

Maybe also in *PS2* have "The Attack of the Subbies." Maybe just as it seems the Subbies are winning, at the end of *PS2*, the aliens show up like deus ex machina to drive them back. And then in *PS3* deal with the aliens, the Peng and the Hrull.

Dec 17-20, 2006. "The Third Bomb," Flurb #2.

I wrote up a counter-cultural short story "The Third Bomb." It seemed very unlikely that I could market it, so I started up a new issue of [Flurb](#) to run it in. *Flurb*

#2. The story has a guy happily blowing off the President's head with a shotgun, and babbling about alien sea cucumbers in UFOs!

Putting Flurb #2 together took a certain amount of work. I couldn't get many new contributors — just Charles Stross and Charlie Anders — otherwise it's the old SF SF core who were in #1. I may end up featuring the same authors over and over in *Flurb* — think *Zap* comix or, for that matter, *Mad* magazine which always featured, "The usual gang of idiots."

Flurb as coterie could be fine. No sweat for me. I can't visualize reading dozens of over-the-transom efforts and then having to write those painful "alas" rejections.

The one thing I'm expecting from *Flurb* is that it can free up the contributors about the kinds of stories they write. I wouldn't have written "The Third Bomb," for instance, if I hadn't known that *Flurb* was there for me. And I think this horizon-opening effect has already spilled over to some of my cronies in this issue.

As well as that "Hormiga Canyon" story with Bruce, I'm also playing around with another Zep and Del story that I started with Marc Laidlaw last spring, "The Perfect Wave." I sent it off to Marc now.

Really, I should be working on stories on my own, it's so much easier than collaborating. I just do it and I'm done.

Dave Hartwell finished reading my revision of *PS1*, and he says it's finished now, although Ond and Chu don't pop back into focus at the end. I could pump that up a little, maybe. Or just leave it for *PS2*. He's paying the advance and putting the book into the production pipeline.

One thing I thought of in [New Zealand](#): I want to change the "neighbors" line at the end of *PS1*, and say a bit more about the harp. I need to phone Dave and ask if it's okay if just do that in the copy-edit stage. Maybe in January when things settle back down.

I like the idea of a chapter about Bosch and the magic harp in *PS2*. I think we send Chu there.

I'm invited to give a talk in Amsterdam in April, 2007, and hopefully I can visit Jeroen's home town Den Bosch, a.k.a. s'Hertogensbosch.

December 28, 2006. Futuristic PS-Style Rap for Edge.

This was written for John Brockman's annual *Edge* question; this year's question being "What Are You Optimistic About?"

At first I couldn't think of anything to be optimistic about, and then I realized that the *PS* world is one that makes me optimistic, so I wrote about that as if I actually believe it's about to come about. Pulling a mad scientist routine.

I'm not sure if Brockman will want a rewrite, or if he'll run it at all; sometimes he gives me a hard time. Sometimes he teases me like I'm a con-man and he has my number. And this contribution is indeed kind of a con-man hoax. [Brockman did indeed run the contribution, and in fact said he liked it.]

There will be an amazing new discovery in physics on a par with the discovery of radio waves or the discovery of nuclear reactions. This new discovery will involve a fuller understanding of the level of reality that lies "below" the haze of

quantum mechanics — suppose we call this new level the domain of the subdimensions.

Endless free energy will flow from the subdimensions. And, by using subdimensional shortcuts akin to what is now called quantum entanglement, we'll become able to send information over great distances with no energy cost. In effect the whole world can become linked like a wireless network, simply by tapping into the subdimensional channel.

This universal telepathy will not be limited to humans; it will extend to animals, plants, and even ordinary objects. Via the subdimensions you'll be able to see every object in the world. Conversely, every object in the world will be in some limited sense conscious, in that it will be aware of all the other objects in the world.

A useful corollary is that any piece of brute matter will be a computer just as it is. That is, once we can reach into the inner self of an object, we'll become able to program the behavior of things like rocks or logs --- without our having to attach any kind of microprocessor as an intermediary.

Humans will communicate at a vastly enhanced level. Presently I communicate an idea by broadcasting a string of words that serves as a program for reconstructing one of my thoughts. Once we enjoy subdimensional telepathy, I can simply send you a link to the location of some particular idea in my head.

Machines will fade away and, in particular, digital computers will be no more. The emerging interactions of Earth's telepathically communicating beings will become a real and knowable Gaian mind. And then we will become aware of the other higher minds in our cosmos.

Writing this up made me excited about working on *PS2*, which is by way of being a thought experiment to better understand how it would be to have all the objects being aware.

It makes me want to work more on [plot ideas](#).

Re. other worlds, today I saw a cosmology/astronomy book about "The Great Attractor." This is a massive region in space towards which a bunch of galaxies (including our Milky Way) are streaming. It would be a nice place to visit in *PS3*.

December 17, 2006 - Jan 5, 2007. James Clerk Maxwell Bio?

December 17, 2006.

I'm toying with the idea of doing a 40,000 word biography of James Clerk Maxwell for Atlas Books; I have an "in" there now, as my old Four Walls Eight Windows (and later Thunder's Mouth Press) editor John Oakes is in charge of this line now, and John always likes my work.

It looks like Michel Gondry isn't going to renew the movie option for *Master of Space and Time* for a third (fourth?) time (the expiration is coming up March 15, 2007, so conceivably he might change his mind), so I'm going to be needing money. I figure Atlas might pay a bit more than I'd get for *PS2*. And Atlas only wants a short book, which makes the thing seem quite feasible.

Would be fun to learn about Maxwell, I've always loved his equations, and he wrote a cool poem about Clifford's "space theory of matter" which I quote in *The Fourth Dimension*. Also there's Maxwell's Demon, and the Maxwell-Boltzmann equation for the statistical mechanics of gas particles.

I've now heard from John Oakes that he likes my idea for the Maxwell book but he has to convince his boss. I hope his organization doesn't have residual anger at

me for slagging David Foster Wallace's cruddy book on my man Georg Cantor. I remember that particular book's editor at Atlas Books (Jesse Cohen) was quite annoyed with me; my review was in [Science](#). But I think publishers don't have much institutional memory.

I'm reading Thomas Pynchon's new novel *Against the Day* right now. He goes into the ~1900 struggle between two schools of mathematical physicists: Quaternionists and Vectorists. I think Maxwell was a Vectorist. Pynchon has a nice way of making Earth's magnetic fields seem mysterious and magical. Maybe in *PS2* the Higgs (*grunt oink squeel*) field could seem equally wondrous.

Maybe I should take off some time to do this historical nonfiction book before *PS2*. Certainly I could later use all the yummy Maxwell material.

December 26, 2006

Writing this, I'm in the NY Public Library, trying to get a look at some of James Clerk Maxwell's original books.

ON THE
STABILITY OF THE MOTION
OF
SATURN'S RINGS.
AN ESSAY,
WHICH OBTAINED THE ADAMS PRIZE FOR THE YEAR 1856, IN THE
UNIVERSITY OF CAMBRIDGE

BY J. CLERK MAXWELL, M.A.
LATE FELLOW OF TRINITY COLLEGE, CAMBRIDGE
PROFESSOR OF NATURAL PHILOSOPHY
IN THE MARISCHAL COLLEGE AND UNIVERSITY OF ABERDEEN

"E pur si muove."

Cambridge:
MACMILLAN AND CO.
AND 23 HENRIETTA STREET, CONVENT GARDEN, LONDON.
1859

Price Six Shillings.

In a way the book deals with chaos theory. It's fairly obvious from one of Laplace's equations that the rings can't be solid. So we know they're rubble. But do we then know that the rubble won't congeal into satellites? This is the burden of Maxwell's 71 page pamphlet with its 13 figures.

There is a very general and very important problem in Dynamics, the solution of which would contain all the results of this Essay and a great deal more. It is this—

“Having found a particular solution of the equations of motion of any material system, to determine whether a slight disturbance of the motion indicated by the solution would cause a small periodic variation, or a total derangement of the

motion.”

I should also consult the essay, John Randall “Aspects of Maxwell’s Life and Work,” in C. Domb, Ed., Clerk Maxwell and Modern Science, Atholone Press, U. of London, 1963.

The key paper, the one with *The Equations* and with the prediction that light is an electromagnetic wave is: “A Dynamical theory of the Electromagnetic Field” 1864.

December 29, 2006.

John Oakes said his boss James Atlas (of James Atlas Books) likes the Maxwell book idea, and that if I write up a five-page proposal they can run that by Atlas’s partners W. W. Norton, and I’d have a good chance of getting the deal to write a 40,000 word bio in the Great Discoveries Series, the advance being perhaps pretty good.

But now I’m getting cold feet. While in NYC I looked at some of the physics books Maxwell wrote, and now, back home, I’m looking at some books about him that I ordered from Amazon.

Facing these hard physics books throws me back to my memories of being such an ineffectual and incompetent student of physics in college—a lamer. I didn’t understand the kinetic theory of gases when I took a class on it then, nor electromagnetism. Is perhaps my plan of writing Maxwell’s bio an attempt to make up for those lost, dissipated semesters? Do I need to bother? Wouldn’t it be more fun to just write more SF? Better to ride the thing that I’m good at? Better to strike while the iron is hot on *Postsingular*?

January 5, 2007.

I decided definitely not to write the Maxwell book. What put me over the edge was seeing *Mathematicians in Love* listed as #3 in the Top Ten SF books of the year in a Barnes and Noble online newsletter.

I feel like *Mathematicians in Love* is hitting pretty well, so it makes sense to strike while the iron is hot. All these years I never really gave SF writing a sustained full-court press, and the next few years are my last best chance to do it. I’m guessing I won’t really be able to write for shit by the time I’m 70. That’ll be memoir time! But now, while I’ve still got my shit together, I want to pound the SF.

If I were to be writing that bio, I’d just be waiting to get back to SF. Like I used to be when I was teaching CS.

But for now I’m not yet telling Oakes the plan is scotched; first I want to be sure that Hartwell is down with me doing *PS2* for Tor.

January 10, 2007.

Now that I talked to Hartwell and am reasonably sure he’ll buy *PS2*, I went ahead and emailed John Oakes:

“I’d like to talk to you on the phone, but the short version is that I started doing some research and I don’t think it would be easy for me to do justice to Maxwell’s work. It’s fascinating, but I don’t feel confident enough about the physics to proceed with a full proposal at this time. It would be a considerable effort for me to gear up for the book, and I’m not sure I have the resolve. At this stage of my career I feel more like doing easier things.”

“A distraction here is that I feel I need to start work on a second novel for my Tor SF trilogy POSTSINGULAR, whose first volume will appear in Fall, 2008.”

“With all this said, I do want you to keep me in mind for some other possible Atlas project. And conceivably we might leave Maxwell moot for awhile, as I am still studying some of the fascinating books on him that I recently acquired. But if you want to put someone else on this project, I’d fully understand that, and in fact maybe I’d be relieved!”

Naturally now I have a slight twinge. I think I will still keep reading up on Maxwell, as I did get some very cool books about him. Even if I don’t do the bio, I might be able to use some of the material for my SF. Understanding electricity and magnetism is so weird really. Action-at-a-distance or a field? And what *is* a field? Maybe I can transfer some of the mysterioso electromagnetism vibe to my discussions of telepathy in the PS books.

Dec 21, 2006 - Jan 5, 2007. More PS2 Plot Ideas (NYC & After)

I started thinking about PS2 about halfway into our vacation in [New Zealand](#), and came up with some plot ideas. And then, on our flight to New York for Christmas, I started going over the plot ideas again, starting by just copying and revising the earlier Plot Ideas entry, which means there’s some overlap and repetition here, but not all that much as I revised this entry again on the flight back from NYC on Dec 28, and then a couple more times too.

And then I finally got stoked enough to switch from working on this “Plot Ideas” entry to working on a more formal [Proposal](#).

(Part 1) Start with the panpsychic excitement of every object being alive. Milk this on some quotidian daily kinds of things.

Gaia is a character, akin to the Big Pig in *PS1*.

I need to work out where the characters are living, go over some of the house construction stuff.

Also get the romance threads going. I can think of four romances to draw upon, though I better focus on the first two pairs so I don’t have too many characters.

Jayjay + Thuy. They’re young marrieds dealing with some stresses, but still passionately in love. Suppose Thuy becomes pregnant, with the birth of the baby coming near the end of the book. And in the middle, they’re separated and then have to get back together.

Ond + Jil. This relationship starts out more as an arrangement of convenience, but then evolves into true love. Jil is somewhat young for Ond, and Ond is somewhat geeky for Jil. Ond is initially just a stop-gap for Jil. Jil still misses Craigor’s body from time to time, but Craigor is a rolling stone. Maybe Ond tries to change his body to please Jil with disastrous (but reversible) results. Maybe Ond becomes a three meter penis. Or, if that’s too graphic and obvious, an imperiously curved pink banana slug that’s rippling with veins and musculature.

Chu + Bixie. Chu has a crush on Bixie. Chu is more normal now, but Bixie isn’t sure she likes Chu. She has a cool surfer boyfriend Rick Mustane, callow, dumb, maybe a little like Sta-Hi, he gets her in some kind of trouble. Chu saves Bixie and wins her over. But, remember, I’m only setting this in 2038, I think, and they’ll be, respectively 15 and 13, so we don’t have all that hot a romance going.

Nektar + Kittie. These two are content, they are happily married, leave them in the background. Or I might have Kittie get into a fling with the delectably filthy Lureen Morales.

There's a problem that appears in the first part, this functions as "The Call." Objects aren't doing what they're supposed to. Physics is in some respects screwed up. The statistical power laws of nature are no longer holding. Like the spectrum of white noise frequencies is skewed.

Turning Point: It's been subtle, but now it's obvious: water is co-opted. Bixie and her surfer friend Rick Mustane notice when they're out at Ocean Beach. No more large waves. It's all small waves. Water loses its free-playing chaoticity. It's computing — something. But what?

Jayjay figures out that our natural computations are being co-opted by some external force, or, rather, distracted by some omnipresent unceasing information input that filters into every quantum computation. There's some unavoidable universal correction term.

Sensitive artist that she is, Thuy becomes directly aware of this extraneous input, too. She's not the only one; Jil is picking up on it too. People perceive the new signal as a free-floating mental mixture of music and images; it's quite engrossing. They call it the Daydream.

Thuy tunes into Gaia and discusses the Daydream with her. Gaia is enjoying the Daydream herself, and isn't worried enough, in Thuy's opinion. Actually, as we'll later realize, Gaia is wiser than us. She's planning a female or jiu-jitsu (these days some spell it "jujutsu") or yang strategy of winning by surrender. Preparing to envelop the aggressor. Thuy's gotten a little too Western and hard-boiled to grasp this.

(Part 2) Thuy becomes mentally aware of some aliens called the Peng. They resemble kiwi birds. Thuy sees them in her mind's eye; she discusses them with Jayjay.

Jayjay forms the theory that the Peng want Earthly objects to think about things for them. The Peng understand that natural processes are optimal, computationally speaking; they're not like Luty who wanted to grind Earth into computer chips. They're like media who get people to think about their agenda (e.g. in order to sell us more crap, the media wants us to think about kiddie porn, E. coli, hiking deaths, and Iraq). See "[Infotainment for the Silps.](#)"

The Peng arrive in the flesh. They're very dull and insistent and hard to get rid of. A lowest-common-denominator kind of race. I think of them as being a cross between Chinese developers, Norwegian farmers, and Hollywood moguls. Or, again, like invasive kudzu vines, cockroaches and rats. But the Peng look cute, they look like fluffy kiwi birds.

They offer us something we don't yet have. Like whalers offering mirrors, knives, and beads. Suppose they offer telekinesis, or, better, direct matter control, so that we can craft objects out of dirt or thin air.

Some other aliens arrive on the heels of the Peng: these are the Hrull. The Hrull are ugly, they look like flying stingrays, and they slobber. Initially we think of them as evil simply because they're so ugly. But then they present themselves as being like Green Peace eco-activists hampering the activities of the imperialist oil-driller types like Peng. The Hrull *say* they want to preserve Earth's indigenous culture and life forms. Eventually, however, we'll push through a second reverse,

another plot trapdoor, and it will turn out the Hrull are really evil and the Peng aren't all that bad, they're a race you can comprise with and make deals with.

Earth itself is like a remote little country relative to the big Galactic civilization—I really appreciate the idea of colony worlds, now that I've traveled Down Under to NZ. We humans and mammals are like moas and kiwis and weta beetles. And the invading destructive "Polynesian rats" are meme eaters. The Peng. In some way all of us Earthlings are as innocent and defenseless as flightless birds.

Really, for self-preservation, indigenous races should eradicate visiting explorers as quickly as they arrive. But this never seems to happen: the invaders are too powerful and too persistent. Now that the Peng and the Hrull have found us, we're never going to be rid of them.

Thuy goes off with the Peng, they lure her into coming, they promise her galactic renown for her metanovels. Also she thinks she can do a Fifth Column move and free Gaia. The Peng get Thuy to improve the infotainment that Gaia and all the objects on Gaia are hooked on. With Thuy helping, the Daydream gets really good.

Turning Point: And now, all at once, Gaia seems to be fully co-opted: Gaia like a crone watching soap operas, Gaia like a corrupted and debased tribal chief watching TV; Gaia like an unsophisticated widow giddily taken in by a city slicker's talk of Art. Our whole planet becomes as dull as an unbroken Chinatown filled with nothing but jade Buddhas, silk pillows, bamboo back-scratchers, and sneezy incense. Cheap watches and plastic purses. An unending Norwegian lutefisk dinner. Everything is a car commercial, a chase scene, a cute meet, a Rudolph the Red-Nosed Reindeer Christmas Special.

Everyone is blaming Thuy, and even Jayjay has to wonder.

(Part 3) The Hrull tell Jayjay they can save Thuy from the Peng and stop the mesmerizing Daydream, but only if they can get hold of the very same magic harp that played such a pivotal role in *PSI*. Recall that Azaroth had taken this harp back to the Hibrane at the end of *PSI*.

Jayjay manages to jump to the Hibrane and somehow (maybe because the Hibraners tilted their brane to try and avoid us, though I think I'll get rid of that tilt after all, so maybe the time-slip is because the Subbies hassle Jayjay during the jump) Jayjay ends up in the Hibrane past, in Bosch's time, it's the 1400s in the town of *den Bosch*.

It isn't a coincidence that Jayjay ends up at this Hibrane spacetime nexus, it'll turn out that the harp herself pulled him thither. The harp is in some sense setting all this up, the harp is like an angel that fell down into our world from beyond infinity.

Jayjay as Bosch's apprentice. We still have the 6-to-1 spacetime scaling of Hibrane relative to Lobrane, so Jayjay is tiny and fast. Bosch doesn't mind, he's used to imagining demons. He carries Jayjay around in a sack.

I think it's a little simplistic—and a belittling of the artist—to say that Bosch *really* saw the demons he painted (like Howard Waldrop did in his short story "What Makes Hieronymus Run"). So I'll resist having the Subbies seethe up to be Bosch's models. But seething Subbies *would* make a good scene, so put this in anyway at some point, just not as an artist's model thing. Speaking of models, it would be cute if Bosch dresses Jayjay up in little gryllos and demon costumes to pose for some of this eyeball kicks.

Describe Bosch painting a scene like *The Haywain* on the harp. Revelers with a demon. *And the little demon looks like Jayjay*. And I have to put this into *PSI* as a prefiguring.

In the middle of the chapter, the harp herself talks to Jayjay, telling some of her own story. She wants Jayjay to play the Lost Chord. And Jayjay plays it and Lazy Eight unfurls for the Hibrane. It's a temporal causal loop, for Jayjay learned about the Lost Chord from visiting the Lazy Eight Hibrane, but it is he who brings Lazy Eight to the Hibrane in Bosch's time. No actual contradiction here, it's a benign loop.

(Part 4) Can Jayjay remove the harp from the past of the Hibrane? Yes, I guess so, but later he will have to bring it back there, otherwise we'll have a yes-and-no paradox.

So he gets the harp to the Hrull on 2030 Earth, and in return, the Hrull give humanity some filter-ware or psychic firewalls so that we can back out the Peng mind-control. The Hrull say use the harp to open a transfinite door to beyond infinity. And they create the ultrafilter to protect Earth from Peng mind-control.

And in the process we come to a reasonable agreement of computational cycle-sharing with the Peng.

(PS3) In fact the Hrull also plan to open a teleportation door to their home archipelago of worlds in the Great Attractor. This will function as an invasion portal; the Hrull plan to slime all over us like the Martians in *War of the Worlds*.

And now we get the danger of a yes-and-no paradox. Jayjay thinks he'll be prevented by the greedy and inconsiderate Hrull from returning the harp to the past of the Hibrane. And there's a sense of reality beginning to unravel. But then the Peng help Jayjay and they manage to return the harp despite the hampering influence.

January 6, 2007. Studying Bosch.

I've been reading in this (very poorly designed but beautifully illustrated and very informative) [book about Bosch](#) this evening. I saw a picture of a harp in here, it's from the right-hand "hell" panel of the Garden of Earthly Delights triptych. *The Magic Harp*. This one actually has it's strings running through *ow* some guy's body.

I'm thinking I really do want to put Bosch into PS2. I'm possessed by this idea that I don't have an endless amount of time left to write in, so I better get my Bosch writing in now. And he's such a wonderful artist. I hope Hartwell doesn't balk at this notion.

January 9-16, 2007. Negotiations with Hartwell.

Jan 9, 2007.

I finally talked to Dave Hartwell today. I outlined my basic ideas for the [PS2 proposal](#) that I've been working on. He thought it sounded okay. To my relief he didn't object to my having a section featuring Hieronymus Bosch. I was worried this would sound too far-fetched.

He was surprised that I would have Thuy go off with the Peng rather than Jayjay. But I want to save Jayjay for being the one with Bosch, I guess because I want to think of it as being me with Bosch, also I don't want to have a sex issue with Bosch. And I see Thuy's experience as a metanovelist making her helpful for the Peng. Jayjay knows a little science, so he might be useful to Bosch in terms of mixing his paints.

Dave made a few quick suggestions:

* It might be good if the Peng weren't bascially interested in us at all, they see us as simply a resource to exploit.

* Don't get too involved with Thuy's inner life, as that slows things down. Have her doing things.

* If Jayjay and Thuy are the main characters, then start the first chapter with them. Readers like to know who they're reading about. We didn't do that in *PS1*, we ended up playing a kind of shell game, but that was a special circumstance because I was fixing up my two short stories as the start and then adding an extra first chapter to account for Luty. But this time out, let's be orderly. No need to *deliberately* make things confusing for the reader.

* The title should somehow continue the theme of *Postsingular*. *The Magic Harp* is too much of a fantasy title.

* He said to end the book after Jayjay gets back with the harp and they block the Peng. He said to save the Hrull's double-cross and attempted invasion for *PS3*. And to maybe even think of writing a fourth book in the series.

January 16, 2007

So I wrote up the Proposal, Version 1, and sent it to Dave, suggesting the three-title sequence: *Postsingular*, *After Everything Woke Up*, *Transfinite*.

He emailed a couple of suggestions today.

* Tiny bit: *After Everything Awoke* has better metrics.

* This all sounds pretty good to me, with the proviso that Chu and Ond make token appearances throughout. And you should probably deal with the absence of Hibrane travel before the end of part one, or include some.

I emailed back:

* Sure, I'll have Chu and Ond in there off and on, I like them a lot. In the outline I focused on the main characters, but the others will be doing some stuff too. Ond and/or Chu might even go along on one or both of the missions. Maybe Chu with Thuy and Ond with Jayjay. They're good comic side-kicks.

* Good point, re. mentioning Hibrane travel in Part I, lest the readers think I forgot. I think it'll be hard to do for awhile, or it'll at least seem forbidding. Thing is, the Hibraneers were paranoid about us infecting them with nants, and somehow tilted their world relative to ours (which will lead to jumps going into the past), I mentioned this very briefly at the end of *PS1*, but will maybe sharpen that up.

* As for title, we can talk it about it more. I still like the more colloquial *After Everything Woke Up* better than *After Everything Awoke*, but I'll think about it. I see your point that metrically the latter ends with an unstressed syllable, but maybe ending with a stressed syllable is kind of exciting, it's like --- and then what?

[Also, I feel like "awoke" is a word I hardly ever write or say, but I didn't mention that.]

January 10-15, 2007. Proposal Version 1.

I'm very happy because today, after ten revisions, Bruce and I are finally done, and our "[Hormiga Canyon](#)" story in the snailmail. He's been rather beastly to collaborate with this time around, too often escalating to biting invective in our debates about what to do next.

I'm also happy because Hartwell is okay with my doing *Postsingular 2*, with a *PS3* and maybe even a *PS4* to come. Today I'm thinking I'll give *PS2* the title *After Everything Woke Up*.

My computer-reading glasses broke in two yesterday, and my desktop machine went to the shop today but, heck, what do I care compared the [tvvrubble](#) I've seen. I'll be starting the new book with new glasses and possibly a new hard drive. Clean slate.

Maybe my average technophile SF reader is gonna want to see the orphids stick around? Do we keep the orphidnet as an interface layer to lazy eight telepathy? Well, even without that layer, seems like we could use Walker's notion of mental Google; we let the beezies do this for us, and, rather than living in the orphidnet, the beezies migrate into the objects. Because of our Google-like interface, we aren't as spaced-out as the Hibrainers, who never evolved anything like the beezies.

In other words, naw, I don't want the redundancy of orphids *and* lazy eight.. The orphids are gone.

I can think of several more changes to the [Proposal, Version 1](#), but I'm sick of working on it, having done about a dozen drafts now, and Hartwell will probably have suggestions anyway, so I don't think I'll change it further.

Pretty soon, I'm gonna have to face writing the first page of the actual Novel—as opposed to puttering around in these Notes. Eeek! The painter's fear of the blank canvas, the writer's anxiety before the blank page. No problem, Ru, it's like with a painting, you just load up the brush and make a mark. I'll start with the POV of a rock, no problem, no problem, no problem, please help me, dear God, I'm so scared, I'll never write a novel again, I'm doomed, my career is over, I might as well be senile or dead.

Hmm, come to think of it, maybe I better revise the end of *PS1* before starting in on *PS2*. This thought is both a relief and a burden. If past experience holds, what's going to happen is that I'll stall another few days or even week or two on writing the first page of *PS2*, and at some point I'll be so eager to be writing that it'll be very easy to start. I'll be so anxious about my creative potency, so desperate for my fix of creative bliss — so *horny for writing*, in other words, that, before I know it, I'll whip out my writing tool and spurt hot words onto the nearest scrap of paper.

January 14-18, 2007. Revising *PS1*.

I have to go over the ending of *PS1* again, to build up the harp to match what I'm planning. Hartwell somewhat grudgingly said I could do a rerevise if I hurried. Maybe I should revise the whole damn book again? Well, I'll work my way backwards, from last-written towards first-written, as the earlier stuff already has so many revisions it's quite smooth, and it would be overkill to dip back into that.

I started reading Part IV today and I'm finding so many things to fix. So many ways to tighten it. After all those revisions of "Hormiga Canyon" with Bruce I've gotten hypersensitive to flabby spots—I learned a lot from seeing him cut my flab, and from me cutting his. WWBD. What Would Bruce Do?

I feel sick at all the mistakes I'm finding and anxious about *PS1*.

PS1 really needs to do well, otherwise *PS2* is just gonna be hanging out there twisting in the wind, and I'll have two bombs in a row, and Tor will cut me off. It's a bit of a risk to be starting #2 of a series before #1 has come out.

Revision = Worry.

With the proposal for *PS2* in hand, here's a list of changes to put into *PS1*:

* Rework the last line of *PS1*, which presently says, "The neighbors were coming to visit." Because people wouldn't know this yet.

* Thuy needs to closely examine the harp's design, with a scene painted on it resembling Bosch's *The Haywain: Revelers with a little demon*. *And the little demon looks like Jayjay!*

* The subbies gnaw or scratch off most of the painting, and when Azaroth sees this, he exclaims, “Aunt Gladax will be furious. I hope I can get this fixed!” This sets him up for giving the harp to Bosch to work on.

* Azaroth has heard rumors of a plan to tilt the two branes relative to each other, but it hasn’t happened yet when he appears at the end of *PS1*. Presumably the tilt happens while he’s in the Lobrane, though, and that’s why when he jumps back goes to the 15th Century.

* Thuy and then Jayjay need to sense that the harp is conscious, though it doesn’t actually talk to them yet, or at least not much. When Jayjay finally figures out the Lost Chord, it’s because the harp *teaches* it to him. (And then in *PS2*, he teaches the Lost Chord to the harp, completing a causal loop.)

* Make it clear that we keep the beezies as *genii loci*. And that the Big Pig becomes part of Gaia.

January 18, 2007.

Okay so I revised all of the last two chapters once, then revised the last half of the final chapter three more times. I kept on seeing big things to change in there, it was scary. I’m ready to stop though. I think it’s finally converged. If there’s more fixes, I can always catch them during copy-edits and page-proofs.

Re. all those consistency changes I had to put in, I was thinking, it’s like I’m installing a female plug into the ass-end of *PS1* so that a male plug from the front end of *PS2* can daisy-chain in!

In any case, now I’m done and I’m ready to move on to *PS2*.

I mailed off a final revised version.

January 19, 2007.

And of course the next day I wanted to revise the last three pages once again. Why was I in such a pig-blind rush to send it off!

But I’m ashamed to bother my editors anymore right now. Well, I can re-edit those final pages in copy-edits.

January 15, 2007. Unfurling in Bosch’s Time

I forgot to mention in the Proposal, Version 1, that when Jayjay plays the Lost Chord on the magic harp in the Hibrane, it’s a very big deal, as right then all Hibrane objects wake up and everyone gets omnividence, telepathy, teleportation, and endless memory. Those medieval types are gonna feel like it’s ergotism to the Nth degree, in fact maybe they pray to Saint Jerome who was, fittingly enough (given that Hieronymus is Latin for Jerome), the patron saint for those afflicted with ergotism (this being a naturally occurring wheat smut that creates effects similar to those of LSD).

Maybe this is when they decide to burn Jayjay at the stake. They’re whipping themselves and freaking out and piling up wood, and the wood and fire is talking to them and they’re thoroughly losing it.

Azaroth comes out of a tavern—dressed like Bosch’s *Peddler*—and saves Jayjay at the last minute.

More things to remember:

After lazy eight, people have eidetic memories like Funes the Memorious.

To teleport, in *PS1*, I have people link up two scenes (by themselves or with the help of a metamorpher agent) and I hint that they shrink.

Jayjay has a lot of crap in his memory from that 60-year dream.
Darlene's book store Metotem Books.

January 22, 2007. Starting the Novel.

Jayjay woke before Thuy; comfortably he molded himself against his wife. Early sunlight filtered in through the redwood trees. The newlyweds were in sleeping bags, lying tentless on a bed of bark and boughs. They'd teleported to their new-bought mountain acreage to build a house.

A big blue-jay perched on a thin branch overhead, cocking his head. Jayjay teeped into the bird's mind, thinking his thoughts. The gentle jouncing of the branch, the minute adjustments of his fine strong claws, the breeze in his comfortable plumage, his strong beak, *caw caw*, animals on the ground, large and alive, some promising scraps on the ground near them, a smell of fruit, better not to land, they had long arms, come back later, *caw caw*, release the branch and, ah, glide free and flap away. *Caw*.

"*Caw*," echoed Thuy, waking, turning her face towards Jayjay, giving him a kiss, teeping him a Pop art image of a comic book woman saying, "Good morning ... darling!"



I think this could be a start to Chapter One. I'll leave these unedited first words in these notes as first written, a memento to the journey's start.

Losing my focus and cruising the web and pasting the *Good Morning Darling* picture into these notes, I have this momentary longing to be able to have *After Everything Awoke* come out as an illustrated edition. All that's a way of trying to avoid the Work, isn't it.

I'd meant to start Chapter One with Jayjay having an omnivident vision of the whole *yawn* planet, or to have a *double-yawn* rock's POV. But starting out with the cute newlyweds makes more sense.

I don't think I'll actually put in the Lichtenstein picture reference. If I did, it should be Jayjay that makes that reference anyway, as I want to build up the idea of him being interested in painting, so he'll be a good apprentice for Bosch. I could even weave back a Jayjay-as-visual-artist theme into *PS1*. But, naw, let *PS1* be, do the Jayjay-as-budding-painter build-up in *PS2*. Maybe he picks it up from Kitty.

I like this opening. I'm glad. I'm off the starting line.

January 24, 2007. Scary Big Basin Hike

[I blogged this as [PS2 Note #5: Hostile Silps](#) on January 25, 2007.]

On Tuesday, Jan 23, 2007, I went for a big hike in the woods at Big Basin State Park, which is an hour-and-a-quarter's drive from my house. I'd planned to walk up the so-called King Trail to the Mt. McAbee overlook, but I missed a turn or something and stemmed off into a smaller trail that dead-ended on an old logging

road with trees across it blocking the way. I picked my way around the trees and kept going. At first I thought I was still on the right trail and that it was just poorly maintained. And then I realized I wasn't on a trail at all, but I figured that as long as I headed uphill, I'd reach the top of Mt. McAbee all the same.

I was enjoying being in the wilderness, thinking about all the silp minds in the trees and leaves and air, and especially the *genii loci* or spirits of place that inhabit certain spots.

I'd been thinking of spirits of place from reading up on Papua New Guinea spirit boards, in which the natives hope to house some local spirits of place. Kind of like bird houses. As chance would have it, the other day I saw a documentary TV show about a tribe in a jungle, and it was raining too much, and an elder man said the rain was because the spirit of the sacred bend in the river was angry because people were disturbing him, and then we see the kids playing there and they say, "We like playing in the sacred bend of the river!" It was refreshing to see how children are just as ready to ignore elders' injunctions when the tribe shares an animistic religion as when they're kids in a Christian society. Somehow when we read about other society's religions, we imagine every single one of "them" takes their religion very seriously and robotically—but in any society there are jokey, agnostic, practical-minded people who view religion as just another input in the mix.

Anyway, I'm walking along, and suddenly the spirits start harshing on me. I encounter a stand of tough-to-get-through manzanita, with branches like stern claws. I fight my way through, expecting to find a saddle ridge leading up to my targeted peak, but damn, there's this really deep gorge here with a kind of scary slope to it.

Studying my map—finally really *seeing* it—I come to understand that the correct trail is way over on my left, passing along the high ground at the head of the canyon. I'm on a wrong (lower) peak, and the gorge is between me and my goal. The good news is that the gorge contains a blue line, which must be stream leading down to the Skyline to the Sea trail which itself wends along the bottom of Big Basin itself. I decide to blow off Mount McAbee and clamber down the slope into the gorge, follow the stream to the Skyline to the Sea trail and take that back up the basin to the park headquarters where I parked my car.

Heading downwards, more and more mental danger signals go off. The thick humus of leaves and sticks slips beneath my feet. Most of the branches I might grab onto are dead and brittle. Up ahead are some giant boulders with fairly sheer drops on their downhill sides. I focus, planning my route, which is something I've always enjoyed about tramping the woods and mountains—looking ahead and picking out the safest and easiest route. I'd be doing that a lot on this outing—to the point of getting sick of doing it.

The best route seems to lead over a boulder, and as I work my way down a spirit—that is a branch—plucks off my beloved, expensive, perfected-via-many-readjustment-trips-to-the-optician bifocals and sends them skittering down the slope, who knows how far. I can't see! I do dig out my prescription shades from my knapsack, but it's shady and dim in the gorge, so it's hard to see through them. I search a half hour for my lost glasses with no success.

And now I'm at the woodsy bottom of the canyon. In retrospect—and I did a lot of retrospection in the next three hours—it would have been easier to go up the canyon and find the so-called King trail that I'd lost. But, seriously underestimating the distance to the Skyline to the Sea trail, I headed downstream.

On a good day, with my glasses and with the sun shining and with a walking stick (which I'd neglected to bring) and without time pressure (I'd gotten a rather late start, so I had nightfall to worry about), I would have found this little scramble to be exhilarating. As it was, the passage was a strenuous ordeal. And the walk back up the Skyline to Sea trail was hella long. It was quite dark when I finally made it back to my car—wet, bruised, exhausted, half-blind. I wore my shades to drive home, switching on the brights whenever the other lane was clear.

But it was a useful day. Even if it wasn't exactly *fun*, I got some insights. For one thing, it's always salutary for me to be reminded that *I'm not in control*. And for another, while I was struggling those miles along the steep, slippery banks of that rock-and-log-choked stream, I came to revise some of my notions about silps, spirits of place, and genii loci. Previously I'd been laboring under a lazy default happy-hippie conviction that Gaia is our friend, that nature is a nurturing mother. But in the wilderness I was reminded that, in truth, nature is utterly *indifferent* to us. Each object is placidly doing it's own thing. They have no feelings towards me whatsoever. And the stark disinterest can feel like hostility.

I now see that if, for the purposes of my novel, I do want to ascribe minds and personal feelings to the spirits of place, then these elemental minds are just as likely to be hostile (stealing my glasses, making me slip), as opposed to being helpful (extending a solid branch for me to grab).

So rather than having the silps smiling and dancing around and helping Jayjay and Thuy build their house in the woods—I'd been thinking of an Amish barn-raising kind of vibe—maybe it's more that the silps will be tripping them up, breaking their fingernails and being sure that nothing fits. Maybe the silps will like hostile xenophobic neighbors jeering at immigrants who are trying to fashion an ethnic little dwelling for themselves. A brick flies through the window, wrapped with a paper saying, "No Humans Here!" In other words, I'm seeing a scene where things go wrong for Thuy and Jayjay in the woods. And that's fine, it's more interesting that way for the story. One of the basic tricks for story-telling is to have the characters' plans go awry.

January 26, 2007. *Stalking the Wily Spectacles*

So I drove back to Big Basin Redwoods State Park today near Boulder Creek, CA. I made a beeline for the spot where I lost my glasses; it took about two hours to walk that far in. On the way it started raining. But I felt happy to be in the primeval woods for the second time in a week. The air has a special clean woodsy quality, and so utterly quiet. There's no machines in earshot.

At first I can't find the same path at all. I think of those fairy tales where a certain door or path appears only occasionally. We'd be in trouble if the nascent spirits in matter starting moving our paths around!

What I'm realizing this week is that the woods are *big*. And somehow I don't end up in the same side arroyo of the woodsy canyon as the other day. I try working my way sideways along the canyon wall, looking for that same stand of manzanita and those particular boulders, but—you know—my legs are still sore from three days ago. I realize I'm not gonna be able to endlessly trot up and down the sloping terrain of a canyon the size of Manhattan. And I've still got the two-hour walk back in the rain ahead of me.

So I gave up. Yesterday, matter of fact, I'd cruised my favorite optician, Eye Contact of Los Gatos, to get the fit of my backup glasses adjusted, and I noticed they had some nice new Oliver Peoples frames. Frame styles are finally rebounding from

those tiny Benjamin Franklin Urim-and-Thummim type lenses that lamentably have been the fashion for the last ten years. Finally you can get some frames with decent-sized lenses so that you're not peering at the world through tiny peepholes. On my way back out of the park, visions of new glasses danced in my head. I can pay for a quality specs with my half of the money for of that story "Hormiga Canyon" that I just wrote with Bruce Sterling, a story set in, oddly enough a canyon very much like this one, populated by ants with legs the size of redwoods...

The redwoods are great. Walking in the woods close to my house is always nice, but when you're in a Redwoods State Park, you feel like, whoah, "Beastie Boys always on vacation."

I had some ideas about the novel along the way. Good to leave the desk.

February 2, 2007. Comments from my Blog Readers.

My desktop machine is — the horror, the horror — back at ClickAway for further repairs. Of course they can't reproduce the problem. Of course they won't listen to me. Going there is like descending into a horrible, crippled, slow-motion world. The Land of the Lamers.

I've been posting a lot of excerpts from these PS2 Notes on my [blog](#). And a some of my readers have been making useful and insightful comments, particularly Emilio Rojas (rs or RedSlime), Steve Hooey (Steve H), Joe Ardent, and Nick Herbert (Doctor Jabbir).

Today I organized the comments thus far, that is, I obsessively collated, edited, ordered, and responded to a bunch of them, posting the result, which I print below.

(Didn't get many comments on this post; it's so frikkin' baroque.)

<<<<<=====RedSlime on One Mind:

I notice that in panpsychism or hylozoism you have many separate consciousnesses, a different mind in each thing. How does this relate to the mystical or Eastern-philosophy notion of the universe being filled by one cosmic mind?

When a log burns, its silp consciousness might experience a great release into the freedom of being the air, merging into the consciousness of the air which previously in sensed not so clearly.

One thing that seems to be consistently reported about awakening, as in enlightenment, is the realization that "I was always awake." It's not the personality that wakes up, but the connection to the All.

<<<<<=====Steve H on One Mind:

Why would each pebble have its own separate memory? Why not have all rocks share a big memory, and all fire, etc.

Fires are transient; they'd see their inevitable entropic destruction as soon as they became sentient and panic, try to spread. I feel like a fire wouldn't have much to say except "Feed me." But maybe they have a shared racial memory, so you can light a match and talk to it; the next match remembers your question.

=====>>>>>Rudy on One Mind

In any case, I do believe in the One Cosmic Mind. Monism. But that's a wholly separate issue from whether or not rocks can think as individuals. The name "panpsychism" for the idea of objects being alive is a little misleading, as it sounds like it might mean that there is Cosmic Mind. Monism can be true or false independently of whether or not rocks have minds.

On enlightenment, the other day Terry Bisson said to me, "I figure that your existence is a huge circle, and everything is singing, and when you're 'alive' is the only time that you don't hear the song."

I think we could accept that a fire has a localized and rather short life. Maybe the fire accepts it too. Maybe they don't care about dying. As I think I said before, the reason death is such a big deal to us is that we are genetically reproducing beings. We need to spread our genes while alive. An inorganic being doesn't have that issue. There's always more fire. The flame dances and enjoys with no fear of extinction.

This said, there's something to the idea that the fire might pass its thoughts on to another one. Maybe fires' souls cumulatively get smarter.

<<<<<=====alek on Living Organs:

Do parts of a human body other than the brain become sentient as well? If so, then as well as your old brain, you'd have silp personalities inside you too, like etheric parasites. Maybe humans turn into something new.

=====>>>>>Rudy on Living Organs

I do sometimes feel like my organs are alive. Richard Pryor had a routine about his heart choking him to repay him for all the cigarettes. But it would be really different to have the parts talk to you in voices in your head. But, you know, they already do. Sometimes you don't listen and the pain gets worse.

In some ways, I think live in the hylozoic era won't be all that different. I'm working all the time now to see objects around me as alive. It's not that big a switch.

<<<<<=====RedSlime on Ghosts:

Maybe when a human dies, there is a real ghost, as the memory persists in the matter that made up the body? Could a body repair itself?

=====>>>>>Rudy on Ghosts:

So your brain is mush, but the muscle silps and bone silps are still active. I can see some zombie scenes. This is a great idea. Zombies are cool.

<<<<<=====RedSlime on Googling:

Note that in our world, effective search in the style of Google requires massive indexing and massively distributed hierarchical computing. Does something analogous happen in the world of *PS2*?

=====>>>>>Rudy on Googling:

That's an interesting problem---to a guy who works for Google! It would be worth at least mentioning this though. About how the silps all have to work together to keep the index working. It's like a tax they're paying to Gaia, and Gaia is doing the indexing because it helps her think. Maybe some silps want to hold on her, but she won't let them.

<<<<<=====Joe Ardent on Atomic Silps:

Is there a threshold of size or complexity for an object to wake up? Are your body's cells awake? The molecules that comprise them? The atoms of the molecules? The quarks of the atoms? There could be disciplines devoted to communing overtly and directly with your cells or atoms. Mindful meditation to the max!

=====>>>>>Rudy on Atomic Silps:

This is a traditional objection to panpsychism, the slippery slope that ends with quarks and electrons being alive. But why be stingy? Let the l'il gaahs have their tiny little lives. Fireflies of mind. Quantum mechanically, even a single electron is a gnarly computation, a vibrating state function field.

There was this stoner bible some forty years back, Thaddeus Golas, *The Lazy Man's Guide to Enlightenment*, I worshipped that book. And his big teaching was

that there's only one kind of thing in the universe. Monads kind of. "Nobody here but us chickens." In his view, the mind of an atom was in fact just as rich and big as the mind of a human, a sun, or a rock. I can see running with this idea a little. If you push too hard, this turns into Monism. The ubiquitous and identical Many are in but multitudinous reflections of the One. I can see using this as a move at some point. But for most of the book, I want the rocks and so on to be nitty-gritty alive. And, yeah, the atoms are alive, but we don't talk to them so much. They're like a chorus in the background.

<<<<<=====Steve H on Time Scale:

Silps might not be on our time scale at all. Rocks might think in geologic time, atoms in Planck time.

=====>>>>>Rudy on Time Scale:

In principle a valid point. Atoms might think really fast, planets really slow. But for purposes of the story, I'm not gonna go there.

<<<<<=====Steve H on Silp Intelligence:

Giving a rock the power to think might not be enough. With no instincts or desires, what would they reach for or wonder about? I'd say you need installed software along with the lazy-8 memory or you'd have a Zen rock garden that did its own meditating. You have it right when you say they'd be little gurus meditating, already in nirvana at birth.

Maybe it takes a nudge to start them off thinking. Didn't Treebeard say the elves wanted to wake everything up and talk to it?

Perhaps a silp mind coalesces around fragments of legacy AI code. Would the new mind find life as a pebble tedious?

I think talking silps would be rare, and silps with something to say even rarer. I suspect silps who spoke might inspire pilgrimages.

=====>>>>>Rudy on Silp Intelligence:

When the lazy eight unfurls and the silps are born, they reflexively "eat" all the nants and orchids, absorbing their data. I'm not going to have the beezies per se survive, but some of that thinky code will be in the silps. It's good legacy code, it comes to us from when Mars was a Dyson sphere of a jillion nants, the Nant Mind figured a lot of stuff out. So that gives our silps a kind of boost that they might not otherwise have. In fact other planets with unfurled lazy eight don't have such smart silps as we do. Earth itself is worth a pilgrimage. "See the incredible talking rock!" But those talking rocks are all over the place on our weird wonderful world.

I'm just beginning to get a glimmer of how rocks think. They actually like being made into walls. They like being stuck together with mortar, and they think it's cool to be raised up a few feet above the ground. Getting high!

<<<<<=====alek on Artistic Hylozoism:

I saw a video kind of like yours on YouTube made by an autistic woman, who has her own language that she describes as 'being in constant conversation with every aspect of my environment'. Living in a panpsychic world would really, really change the way we are.

=====Ira Madclaw on artistic hylozoism:

The artist Andy Goldsworthy totally lives in the hylozoic world.

=====>>>>>Rudy on Artistic Hylozoism:

rs compared my videos to the autistic video too. Thanks a lot, guys! I was just really happy in my video, don't you understand? Seriously, I get what you're saying. That's a great video, too, by the way, I'll put a link to it right here. I can

really relate to where that woman is at. And her argument is that by kind of dancing with the world she's speaking a kind of language with it — in addition to the regular language that we normals speak. Sometimes I go hiking with people and we end up talking the whole time and not adequately seeing the nature.

<<<<<=====Steve H on Kiqqie Animals:

Sentient dogs and cats might be very common and dangerous. As smart as we are and with less morals, they could become a new criminal class. Insects could be very dangerous - hordes of hyperlinked roaches might be a menace.

=====>>>>>Rudy on Kiqqie Animals:

I haven't thought much about animals with high IQ or at least perception increase. This is a good point, I'll have to take it into account. But maybe not till PS3, I have enough issues already I think.

<<<<<=====Steve H on Scary Silps:

I think you've had a key insight that some of them might be angry or cold, and not very good company.

It would be a handy trick if, say, a garden gnome took over the planet or your kneecap went on strike; just erase them. Every doorway might have a silp-remover field to prevent your pocket change from screaming "don't spend me, daddy," or your rings and jewelry from demanding jewelry of their own.

<<<<<=====Doctor Jabbir on Scary Silps:

Redwoods are not intrinsically unfriendly. But remember our species clear-cut this entire valley about 100 years ago and trees have very long memories. I am wary of redwoods and give them my excess nitrogen whenever i can.

=====>>>>>Rudy on Scary Silps:

I don't think there's any way to "stun" the mind out of a silp. Their mind is stored in the eighth dimension, and we can't really touch that. I do see some limitations on the silps imposed by Gaia. It would just ruin things if objects could teleport, so I'm gonna decree that Gaia doesn't let them.

I like the idea of cranky silps. That's what animist religions are all about. Getting in good with the spirit that you annoyed by defiling a certain glade. In animism we have meta silps too, like a panther god that lives in all panthers, which was something Steve H was talking about. But I don't want to go there. Gotta limit the options. As it is, I'm in more danger than ever in writing the Mathematician Godfather novel: "He makes you an offer you can't understand."

<<<<<=====Steve H on Telepathic Parasitism:

In terms of being parasitized or used as a slave on a server farm, someone could come up with a bit of brain software to prevent someone leeching off your calculating ability by distorting the data as it was processed. Or maybe your brainware could give them viruses. If leeches couldn't trust the data they cribbed, they'd give up.

If we could block parasitic usage of our computation, then we could sell off computer time. Or band together for members-only brain sharing.

=====>>>>>Rudy on Telepathic Parasitism:

I've already decided that in day to day life humans simply have the ability to close off our telepathy. Like you can close your eyes or put in ear plugs. We gotta have that or we're screwed. Maybe rocks aren't that skilled, maybe they can't close themselves off, because they don't need to anyway, as rocks aren't mind gaming each other much.

The evil Peng are in fact going to parasitize our uncommonly rich silps and use them as a server farm. And they'll be waiting like slobbering ghouls at the door to parasitize us every time we open our telepathy blinders. So it's either be parasitized or don't do telepathy.

The Hrull and the Magic Harp will in fact help humanity figure out a way to stave off the Peng parasitism. I'm calling the firewall (obscure math joke) an Ultrafilter. I suppose it could work by warping the input/output enough to make it useless or by spreading viruses. But I'm thinking I'll come up with some other means of its action.

As for the group mind-sharing, that's a separate idea, and a good one. Thinking clubs. Well, that's what this blog is an example of right now, isn't it?

<<<<<=====Joe Ardent on Telepathic Society:

How is individuality preserved? Because of course, the gnarliest behaviors come from just that right mix of boundaries and merging. People are really anthologies as it is: our separate cognitive modules have really high-bandwidth interconnections inside our brains; a group of people is really just a single cognitive entity whose higher-level cognitive modules (whole brains) communicate via low-bandwidth channels (language and other expressive mechanisms). There's probably an inverse relationship between level of cognitive ability and maximum speed of data transfer between peer-level modules, and that relationship has evolved over millennia for maximum gnarliness (and hence adaptability). The lazy eight telepathy seems like a way around that: a high-quality, high-speed channel between two or more really giant, sophisticated cognitive machines (brains).

But maybe society works worse with high-bandwidth communication. A lot of effort might go into techniques for maintaining and defining inter-brain boundaries, much like the discipline of cultivating Zen non-attachment in the face of the overwhelming material richness the world provides. Increasing the data flow could easily degrade the gnarliness of the computation space, like a flash flood overwhelming a whirlpool in a stream.

=====>>>>>Rudy on Telepathic Society:

This is a rich vein of thought. I've played a lot with dynamical systems and parallel systems like alife colonies or cellular automata. And indeed, these things can be very finely tuned for gnarl, and if you change essential parameters you spiral down into dead repetition or up into chaotic dog-barf seething. So maybe society doesn't "work" when communication gets to be so high-bandwidth. Certainly it would change in ways hard to imagine---thus the need for the *PS2* thought experiment.

<<<<<=====Joe Ardent on Merging:

It might be hard to restore the flame of an individual mind after too deep a merge.

=====>>>>>Rudy on Merging:

Yeah, I'm all over this idea, I talked about it in my novel *Saucer Wisdom* already. I also think of the spacecases who took acid too many times. Too much merge. Can't snap back. But with lazy eight we'll be more robust. A complete system backup awaits in the eighth dimension.

<<<<<=====Doctor Jabbir on Quantum Mechanics:

The most intriguing property of the quantum world is the notion of complementarity—that you can ask one question (momentum?) or another (position?) but not both and that somehow the world contains both but you can't get at it. There is also the possibility of asking questions that were simply inconceivable in a classical.

Maybe if we could find some classically nonsensical ways to address the macroscopic world we'd produce entirely novel and unexpected outcomes. I suspect that consciousness is one of these answers that the world gives to a weird-ass request and that there are more ways of being out/in there too that can be discovered by learning to ask to right questions.

=====>>>>>Rudy on Quantum Mechanics:

I love this line of thought. Maybe consciousness consists of a weird-ass request. "Am I happy?" I always come back to Damasio's idea that being consciousness means having a mental image of yourself watching your life. So your conscious mind is the thing watching the feelings of your self-image as it watches your life. That's how rocks get conscious too, by the way. They become aware of themselves having feelings about things.

<<<<<=====RedSlime on Quantum Computation:

From the perspective of quantum computation as described in Seth Lloyd's *Programming the Universe* it seems easy to have memory and computation all over the place, there are lots of bits to go around.

<<<<<=====RedSlime on Quantum Computation:

From the perspective of quantum computation as described in Set Lloyd's "Programming the Universe" it seems easy to have memory and computation all over the place, there are lots of bits to go around.

=====>>>>>Rudy on Quantum Computation:

Yes, I recently came to realize that, given quantum computation, a rock really is as rich a system as a fire or a waterfall. At the quantum scale it's like a sun. Or like a ball and spring model with a trillion chaotic strings.

<<<<<=====RedSlime on Silp Happiness:

Consciousness centered in inorganic objects would have different motivations, different mental axes. For instance a rock might not mind if it never moved? Perhaps it's only humans that are so often unhappy with their situations. Maybe silps don't even have the unhappy/happy axis.

=====>>>>>Rudy on Silp Happiness:

Maybe not, but I think it's gonna be more fun to pretend that they do. The animist religions always have the spirits being happy or unhappy with what we're doing.

February 5-7, 2007. Working on Chapter One

I'll call my first chapter, "After Everything Woke Up," thereby getting some use out of this pleasant phrase, which I'd once considered using as the book's [title](#).

I'll start with the newlyweds building a house in the mountains. They can teleport in and out of there.

Today I'm worrying about the practicalities and details. Building a house is a really big job and I'm not sure it makes sense to expect two inexperienced kids to do it in a reasonable amount of time. Maybe they have a month or two set aside for the task—but I'd kind of like to get the house in place in the first few scenes and them move on. This suggests I might use a pre-fab house. And then maybe all they'd have to build would be the foundation for the home. They might make that from stones and mortar.

How do they get their wall-building supplies to their site, and how would they bring in a whole house's worth of material—or a prefab home?

Perhaps they could have a helicopter lower down a container or a prefab home. But I'd dislike using a helicopter as that's such old 20th C tech, also gasoline is

gone, also I hate the noise helicopters make. A blimp would be nice, but I think blimps might be a distraction here, as we've already got psychic powers and we need to focus on them.

The best solution is to teleport a prefab house to their mountain land. Thuy and Jayjay build the foundation and *pop* the prefab home appears. Experientially, that's kind of how it is. You drive past a vacant lot, then later you drive by it again and *pop* there's a new house in place.

Maybe the house isn't a commercial prefab, maybe Ond helped Thuy and Jayjay build it on a pad in his lot. But if we're teleporting a house, I need to put some more thought into the nature of teleportation. So I added some notes to the end of the [Teleportation](#) section, also to the [Telepathy](#) section. The constraints, issues, and desiderata are multiplying like bacteria!

I always forget how much I worry when I'm writing a novel. I need to always remind myself that eventually I always find solutions. SF is so different from Math or CS that way. In SF you can work your way outta any corner.

In my proposal, I had Thuy and Jayjay going off to surf with Bixie and Chu in the afternoon after working on their house. But I think they'd be too tired. Also, seems like they'd want to enjoy their new spot. Maybe they just go and are telepresent with Bixie and Chu.

Might be nice just to end the first chap with a cook-out with Ond and maybe Jil. Ond could say, "We have to think like shamans to deal with troublesome silps. Nothing's really changed that much. The hylozoism is just more explicit than it used to be."

Have everything be perfect and nice in the first chapter, that is, don't have the Peng parasitism be a factor yet. Save the surfing for chapter two.

Chap 2 can be Thuy's POV, she goes along with Chu and Bixie who are talking about it at supper, end of Chap 1.

One thing, in Chap 1, have something go wrong in the group teleportation of the house. Someone blunders, someone gets high on the Gaia, loses their focus, and a chunk of the house disappears into the subdimensions. Part of a wall. They patch it with some branches from Grew the friendly redwood.

And then they're partying, and Jayjay starts playing a video game with Sonic, which ends with them jacking into the Big Pig aspect of Gaia, and they end up on the nod. The "drunk groom on his wedding-night" archetype. Next morning Thuy will be mad at him.

Feeling the story coming together.

Driving in the car, doing errands with my iPod playing through the radio, I hear Frank Zappa starting up "Transylvania Boogie," loose and feeling around at first, and I have an image of myself, starting this novel, as being like a musician onstage, playing, riffing, listening, feeling for the groove that's gonna carry the song.

Gosh, in terms of mellow music, I heard something even more kicked back the next day: "Slim's Jam" from Charlie Parker, *The Quintessence*, a 2-CD French collection. This song hails from December, 1945, three months before I was born, a particularly fascinating period to me. The world just as it is now, but with me not quite yet in it. The loam in which I grew. The world right after my death is similarly strange, but not in so nice a way.

February 23 - March 5, 2007. Why Humans Can Teleport.

I was going good on Chapter One for about a week, and then around Feb 13, I had a bunch of readings, the kids came to visit, and I got the copy-edited *Postsingular* manuscript to review. I finished reviewing Chaps 1 - 10, just finished reviewing Chap 10 today, but I'm still waiting for them to mail me the copy-edits on the right version of Chaps 11 and 12, but I'll put the tedious and anxious-making details of that ongoing tussle into the *PS1* notes.

A couple of thoughts on rereading the Chaps 1-10.

Keep in mind that that Thuy and Jayjay love natural gnarl.

Try to revisit the idea of snap-on gills at some point. I could have a SCUBA scene.

The first few chapters are pretty choppy.

I'm concerned about the telepathy theme. In the middle of *PS1*, Jayjay is saying he invented a "metamorpher" agent that enables people to teleport. But later in *PS1*, and in all of *PS2*, I have just about any human able to teleport. I'm thinking I should edit out all the metamorpher stuff.

A hang-up is that Jayjay makes such a big deal about discovering the teleportation gimmick: he's using high-level physics, he's jamming with the Big Pig, Azaroth is helping him remember the sessions. But then I want to turn around and say that Thuy can do it too via the orphidnet. And then in *PS2*, after lazy eight, any human can do it. And all along the Hibrainers can do it via lazy eight.

Maybe teleportation is easier when you have Lazy Eight, maybe it's only hard when you're doing it via the orphidnet. If that's the case, I need to say something about that. I think I better wait on this till I've reread Chapters 11 and 12.

Interesting comment on my blog from RedSlime: "I think you need a good physics reason for limiting teleportation — suppose that, say, humans' Higgs particle interactions are unique, with the difference caused by some quality of human mentation."

Yes, what if the human ability to teleport is very rare among the intelligent beings of the cosmos? It would be cool if the Peng need humanoids to drive the teleportation engines of their intergalactic spaceships. Maybe they've enslaved a humanoid race in another galaxy.

This puts me in mind of Robert Sheckley's 1953 story 'Specialist,' from his landmark anthology, *Untouched By Human Hands*. In the story, humans are so-called Pushers, who can push starcraft to faster-than-light speeds. The starcraft is in fact a symbiotic organism composed of cooperating aliens: Walls, Engine, Thinker, Eye, Talker. Their Pusher has died, and they land on Earth to abduct a regular guy to help them.

He Pushed.

Nothing happened.

"Try again," Talker begged.

Pusher searched his mind. He found a deep well of doubt and fear. Staring into it, he saw his own tortured face.

Thinker illuminated it for him.

Pushers had lived with this doubt and fear for centuries.

Pushers had fought through fear, killed through doubt.
That was where the Pusher organ was!
Human—specialist—Pusher—he entered fully into the
Crew, merged with them, threw mental arms around the
shoulders of Thinker and Talker.
Suddenly, the Ship shot forward at eight times the speed
of light. It continued to accelerate.
---from Robert Sheckley, “Specialist”

It occurs to me today that this is a transreal description of becoming a writer! Doubt and fear is why I write. Also, of course, the jonesin for “the narcotic moment of creative bliss.” But in any case, it’s the doubt and fear that make me need that rush so much.

Back to teleportation, yeah, it’s gotta be what the Sheck-man says. Doubt and fear. That’s what makes me write; that’s what allows humans to teleport. And hardly any other beings have our levels of doubt and fear.

Certainly it seems as if animals don’t have doubt and fear in the same way that we do. If a predator comes, an animal runs away, end of story. If cornered, a rat bares his teeth and fights. Animals don’t worry about what might happen; they don’t brood over what they did in the past; they don’t mentally agonize—or at least one can *suppose* that they don’t. [Maybe elephants do, though. Maybe elephants can teleport, too.]

And it’s easy to suppose that the silps that inhabit natural processes don’t have doubt and fear either. Silps don’t much care if they die. A vortex of air forms and disperses, no problem.

And for the purposes of the story, we can suppose the aliens—the Peng and Hrull—are also lacking in doubt and fear. They’re like kiwis/cockroaches and manta-rays/rats. So they can’t teleport either.

I still need to cook up some physics-like explanation for why the human qualities of doubt and fear entail the ability to teleport.

As a first stab, I’m thinking that having doubt and fear involves creating really good mental models of alternate realities. And being able to create good mental models of alternate realities means the ability to imagine yourself being there rather than here. And this means that we can spread out our wave functions in ways that other beings can’t. We carry out certain delicate kinds of quantum computation.

I posted the preceding ideas on my blog, and got into a thread with “Al” who, by the way takes really interesting gnarly photos.

Al Feb 25, 2007.

I can’t help but think that any organism sufficiently evolved to be able to teleport themselves through force of mentation alone has already evolved beyond the states we know as doubt and fear. (Someone once suggested to me that trees are not less fully evolved than we mammals, but more so.)

Rudy, March 2, 2007.

Al, I disagree with your remark that “any organism sufficiently evolved to be able to teleport themselves through force of mentation alone has already evolved beyond the states we know as doubt and fear”.

The smarter you get the MORE doubt and fear you have!

I don't see doubt and fear as negative qualities, but rather as essential human qualities, they come with empathy and an ability to imagine other realities.

That's what Sheckley was getting at.

Al, March 4, 2007.

So could other emotions that humans experience in a far more complex way than animals (love, pity, humor, anger, pride, curiosity, greed...) also be used as sources of energy?

I guess I'm wondering, Why doubt and fear? Why not some positive emotions? Because doubt and fear are integral to the creative drive, which is inherently restless, abhorring vacuums? Because they're more dramatic, and the task at hand is to write compelling fiction?

Someone I know likes to say that "people are motivated by two things: fear and greed." I like to think we're more complex than that and that carrots are more motivating than sticks.

I'm wondering too if imagining alternative realities, or even just imagining what we're going to do tomorrow, things that dogs can't do, are just emotive or abstract parts of human thinking? I mean, dogs can't do math, either. Should teleportation perhaps come from some higher logical abilities that we have?

Rudy, March 5, 2007.

For the sake of an interesting story, doubt and fear seem like good emotions for basing teleportation upon — *exactly* because they are normally viewed as negative things we want to get rid of. I think it's kind of pleasing to have the powers come from familiar negative emotions rather than positive emotions or from intellectual feats. This way, there's a reversal of expectations.

Something I learned from Sheckley is to have my characters be as fallible and screwed-up and neurotic and human as I know myself to be. If you're not familiar with Sheckley, you might think of him as being a writer a little like Woody Allen. I've never liked the bombastic superhero kind of SF where the characters are conventionally heroic. I like my characters to be more realistically flawed, more human, or, as I often say, more transreal — see my "Transrealist Manifesto" off my [writing](#) page.

Given that the Sheck-man is the master, my first impulse was simply to make things easy for myself and copy him with no further thought. But, okay, with all this said, let me think a bit more deeply about the questions Al raises. After all, when I post these ideas of mine, I'm asking for suggestions, so I need to open my mind enough to actually think about intelligent responses. As opposed to reacting with defensiveness and blind fury (always my default response!) It's painful work to actually listen to another mind...

Let's see — my underlying scientific idea is that the ability to teleport results from a heightened ability to imagine other realities. Which emotions in fact involve this? *Hmmm.*

Regret involves imagining alternate pasts. If you want to flip this to a positive emotion, you might think of *gratitude* that things came out the way they did instead of in some other way. Like the gratitude you might have over that you were able to raise your children fairly well. You might even speak of this as pride, like a quiet pride in a job well done. But pride easily curdles into a negative, after all it's a Deadly Sin.

Doubt involves imagining alternate present times and locations. In doubt, you wonder if everything you believe is wrong and the world is different than you imagined. Flipping to a positive, we could speak of humans have *curiosity* or adventurousness or enterprise.

Fear involves imagining bad alternate futures. *Hope* and yearning and longing are about positive futures. This said, yearning can be a negative in that it saps your appreciation of the present.

I think it's subtly funny to have teleportation arise from what we (perhaps mistakenly) consider "bad" things about human personality. Regret about the past Doubt regarding the present, Fear regarding the future.

I'm well aware that these aren't pleasant feelings. Meditation often involves trying not to think about the future, about the outer world, and about the past, that is, to stay away from regret, doubt, and fear. But it's also true that, when meditating, you can learn to accept these negative emotions as an inevitable part of your psyche — but without letting them take over the driver's seat.

If we wanted to speak only in terms of positive emotions, we might say that the ability to teleport arises from gratitude, curiosity, and hope. Instead of saying it comes from regret, doubt, and fear. To me the positive version seems duller to read about, too self-congratulatory. The quirkiest, more perverse, negative formulation jolts you up and makes you think—the rah-rah "uplifting" version sound soporific, like a platitude, and may even provoke resentment, as in: "Why don't *I* have all those good feelings?" *Everyone* can relate to negative feelings; they're in some way more universal.

As I mentioned, I'm seeing a kind of transreal equivalence between teleportation and writing. And I'm thinking that if all I had were positive pleasant emotions, I probably wouldn't be taking the trouble to write. It's the negatives that get me moving.

A completely different positive emotional complex that I'm bringing into play here involves compassion, empathy, pity and love, all of which involve imagining the minds of other beings in the present. I may yet use these emotions in the book, but for some other superpower. Maybe I'll use love to enable people to jump out of cosmos and into the land of the actual infinites, possibly to be featured in a *PS3* called *Transfinite*.

Just for the sake of systemizing completeness, what might be the lower-order animal versions of the paired human past-present-future complexes of (Human negative) regret-doubt-fear or (Human positive) gratitude-curiosity-hope?

(*Animal regret/gratitude*.) Negative and positive versions of this that animals might share could simply be discontentment and contentment.

(*Animal doubt/curiosity*.) With animal doubt, I'm thinking of an animal compulsively looking out of the burrow to see if an enemy is coming. And animal curiosity is inquisitiveness, like in restless foraging behavior and searching for mates.

(*Animal fear/hope*.) I think maybe this is where greed fits in. Greed is a low-level desire relating to the future. Greed is both a positive and negative, I think, depending on how hard you push it.

February 24-28, 2007. Peng Craft. Supermind & Big Memory.

I found a version of the kiwi-like Peng's starship in a photo supply store, it's a black natural-rubber dust-blower bulb called Giottos Q.ball. The tip tilts over and *poof*, the kiwi Peng come tumbling out.



And, dig this, the Peng have a pilot. A humanoid Pusher who allows them to teleport between the galaxies. He's black and stocky and he wears shades. He's modeled on the jazz hero Charlie Parker! Maybe he'll win Thuy away from Jayjay. Maybe he plays an alien instrument that's something like a saxophone.

I've been listening to Charlie Parker all day every day lately—I'm a born-again late-life convert to the Church of Bebop. I'm reading this great biography, *Bird Lives*, by Ross Russell (Charterhouse, New York 1973).

In *PS1*, Jayjay uses Azaroth's memory to save information from his Big Pig trips, and thus is able to invent teleportation.

But now in *PS2*, he can take Gaia trips. And he has his own infinite memory. So he can think of really smart and hard things and remember them. So it's like he's a trillion times as smart as when he was a kiquie.

Same goes for everyone else. Maybe Jayjay discovers this at the end of Chapter One when he gets "high" instead of carrying out his husbandly duties on his "wedding night".

March 4, 2007. Restarting.

Time to start again; just now I lost about a month to the *Postsingular* copy-edits, a joyous family visit, photographing all my paintings, and a bunch of appearances and interviews.

I'm very eager to immerse myself in the book again. I've been reading a non-fiction history of panpsychism in philosophy; I'm looking forward to working with the ideas. And I want to spend time with my characters. At the same time, I have a little fear of the blank page, a little performance anxiety.

And maybe I have a sense of fatigue at the prospect of the long process of another novel. Sometimes, if it's a really nice day outside and I'm slaving away on my computer, I feel sorry for myself.

March 13, 2007. Getting in the Groove.

I'm finally getting a little bit into the groove. I had a nice day where I probably only wrote about 300 words, but all day was "about" the book, I was wandering around happy thinking about it. And I had some fun writing Sonic in as a stoner character. I love those lower companions. *Nostalgie de la boue*.

Off and on I have to get into problem-solving mode, setting things up. I feel anxious when I'm problem-solving. It's more fun for me (and maybe the reader) when the characters are just hanging out, expressing themselves, developing their personalities.

My favorite part of *Mathematicians in Love*, for instance, was that dinner party at the beginning, with Bela, Paul, Alma and Alma's woman friend, I forget her name.

I remember something Greg Gibson said about my Fletcher and Harry novel *Master of Space and Time*, comparing it my story about the same characters, "Inertia." He said that in the novel they had more heavy lifting to do, more plot machineries to crank, and they'd been more fun in the story, as there they were (at least part of the time) just hanging out—like at the beginning when they were getting drunk in the kitchen.

I'm coming up on what could be a series of conversations among my characters as they all gather on-stage. I should relax and draw this out, let them talk and develop, don't be in too big a rush to get the story going.

I'd had this notion of doing 12 chapters, each 7,500 words long, thereby arriving at precisely 90,000 words. And of course Chapter One is gonna run longer than that, and I'm so uptight I was worrying about that? Come on, Ru. Let it flow. Not every chapter has to be the same. Write a chapter till its done. And, you know, if a lot of them are long, you can have less than 12 of them. Never mind whatever you put into the proposal.

Speaking of the proposal, I'm still waiting for an offer from Tor. Not that they don't want to buy it, but Dave's overscheduled as usual.

March 14, 2007. New Keyboard

ThinkPad / Lenovo sent me an email telling me the warranty on my x40 laptop was about to expire. And the keyboard was just starting to wear out, as it did with the last one—I type so much that eventually the switches in my keys stop responding, usually the spacebar is the first to go.

So I got the new keyboard by mail—for free! First they sent me the wrong size keyboard, though. They said not to bother returning that one, which seems wasteful, they said it's a "non-returnable part." The people I talked to were mostly in Atlanta, nice guys, but not very together and not geeky enough. Eventually I talked to a tru-geek in the parts warehouse and he sorted me out. Maybe the company isn't so well-functioning anymore now that IBM's not running it.

In any case, I just bolted my wafer-thin new clavier in place, and it's clicking great. Nice, responsive action. The nubile flesh of a fresh keyboard. Flesh fish.

March 17-19, 2007. Discouraged.

I do get some good reviews, but I feel like the mass of fans don't *care* what the critics say, they've long ago decided for once and for all that Rudy Rucker is not for them. Rudy who? That drunk stoner professor? Is he still around? He hasn't really written anything good since *Software*, has he?

Oh, why bother? Why not just quit. I'm tired of pissing into the wind.

I'm tired this week, feeling run-down. I did some backbreaking work on the kitchen counter, and have felt sore all over. I think I might have a virus.

I napped in the hammock, and then I stared up at the trees and the sky for a long time. I feel a little better now.

Though I still do wish I could find a way to just quit writing. It's too much work. I'd like to be empty-headed, content to lie in the hammock all day every day. Maybe I should become a heroin addict. But that's probably a lot of hassle, too.

I'm looking over the outline for the novel. I'm not sure how smoothly the Bosch stuff will fit in. Maybe I need to do Bosch in his own book, I don't know. Or maybe it will be fun to have something so outré pop up in *Hylozoic*. We'll see how it goes.

I'm working on a couple of Bosch research angles. I plan to go to his hometown s'Hertogenbosch for a couple of days in April. And I'm trying to set up a gig to make a film about his masterwork, *The Temptation of St. Anthony*. It lives in Lisbon, and my film-maker pal Edgar Pera is there; he's a respected local artist and can set up museum permissions to film the painting and maybe even get some money for the film and my travel expenses. There's a copy of *The Temptation of St. Anthony* in Brussels, I think, that I've looked at a lot. Or, no, maybe the copy is in the Met. Worldwide there's a bunch of copies. Years ago, Edgar made a movie with me, Terence McKenna, and Robert Anton Wilson. The other two are dead now.

I'm supposed to write a couple of thousand words about how things will be one million years from now—for a book edited by Damien Broderick. Maybe I'll take a break from *Hylozoic* until I get a contract, and work on that essay next week. "They" don't deserve my books!

Though I really *would* like to finish Chapter One. Three scenes left: the partially bungled teleportation of the house, the housewarming party, and Jayjay getting stoned on the Gaian Pig and inadvertently attracting the attention of the Peng and the Hrull.

I can't just sulk and stop writing. If I do that, then "they" win, don't they?

Really I'm lucky to be getting published. So be grateful, Rudy. And finish the frikkin' first chapter.

March 21, 2007. Done with Chapter One!

So, huzzah, I finished the draft of *Hylozoic* Chapter One today and I emailed it to Hartwell to help get him and his colleagues stoked about making me an offer

I think I'm off to a great start.

It's fun to be doing a sequel for a change. By the end of most of my novels, I've got all the amps turned up to 11 and feedback is filling the air---and then I walk off the stage. And NOW, writing this sequel, I get to come back onto that same vibe-laden stage and pick up my still-pulsing instrument and take it even higher. Why stop at 11? Why not 111? And volume three can hit 1111.

Forget about the biz and enjoy the fun. I wrote something today, for instance, that made me laugh out loud for about five minutes—not that most people would find it funny. But I do. The set-up is that Jayjay is very wasted on the night of his

wedding with Thuy, he's essentially dead drunk or on an acid trip or on the nod—the sfictional transreal version of this is that he's plugged into the Gaian overmind.

“At some point during the night's long chaotic journey, Jayjay felt Thuy shaking him and walking him as far as the cabin's main room—where he collapsed on the floor and settled deeper into his trip. Laughingly Gaia displayed a relevant archetype, bristling with references and links: The Groom Drunk On His Wedding Night. It seemed very rich and true and clever—a wonderful thing to do.”

That last sentence is the one that made me laugh. *Wonderful*. What fools we mortals be. At least Jayjay is happy there for a little while!

March 23-28, 2007. Rewriting the Outline. The Missing Gnarl.

Susan tells me Hartwell needs another four weeks before he can make an offer. I might as well send him a fresh outline. I now see the [old outline](#) as a fucked-up mess.

I have a shitload of characters in Chap 1, like fifteen of them.. I need to give at least some of them something to do in the rest of the book. I should build up the Bixie/Chu romance.

The Hrull can wait for volume 3. They're religiously obsessed with the transfinite, so whatever the Magic Harp does with the door to infinity attracts them. The Hrull *appear to be* slavers. Humanoids are the only ones who can teleport. “Pushers.” Intergalactic craft use Rull-built engines made of squashed humanoid Pushers.

Kicker: in volume three we learn that the humanoids in the motors *don't mind!* It's fun to be in a Rull engine. The most important part of you is infinite, in heaven. The engine is just an attachment point to maintain a presence in the gross material plane.

Perhaps the Peng have a very few Rull-engine-powered craft. Perhaps the first ones to come are in a ship like this? No, just let them arrive in that same way of sending information to run an emulation of themselves. This is different form teleportation. It's just an information transfer. All species but humanoids are somehow too unimaginative to be able to teleport their own matter as we can.

My book is called *Hylozoic*, and my goal is thinking about having everything be alive. It would be an evasion to gallivant off to both Pengö and to the Hibrane as originally planned. I'll keep the Bosch studio trip and drop the trip to Pengö.

Re. the Bosch studio, I'll emphasize the living quality of the objects there, which in fact characterizes the way the Master paints.

Instead of going to Pengö, I'll have plenty of the Peng active on Earth. Also I'll have a few several-page visions of life on Pengö.

As the Peng can't teleport, they are here only in a certain virtual sense. My idea, described below, is that they siphon off Earthly computation to emulate versions of themselves but it's a full-on quantum-computed *material* emulation. All of the wave functions jibe together to produce a bump of matter in the shape of the Peng.

The Missing Gnarl.

This is where I want to end up: the birdlike alien Peng are siphoning off the gnarly computation from Earth's matter. As a result, our clouds, waves, fire, wind,

plants and minds behave more simply. What are the Peng using the gnarl for, and how are they stealing it?

What the Peng Do With Our Gnarl.

They use it to simulate individual Peng that thereby acquire a physical presence on Earth. These “tulpas” are much stronger form of emulation than a simulation that lives within a virtual reality. Tulpas have mass and physical presence. They’re the output of a heavy-duty distributed quantum computation spanning the decillion or so particles on the tulpas’ “ranch.” The tulpa Peng fall apart without a steady influx of computation. They’re like ice-sculptures in a blast furnace, being kept together by a zillion gnats with trowels and Slushy cones.

Here’s the kicker. Due to certain inefficiencies of the emulation procedure, maintaining the physical presence of a single Peng family’s tulpas requires every bit of the gnarly computation contained within a patch that covers some ten thousand square kilometers of Earth’s surface. That’s a million hectares. Putting it another way, tulpas for a small Peng family require the resources of Peng ranch which is a square that’s roughly sixty miles on a side, like a large county. And the tulpas soak up the computation in 100 vertical kilometers of volume as well, thirty miles straight up into the air above the Peng ranch as well as thirty mile’s worth of the Earth’s crust below.

A Peng has to be very wealthy and high-ranking to become an Earth-based tulpa. It’s the final big pay-off for a prosperous Peng life, it’s like immortality. Our Earth is like a heaven for the Peng. Although their planet Pengö is forested, it’s a cooled-off, senescent, uninteresting world—like the Peng civilization itself. Earth is a Pengese post-retirement paradise. We marginalized humans are like natives bitterly squinting at a McMansion development that takes up most of our island.

Talk about conspicuous consumption! Huge areas of Earth are to be drained of interest to support a few smelly, pecking Peng. There’s just the one dot of bright, happy Peng gnarly amid a million hectares of dullness.

How many Peng does Earth have room for? Suppose the Peng want to live on land, not water. Earth’s surface has 150 million square kilometers of land, that is, $1.5 * 10^8$ square kilometers. And I’m supposing that a Peng (or a small Peng family) requires the computational resources of a land area that’s a hundred kilometers by a hundred kilometers, a Peng ranch of, once again, 10^4 square kilometers. Doing the math, on Earth’s whole land surface we’d have room for some fifteen thousand Peng ranches. Only the cream of Pengese society need apply! Announcing the Wigfalls of West Philadelphia! Assuming the Peng won’t be moving into the intrinsically dull zones, Earth’s developers will only have room for maybe five to ten thousand Peng ranches.

Wow. I’m thinking of some great possibilities here. Peng realtors! Sell-out Earth developers!

Peng Propaganda

I’m gonna view telepathy is a new medium to exploit.

Media Promote Worship: The media get us to worship certain people. These are “stars” and “leaders”. A superficial motive is to get the public to pay to hear more about the stars. A fundamental motive is to get the public to obey the leaders and give them their wealth and the resources of their land. The stars are the content, the leaders are the sponsors.

Media Spread Fear. The media press us to think about a few “issues” at a time, always disturbing ones. The motive is to make us afraid so that we want our leaders to protect us and are willing to cede our autonomy. Fear is the content, the leaders are the sponsors.

Peng Promote Worship. Peng present themselves as cute and interesting. They put a dazzle-aura around themselves. They trail memory sheets of happy family memories and colorful anecdotes. They engage in riveting soap-opera intrigues. They have a big singing contest coming up, and they do sing very well. People root for them like for sports teams. People don’t mind that all of, say, Oakland is de-energized so that the Oaktown Peng can warble and croon. There might as well be a tie-in between the Peng and the *Founders* reality show that my main characters are in.

Peng Spread Fear. They tell us horror stories about bad other aliens. They tell us about the Hrull starship-engines that are made of squashed humanoids. A whole list of scary aliens. Tentacle monsters. Pinchy beetles. The Wyrms. The Holothurians. The Hoarse Roar from the Dawn of Time.

March 30-April 2, 2007. Merging the Plot Lines

I’m working on a new plot outline. I have several plot lines to merge: The *Founders* soap opera (Jayjay & Thuy, Bixie & Chu, etc.); the Peng and the missing gnarl; the hylozoic world and Gaia; Bosch’s studio; the magic harp from infinity.

Let me work towards a solution via some questions that came up for me during my most recent rereading of the current version of the “[Detailed Active Outline for Hylozoic](#)” (which is presently much cruder and vaguer than the deceptively polished version that will be present at the other end of this link by the time (God willing) that this book is done and these *Notes* are posted.)

Work out more (pseudo)science about how distributed quantum computation can produce a physical output like a Peng. Why do the Peng émigrés have to be wealthy? What’s the set-up at the Peng end? Etc.

I originally had a long discussion of these and other related questions in this writing journal entry, but I revised the material over and over and ended up moving it all into a now very long Ideas note on [tulpas](#), which I also posted as a series of blog entries.

Connect Bosch and the gnarl to the magic harp. Invent a connection between Bosch’s art and the Peng’s defalcation of gnarl. Connect Jayjay and Thuy’s actions in Bosch’s studio to the concurrent actions on Earth.

Early set-up: Kittie is into Bosch, she’s talking about him a lot when she comes over to Jayjay and Thuy’s house at the end of Chapter Two. She’s saying that having everything alive makes her think of Bosch’s paintings.

When Jayjay visits the Hibrane and talks to the harp, he’ll learn that Bosch himself is what attracted the magic harp to the Lobrane/Hibrane Earths. The harp wanted to touch maybe three people: Bosch, Jayjay, and Thuy. There are heavenly beings who felt that Bosch depicted them in interesting ways. Bosch saw the *real* gods. Very few races have the mental capacity to teleport, and Jayjay learned out. Thuy’s *Wheenk* is a supreme work of art.

Thanks to the magic harp’s closed causal loop, everything that she encounters anywhere on her path resonates along the rest of the path. She really thinks atemporally.

Maybe the fact that the harp dealt with Jayjay is why he is in fact able to serve as a medium for the Peng. Maybe she gave him certain powers. Maybe Thuy got the same powers from the harp, and she can be a medium too.

Jayjay and Thuy are the Adam and Eve of the new infinite world.

April 1, 2007. Useful Comment by Henry Wessells

I think we're starting to lose gnarl in our present-day society: folks get so involved in mental/virtual stuff that they neglect to learn/remember how to *make things*. So you get vinyl computer-generated-wood-grain-pattern-embossed siding instead of carpenter gothic, chain stores instead of local varieties, POD paperbacks instead of hand-made books.

Perhaps the Peng can't make anything, so they are blasting big hits of our gnarl to make their fields of vision more interesting. Like cokers? Is there a cost to the Peng in dealing with rip-off sell-out human real estate scammers instead of with creative human beings?

April 5, 2007. Ideas for Year Million Anthology

Damien Broderick is editing *Year Million* for John Oakes at Atlas Books. The pieces are supposed to be 5,000 words long, and be done by the end of June, 2007. He wants accessible, informed speculation on how things will be a million years from now, aimed at the general intelligent reader.

I wrote him that I'm thinking of writing about the themes of my trilogy-in-progress, *Postsingular*, *Hylozoic* and *Transfinite*, as described in my recent [Edge](#) piece. I've got sub-quantum determinism in there. Also, as I wrote Broderick, "The ideas have to do with far future science and non-traditional computation—or, more frankly, omnividence, telepathy, teleportation, and hylozoism."

Yesterday my friend John Roche at RIT mentioned that I might also write about my notion of "hierophantic reasoning" from *Mathematicians in Love*; I can lift some stuff from the *Lifebox* tome for this.

April 11, 2007. Psipunk

I've been so busy hyping myself lately. In the Netherlands I gave a talk on "[Psipunk](#)," which is a theory leading to the novel trilogy I'm currently writing. I got a [video of me reading it](#) online. I was keyed up. I'd been in a big fight with one of the organizers the day before the talk because he dared to publicize the talk in a local newspaper under the rubric "FS is Dead." He can't even spell a two letter abbreviation for the SF genre and he's such an expert he's pronouncing it dead? Paraphrasing the jazzmen: "SF isn't dead. It just smells funny."

***Psipunk*, Rudy Rucker, Amsterdam Lecture, April 11, 2007**

The theme of these talks is science fiction and fact. I often call myself a [transrealist](#) SF writer. This means that I turn my life and my speculations into science fiction, I watch what emerges in my novelistic laboratories, and I turn my science-fictional discoveries into scientific speculation, which in turn fuels fresh novels, on and on in an endless, rising gyre. Today I'll give you a specific example of how I work.

(1) First I'm going to talk about a particular idea that fueled the cyberpunk literary movement in the 1980s.

(2) Second I'm going to talk about how this idea has affected technology over the last twenty-five years.

(3) Third I'm going to talk about some ideas that I'm using in my new series of psipunk novels.

(4) Fourth I'll say a bit about how I think my new ideas might play out in the technology of the coming twenty-five years.

1. My Idea for Cyberpunk

During the year 1979-1980 I wrote a novel called *Software*, which was to take its place as one of the very first cyberpunk novels. My new idea for the book was this:

Software Immortality:

A person's mind can be uploaded into a computer.

To make the situation colorful, I had the subject's software extracted by having a gang of sleazy biker-type androids eat his brain!

Although the notion of uploading a human into a computer is now commonplace, when I wrote *Software*, it was a genuinely new idea. I invented my notion of software immortality by thinking in terms of the then-new distinction between a system's physical hardware and the software that's running on it. This was not at all an obvious thought in 1979, it took me nearly a year to wrap my mind around it.

2. The Tech From Cyberpunk

What's happened in the intervening quarter century? My idea has served as a metaphor, a guide, a vision. There are a number of figurative ways in which we do now upload into the machine.

In particular I'm thinking of how people upload text, pictures, audio and video. Although I can't literally transform my personality into software, I can create a reasonable facsimile of myself online. The Web makes all the difference.

I often use the my word **lifebox** in this context to stand for a collection of data that holds a copy of a person's life. My recent non-fiction book *The Lifebox, the Seashell, and the Soul* discusses whether a lifebox emulation could ever truly be alive—and I think the answer will eventually be yes—but that's not the issue I want to talk about today. Instead I want to focus on present-day and near-future technology.

As I say, the Web makes all the difference. The Web is something that I didn't foresee in *Software*, but which William Gibson stressed in his contemporaneous *Neuromancer*, calling it cyberspace.

In the past, your life's mementoes were but a dusty drawer of photos and diaries, or a cardboard box in a basement. But with the Web, your records can become a lifebox: a hyperlinked and searchable website mixing text, photos, sound and video.

If you're technically inclined, you might make a personal website. If you're a blogger like me, you create part of the lifebox on the fly, as you go along. Or, if you're busy with other things, you might employ someone to create a lifebox for you: I think of, for instance, Stephen Wolfram's [website](#), which includes a very nice "scrapbook" section.

In the coming decade, there will be a very big business in lifebox-generation.

Why are online lifeboxes going to be so popular? The Web makes all the difference. If I'm blogging, then I have the gratification of being able to post to my blog right away. I can post this speech, and pictures of the audience, and everyone in the world can read it, and recommend it, and post comments, and give me feedback. I'm not a lonely nut. I'm part of the planetary mind. It feels good to be plugged in.

The ability to share and be heard and be connected is one reason for wanting a lifebox. But when I wrote *Software*, I was thinking in terms of literal, personal immortality. That's not happening. In the *literal* sense, we're not very close to transferring minds into computers.

At present we don't have terribly strong tools for munging a lifebox's data. But don't underestimate the power of automated Web search. More specifically, the *Search This Site* box to be found on most blogs allows you to search a series of topics so that you are, in effect, interviewing the lifebox. What is an interview, after all, but applying a search engine to a data base?

A big part that's still missing is the AI animation that'll get my blog site to keep on generating entries after I'm dead! I can see a story idea in that, actually.

Finally I need to acknowledge that having even an artificially intelligent online copy of me somehow doesn't seem like true immortality. But I don't worry as much about personal immortality as I used to. The secret is to identify my inner glowing "I Am" with the universal light that fills the cosmos, and then there is no death to worry about.

But if it won't really make you immortal, why have a lifebox, a personal website, a photo-sharing page, a video-sharing presence, or a blog? To communicate with lots of people at once. To enable strangers to get to know you. To build a playground that people can interact with for a long time to come. To work in a new medium, to create a new kind of art.

And I would argue that technology has brought us these pleasures as part of our instinctive quest for Software Immortality

3. My Ideas for Psipunk

Nowadays I'm dreaming of getting rid of computers. What are the ideas that I'm using for this? And what tech might this lead to?

I got started by thinking about what comes after the vaunted computational singularity that we may be approaching. I think most thinkers get it absolutely wrong. They think we're heading towards an ever more digital world. I believe that the opposite is the case. Chip-based digital machines will soon go the way of horse-drawn carriages, steam engines, and wrist-watches made of gears.

How would this work? I have two desiderata, as the philosophers say, that is, I'm looking for two desired states of affairs: non-digital computational engines, and a means of interfacing with them. To wit:

Natural computation:

Natural objects can do all the computation we need.

Natural Interface:

We can talk to objects.

Science fiction is all about transmuting philosophy into funky fact. In order to achieve my desiderata, here are the SF-fictional axioms I'm now working with:

Hylozoism: Every object is alive.
Psi: Telepathy is possible.

Hylozoism has an estimable history in philosophy, the word come from the Greek *hyle*, matter, and *zoe*, life. [Hylozoism](#) is related to the similar doctrine [panpsychism](#), which says that every object has a mind.

In my recent novel *Mathematicians in Love*, I wrote about naturally occurring computations. In my short story “Panpsychism Proved” in *Mad Professor*, I have a preliminary sketch of using quantum-entanglement based telepathy to talk to objects.

In my novel *Postsingular* [these blog entries](#) coming out in Fall, 2008, I show how to move through a nanomachine-based singularity into a digital-free future.

And in the sequel I’m now writing, *Hylozoic*, everything is alive. You’re building a stone wall, and the stones are talking to you, they’re happy, they think it’s cool to get to live half a meter off the ground, and they dig being mortared together. But, oh-oh, you pissed near the stream, so now the stream gets the trowel to twist and cut your hand. Animism becomes real.

How do the objects wake up? Well, at the end of *Postsingular*, I give every point on Earth an infinite memory upgrade. It’s just a matter of unrolling the eighth dimension—which today’s stingy physicists have insisted on rolling into a tiny loop. Unroll the eighth dimension and make tick-marks on it for memory!

Might my new work be part of burgeoning literary movement? I don’t know, though some like-minded people are gathering in the pages of my webzine *Flurb*.

Call it **psipunk**.

4. The Tech From Psipunk

Okay, so we still can’t really upload ourselves into computers, but the idea of it us has led us to photo-sharing, personal web pages, social networking, and blogs. Where do hylozoism and telepathy lead?

Let’s take telepathy first. Cell phones, instant messages, and email are already bordering on telepathy. One missing thing is the ability to link into another person’s mind.

Ordinarily, I communicate an idea to you by talking or writing. I give you a kit so that you can reconstruct my idea in your own head. If I had telepathy, I could pass you a link that would let you directly access the idea ready-formed in my head, without your having to reconstruct it.

In terms of technology, this might an increased use of links. Why are we distributing bit-built music files? Why not have a music player that just holds links? Why not have the one platonic music file for each song and let people link into it with a micropayment structure? This was Ted Nelson’s Xanadu dream back when I was working with him at Autodesk in the 1990s. Maybe it’s finally time to make it work.

Another technological aspect of telepathy is that we imagine it as working across great distances. How can this be done? Quantum entanglement may yet lead the way. We haven’t yet begun to utilize the magic of quantum computation.

A more rudimentary instance of telepathy-like tech: cell phones that can detect and transmit subvocal speech, so you don’t have to actually talk out loud like a crazy person on the street.

Let me move on to the less familiar notion: hylozoism. As Stephen Wolfram and I have discussed in our tomes, natural processes are already carrying out universal computations. If we take a femtoscale—rather than nanoscale—view, any object is seething with quantum computation. At present, objects are solely interested in computing themselves. But why not siphon off some of this richness for our own purposes?

A technology that smacks of hylozoism is giving a computer really good voice and gesture recognition. Let it track your eye movements as well as analyzing your voice. If your computer can simply watch and listen to you and figure out what you want, it'll feel like as if it's finally alive.

Ubiquitous computation and giving objects RFID identifiers also shades into hylozoism.

As with Software Immortality, think of Hylozoism and Telepathy not so much as things we actually expect to achieve, but as dreams to beckon us forward into a fresh wave of technology.

Or then again, you might think of them as great ideas for novels.

April 13, 2007. Visiting Bosch's Town

In Amsterdam I'm staying in a B&B on a street off Van Wou Street. It's pronounced like "von vaow". The name amuses me. I see it as being like an intense form of wow. Imaginary conversation: "Wow." "Better than that, man. Van Wou."

Potato is "aardappel." I think of the Penguins singing, "Aard Apple, Aard Apple—will you ever me mine?"

Lots of the women here are natural blonde, a rare sight at home. I'll make Bosch's wife a blonde.

I took the train to s'Hertogenbosch (called Den Bosch for short) and spent the night. My pilgrimage to the home of Jeroen Bosch (1450-1516). The locals say his name like "Yeroon Bos." The ride was already like being in a Bosch landscape, the Brabant landscape, with the rows of trees along the edges of the green fields. Milky sky. Willow stumps with fresh spring shoots.

Den Bosch has a small triangular town center, with a triangular marketplace in the middle, mirroring the fact that the town originally had three gates that led to the three other main Brabant cities: Brussels, Leuven, and Antwerp. The town's also triangular because it's wedged into the delta where two small rivers meet: the Aar and the Dommel.

Walking around the town, I'd get these flashes that the crowds were the people of a Bosch painting. Particularly when I saw them in silhouette, and their unseemly raiment dropped from visibility.

Two Bosch houses stand on the town's marketplace. I sat on the edge of marketplace's old well at night, looking from one house to the other, imagining Jeroen running around as a serious boy, and walking around as a confident grown-up.

The first house was Bosch's father's house, on the west side of the market, it was called "Sint Thoenis" (for Saint Anthony) ; they lived there when our Jeroen was 12, and maybe when he was younger. It's been burned and rebuilt a number of times, the building on the spot now houses a souvenir shop called "De Kleine Winst," meaning "The Small Profit."

The second house was called "In den Salvatoer," Bosch moved into it when he got married around age 31, it belonged to the family of his wife, Aleid van de

Meervenne. It too has been destroyed and rebuilt. It now houses a shoe store called In Vivo. This house is on the north side of the market, with its windows facing south so the sun streams in.

I went into both shops of course, the owners weren't that interested in the topic of Bosch. There exists a painting of the marketplace in Bosch's time, with tents on it for the merchants, and this morning, by God, the market tents looked just like the picture.

There's a newly opened Hieronymus Bosch Art Center in the town, housed in a deconsecrated church. In the basement they have a little reconstruction of Bosch's studio with a fake window like the window in the In den Salvatoer house, and a copy of that old painting of the market place on the other side of the window and—great touch—a tape of marketplace sounds playing. Church bells, geese honking, wooden cartwheels on cobblestones, pigs squealing, children shouting, cows mooing, people talking, sheep baaing, a smith hammering an anvil. Wonderful.

I was alone in the mock studio for half an hour, just me and—Jeroen. A nice mannequin of him stands before a canvas; he's wearing a robe and a hat with earflaps. I sat at his work table watching him, listening to the sounds through the window, talking to him a bit, like, "Hello, Master."

On the table were copies of some of his drawings, bowls of berries, a bowl of eggshells, a peacock feather in a glass jar, gourds. A cow skull on the wall. A stuffed heron and a stuffed owl. A lute.

Before going to the Hieronymus Bosch Art Center, I visited the building of the Swan Brotherhood or Zwaanbroederschap, founded 1318. They're also called the Brotherhood of Our Lady. Bosch became a member when he was about 40, and it was a big deal. Not all that many mere painters got to join the upper-crust group. In his time a painter was just a kind of craftsman, who might take all kinds of decorating jobs.

The only way to get inside the building—which like the houses has been destroyed and rebuilt several times since Bosch's day—was to take a guided tour in Dutch. I might have been the youngest guy on the tour! Only old people care about the past. They were Dutch, with thin lips. We looked at a small meeting room and paneled banquet room. The walls had columns with statues of swans bending their necks down to menace with their beaks. They looked a little like bagpipes. The Dutch say swan like "zvaan." The slogan of the society is "Sicut Lilium Inter Spinis," like a lily among thorns, and it refers to Our Lady. There were coats of arms embroidered on the backs of the chairs—so we weren't allowed to sit in them—these were the insignia of current members; the Swan Brotherhood is still active, initiation only, and packed with local nobles. I had the impression the people touring with me were happy to be breathing in such rarified air.

The fireplace lintel was adorned with a sculpture of a skinny Borzoi dog with prominent ribs and little bat wings, his tail growing out long and tapering into a leafy vine. Needle-like teeth. I can see a dog taking on that appearance in my book.

The Boston "Ecce Homo," attributed to Bosch, has portraits of donors wearing robes bearing the lily-amid-thorns device of the Swan Brotherhood, and the marketplace in the background of this picture resembles that of s'Hertogenbosch.

Much of our small amount of info about Bosch's life comes from the records of the Brotherhood of Our Lady; they had on display a copy of the page mentioning

the funeral expenses of their brother Jeroen van Aken, “van Aken” being his local family name—Bosch was his public name.

I talked to one of the guides in English a bit after the tour. A big feature of the Brotherhood of Our Lady used to be their annual swan banquet; Bosch himself is known to have paid for the swan one year. I asked if they still do that, but she said no, the swan is a protected species.

Also in the Hieronymus Bosch Art Center were full-size copies of some twenty-five of the main paintings attributed to Bosch, although as Thomas Vriens told me, there could equally well be 20 or 30 instead of 25. Many of the attributions are dicey. I went through the whole collection, discussing each picture with Thomas, it was like walking through a book, wonderful. Thomas is a young art historian, working towards a Ph. D. thesis on Bosch. tv@jheronimusbosch-artcenter.nl.

I really enjoyed Thomas’s comments on *The Pedlar*; there are two versions of this painting and the man looks the same in both. He’s white-haired, intelligent, worn. It might be Bosch himself. The man is on a narrow path approaching a change; in one version it’s a little bridge, in the better version of the picture (now in Rotterdam) it’s a gate. Thomas said the gate (or bridge) stands for a transition the man is approaching: death. Not immediately, perhaps, but it’s closer than it used to be. In both he’s fending off a nasty dog with a stick; the dog is the devil, the stick is his faith.

The pedlar is looking back—on his past life, perhaps, or on the worldly things he’s avoided. In the Rotterdam *Pedlar*, we see an inn with pigeons flying in and out, which in medieval iconography indicates that it’s a brothel. (Beehives symbolized gluttony.) The good news is that an ox or cow stands beyond the gate the weary traveler is approaching; the ox is a symbol of Christ. The pedlar is bound for greener pastures!

I identify with the pedlar, I feel like I’m him. I’m on the narrow path, avoiding evil, and death is certainly closer than before. I avoided Amsterdam’s marijuana stores, and her smiling, beckoning prostitutes. I fended off my enemies with my language-stick. But I’m wearing from life’s long journey, I’m tired of putting myself on the line. I’m happy to think that when I cross that gate I’ll be safe in heaven with the Holy Cow. Mur! Maybe heaven is real. Maybe heaven is California.

Another thought here. I could have my character Ond come along to Bosch’s house in *Hylozoic*, and have Ond die there! Ond can be the pedlar and take the fall instead of me.

Thomas and I also discussed the question of why Bosch had no children, and how this might have related to his feelings about sex. His wife Aleid van de Meervenne was from a well-off merchant’s family, and three years older than him, so that when they married he was 31 and she 34. I myself have sometimes wondered if Bosch disliked sex; and Thomas remarked that in his paintings one never sees real intimacy. There’s no love or sexual passion, even in the famous “dogpile orgy” of *The Garden of Earthly Delights*, which is more like a cool tableau. All those toothy, red mouths in the Hell pictures suggest a fear of the *vagina dentata*. Yet, looked at in another way, one might say that Bosch was obsessed with sex. All those bursting seed pods speak of fertility. And the occasionally coprophagic depictions of excretion certainly betoken a fetishistic interest in sex, which is also found, by the

way, in the other great Lowlands master, Bruegel. Coming back to why Bosch had no children, Thomas remarked that health conditions were poor in those times, and it's possible that at 34 Aleid was infertile. Also, records indicate that infant mortality was very high in Aleid's family, so it could be that they had some children but lost them in infancy.

In those times, a man often would commission a picture, and the "donor" would then be added into the painting, often kneeling in prayer on the side with his wife. I'd heard that the donors were painted over in some of Bosch's paintings. I'd been thinking maybe sometimes he'd finished a picture with the donor painted in, the donor had said, "That picture's too weird, I'm not paying for it unless you change it," and Bosch had preferred painting out the donor to altering his creative vision. Thomas didn't see this scenario as very likely. He said it's more likely that when a donor died and his heirs wanted to resell the picture, in order to improve the marketability of the picture they'd get the donor painted over, if possible by the original artist himself. One possibly contentious donor-covering incident did happen. In Bosch's painting *John the Baptist*, which also contains a human-shaped mandrake root, there's a huge mound of elaborate foliage in the middle of the picture, and infrared shows there's a kneeling donor under the foliage. Records show that this painting was commissioned by the Swan Brotherhood of Our Dear Lady for their chapel in the Saint John's church. The president of the society was Bosch's neighbor, Jan van Vladeracken, and he probably got himself painted into the picture, and then the other members said, "Hey, that's our society's joint money you're paying with, don't hog the credit and have just yourself in the picture, Jan."

I see putting a quarrel into my story. The Dutch can be unpleasant. The first day a waitress yelled at me for pointing out that the shrimp my soup weren't fresh—even though they were quite gamey. The night after I gave my big talk, day a street-car conductor started screaming at me simply because I handed him the change for my ticket without saying, "Good evening." And yesterday a street-cleaner yelled at me because I squeezed past him to get into my hotel door. And the day before the talk I got into a flame war with a man who was some kind of functionary for the people who invited me to lecture. Like I mentioned, when I met him in person the night before the lecture, I got angry with him because he'd publicized my talk under the tag-line "FS Is Dead," not only calling my vibrant, beloved genre dead, but also getting its two-letter abbreviation wrong. He thought this was funny. He spoke sneeringly of my blog. And then he said it would be difficult to jack in my laptop to show cellular automata graphics during the talk, and that he'd like to show Hollywood SF movie videos instead. He seemed to be a bully, and the night of the performance he wasn't speaking to me. Sheesh.

I'm about ready to clear out of here and leave the barking dogs behind. I'll put the guy into my book. He can be Bosch's neighbor. Transmuting the dross of painful life into the gold of artistic creation.

Oh, one more thing about the Bosch paintings. Certainly one of his greatest works is the Lisbon Temptation of Saint Anthony. It's a triptych showing three torments of Saint Anthony—on the left the devil lifts him high into the sky, on the right he's besieged by lustful women, and in the middle he's surrounded by monsters. Thomas remarked that Saint Anthony was popular in the Middle Ages of the patron saint of those afflicted by ergotism, that is, cumulative poisoning by repeated doses of

a black smut or fungus called ergot which some years grew upon the rye. As many will know, one of the compounds found in ergot is lysergic acid, a.k.a. LSD.

[Ergotism](#) was accompanied by powerful hallucinations and was frequently lethal. People would blister up and their limbs would rot off. But if you survived an attack, you never forgot it. The affliction was known as Saint Anthony's fire. They had no clue what caused it until about 1670. Ergotism may also have played a role in the Salem witch trials of 1690.

People sometimes like to propose chemical explanations for Bosch's visions of hell. In one sense this is reductionistic—certainly I'm annoyed if someone's only reaction to one of my weird tales is, "What were you on when you wrote that?" An artist doesn't necessarily need to be "on" anything. In the 1960s there was a popular belief—now largely discredited—that Bosch was regularly taken psychedelic potions. That's really not where people in his time were at. But I think it's possible that he might have had some long, strange nights under the influence of light doses of ergot-tainted rye. Maybe he was fighting off the effects as he didn't want his legs to fall off.

I looked at their copies of Bosch's drawings on my own. Two pages filled with cripples; 32 on one page, 30 on the other. Most of them are smiling devilishly. I think Bosch shared the medieval belief that cripples were in fact evil, and that they had an easy life since they were deemed unfit for ordinary work. Their expressions almost seem to say, "We've got it made! We're beggars!" This makes Jeroen seem not very sympathetic, but I don't want to be too quick to fall into judging a medieval person by today's standards.

Another drawing shows a dog bemusedly looking back at his butt, which has turned into a legless warty lump. As we'd say in German, "Ach du lieber, wo ist mein Arsch?" [That's a riff on a line from *Gravity's Rainbow*, a quote from Major Marvy talking about Patton handing Rommel his ass.]

My favorite drawing is of a kind of lizard man, also with a warty, hairy gross butt. He's posed with his butt towards you, looking back at you over his shoulder, which makes me laugh, as this is such a shop-worn "sexy" pose for women in ads, and the centerpiece of every "sizzling" Bob Fosse ballet number. "Hey there. How do you like my butt?" Thinking of the Bosch beast is way to throw cold water on that tired commercial cliché.

Some fragments of 15th century pottery on view. Very thick plates, very coarsely made. Pottery kettles with four legs. Everything heavy and clumsy. A key with a barrel and a single square S-squiggle.

The next morning I went into the St. Janskerk where some of Bosch's work had been installed. High on the ceiling above the transept is a triangle with the eye of God. Staring down, watching our every move, continually assessing whether we're bound for Heaven or Hell.

The medieval people were really under the thumb of religion. They were endlessly obsessed with sin and punishment, and with the notion that God was always ready to judge you. A collective mental illness promulgated by the Church in order to scare people into giving them lots of money.

In Bosch's time, the town Den Bosch had, percentage wise, more clergy than any other town around; they even called it Little Rome. All those parasites and spongers.

It was good to go to Den Bosch. Up till now I could never quite visualize Bosch as a character. But I feel like I've got a sense of him now. It was so great to hang out with "him" in his studio.

April 15-29, 2007. Version 2 of the Outline. I Lose a Month.

(On the plane from Amsterdam to San Francisco.) I lost two weeks on the road. While I was out, I rewrote the outline and I sent it to Hartwell on April 9, 2007, to help him pitch the book to his boss. No word back from him yet. I could use a boost to get going again. As I write this, I'm squeezed onto a plane. They have less leg room every year, seems like. I'm too uncomfortable to consider starting the chapter right now.

Back home I found the page proofs for *Postsingular*. I read through them pretty fast, it took maybe three days. The beginning seemed rougher than the end. The "Orphid Night" chapter in particular is a little choppy and has a bit too much repetition. Oh well. It's really flying at the end.

I put in a prefiguring mention of Hieronymus Bosch and described the harp painting to look a bit like *Garden of Earthly Delights*, if not the center panel, then the left "Eden" wing. Mailed off the changes on April 19, 2007.

So now I can get back to *Hylozoic*, though I do want to put together issue #3 of my webzine *Flurb* this week or next. But my back is so sore from all the fiddling track pointer mousing that I did on my Thinkpad laptop while blogging from the Netherlands. I don't feel up for all the mousing that designing a webzine will take.

It'd be nice to go back to writing. It's ridiculous how slowly I'm moving on *Hylozoic*, really. I spend so much time just doing biz-related email every day. And the blogging is an endless black hole.

Maybe just to get rolling again, I'll read and mark-up Chapter One.

April 26, 2007. Flurb. Postsingular Cover. My Hype.

Basically as a way to avoid getting back to writing, I spent a lot of time this week putting together *Flurb* #3. It was a double issue, twelve stories, about 40,000 words, illustrated by 84 of my photos and three of my paintings.

I'd accumulated so much material for *Flurb* that it was time to put it out. But unlike the first two issues, I didn't have on hand an unpublishable story of mine to run in it. Earlier I'd expected to be running my story, "The Imitation Game," about Alan Turing's murder by the British intelligence agency. But *Interzone* is still looking at that story, deciding whether or not to accept it, and I have to wait them out.

So, just to have something of my own to put into *Flurb* #3, I collaged together a bunch of the *Deleted Fragments* from the notes for my novel *Postsingular*, and called it "Postsingular Outtakes." It's not a cohesive piece, but there's a few chuckles in there, and the bite-size quality works on the web. The stuff should seem quite fresh and crispy to those who haven't (like me) spent the last year and a half with the book.

Flurb is doing well, my authors are happy with it, and we got 1,000 visits on day #1 then 3,000 on day #2, then back to 1,000 on day #3. 5,000 in the first three days, with a long tail to come. Yaar.

While I was poking around on the web to see how *Flurb* is doing, I Googled my story title “Postsingular Outtakes,” and ended up at Amazon where, lo and behold, they already have a cover up for [Postsingular](#). Great cover. A green hole in space with a purple cuttlefish emerging from it. And they’re using a great blurb Bill Gibson wrote for me, where he says that I “should be declared a national treasure of American science fiction.” Yeah, baby.

I reread *Hylozoic* Chapter One and marked it up, working slowly, and now I’m slowly typing the changes in. Wow, the last time I edited the novel was March 21. My writing muscles are creaky and out of shape.

I feel like I’ve been lost in a fog of hype—what with the readings for *Mathematicians in Love*, Rochester and Amsterdam appearances, the Psipunk speech and video, also all the blogging I did on the road, the *Flurb* promotion, and the *Postsingular* push to come. Instead of thinking about my work, I’ve been thinking about my hype.

I’ve heard media figures say that they get into trouble when they start believing their own hype. I can sense the danger, but what is the nature of the danger, exactly?

Maybe, if I believe the hype, I don’t feel a need to even try to write, as I think I’m already so great. Maybe, if I believe my hype, then I’m not willing to put in the work it takes to write because I’m too important for the thousand-miles-on-foot slog.

Or maybe, if I believe the hype, I do still *want* to write, but I become blocked—because nothing I actually do write lives up to the hype? That is, maybe if I believe the hype, when I try and get to work, I freak out over the very real disparity between the contingent and mortal quality of what I actually do write vis-a-vis the much higher Parnassian quality that my hype ascribes to my oeuvre.

Or, yet again, maybe I am still able to write but, believing the hype, I get lazy and begin neglecting the necessary but painful work of outlining, revision, scientific theorizing, and pre-visualization.

Or perhaps, if I believe my hype, I lose my sense of humor and become pompous and self-referential. “Fatuous,” to use an apt word that Bruce Sterling’s character, Revel, flings at my character, Tug, in our story “Big Jelly.”

It’s nice to get away from the hype and back to the actual work. The *Hylozoic* material is better than I remembered. Funnier. I’m glad to have my character, Sonic, delivering some stoner humor, I live for that stuff, sober or not. Stoner humor is a way of giving the finger to consensus reality. That’s what I always liked in Burroughs or in Phil’s *Scanner Darkly*, or William J. Craddock’s *Be Not Content*. Turning your back on received ideas.

April 30, 2007. Photographing my Paintings.

I’m finally working on Chapter Two of *Hylozoic*. I started yesterday. I’m making Thuy more and more mouthy, having her say wild things, like I myself like to do, speaking in an extravagant style that borders on Tourette’s Syndrome. Cowabuuuunga.

Today I didn’t write as much as I would have liked, though I was distracted by working on my painting websites; I have a local paintings page on my site, and I’m also uploading higher-res versions of my pictures to Imagekind, a company that sells prints of images online.

It’s been a long, drawn-out process getting the pictures up. I first had the idea a few months ago when one of my fans emailed that he wanted to buy prints of my

paintings. I did some research and found a couple of sites that sell prints of pictures. The artist sends in the image file, and the site takes the orders, makes the prints, collects the money, sends the prints out, and gives the artist a cut.

Zazzle.com is for the T-shirt and coffee-cup end of things. Art.com is the biggest image-seller, I think, but they only give the artist a fixed 10% of the sales price, which seems too low. Imagekind.com lets you set your cut to be higher, like 40%, and they have a classier feel. So I opened a free account at Imagekind.

Next was the issue of how to get good images of my pictures. I shot some images with my digital camera, but the resolution isn't all that high, with my 8 Meg SONY digital I get 3,200 by 2,400 pixels. Also my sense was that the image quality wasn't going to be as good with the pocket point-and-shoot as it would be with my trusty old Leica, a clunky old R3 single-lens reflex that feels like it's made of solid steel.

Initially, I thought I'd get prints and scan those and thereby get hi-res images. But that seems not to be a good way to go. If you scan a print, you add two weak points in the image chain: you're dependent on a desktop scanner, whose quality isn't necessarily that great, and you're undergoing image degradation via the process of printing from negative to paper. So I decided to have the photo shop directly scan my negatives to CD (they can "invert" a negative's scan to look just like print). Unfortunately, the local shops only scan at 2000 ppi (pixels-per-inch), and a "35 mm" negative has the dimensions of about 1.5 inches by 1 inch, so you end up with 3100 by 2100 pixels, which is no better than what the digital camera does.

By the way, they can scan negatives or slides equally well. If your target is scanning, slides turn out to be a better way to go, as it's easier to send in individual slides for further scans than it is to send in individual negatives. Also you can get a wider range of high-end color-sensitive film in slide format.

One stressful thing is that, if the photo shop people don't know what they're doing, and if you don't make a real pest out of yourself, they'll often scan at some incredibly low resolution, like 400 ppi—I had Long's Drugs do this to a roll of film last week. Also, if you don't say anything, they'll scan to a really low JPEG quality. It's a hassle. But you can always get the negatives or slides re-scanned.

Shooting the pictures, I came to the question of lighting. I don't have a flash for my Leica, and my sense is that flash produces somewhat uncontrollable glare in any case. So I tried setting up lights; I actually went to the hardware and bought this heavy-duty rack of halogen lights. Here there was a big glare problem unless I put the lights over to the side and had them glance off the canvas at a shallow angle. But then, since I only had the one rack of lights, I had the problem that one side of the canvas would be lit more brightly.

Regarding glare, I did find that the problem is less if you back off and use a longer lens. The closer the canvas you physically are, the likelier it is that you'll be including a glare angle. But it's hard to beat it unless you have lights on both sides, plus gauze over the lights.

After a few rolls of struggling with the lights, I gave up on them and went out on my deck, where I get a nice low sun coming in full in the mornings. I got the best slide film I could find, some expensive Ektachrome. I put the canvases on an easel and put the camera on a tripod, adjusting the camera so its height matched the center of the canvas. I used a plunger-type remote to press the shutter so I didn't have to worry about jiggling the camera. I measured the distance with a tape-measure to confirm what the rangefinder was telling me. I stopped the camera down to

something like f11 or f16 for totally crisp focus, and shot each picture at three speeds, bracketing to make sure that at least one image would have a good exposure.

So then I got these slides scanned at 2000 ppi (pixels per inch) at the photo shop and picked out the good ones. But then I wanted to get a higher-res scan so that I could sell bigger prints of my pictures.

If you want to pay maybe \$20 to \$50 per picture you can get an individual negative or slide scanned at much higher density, like 10,000 ppi. But there are a number of lower-end mail-order firms which will scan at 4,000 ppi, which turns a slide into an image with dimensions of some 5,800 by 4,000 pixels. I went with one of these companies, called Digital Memories, although next time I might try a different one, as my sense is that the Digital Memories scans came out darker than they should have.

So, as I'm saying, I had the local store develop my slides and scan them at 2,000 ppi, and then I picked out the best ones and had the mail-order company scan them at 4,000 ppi. Another gain in image quality here is that I was able to ask the company to (a) save the images in non-lossy TIF format instead of the standard lossy JPG format that the local shops use and (b) to scan at 48 bits of color information per pixel instead of the usual 24 bits per pixel. This makes for gigundo TIF files of nearly 100 Meg per image.

The nice thing about TIF file is that you can keep re-opening it and re-editing the color maps, and you aren't degrading the information in the image by doing this. With a JPEG image, every time you save it, you're crushing a little more information out of it.

Even though my scans came back a little dark, I was able to fix the pictures to look nice in Photoshop. I used the crop tool with Perspective turned on to crop the canvas to occupy the full picture frame. The crop tool lets you select a trapezoidal or arbitrary quadrilateral area, which means you get to correct for perspective distortion.

And then I worked on the colors and contrasts for days. Most often I used these three Image | Adjustments dialogs: Shadow / Highlight..., Color Balance, and Hue / Saturation. One of the virtues of having the image in 48 bit color is that you're less likely to be clipping graded colors into flat areas, as having more bits gives you a bigger range of possibility to play in.

At first I was trying to make the images look like the paintings, but after awhile I realized that's flat-out totally hopeless. So then I worked for making the images look good. Making them pop and be crisp, making them sweet and warm. Sometimes I'd even use the Magnetic Lasso tool to select a region and adjust its color separately.

To make the size of TIF smaller, I found that I could save them with either LZH or ZIP compression, and the ZIP compression makes them smaller—this is again without any actual loss of information. Once it's cropped and put into ZIP most of the image are around 70 Meg.

By the way, I think that the fan who started me off on all this isn't actually going to buy a picture, the cheap prick. But someone will. And also, big win, the images are safe in my lifebox.

May 2, 2007. Psipunk at Dorkbot

I gave my Amsterdam "Psipunk" talk to the Dorkbot group in San Francisco tonight. It's run by one of Rudy's friends Karen Marcelo; it's a gathering of techies and artists from SF.

In Amsterdam I was uptight because of the language barrier and because one too many people had raved about my perennial friendly rival Bruce Sterling's earlier speech at this venue and because I'd had an argument with one of the organizers—who, to my annoyance, had announced my talk under the moronic and misspelled rubric "FS Is Dead." So for the Amsterdam talk, I actually read my speech from a print-out of it I'd prepared in advance—warping the words with weird accents.

I'd thought I might just read the speech by rote at Dorkbot, make it a no-brainer, but—hell—up until Amsterdam, I've never read a frikkin' speech in my life. That's for the liberal arts types who are offering fancy language rather than extreme deluges of novel ideas. And seeing all those hip, lively kids there, I didn't want to come on all stiff and fuddy-duddy and scared.

So I didn't use the text or, for that matter, any computer projection—a good call, that last decision, as the Dorkbot projector was a feeble device dangling from a swaying rope above the crowd of maybe two hundred, who were seated in church pews. I just stood up there and *taught* the lecture like a class, hell, as a prof I did that ten times a week for twenty years. Making it live and real and somewhat punk. It went over well, lots of laughs, and Rudy, Jr., looked proud of me, which was the best reward of all.

After me some representatives of the Osaka incarnation of Dorkbot spoke, describing a vibby installation they called Open Pool; they showed some film of it. The speaker's English was borderline incomprehensible, but, hey, how well do we speak Japanese? The images were lovely; turns out these Japanese dorks like the same kinds of things that we West coast dorks like: chaotic things. Big undulating domes of fabric. Dangling electronic mobiles twisting in the air currents.

May 4 - 9, 2007. Need More Story.

In April I revised my outline a bunch more times and I ended up with only seven chapters. So I really need 12,000 word chapters to get close to the minimally acceptable length of 85,000 words.

Chapter One is just about 11,500 words now, which is close enough. But I'm writing Chapter Two now, and looks like all the stuff I for this chapter is only gonna produce about 5,000 words. I guess I could go with variable-length chapters and have more than the mere seven chapters that I've now whittled my outline down to. But, so as not to have to—god forbid—*think* about it anymore, I'd prefer to stick with a simple plan: $7 \times 12,000$.

Sooo—I'll have to shift some of the material that I outlined for Chapter Three into Chapter Two, maybe all of that material. On second thought, if I shift all of Chap 3 stuff into Chap 2, I'll lose the rhythm of Jayjay/Thuy y alternation that I had in mind. So I'm not gonna shift the material after all. Chapter 2 will simply be shorter than I'd planned. It'll be maybe 7,000 words.

That means I'll need more than the seven chapters I'd envisioned. Slice it anyway I like, I'm gonna need more story than I outlined in Proposal 2 on April 9, 2007. A subplot, or another obstacle. Well, that's so unusual. You can do it, Ru. You can always think of more story.

Maybe I can do something with Chu and perhaps Ond; Hartwell's been clamoring for more about them. I can bring in the second alien race that I had in the outline for Proposal 1 on January 15, 2007: the Hrull and that whole notion of enslaving humans to be starship Pushers. I won't split up Jayjay and Thuy, like in Proposal 1, I want to keep them together. But *Chu* and maybe Bixie could be Pushers for a couple of Hrull slave ships. They could even visit Hrullwelt.

The good news is that Chapter Two has been going good, in fact it's almost done now; I'll finish it tomorrow. I'm putting in more weird talk and bad attitude than usual, doing a bit more of the old cyberpunk thing.

May 14, 2007. Visit Nick Herbert.

I went to see my far-out physicist friend Nick Herbert in Boulder Creek, as I so often do when I'm starting a novel. Nick knows a lot about quantum mechanics; he has this abiding hope/dream that people will some day learn how to communicate directly with matter. He calls this "quantum tantra." As Nick puts it, our standard scientific experiments are ways of interrogating matter; and our brains are complex quantum-influenced systems; so why not find a way to get it on with matter.

This lies close to my dream of hylozoism and telepathy, so we see eye-to-eye; though for Nick this is more than SF fodder, it's a serious quest.

Nick showed me what he called a Heisentoy, which was a small hand-made fired-clay sculpture that Arne Olafson of Denham Island, British Columbia, had mailed Nick. Nick first opened the box at night, and touched the object without looking at it, and then he got the idea that it would be fun to leave the object's appearance in a permanently uncertain state. So he "showed" it to me by handing it to me swathed inside an "anti-viewer" made up of the spandex sleeve of one of his neighbor's shirts (she liked to cut off her sleeves). It felt like a cube with the edges finger-pinched out like petals, in an irregular pattern.

Today I was asking him about my notion of having a Peng family appear on Earth by means of a "Peng ranch" quantum computation distributed across a million cubic kilometers of Earth. My idea is to have the de Broglie matter waves converging on a single spot and producing not *light* holograms, but *matter* holograms, that is, physical objects created by computation. These so-called *tulpas* are the Peng immigrants.

As we discussed this, we sat in the La Joya cafe in Boulder Creek, formerly the Blue Sun. They were playing the Beatles *White Album* on the sound system, which I can't recall having heard played in a public place since the summer of the Manson murders.

Nick said there was one problem in the analogy to light holograms, in that light is based on photons which are bosons. And matter is based on fermions. And, due to the Pauli exclusion principle, you can't have masses of fermions moving in the same coherent state—analogously to the photons in a high-energy laser beam. He said there's a way around this: work with paired fermions, for if a pair of fermions are coupled they can behave like a boson. Nick says this is what's going on in superconductivity.

He also remarked that if we were to extract a fermion pair from an individual atom, the atom would in effect be decaying. And I don't want the Peng ranch matter to be falling apart. But here we can find a way out by having an ensemble of atoms emit the fermion pair. We use quantum uncertainty to blur out the "debt," so that no one atom has to actually decay.

Nick has a cactus on his porch looking at itself in a mirror.

After lunch we synchronistically ran into a guy on the street who'd worked on the Doubleday Books sales force promoting Billie Craddock's *Be Not Content* way back when. The guy said Billie's editor was Luther Nichols, and that Billie had been under 21 when his early masterpiece was published.

We discussed the issue of the Hrull enslaving their human engine pushers via an addiction to Hrull-secreted godslime. Nick remarked that since the Big Pig addiction already plays upon a love of knowledge and transcendence, then it would be more interesting to have the godslime play to lower chakra pleasures, such as power or sex or simply romance. Maybe when our thirteen-year-old Chu is wrapped in godslime he thinks he's on an endless happy date with Bixie, the girl he has a crush on.

May 31, 2007. "Not a thing in his head"

I was in Big Sur the last couple of days. Sitting on a hillock looking at the sea, I had a nice feeling of not thinking. Like what was going on outside didn't need embellishment. It was exactly what I like. Usually I'm adding ideas, like the little robots watching the bad movies in *Mystery Science Theater 3000*, or the original Beavis and Butthead commenting on cheesy videos while they play. That's consciousness, isn't it, the little comment-bot. But the narrator takes a break when the show is fabulous.

"...and now, in the Zone,...after a heavy rain he doesn't recall, Slothrop sees a very thick rainbow here, a stout rainbow cock driven down out of the pubic clouds into Earth, green wet valleyed Earth, and his chest fills and he stand crying, not a thing in his head, just feeling natural... Thomas Pynchon, *Gravity's Rainbow* (Penguin 2000 edition), p. 638.



Figure 13: POV list on Pfeiffer Beach.

Now I'm trying to get going on Chapter Three again. I thought about the book a certain amount while at the beach. I remembered having a big insight about the story for *Mathematicians in Love* on Pfeiffer Beach two years ago, and drawing a diagram on the sand. So, for good luck, even though I didn't have any big insight this time, I drew a diagram of the chapter sequence of [POVs](#) for *Hylozoic*, along with a picture of a Peng, the Magic Harp, and a Hrull, nicely framed by a kelp stalk. (The letters stand for my characters, Jayjay, Thuy and Chu, and I use them to indicate whose point of view I use for the successive chapters. I see the book breaking into two parts, with the sequences J TCT and J CTC.

Some people walking by decided I really was nuts. But everyone expects to see weirdos in Big Sur.

Earlier I'd spent about half an hour rolling crossways on a log, face up, massaging my back in this fashion, groaning with pleasure. I chose the log to be a bit out of the way, in a little gully where I always like to go, the same gully where I filmed the eddy and the plant silp for "What Is Gnarl?"

When I was done rolling on the log, and sitting up a bit drunk with *chi* energy, a couple walked by. The woman said, "I don't have my glasses with me and at first when I saw you, I thought you were a mammal." "I am a mammal," I replied. "I mean like a bobcat or a bear," she amplified. "I was getting down to my mammal self," I said.

Anyway, those were the two who then saw me drawing the Peng'n'Hrull POV diagram with my cane.

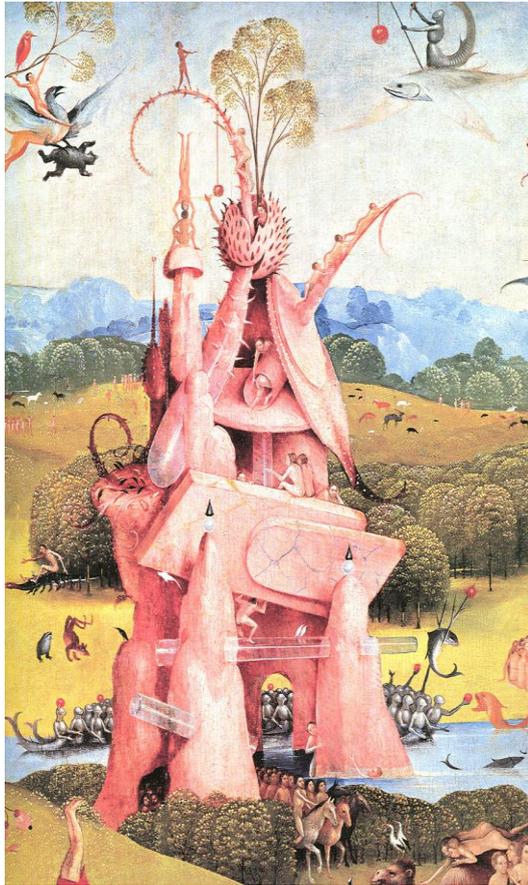
"Val fisk," I told them, by way of explanation.

Swedish for whale fish. I just checked on Google, and there are some women actually named Val Fisk, like one is a teaching assistant in Suffolk, England. How great is that?

Still shying away from getting back into Chap 3...to kill time, I [blogged](#) what turned out to be a slightly expanded version of this entry.

June 5, 2007. Bosch River Castle

I was studying *The Garden of Earthly Delights* last night, reading a book about it: . I'm going to lodge the Peng in a copy of the pink gateway house over one of the four rivers branching out from the sex sphere in the pond at the top. I'll say it's made of pink marble: pink calcite marble quarried in Canada near Madoc, Ontario.



As it happens, I'll soon be visiting a red marble quarry near Caunes-Minervois.

June 19, 2007. Trilogy Musings.

I decided to make the third volume be called just *Infinite* instead of *Transfinite*. And then the three titles are all describing odd, non-standard realities:

Postsingular

Hylozoic

Infinite

I'm thinking in terms of the trilogy because I'm hoping to start a triptych in Caunes-Minervois at our paintings workshop soon.

Images.

Postsingular: the nants, the giants, the BZ scrolls, living objects.

Hylozoic: Bosch at his easel gazing at the viewer like Saint Anthony, a giant Hrull manta ray, a Peng bird, the beanstalk, galaxies.

Infinite: A race of harps, the tunnel to heaven, the subbies boiling up like hell-demons.

This trilogy might very well be the last work of this scale that I undertake. My last testament. A magisterial recapitulation and summing-up of the themes I've explored throughout my career. A serene and assured masterwork, endlessly rich and allusive, comparable to Bruegel's *Seasons* and Shakespeare's *The Tempest*. I wish...

June 24-July 4, 2007. In France. Painting Hylozoic.

We're in France for a few weeks, taking a painting workshop.

The windows at Chartres were wonderful, dating back to the 11th or 12th century. A thousand years old. We even took a little tour, and the guide pointed out that in the Middle ages most people didn't read, so the cathedral itself was like a book, with the key facts of the religion on display. The ultimate Sunday funnies. He showed us how to read the windows; bottom row to top row, often reading each row left to right.

Stained glass windows are a great medium, a very heavy means of information transmission. Like runes or glyphs. And so psychedelic. In a church in Toulouse I sat with the sun shining through a stained glass window onto my face and slowly the colors against my eyes changed as the sun moved across the sky.

A futuristic equivalent of stained glass windows. A mental array of glyphs?

Rocamadour was a wild card that I found in the guidebook, a bunch of chapels set into a cliff, with a castle on top and a little town at the base. Tons of swallows busy in the air all the time—swallows around all the castles, as a matter of fact. We had a goose liver and truffles for dinner and spent a comfortable night in our cheap rickety old-fashioned room.

The Peng live in places like Rocamadour.

In the 13th century there was a big heresy in the Carcassonne area: the Cathars. As I understand it, they believed that the God of the old Testament was in fact Satan! Not so unreasonable, really, given all that “for I am a jealous God” stuff. My SF writer friend John Shirley says something like this in his novel *The Other End*, that is, he says the god who made our world is a demiurge who turned evil and became parasitic upon human worship and then became addicted to the vibe of human suffering. Maybe I can work some of this into my trilogy. A line about Shirley: “Eschatology is too important to leave to scientists and theologians.”

At the market in Place Carnot in the Lower Town of Carcassonne we saw a group of bagpipers (bagpipe=cornemuse) with bags that were inside-out goatskins, the whole goat with. They blew into the neck hole, played a flute coming out of one front leg and a drone coming out the other, and had one rear leg doing something for them too, with the other rear leg being the only one that had been snipped off and patched over.

Now I'm imagining that on his voyage with the Lusky, Chu will find someone using the skin of a dead pusher in this fashion.

I showed my slides to the group, and the teacher, Glenn Moriwaka, gave me a really hard time about how big I sign my name. That was practically all he talked about, which really got old by the fifth picture or so. It was annoying and embarrassing, but I like the guy anyway, he's a character, an artist full of ideas. And I guess I'll start signing my name smaller. I'd thought, all along, that it was funny and cute to sign my name big. Also I was doing it as a kind of Warhol goof, taking off on the fact that a key thing that makes my pictures potentially marketable is the fact that I'm a well-known writer, so the branding is an essential part.

Glenn made me feel like a nut, an outsider artist.

Be that as it may, the other students are friendly, and accept me as a painter. It's like when I started being a science-fiction writer. Everyone is, like, "Come on in, the water's fine. The more the merrier."

Yes, but on the other hand, Glen was kind of hostile, like I said. He mentioned to me later that painters all hate each other.

Later, when I was discussing his reaction to my pictures with Sylvia, she said the problem was that the others were "flabbergasted" by my paintings and simply couldn't think of anything to say. And when I said maybe I'm an outsider, Sylvia said, "So what else is new?"

I've finished four paintings now, working six or more hours a day for eight days in the studio, which is a big old building in a field by a river, it's a former saw mill for blocks of the local red marble from the Caunes quarry, "Le Carrière du Roi." Only four more days to go here, I'll miss this life.

Glenn is giving me really good practical advice about the pictures. He never talks about the content, just about the composition. Tricks to push things forward, or to avoid "triple points" (where too many lines come together).

Riding my bike home today after finishing my painting, *Hylozoic*, I was enthralled by the alternating shutters and doors in the yellow stone house by the road. And on the porch, the wind feels like a paintbrush, a sweep of color.

In the tub this morning, rubbing my back with a washcloth, it felt like I was painting on blue-white paint. Imagine everything becoming color and gesture.

It's all about painting these days. I wake up at night and think about what I'll paint the next day.

I wake up sore from the painting. Today I did yoga and I was seeing my muscle pains as colors. Not intellectually imagining this, but viscerally *feeling* washes of color in my brain. My forever-sore muscle along the right side of my spine oozed a pale cobalt blue as I squeezed it out. The sharp pain in my right shoulder a triangle of orange (made of vermilion and cadmium yellow). My legs a mixture of Mars black and cadmium red. The pain in my lower back is an acid green produced by mixing cobalt blue with cadmium yellow and white. Veins of thalo green creeping in.

Idea: Jayjay becomes a good painter under Bosch's tutelage. That would make him finally be an interesting person.

He starts thinking in color.

Jayjay learns to create what pass for Bosch paintings. Perhaps he paints the *Garden of Earthly Delights*. At least the Hibrane version, also the painting on the harp.

I was planning to do a triptych here: *Postsingular*, *Hylozoic*, and *Infinite*. I got some canvas for it, and finished the middle one, a square meter.

In the sky and in the foreground are circular blobs, representing the ubiquity of consciousness (every atom has a mind).

It shows Thuy Nguyen with her pigtails in the lower right corner. You see her from behind, just the part and the pigtails and her bare neck. To the left stands a painter holding up a brush and looking towards her. He has a hat like Bosch in that drawing that's sometimes said to represent him. Also he has a halo. I think of him as Bosh, as me, as Jayjay. Our teacher Glenn's cute 12-year old daughter Miya has long

hair and we got her to put it in pigtails for a minute so I could have a model for how the hair should look, which complicates the subtext of the painting, as now there's an element of Miya in the figure, not that I know all that much about Miya, or want to. A further complication is that the painter resembles my daughter Isabel's husband Gus, and Isabel often wears pigtails like Thuy Nguyen has.

The largest and brightest thing in the picture is a flying manta ray, a Hrull mothership. Her mouth is open and you can see someone inside her mouth, like the people inside the body of the tree-man in the hell panel of *GOED*. This is Chu, who becomes a Hrull ship crew member. The manta ray's mouth is vaginal, so Chu also resembles a fetus. There's a logical flow from the pig-tailed young woman to the painter phallically displaying his brush to the small figure inside the manta ray. Woman seduced by magus becomes pregnant.

Doesn't quite fit the book, as in fact Thuy seduces the young Chu and gets pregnant from that. But when I paint from one of my novels before actually writing the material, I'm using the painting to uncover possibilities. Maybe Bosch becomes besotted with Thuy, even though she's only one foot tall relative to him. Or maybe we're seeing Bosch steering the Hrull mothership (bearing Chu inside) to Thuy in the second to last chapter. Or, again, Jayjay could be the painter, and then the picture would make more sense. Thuy, Jayjay, and Chu.

So what I learned from the painting is that Jayjay does in fact become a painter like Bosch, maybe even a Bosch impersonator.

Maybe Bosch becomes temporarily (permanently?) disabled and Jayjay is standing in for him. Maybe Jayjay himself paints the design on the harp (another circular cause-effect loop).

Glen says that he dreams of making a "breakthrough" and coming up with some new angle on painting. I was thinking that I don't worry about that any more. I'm happy to be able to write at all, and to get my work published. Maybe I made my breakthrough some time ago and am now enjoying my mature style.

But maybe I am working for breakthrough too. I try and break through to new ideas each time out. But my characters and incidentals are much the same. I do have a sense that trying for a breakthrough doesn't seem like a good idea. It's hard enough to write at all. Going for a breakthrough is that "knock it outta the park" thing—and you end up whiffing. *Saucer Wisdom* was a breakthrough books that didn't do too well in the marketplace.

As Above, So Below was a breakthrough, and did as well as my regular SF, according to the royalty numbers. But Hartwell seems to think it didn't do so well that I should try another non-SF book. So Bosch is in *Hylozoic*. I'm really looking forward to writing about him.

I did a very nice final landscape. I was working on it at night in the studio and then I went outside and it was still a little bit light even though it was 10 p.m. and I had my brush in my hand and I was reaching out towards the trees and clouds and the house, moving my brush in the air, "painting" the things in place.

It was in the Wayne Thiebaud multiperspective style, a view of the vineyards with a piñon pine in the foreground. Glen said it was a very personal take on Thiebaud, a fantasy landscape, with a lot of rhythm. I suggested putting in a UFO and he said "Don't do 'blue dog' art. You can reach a new audience of people who aren't even interested in your books or in science fiction."

Walking around the little medieval village of Caunes day after day. It's so tiny. And on most of the streets you can't see the horizon, or even any green. You just see the walls. It's like being inside a very high-walled maze. The village. And when you get out into the green fields it's such a relief. I see Thuy and Jayjay having this feeling in s'Hertogenbosch.

Glen lent me a cool book, *What Painting Is*, by James Elkins. It's a sustained analogy between painting and the medieval practice of alchemy. Paint is water (the medium) and stone (the pigment), and you're trying to distill the fire of light. On the palette, the mixed paints are like excrement, the "prima materia" of alchemists. They paints transform unexpectedly. You don't really know what you're doing, it's a somewhat magical and intuitive process.

I personally hate to try and think about the color wheel when I'm mixing paints—logical analysis feels wrong in this context. It's much more pleasant to just muddle the paints together and see what I get, and if it's not what I wanted, maybe I can use the "wrong" color somewhere else. This said, I am learning a few basics, like that cobalt blue and cadmium yellow make a nice green—but still, and here's the alchemy of it, this mixture doesn't always seem to work. I have to throw in an unspecified amount of white. Or adjust the amount of yellow.

Would be nice to have an actual alchemist in the story. Maybe Thuy and Azaroth are hanging out with one. A guy like in Bruegel's drawing of a Nick Herbert or Phineas McWhinney type alchemist. "Al gemischt," it says in the Bruegel drawing, which means all mixed up.

I'm planning to model my *Infinite* wing of the triptych on Bosch's Venice painting of *The Ascent of the Blessed* (to heaven), where the image is (perhaps) inspired by the appearance of the water-mirrored round arches in the s'Hertogenbosch town canal.

So I can have Bosch point this out to Jayjay.

In general, I need more conversation in Chaps 2 and 4. Need to individuate Chick and Duckie, give them foibles. Really, it's fun when you're just hanging out with people; no need to always be pushing on to some new action.

The students' mood and state of well being was very dependent on Glen's moods. Imagine this for Bosch's studio. Maybe Kevin is Bosch and Glen is Goossen.

July 5-10, 2007. Revising Chaps 2-3.

I typed in a certain amount of stuff on the road, and now I'm gonna revise Chapters 2 and 3 a little. I wish I could fatten up Chapter 2.

Suppose that Sonic is involved with the San Francisco Peng. Then we can bring him back into Chapter Four. The SF Peng are in his apartment!

What does Thuy call her novel in this book? It's an analogies question.

Wheenk : *Postsingular* :: ??? : *Hylozoic*.

I was thinking *Duh*, but that's no good. Once I actually wanted to sell a book called *Duh* to Houghton-Mifflin.

Maybe in *Postsingular*, I was trying to do more wheenk (a code word that I use to stand for talk about emotion), so that's what Thuy's title was: *Wheenk*.

This time around, at least right now, it feels like I'm striving for more length. *Word count. Bulk.* An easy way to bulk up a book is with more dialog. *Dialog. Talk. Yadda. Quotes.* Also I'm trying to slow the book down, to savor my weird situations and not just sketchily leap to the next ten-second wonder. *Look. Ponder. Dwell. Savor. Obsess. Deeper. Merge. Trip. Goof. Channel. Vib.*

I like *Vib*. It's short for "vibration," like *Vibe*, but that's the name of a Black magazine. *Vib* is also short for "vibby," a slang word that my characters use to mean cool, trippy, interesting. What *is* a vib, though? A kick, a feeling that the world is thinking you.

Maybe near the end, Chu destroys the Peng by smuggling some *rats* to Pengö! Like the way the Polynesian rats helped wipe out the moas on New Zealand.

I finally got Chapter Two above 8,000 words, bringing my average chapter length above 10,000, which is good.

The big dried flat fish serving as the top roof of the Bosch house is a preserved Hrull. The Peng love eating Hrull, which lends to the hostility between the races.

July 15, 2007, On Mundane SF

[I [blogged](#) this on July 15, 2007, and then edited it into this version on July 23, 2007, to send to the New York Review of Science Fiction as a Letter of Comment.]

In 2004, Geoff Ryman and his Clarion West SF Writing Workshop students proposed a "Mundane SF Manifesto." I never liked the idea, and I started brooding over Mundane SF again because Geoff reprinted the manifesto in the last edition of the *New York Review of Science Fiction* along with a thoughtful essay based on a talk he gave at the Boréal SF con in Montreal this April. I also checked out the Wikipedia "Mundane SF" entry (http://en.wikipedia.org/wiki/Mundane_science_fiction), as well as the Mundane SF blog (<http://mundane-sf.blogspot.com/>).

A rude person might imagine one of the original Clarion students' thought processes to be as follows:

"I've always wanted to write like Henry James or John Updike or Jane Austen --- don't you just adore Jane Austen? But, frankly, it's so hard to break into mainstream writing that I figured I'd try a genre first. And then I thought, why not be a science fiction writer! Only, then, when I start looking at sci fi a little bit, I find out that a lot of it is written by nutty loners, and it's full of science and crazy ideas, and it's not like Jane Austen or John Updike at all. So I'm thinking, why not get rid of all the weird icky science and write stories about people's emotions and about the kinds of problems you read about in the newspaper?"

The basic idea of Mundane SF is to avoid the more unrealistic of the classic SF tropes—or power chords, as I like to call them. Geoff feels that faster than light travel, human-alien encounters, time travel, alternate universes, and telepathy are absolutely impossible. He feels that if we draw on these unlikely power chords, we are feeding people wish-fulfillment pap.

Like me, the Mundanes would like to see SF as real literature. They feel that real literature mustn't use fundamentally false scenarios. By the way, Ryman has

very good lit chops, he has a cool modernistic novel 253 online at <http://www.ryman-novel.com>---it's in the form of a subway car full of people!

Mundane SF is to be about picturing possible futures, drawing on such sober-sided Sunday magazine think-piece topics as "Disaster, innovation, climate change, virtual reality, understanding of our DNA, and biocomputers that evolve."

I have so many objections!

I don't think SF is necessarily about predicting possible futures. I've always felt that SF is more like surrealism. The idea is to shock people into awareness. Show them how odd the world is. Whether or not you draw on realistic tropes is irrelevant. But my personal bent is always to try and make the science plausible.

Let it be said that futurism and SF are quite different endeavors. A rude person might say that futurism is about feeding inspirational received truths to businessmen and telling them it will help them make more money. SF is about unruly artistic visions. Why let the ruling class's media propaganda condition our practice of Art?

Writing responsibly about socially important issues can be timid and boring. The thing is, science really does change a lot over time. Compare what we're doing now to what we were doing in the year 1000. A Mundane SF writer of year 1000 might want us to write only about alchemy, the black plague, and the papacy.

Not that Mundane SF really has to be stuffy. Come to think of it, my early cyberpunk novel *Software* was thoroughly mundane, as was my Silicon Valley novel, *The Hacker and the Ants*---everything in these novels could well happen---and they were pretty lively. Maybe that's why I don't see my books showing up on any lists of Mundane SF. Can serious literature be dirty and funny? Of course!

Despite my sniping, I do understand, for instance, someone like Charles Stross's relish in accepting the Mundane strictures and in writing a Mundane SF novel, as he says he's done with *Halting State*. Why not? It's a form, like a sonnet or a one-square-meter canvas. And, of course, clever Mundanes like Geoff Ryman know this. A manifesto needn't be a universal strait-jacket. But maybe some forms are self-defeating. Like a novel that doesn't use the letter E. Or a piano piece that doesn't use the black keys. Or a painting with no red or yellow.

Personally I've been growing less constrained from novel to novel---I keep trying to get further out into space. I was mundanely stuck on the Moon for a long time! I think it's an interesting intellectual game to find valid scientific ways around the specific strictures suggested by Mundane SF.

Yes, **FTL travel** is hard. But I know of at least four ways to travel very rapidly.

(a) The traditional way is to do down into the subdimensions and take shortcuts. And, no, you don't have to do this via wormholes. Nor do you need to travel in large steel cylinders. Science finds new things.

(b) A simple method that I've discussed in my books *Freeware* and in *Saucer Wisdom* is to send your personality as a zipped up information file and have it unzipped at your destination. This doesn't go faster than light, but it goes at the speed of light, and seems to the traveler to take no time at all. Charles Stross used a weaker form of this in *Accelerando*, where people's codes are packed into a ship the size of a soft drink can that travels at near-light speed. But, yes, when you get back home, a lot of time has elapsed.

(c) Teleportation, based on quantum indeterminacy. There's a finite (small) chance that I'm on planet Pengö near the Great Attractor as well as here. It's not hard

to imagine that coming improvements of quantum computation will make it possible to amplify the indeterminacy and collapse it so that I can make the trip.

(d) The yunching technique described in my *Frek and the Elixir* (cf. also the Bloater Drive in Harry Harrison's *Bill the Galactic Hero*). You wind some of your strings to get really big, then step across the galaxy, then shrink back down.

As for **aliens**, perhaps they come via one of these rapid travel methods. But perhaps they are already here. Living in the subdimensions. What are the subdimensions? A power chord from the 1930s. Whatever is going on below the Planck length. We have no idea. Why not assume it might be interesting? Maybe aliens are those flashes you see out of the corner of your eye sometime. Maybe they're aethereal protozoa in the atmosphere.

When trying to justify **telepathy**, don't forget that only a tiny fraction of our universe's mass is the familiar visible matter. Most of it is dark energy and dark matter. As my physicist friend Nick Herbert has remarked, maybe some of that dark stuff is *consciousness*.

Alternate universes are quite popular in modern physics. Something is going on in all those extra dimensions. Why not other worlds? Looked at in a certain quantum-mechanical way, each conscious being lives in a different parallel universe. Why should we settle for consensus reality?

Implausible as **time travel** is, it may be the SF power chord most commonly used by non-SF writers. I've always wanted to write a time travel book and get it right. Surely this can be done. Rather than throwing up my hands, I prefer to continue searching for ways to be less and less Mundane.

July 13 - 24, 2007. Working on Chapter Four.

July 13, 2007. Halfway through, planning the rest. How about this:

Thuy gets drunk on whiskey in Iowa, and sounds the Hrull whistle, and Lusky appears, and Chu comes emerges, and Thuy seduces him in the motel because she's drunk and desperate, and he's desperate for Thuy, they do it with Jayjay in the next bed, and Kittie is there too, and then the Peng and the mob come, and Jayjay, Thuy, and Chu escape in Lusky, and in there Jayjay is shielded from Panpenga, so he wakes up, and he's really pissed about Thuy fucking Chu, which he saw even though he was seemingly in a coma, but they liberate San Francisco and Yolla Bolly anyway, but there's not time to liberate Iowa, as the Peng are shooting at Lusky, who wants to leave for Hrullwelt, and Chu is gonna go with her, but Jayjay doesn't want to, but if Lusky spits them out Jayjay will get under Panpenga's thumb again, so Jayjay and Thuy hop to Hibrane together from inside Lusky. And Jayjay is mad at her, but she comes along anyway.

Maybe it's not in Iowa? Maybe it would be better to make fun of Texas. The largest evangelical church in America is the [Lakewood Church](#) in Houston; they meet in a former basketball arena, 30,000 people per Sunday, broadcasting on TV. But why pick on the, the little video of them makes it just seem like fun singing and upbeat messages. Better to pick on the more right-wing [Thomas Road Baptist Church](#), founded by my old *bête noir* Jerry Falwell. Possibly a Peng we install there begins imitating Jerry. I could have Dr. Jerry Falwell, his wife Macel Falwell, and their son Jerry Falwell, Jr. all back in action. But Macel wasn't a public figure, I'd feel a little mean picking on her. Maybe the wife can be Tammy Faye Bakker instead? Naah, she's got cancer, can't pick on her either. Jerry Falwell, Jr., has taken over Liberty University, and Jonathan Falwell has taken over the church. Perhaps I

once again call it Killeville, not Lynchburg, and then I can be funnier and more biting in my satire.

The Peng go to Killeville first, picking up support from Thomas Road misters. Then they go to a smaller town. Then they go to Charlottesville, where they mob riots against them. Charlottesville is 100 km from Lynchburg, which is just right in terms of ranch spacing. The smaller town needs to be 100 km from each. If I go up into the Blue Ridge mountains, I see a town called Deerfield, Virginia, in about the right location, but that's a confusing name, conflicting with the Deerfield Academy of Massachusetts. [Yost, Virginia](#) is nearby, I'll take that, though I think it's only a wide place in the road, if that.

July 15, 2007. I've been mulling it over for a couple of days. The key thing I always keep remembering is: "Respect your constraints." Rather than making loopholes, follow the logic that the constraints and desiderata impose. I think I've got it now.

Jayjay is too worn out to do another Peng ranch. He's in a motel in Charlottesville. A mob wants to kill him. The mob is being slightly held back by fundamentalist Peng enthusiasts, but not decisively so. The mob breaks in.

Rather than teleporting Jayjay away, Thuy seizes the moment to sound the Hrull whistle.

Lusky appears and swallows Thuy and Jayjay. Chu is waiting inside.

Thuy had expected Jayjay to wake up inside Lusky; she'd thought the Hrull would be able to shield Jayjay from Panpenga's connection. But she was wrong. Jayjay sleeps on.

Chu is with a humanoid, a female pusher named Glee. Apparently every Hrull starship has a male/female pair of pushers. Glee isn't doing so well, she's strung out on Hrull gel, and mourning the death of her mate.

Chu suggests that Thuy be a pusher too. Thuy says no.

Now the Peng are calling to Thuy, telling her to bring Jayjay back down. Thuy realizes that they won't actually use Panpenga to kill Jayjay, as they need him as medium so much. So she's riding high.

Thuy and Chu have a taste of Hrull gel and get high. They fuck passionately. *In medias res*, Thuy flashes that Jayjay's mind is alert even though his body is in a coma.

Jayjay starts humming. Panpenga is using him to—destroy Lusky. The great ray spirals down and crashes in San Francisco. Glee is killed in the crash.

Guided by Ond, Thuy rapidly teleports Jayjay to the quantum-mirrored room at Seven Wiggle labs. Finally Jayjay is his old self. And boy is he pissed about Thuy fucking Chu.

He has to leave, though. The Peng are outside trying to peck down the lab. Thuy and Jayjay hop to the Mirrorbrane.

In Chapter Six, I'll show that meanwhile Duxy is promoted to be the new mothership. She grows. She needs a pair of pushers. Chu goes, and he gets Bixie to come along.

July 23, 2007

Changed the plan some more and just about finished Chapter Four.

The length is good for this chapter, today it's about 10,000, so I'm over 42,250 at the halfway point, meaning I am on target to bring the book in at 85 K words plus in 8 chapters as planned.

I decided not to send Bixie off in the Hrull with Chu, as then they'd those two would have sex—on account of the Hrull gel—and that'd be repellant, what with Bixie only being 12. So I'm shipping Chu out with an alien girl named Glee, from the planet of Bulba, and the race difference is great enough that they aren't gonna even *want* to have sex, at least not right away, although possibly later they'll get desperado enough if needed for the flow of action.

July 24, 2007

I changed it again to give Thuy more remorse and *wheenk* about fucking Chu. He's only 14. When I was 14, I was in the ninth grade at Catholic Country Day school, and I was awed and confused by an anatomy book picture I saw of the female genitalia. I was so tender and clueless. My idea of hot sex was to kiss my girl friend for ten minutes. I would have been overwhelmed by an intense around-the-world fuckathon. A 14 year old is an innocent.

I had Chu saying to Thuy, "I only wanted to kiss you," which is I think too over-the-top heartbreakingly pathetic, and makes her out to be too nasty. I dialed this back to, "I only wanted to make out with you." Still pathetic. I'm a little worried some readers are going to lose sympathy with Thuy.

A way to let Thuy off the hook a little bit is to have the giant alien manta ray Lusky be "riding" her as she rides Chu. The alien is in her head, controlling her, at least at the start. But then I think I need to have the Hrull back off, so that Thuy really does make her own decision, otherwise she's just a puppet. And she's hot, and she goes ahead. "Wouldn't you?"

Over time a Hrull pusher learns not to let the Hrull take over. But the Hrull tends to overwhelm you the first couple of times. You're not ready for it. That's why the old hand pusher Glee is kind of laughing while Thuy and Chu go at it hammer and tongs.

Have Thuy look into her body right at the end of Chapter Four, assessing the effects of her fucking Chu. And she sees something disturbing. But we don't say what.

And then near the start of Chapter Five, she goes ahead and tells Jayjay that she's pregnant.

"Abort it," said Jayjay. "You don't want to be raising a kid like Chu."

"I owe this to him," said Thuy. "I stole his innocence and then I sent him off to die."

July 24, 2007. *"Imagining Infinity"*

Today I got an attractive offer to write an article on for a prestigious academic anthology of papers on infinity, co-edited by my favorite modern set-theorist, Hugh Woodin. What makes the offer a slam-dunk is that they'll pay me! Unheard of to pay good money for a paper in academe. The money comes from this outfit called the Templeton Foundation; they're interested in sponsoring scientific investigations involving deep questions involving higher philosophical concepts. I'm gonna do it. They'd want about 7,000 words by the end of November, 2007.

My initial plan for my paper was to describe and dramatize some (imaginary) beings who live in a transfinite higher world. Like *Flatland* for infinity! I'm seeing some of these beings as transfinitely long snakes.

And then today, riding my bike, I started thinking it might be even cooler to have a narrative in which regular Earth people become aware that their minds *are* infinite. Or do both things together, first the higher worlders, and then the trickle down to Earth.

This dovetails with my inchoate plans for PS3, which has working title *Infinite*—I think I'll be writing that in 2009. Maybe at the end of *Hylozoic*, the characters do something to reality like they did at *Postsingular*. And this time instead of spreading universal consciousness, they give everyone a transfinite mind! Not just *infinite* minds, we're talking *transfinite* with actual infinities of various orders.

It makes me happy to imagine being myself in this august tome, not playing catch-up ball, but going ahead and doing what I do best, which is spinning a philosophical fiction, a thought experiment, an SF wonder tale. This will be a fresh approach, and should make a nice contrast with the other papers in the book.

July 25, 2007. Unifying my Fictional Worlds.

The *Hylozoic* character Glee thinks that humans smell like Bulban pigs (Bulba being her home planet). Could I call these animals vigs, just like the critters on Unipusk, a planet that appeared in *Frek and the Elixir*? I've already intimated in Chapter Three of *Hylozoic* that the Peng artist Waheer ended up on Unipusk (without explicitly naming the world); perhaps the vig wetware has been exported across the galaxy!

But there would be a logical problem in combining the universes of *Frek* and *Hylozoic*. To wit, *Frek* lives on Earth in 3003, and it's not the kind of planet that *Hylozoic* Earth is heading towards.

The only way to merge these two would be have them be parallel universes of a multiverse, which is kind of cheap way out. A scoundrel's last resort.

I seem to recall that in his last books, Isaac Asimov was trying to reconcile the differences between his fictional settings so as to fit them all into one big coherent world, though I don't remember the details.

Perhaps this is a typical impulse in an aging SF writer. Loosely speaking, of course, all my books are set in the same "world," that is, in the land of Rudy's imagination.

As my scoundrelly last resort, after *Transfinite*, which shapes up to be 19th novel, I could in fact write a transreal novel called *Twenty* in which I realize that all my past fictional worlds are all in fact real, and I'm bouncing around in the multiverse throughout the novel. It could be baselined as another Frank Shook story, in the mode of *Saucer Wisdom*. I could be pretending to be having a nervous breakdown, in the manner of Malzberg's *Herovit's World*.

July 25, 2007. Infinite Minds.

([Blogged](#) a version of this entry.)

Good news: the first half of my novel *Hylozoic* is done, and so, by extension, my projected trilogy is half done as well: *Postsingular*, *Hylozoic*, *Transfinite*.

Bad news: I'm quite vague about what happens in the second half.

I do have what *looks* like an outline for the second half of *Hylozoic*, but it's largely gauze and mist. So I'll be redoing the outline for a few days now.

And, while I'm in planning mode, it would be great to get more ideas about that third novel, *Transfinite*.

Today I rode up onto St. Joseph's Hill in Los Gatos with my trusty Pilot P-700 black fine gel pen and with my outline printed on a few pages of paper folded in four in my back pocket—my favorite form of portable word processing set-up. I marked it up. My handwriting has gotten so free (elderly?) that later I often need to use a magnifying glass to figure out what I wrote.

I need a name for the transfinite beings such as the magic harp. I was calling them "infinities," though "transfinites" would be better. "Gods" has too much baggage. Maybe "snakes" or "snaakes," with the iterated "a" suggesting their (extreme) length. Oh, I know, how about "immortals."

Transfinite, treef, teef, trai, trafrin. Joot. Deva, ideal, supernal, omega, om-plus, afta. Actual infinite, actin, affi, akkin akken, aktual (as in *aktuale Undendliche*, in Georg Cantor's phrase).

Yeah, I like aktual.

[November 15, 2007. **Doh!** Cantor's phrase in his paper's title is "*aktuelle unendliche*." Is aktual is even a German word? Oh, yeah, I'm cool, he also write aktual unendlich sometimes.]

Some tough questions:

Q: What is a rune? What is a runemaster?

A: A rune is like a magic spell that directly affects matter. In *Hylozoic* at present I describe a rune is combination of a telepathic contact, a telekinetic push, and a higher-dimensional flip. And when you lay a rune on something you are "casting" it. And if you can cast runes, you're a runemaster.

I've described three kinds of runes.

* The *summoning rune*, which linked Jayjay via a subdimensional wormhole to a mind in a distant galaxy.

* The *ioneer runes* which convert the information in a distant alien's body into a behavior in a group of Earthly atoms, causing the atoms to emit matter waves that produce a matter-hologram copy of the alien.

* The *atomic reset rune* which clears the ioneer runes out of the enslaved atoms.

For story purposes, I have it set up so that only Jayjay, of all the people on Earth, can cast runes. He has a dream where the magic harp makes him a runemaster.

Perhaps a rune has something to do with higher infinities. A self-referential loop. But why can only Jayjay cast runes? He's not really the smartest guy in the world. Maybe it has to do with his (so far latent) painting talent?

Q: When and where is the magic harp located when Jayjay sees her in his dream.

A: I'd like to just say the harp is dreaming too, and this appearance emerges from the massed moments of her whole life. Except for an immortal like the magic harp, this visionary state is not like dreaming, its like the normal state, and the part where they are embedded in our world is more like the *dream*.

Q: Why did magic harp make Jayjay a runemaster?

A: Perhaps the magic harp is a future version of my character Thuy Nguyen. Maybe in *Transfinite*, Thuy goes through an apotheosis and becomes an immortal, in particular, she becomes the magic harp. And then goes back to do what she needs to do. And that's the end of the trilogy; the snake of history bites its own tail.

And Jayjay becomes some other immortal. Make his name Brummbär? German for "grizzly bear." There was a Nazi tank with this name. Nah, too gay.

Q: Why does the magic harp forget the Lost Chord on her journey from the present-day Loblane to the Fifteenth Century of the Hibrane?

A: The magic harp is a higher mind that lives in every moment of her Earthly manifestation, yes. But this mind is subject to time flow constraints when embedded in the physical world. If I raise my consciousness to be conscious of my entire lifeworld at each instant of my life, it's still true that today know what I'll do tomorrow. Even though I will in another sense feel the "same" tomorrow, like the same lifeworld.

Q: Where do the aktuals live?

A: I will call it Walhalla for now, echoing the Valhalla of Wagnerian myth. I don't want Walhalla to be pie in the sky, or infinite dimensional Hilbert space. I'd like it to be our actual world, regarded in a different way. We are in Walhalla all the time.

So I'm saying the aktuals are physically in our world, but they make the most of what's available and manage to have infinite minds.

It's possible that a infinite aktual mind is connected to more than one finite body. In this case, the bodies are like pearls upon an endless golden strand. Two people might separately have infinite souls, and then choose to combine the souls into one; the single soul living in two bodies. A cosmic marriage.

In principle all the silps in an alef-null-sized universe could be bodies of one and the same infinite mind.

Q: Can I see Walhalla?

A: When you dream you are in Walhalla. Time sequence constraints can break down here; you can dream the past and the future. There's not a problem with a yes-and-no temporal paradox because when you wake up and all quantum states are collapsed, then you aren't sure what happened in the dream, or you don't really believe it.

Q: How is our universe infinite?

A: I can think of three senses:

(a) *Upward infinity*. Infinite spatial extent, with infinitely many stars, and infinitely many degrees of higher level structures, that is, ultra-k-clusters of galaxies for every number k.

(b) *Downward infinity*. Infinitely divisible matter. The Planck barrier is simply an illusion. By renormalizing, we can in fact flip our view of things, and see the "big" stuff as being below the Planck scale and us as being the "small" stuff. A flip-flop. The endlessly many ultra-k-clusters below the Planck scale would then represent lower and lower levels of matter.

(c) *Infinite dimensionality*. There may be endlessly many dimensions.

Q: How big is the infinity of our universe?

A: In the previous answer I was coy about the range of k and the meaning of “infinity”. But if I say our physical world is infinite, which level of infinity *do* I mean? As a set theorist I know of lots of options. Here are four that come to mind:

(i) **Alef-null**, the smallest infinite number, the cardinality of the set of natural numbers.

(ii) **c**, the power of the continuum, that is, the cardinality of the set of real numbers. Note that the size of **c** is at least as big as **alef-one**, which is the first infinity after **alef-null**. So far as we know, **c** may be very high up in the alef hierarchy, indeed it could even be as big as Ω . But some present-day set theorists like Hugh Woodin feel **c** is **alef-two**. As I recall, in *White Light*, I espoused this belief, which was also advocated by Kurt Gödel.

(iii) Ω , the class of all ordinals, which Georg Cantor calls Absolute Infinity.

(iv) The size η_Ω of the Absolute Continuum, where I use the terminology of www.aic.uni-wuppertal.de/fb7/hausdorff/Eta_alpha.pdf Hausdorff. This would be at least as big as Ω . I discuss the Absolute Continuum in my book, *Mind Tools*, it is a class of points in which you can find another point between any two sets of points. An Absolute Continuum is a proper class which contains embedded into it every possible set-sized order type. It's moot whether or not you can well-order the Absolute Continuum as a whole, so it's not necessarily true that it can be mapped one-to-one onto Ω .

So which infinity is the size of our space?

A cautious idea is to settle for alef-null stars, alef-null levels, alef-null divisibility, and alef-null dimensions. In this case, however, the infinite overminds are not really transfinite; they have size alef-null. If they like, they can arrange themselves into countable transfinite order types such as $\omega + \omega$ and get a weak kind of transfinitism, but even so, it would be questionable in this case whether I could justify calling the third novel *Transfinite* as I would like to.

Or I can rush to the higher extremes and say that I'm after Absolute Infinity, or Ω ; after all, this is SF, why hold back. In *White Light*, my character went out to Ω .

Perhaps this time around I'll require even more. I'd like the higher infinities to be immanent, embedded in our immediate surroundings, in my finger tips. And I can do this by saying that our physical space is Absolutely Continuous, at least in the small, that is, in terms of divisibility.

Given that I would prefer a symmetry between large and small, this also entails that the physical world is Absolutely Infinite, and that it extends past alef-null, alef-one, and so on, star upon star. A principle of plenitude is in operation here.

The following issue comes up in this case. If I say our space is a proper class, then I have to wonder if the actuals proper classes or merely transfinite sets? I suppose I'd have them be merely transfinite sets, so that they, like us, still have higher levels to aspire to. Alef-null's ceiling is alef-two's floor...

And we could then have a higher Divine which is a proper class. This would lie over and above the transfinite actuals; akin to Meister Eckhart's Godhead beyond God.

Q: How do the two branes of Postsingular fit in?

A: I have set it up so that reality has two (and only two) parallel branes: the Lobrane and the Hibrane. Perhaps the actuals are transfinite minds based upon the

Lobrane, and the less pleasant subbies are minds based upon the Hibrane. Each brane can be an Absolute Continuum.

The paired branes are the underlying dyad that drives creation. Yin and yang.

Reveal: The Peng atomic reprogramming spreads slowly atom to atom like rot; they don't actually have to hit every single spot on Earth, the rot will eat the whole thing bit by bit. Like the quap of H. G. Wells's book *Tono-Bungay*, a kind of contagiously degenerate matter (inspired by the then-new radium). Earth like a rotting peach on the kitchen counter.

The Peng are on the point of developing a way to transmit ioneer runes without having to use a runemaster. This sets up a ticking clock; we have to block off the Peng before they get their auto-runemaster working, as once that happens, they'll frikkin' *all* show up on Earth.

I need to discuss an issue about people teleporting in and out of Peng ranches.

The ioneer runes wear off in a minute or two when you leave an infected zone. And when you enter an infected zone, the ioneer runes spread into the atoms of your body and your gnarl drops.

Now, *why* does your body go with your surroundings? Quantum synch. Entanglement.

What's happening at the interface, at the border zone of a Peng ranch? For now we'll say its in equilibrium, it's neither growing nor shrinking. But later, when we get into ticking-clock crisis mode, the ranches begin to spontaneously spread.

July 26-28, 2007. *The Evil(?) Pitchfork.*

The harp is more or less good. We need a rival higher being. A male.

The giant Cronos? No, let's keep Cronos as the silp of our local ultracluster.

A pitchfork! The sorcerer pitchfork vs. the magic harp. Angels hold harps; devils hold pitchforks. I'm thinking of a two-tined pitchfork, like rattlesnake teeth.

I would remark that in Bosch's paintings you don't actually see angels with harps (for him, music is more something the devils are into). And you don't particularly see devils with pitchforks either. I wonder when the angel-harp and devil-pitchfork visual convention came into standard usage? Sometimes these taken-for-granted cartoon shorthand symbols are more recent than we realize—for instance the standard "gray" alien face is only about thirty years old.

The old peasant pitchforks were made all of wood. With no metal. They found a branch that happened to have the two prongs, and then the peeled the bark and hardened the prongs in fire. So we have a smooth twisty piece of gray wood with blackened tines.

Bosch likes to dress up as a peddler so he can hang out with cripples and beggars, sketching them. On the outings, he carries Jayjay in a sack like a pet imp.

They go on an outing to a peasant fair. At the party Jayjay sees something that scares him. He has an upset stomach from eating some gnarly pickled herring; he goes off to crap in the woods; and looking out from under a tree at a sunny meadow, he sees a two-tined pitchfork standing on its butt in a field, hopping. The evil pitchfork. It gives off a note, like a tuning-fork.

After seeing the evil pitchfork sunning himself in the meadow, Jayjay starts (correctly?) seeing the pitchfork in every forked branch. He sees the perhaps-not-so-

trustworthy-after-all harp in every triangle. Panicking, he finds comfort in the music of a squalling bagpipe made of an inside-out sheep.

To help visualize this scene, I went up on St. Joseph's hill with my friend Vernon and painted my vision of the evil pitchfork. I set him (the evil pitchfork) in a field up there.

And now I'm trying to fit the pitchfork into my tale. At the (boring) logical level I know that this is an arbitrary story pattern that I stumbled upon haphazardly.

But at the (magical) creative level, I feel sure there has to be an underlying reason. A way to make sense of it.

I can't let myself doubt this too soon. Otherwise I might give up too soon. If I petition the muse for a few days (i. e. obsess over this odd idea), I'll find a higher picture that contains these shards.

This said, I also know that sometimes a particular set of assumptions and scenarios can't be pieced together. Sometimes I need to back up and make more thorough-going revisions than I might have expected.

I'm pretty sure I can keep the harp and the pitchfork. But I'm not sure how it's gonna work.

To begin with, let's suppose that it was the pitchfork that Jayjay saw in his vision early in *Hylozoic* when he became a runemaster. Initially, in the vision, the pitchfork, was disguised as the harp, so Jayjay wouldn't be scared of it.

But—the harp was undergoing a bizarre metamorphosis. One by one her strings were snapping and sinking into her frame. The post at her front end turned to taffy, melted in two, and the stubs sank into the frame leaving a shape like a U. And now, from the butt of the U, a bump grew out and lengthened.

Jayjay sprang back. The creature had turned into—a pitchfork? The pitchfork balanced on his single rubbery leg. No longer a she, but a he. The evil pitchfork's two prongs were vibrating.

“Surprised?” said the pitchfork mockingly, his tines focusing an unbearable vibration upon Jayjay, a vibration that was at the same time a sound, a teep signal, a teek jostle—plus some oddball fourth ingredient. A higher-dimensional flip.

I want the magic harp and the evil pitchfork be transfinite beings which I'll call **aktuals**, after Georg Cantor's usage, “aktuale Unendliche,” meaning “actual infinity.”

As Cantor said, “The fear of infinity is a form of myopia that destroys the possibility of seeing the actual infinite, even though it in its highest form has created and sustains us, and in its secondary transfinite forms occurs all around us and even inhabits our minds.” This translation is drawn from my book *Infinity and the Mind*, p. 43, and the passage I based it on can be found in, “Über die verschiedenen Standpunkte in bezug auf das aktuelle Unendliche,” [Cantor's collected works](#), pp. 374-375.

Our space is transfinite in the small and in the large. It's a Hausdorff eta- Ω ordering, that is, an Ω -saturated ordering: between any two sets, you can find more points. Below any sequence of subdivisions lie more subdivisions. The levels go up forever as well.

In the potentially infinite real number line, the whole numbers march out to ω , and you can find an ω sequence running from 1 down to 0 just as well. By the same token in an absolutely continuous space you can march out to \aleph_1 on the ordinal line, but you can also find an \aleph_1 sequence running from 1 down to 0. And ditto for the Absolute Infinite Ω .

The aktuals don't need to come from far away, that is, from beyond ω space or ω time. They can be down in the cracks and crevices, right here. The God within.

The harp has unfurled the eighth dimension on Earth, Hrullwelt, and Pengö, among

other places. The harp wants these worlds to attain higher planetary minds, and she wants the locals to develop transfinite consciousness so they can be her allies. I might say that maybe it wasn't her, maybe it was one of her cousins, but remember that, as an aktual, the harp is endlessly large, so she can be in many places at once.

[When Phil Dick called his book *Ubik*, was he thinking of "ubiquitous?"]

The pitchfork wants to kill off these uplifted worlds. The pitchfork doesn't want to transfinite consciousness to spread. The pitchfork promotes war to bring suffering and wipe out more minds or at the very least to lower mortals' consciousness.

Thus the harp and pitchfork play, in some measure, the roles of God and the Devil.

Also consider the harp and pitchfork as mathematical forms: the triangle and the fork. Cycle vs. bifurcation. Reversible vs. irreversible.

And as musical forms: harp is melody, pitchfork is a single tone.

Maybe our time is an illusion for the aktuals. Perhaps they stick a series of body manifestations into our spacetime that seem to link up into a worldline of a body, but which are really a series of still images, like a movie. An aktual seems to twinkle when you look at him or her, as they are disappearing and reappearing over and over.

But, no, taking them out of our time is a bad idea for this book. Why?

For the sake of drama and conflict, we expect characters be embedded in some kind of time flow. So if the aktuals aren't in *our* time, then they must be in a higher-dimensional metatime. And if I have a metatime elapsing, then it's likely that our sheet of spacetime is changing as metatime goes by—like in *Mathematicians in Love*—and I'd rather not tack on that complication to this book. I don't want a lot of universes. I just want two: Lobrane and Hibrane. Given that these universes are probably of Absolute Infinite size, it'd be overkill to ask for more of them.

So I'll submerge the aktuals in our time stream after all. The fact that, for them the time stream is an Absolute Continuum might be of some significance. If they like they can make a second drag out forever.

The harp and pitchfork both do happen to appear as [closed temporal loops](#) in the joint spacetime of Lobrane and Hibrane. Perhaps this is inevitable; perhaps this has to do with how they manifest themselves at the finite level.

Studying the spacetime diagrams, I discover that the pitchfork has been in America making trouble since 1492 [or, no, correction, since 1000 BC. But don't do that, have him jump back up to 2037]. Vision of it knocking on someone's door.

August 1, 2007. Remember the Silps!

I need to remember to focus on the silps and on hylozoism. Lately I've been focused on my various kinds of aliens and on laying the groundwork for PS3: *Transfinite*. But here I've set up this very cool thing with the silps, and the book is called *Hylozoic*, and I need to savor and play with and exfoliate this. Sometimes I find it too hard to think—it's that "staring into the sun" sensation—and I flinch aside, and rush onto the next shiny Xmas present under the tree.

So let me make a list of things to do with the silps.

Chap 4: *Thuy inside the Hrull*. I don't mention them enough. Have the silps enjoying the lovemaking, for instance. Thuy's atoms are into it. But her atoms rebel against the Hrull goo.

Chap 5: *Jayjay in Bosch's studio*. Here we're silp-free until the chapter's end when Jayjay plays the Hibrane harp. And they've lost their lazy eight memory. Make a big deal about how it feels not to have silps around. Make a big deal when they come back. Maybe have the silps give Jayjay some good advice really quickly after they appear.

Chap 6: *Chu in Hrullwelt and Pengö*. Might the silps in these other places be somehow alien too? Chu retains his lazy eight memory in flight, as he hops all the way from one lazy eight zone to another. And—aha!—his smart silps educate the alien silps. It spreads like a mind virus. Like a rune. They want to help him. And keep in mind, the harp is pro-hylozoism, and the pitchfork is anti.

Chap 7: *Thuy in den Bosch*. Open the chapter with a rhapsody of Thuy and the silps, like in Chapter 1. The silps totally help them escape.

Chap 8: *Chu saves Earth*. Use Steve H's idea that the silps can sing together like rappers to drive out the ioneers programs. "Bass way up high, keyboards barking synthesized voices, and some guy talking a bunch of sly, insinuating jive faster than you can pay attention."

August 8, 2007. *Black Point*.



I finished a draft of a painting of *Postsingular* today. I [blogged](#) about it.

I'm at that frightening black point that I always reach in the middle of a novel. Confusion and despair. I fantasize that I can stave this off by outlining, but the black point crops up anyway, heedless as a meteorite. It's where reality meets dream, where the rubber hits the road.

As Dante puts it in *La Commedia Divina*,

*Nel mezzo del cammin di nostra vita
mi ritrovai per una selva oscura,
che la diritta via era smarrita.*

I found an interesting web page exploring [lots of ways to translate](#) this. One version reads as follows:

*Midway in life's journey
I found myself in a dark wood,
and the straight way was lost.*

Another translation might be:

*Halfway through my novel
I know I don't know
What the hell I'm doing.*

What the hey, I'm going to the beach. Sooner or later, the Muse is bound to show up and extricate me. She always does. It's probably just a matter of dropping a few of the candies I'm holding in my greedy monkey-fist. I, like, stuck my arm into the dark cave and grabbed as much as I could and now when I try and pull my arm back out, my fist is too bulgy to fit through the hole.

Or, putting it differently, I'll cut loose some sand bags so the balloon can rise.



Looking at my *Hylozoic* painting, I see that, *duh*, this is a picture of a scene that I should write. I can have Chu fly a Hrull across the branes, from Lobrane to Hibrane, and arrive in Bosch's town just in time to save Thuy and Jayjay. Who's the painter? I think it might as well be Bosch; he's acting as a beacon to guide Chu and the Hrull their way.

In fact we can suppose that Bosch sends a summoning rune to Chu after the pitchfork and the harp aktualize him.

I won't have Chu go to the Hrullwelt in Chapter Seven, by the way. Instead he stays on Earth and does stuff with the silps.

He wants to be near Bixie; he wants to save Earth; he wants to groove with the silps; he doesn't want to be a Hrull-gel junkie.

But when the pitchfork helps Bosch call to Chu on behalf of Thuy and Jayjay, Chu does fly the Hrull across the branes. We'll suppose that Chu can make himself immune to Hrull gel by enlisting the aid of his silps.

August 10-15, 2007. Q & A About Aktualization.

[I blogged parts of this long entry with photos (mostly of Santa Cruz) on [August 15, 2007](#) and [August 17, 2007](#).]

Q: What is the structure of spacetimescale?

A: The basic intuition is that reality looks different at varying scales and that interesting new features appear endlessly. You can zoom up or down, transfinitely finding unending novelty.

I speak of a *spacetimescale* continuum to indicate that scale is as fundamental a dimension as space or time. This follows if matter is infinitely divisible. For if there is no smallest feature of the world that can serve as a unit length, it's necessary to specify the scale at which one is observing the world. There is no privileged lowest level to serve as the default scale. Therefore we need to work with the full spacetimescale continuum.

The Planck length (about 10^{-35} meters) has sometimes been regarded as a lower bound on scale. But I prefer to think of the Planck length as simply a particularly interesting location on an endless scale axis. What's above the Planck length is dual to what's below—in the sense that we find equally many scale levels on either side. We can think of the size N above matching a reciprocal size of the order $1/N$ below. In my SF, I refer to the sub-Planck-length region as “the subdimensions” or as Subdee, and I call the creatures in this realm *subbies*.

I'm supposing that the scale dimension is transfinite in both directions. For instance, there's alef-null and alef-one above, and below I have $1/\text{alef-null}$ and then $1/\text{alef-one}$. More than that, in keeping with my notion that space is an Absolutely Continuum, the scale axis is Absolutely Infinite.

We can call the beings up above the transfinite levels *alefites*. And if we push down to transfinitely small levels we have *subalefites*.

Q: What are the bodies of aktuals such as the harp and the pitchfork?

A: I am writing about some transfinite beings called *aktuals*, where the name comes from Georg Cantor's discussions of “aktual Unendliche” or “actual infinities.” The harp and the pitchfork are aktuals.

Rather than having my aktuals be transfinite in space or time, I'll have them be transfinite in scale. A given aktual might be in contact with us and the subbies, also with the alefites and the subalefites.

To begin with, think of an aktual as a scale cylinder. By this I mean a bounded region of spacetime viewed at every scale up and down. My usage of “cylinder” here echoes the familiar geometric notion of a cylinder as a plane region that’s extruded into the third dimension.

I’ll suppose that the aktual’s body cylinders extend through every level of scale, that is, an aktual’s body is an Absolutely Infinite scale cylinder.

I think of there being an Infinity = Zero wraparound, as in my novel *White Light*. The wrap is at Absolute Infinity, also known as Ω , which wraps to $1/\Omega$, which is the same as 0.

An aktual instantiates a wraparound of this nature. An aktual is a worldsnake Ouroboulos biting his/her tail. So an aktual could, strictly speaking, be viewed as a scale *torus* rather than a scale *cylinder*.

Q: Do aktuals overlap?

A: The scale cylinders of two aktuals have to overlap, for otherwise, there’s only room for one aktualized being on a planet, one aktualized cell in an individual’s body, and so on. If there were no overlap allowed, and if the harp and the pitchfork were to be distinct beings, then their avatars at any given spacetimescale cross-section would have to be an Absolutely Infinite distance apart.

This said, it may be that there’s only one aktual on Earth, at least to start with. This would be good for the story. It’s just my character Jayjay to start with; he’s different. And at the end of the novel *Hylozoic*, everyone gets aktualized, which leads to the third novel, *Transfinite*.

A physical change has to happen during aktualization, your body has to actually match the patterning of Gaia and the patterning of at least one of your cells—although I suppose eventually all your cells could be aktualized to match you.

Q: Say more about the limited intersection of an aktual with the spacetime of a particular scale level.

A: The harp and the pitchfork only intersect our spacetimescale in a limited zone.

These manifestations within our spacetime are incarnations or *avatars* of the higher aktual beings. Aktuals’ avatars are subject to the vicissitudes of cause and effect; they can’t walk through walls; they don’t have infinite intelligence.

The avatars don’t in fact know what the eventual outcome of their efforts will be. They hope that fresh regions of spacetime will aktualize in the near future. Their goal in visiting us is to promote these transformations. In fact the process works even though they couldn’t plan the details.

The aktuals have worldlines that form loops within the joint continuum of our Lobrane and the parallel world called the Hibrane. I’m thinking of closed causal loops for the sake of both tidiness and paradoxicality.

The higher self of the full aktual isn’t something accessible to any of its avatar cross-sections, save in an emotive way: an unspecific sensation of metaphysical profundity that has no actual content.

Q: What are the personalities of the harp and the pitchfork?

A: Instead of being like blinding, dull gods, the avatars are somewhat humanized: bumbling and uncertain. The pitchfork and the harp are mates: a he and a she, in love with each other.

The harp has a poor sense of direction, she's patient and musical. She bosses the pitchfork and she nearly always thinks he's wrong, even when he's right. She likes to sing. She likes for the pitchfork to strum her with his tines. She has a beautiful contralto voice.

The pitchfork is pushy and physically clumsy and has difficulty reading the emotions of other beings. He's less verbal. He likes to jab things with his tines. He loves the vibrations of the harp's music and voice; he wriggles when he hears them. He himself speaks in a twangy Kentucky accent.

The pitchfork wants to get to 's-Hertogenbosch to be near the harp. But he can't go straight to her because his and the harp's human-scale avatars are subject to normal physics. As long as the harp is locked up in Hieronymus Bosch's studio, the pitchfork can't get at her.

Q: Why, in general, did the pitchfork and the harp get involved with us?

A: In general, aktuals want more beings to become transfinite aktuals. The aktuals reproduce like crystals, by spreading a particular kind of spacetimescale patterning. Think of the vertical "post pile" crystals within a cooled volcano's lava plug. Each crystal is the template for the next one.

One might say that the aktuals want all beings to have transfinite consciousness, but this would be a bit too exalted. Basically they want to reproduce.

There might well be an aktual body intersecting with some or all of a person's life history—indeed if you become part of an aktual, this is the case. This transformation is *aktualization*; I use this word to refer to the process of a spacetime region linking up and down to form an aktual.

Any specific spacetimescale being can serve as a crystallization point: a seed that sends a transfinitely rapid cascade of aktualization up and down, linking the entire spectrum of levels and then, in a culminating ecstasy of unification, closing the loop from Absolute Infinity to Zero.

Q: How, specifically, does the pitchfork get involved with Jayjay?

A: The pitchfork appears in the Lobrane time stream shortly before Jayjay has his vision in Chapter One. He and the harp have some hope of actualizing Jayjay. They see an opportunity to work via Jayjay, as Jayjay is so high.

Some of my characters actually see the pitchfork in Chapter One or Two. The pitchfork is a real presence. He's standing over Jayjay and Sonic while they have their vision, he's crept out of the woods. Sonic sees the pitchfork again after he comes down from his Big Pig trip. And Thuy seems him the next morning.

Jayjay sees the pitchfork just before the jump to the Hibrane. The San Francisco Peng break down the geeks' protective force field around Jayjay and, just in time, the pitchfork kills off the Peng, stabbing them through and through, vibrating them into nonexistence with the reset rune.

The pitchfork and the harp intended to incarnate themselves together, but an aktual can't consciously control the patterning of its avatar's worldline. The whole

overall gestalt of the universe comes into play, ensuring that the patterns are consistent.

When the pitchfork appears in the Lobrane, the harp is over in the Hibrane in the medieval village of Hieronymus Bosch. The pitchfork wants to get to the harp, but he finds he's able to aktualize Jayjay on his own, and use Jayjay as a way to get to the harp.

The pitchfork and the harp meet in 's-Hertogenbosch, but then the pitchfork hops back to Lobrane with Jayjay, during the cross-brane trip the pitchfork stems off so as to land right before Jayjay's vision—making a temporal loop, as the avatars always seem to do.

Note that it takes the whole book for Jayjay to realize the full import of what's happened to him in Chapter One. This is, a transreal correlative for my own process of discovering Jayjay's altered nature via the process of writing the book.

Q: The aktuals impose two kinds of changes upon us: lazy eight, which means that they unfurl the eighth dimension to give us endless RAM and telepathy; and aktualization, which means that they put us in touch with the transfinite scales. What is the relation between the two kinds of changes?

A: The lazy eight is stage one, the aktualization is stage two. The lazy eight telepathy and infinite memory prepares you for aktualization.

Lazy eight involves a physical alteration of the topology of spacetime: the eighth dimension is unfurled.

Aktualization involves another alteration: a helical connection arises among the scale levels. I might say that the scale connectivity is a series of gauge renormalization morphisms. In ordinary words, it works by connecting a series of looped strings of graded sizes: cutting the loops and sewing them together, each loop hooking to a next larger loop and to a next smaller loop.

To make someone an aktual, you snip his knotted loop, and attach one end to an end you get by snipping a loop at the next higher level, and attach the other free end to an end you get by snipping a loop at the next lower level.

For this to work, we need for there to be large string loops as well as little ones—think of cosmic superstrings.

And iterate this, cutting further loops up and down to take care of the new free ends you keep producing.

To enrich the range of string loops, we'll also suppose that consciousness has a physical dark energy correlative of a string-loop nature. As James Clerk Maxwell wrote (if only jestingly):

*My soul is an entangled knot,
Upon a liquid vortex wrought
By Intellect in the Unseen residing,
And thine doth like a convict sit,
With marlin-spike untwisting it,
Only to find its knottiness abiding;
Since all the tools for its untying
In four-dimensional space are lying.*

Looking downward, when you are aktualized, your body is the same as one of your cells, that cell is the same as a particular atom, and so on. Looking upward, your

body is the same as your planet, your planet is the same as your galaxy, and so on upward.

Q: How does it feel to be aktualized?

A: Jayjay's awareness of his atomic silps is a partial step towards aktualization; and his vision of our galactic [supercluster](#)'s silp, Cronos, is an upward step.

His mind goes into a transfinite regress, like a transfinite sequence of falling dominoes.

He is Earth, the galaxy, a cell, an atom. He even feels sympathy for the subbies now. For everything to fit consistently, he has to give up a certain autonomy, a certain patterning, but he gains as well. Things shift and link.

He sees a collapsing travel cup with endlessly many cylinders being pulled up and up. The cylinders snip join, making a helix. At the end, he can see down the hollow axis of the helix to Absolute Infinity or Absolute Zero—and these two insuperable limits are the same. Like surfing down a glassy tube toward the rising sun. He feels an ecstatic sense of closure when the Absolutely Infinite scale cylinder wraps around and bites its own tail.

On the one hand, he moved towards Everything by letting his feeling of spatial immediacy expand from his head to include his whole body, then the tree branch and the beehive in the tree, then the garden, the city and the night sky. He expanded his time awareness as well, to include the paths of the rain drops, his last few thoughts, his childhood, the tree's growth, and the turning of the galaxy.

On the other hand, he was also moving towards Nothing by ceasing to identify himself with any one part of space at all. He contracted his time awareness towards Nothing by letting go of more and more of his individual thoughts and sensations constantly diminishing his mental busyness.

The overall image he had of this activity was of two spheres, one expanding towards infinity, and the other contracting towards zero. The large one grew by continually doubling its size, the smaller shrank by repeatedly halving its size and they seemed to be endlessly drawing apart. But with a sudden feeling of freedom and air, Vernor had the conviction that the two spheres were on a direct collision course—that somehow the expanding and contracting spheres would meet and merge at some attainable point where Zero was Infinity, where Nothing was Everything.

--- *Spacetime Donuts*

Last night I had a hypnagogic pre-dream while pondering this; a fabulous rush. I was on rails going out past a vanishing point; this was mixed with the sensation of being in an elevator. I had the ecstasy of transfinite acceleration: more, more, more. And then I was a flat railroad car with two antennae—that's what my body looked like, seen from the rear. I was looking at myself from a few feet behind, seeing over my own shoulder. I glowed yellow-white against the black/dull-red night sky, a sky stippled with starships, dimensional transporters, and transfinite hoppers.

Q: How is it that after aktualization you have telepathy and endless memory, even if you travel to a non-lazy-eight zone?

A: Lazy eight telepathy works by reaching out to the point at infinity on the unfurled eighth dimension axis and coming back to any other being. We need for the aktuals to be inherently telepathic even in the absence of lazy eight—for the harp at the end of *Postsingular* is telepathic on pre-lazy-eight Lobrane Earth.

Aktual telepathy works by reaching up in scale to the mind of Gaia and dropping down from there to any other being on the planet. Also note that an aktual has access to all the mass of Earth—and up beyond—and can easily store endless amounts of data.

Since Jayjay was aktualized at the end of Chapter One, he will have telepathy and endless memory when he jumps to Hieronymus Bosch's medieval 's-Hertogenbosch in Chapter Five.

Therefore Jayjay will be able to read the minds of the medieval Dutch and he can project thoughts into their minds. But it's safer for him to just speak Dutch, lest he be viewed as a sorcerer. He siphons out the knowledge of Dutch, stores it, and imparts it to Thuy.

Q: Why is an aktual a runemaster?

A: Rune mastery results from spanning all the scales; you can teek down into every level of a material region and control the endless (convergent) series that is reality.

After I'm aktualized I can create an object by raising up some Subdee matter. I can, like, spin the wheel of scale in a region. And I can change my size.

I can shrink myself to atomic scale and directly kick an atom. I'm a true quantum mechanic—with a wrench. This is a more powerful interaction than is possible via lazy-eight teek, which lets you move things but doesn't let you actually change the quantum computations.

When Jayjay is casting ioneer runes, he's jittering from normal to atomic size at a femtohertz rate—he looks hazy. Maybe he emits some Cerenkov radiation, or grows evanescent transinitely complex beetle antennae from his head.

Q: What's the relationship between the transfinite aktuals and the alien Peng?

A: Let's suppose that the Peng make a practice of parasitizing newly aktualized beings such as Jayjay. The Peng typically try and grab onto newly minted aktuals, using them to send their ioneers.

Allowing Panpenga to link to him was a major goof on Jayjay's part.

The aktuals should have warned Jayjay, but they neglected to. They're fallible. They apologize. The experienced aktuals know better than to open themselves up to contact with parasitic races like the Peng, but Jayjay was caught unaware, like a newborn antelope attacked by lions.

The Peng prey upon telepathic aktuals, and the Hrull prey upon telepathic humanoids who aren't aktuals yet. The Hrull like to stunt humanoid races at a lazy eight stage, which is really only a prelude to the full aktualization stage. They infantilize races so as to parasitize them.

Subtextually, the Hrull and the Peng represent two kinds of obstacles to enlightenment: conventionality and decadence.

Peng = Consensus reality, McDonaldsization, TV, lack of imagination.

Hrull = Drug addiction, sexual orgies, the “left-handed path” of sensual indulgence.

Q: How does it feel to be enslaved by Panpenga? How does Panpenga control Jayjay?

A: She works via guilt, like a controlling mother or wife. She pecks at his sympathies, and exploits his low esteem. She rewards him with warm smiles and motherly love when he does her bidding. When running the ioneer rune chores, he feels like a good boy doing chores. To free himself, he learns to relax and enjoy and feel good on his own; he breaks the cycle of guilt and atonement. The mantra of liberation: “I don’t care.”

August 18, 2007. I just remembered that Thuy’s mother is a guilt-monger, and that Jayjay doesn’t care much about his mother either way, he’s pretty much walked away from her. So it’s not a good psychological fit to cast Panpenga as a nagging mother figure. And with Jayjay a newlywed, a nagging wife routine wouldn’t be a good fit either. So let’s suppose the control is more along dominatrix lines. Sexual obsession with a male-submission theme. Maybe Panpenga is like [La Azteca](#) who, after all, is dressed in feathers. Metaphorically, Jayjay’s hooked on internet porn from a site that’s *very* far away. Jayjay has a hard-on most of the time that he’s under Panpenga’s control. And he has a body-wrenching orgasm each and every time he casts an ioneer rune, which makes him that much more off-putting to Thuy.

August 16, 2007. To-Do List for Aktualizing Chaps 1-4.

In the [previous entry](#), I expanded on my ideas about the aktuals and aktualization. Now I need to integrate these discoveries by making changes to the novel text for chapters 1-4, and to the outline for the upcoming chapters.

Here’s a to-do list. I’ll put in * symbols as I take care of the items.

- * The pitchfork is standing over Jayjay and Sonic while they have their vision, he’s crept out of the woods.
- * Characterize harp and pitchfork’s personalities as described in the previous entry: *The harp has a poor sense of direction, she’s patient and musical. She bosses the pitchfork and she nearly always thinks he’s wrong, even when he’s right. She likes to sing. She likes for the pitchfork to strum her with his tines. She has a beautiful contralto voice. The pitchfork is pushy and physically clumsy and has difficulty reading the emotions of other beings. He’s less verbal. He likes to jab things with his tines. He loves the vibrations of the harp’s music and voice; he wriggles when he hears them. He speaks in a twangy Kentucky accent.*
- * Rewrite Jayjay’s experience of aktualization as described in the [previous entry](#).
- * Thuy sees the pitchfork in the night, and Sonic mentions that he saw the pitchfork again after he came down from his Big Pig trip.

- * Jayjay experiences Panpenga as a sexually fascinating dominatrix, and he has an orgasm some of the times she uses him. In the Killeville parking-lot, he's moaning and sexually squirming as he casts the ioneer runes. Wonderfully inappropriate.
- * The San Francisco Peng break down the geeks' protective force field around Seven Wiggle Labs and, just in time, the pitchfork chases off the Peng, curdling their focus with his vibes.
- * The pitchfork and the harp intended to incarnate themselves together, but an aktual can't consciously control the patterning of its avatar's worldline.
- * The pitchfork hops back to Lobrane with Jayjay.

August 18-26, 2007. Revising Chapters 1-4.

I put in the To Do changes that affect the novel, but now the text is all lumpy, with consistency gaps and bad segues, so I printed Chapters 1-4 and am rereading them. Also I revised the outline again to incorporate the last couple of To Do items.

As I build up the interaction between the harp and the pitchfork, I see that I need more plot between them. The pitchfork aktualizes Jayjay, and then helps Jayjay and Thuy jump across to the Hibrane. And Jayjay presence there does something for the harp, oh yeah, he teaches her the Lost Chord. Why did she forget it, anyway? Maybe I'll just wave my hands on that, also on the issue that Jayjay's vision in the Virgo supercluster's castle is outside of our spacetime continuum.

I have two kinds of teep, the lazy eight teep on Earth, and a scale tendril teep. I'd planned to have a third kind of teep, a wormhole teep for Panpenga. It would be cleaner to eliminate the third kind of telepathy and have Panpenga be an aktual who uses scale teep.

A problem with this is that I'd wanted to have Jayjay be (a) blocked from Panpenga's teep inside the Seven Wiggle Labs quantum-mirror chamber, but (b) able to scale teep to the pitchfork and help him wipe out the Peng.

I think I'll try and do without wormhole teep. I can suppose Panpenga uses scale teep, and that the quantum mirror *does* block scale teep and just have Jayjay tell the reset rune to the pitchfork earlier, while they're both outside.

Things to mention again, or weave forward, or think about:

- Huffin Psi Secure
- Electric trees for Chapter 6
- Discuss normal lazy-eight teep vs. Scale tendril teep.
- Mention Founders again near end of Chapter 4.
- Thuy, Chu and Jayjay should talk to their body silps from time to time.
- Use the Whuff/Fuffo greeting again between Sonic and Jayjay.
- Mention again that Jayjay's cabin is called Vrilla.
- Have Jayjay think of his 60 year freak out again.
- Lusky has a deep voice.
- Vrilla, the cabin, might mention seeing the pitchfork. She might also chat with Thuy about the loss of gnarl.
- More detail about how exactly Panpenga's mind knotted into Jayjay's right after his aktualization. Was there a direct connection? What was the chrome rune, anyway?

- Why didn't we talk to lazy eight aliens before? We were never high enough. The beanstalk was crucial.

When I woke up this morning (August 24, 2007) I realized that in the last round of revisions I'd been making things too complicated.

I decided it's a mistake to try and force the transfinite infinities into *Hylozoic*. That's too much a matter of rushing past the main course into the dessert. Also it's confusing. In fact I'm thinking it might be a mistake to try and do volume three as *Transfinite*. Maybe I just save those transfinite Absolute Continuum ideas for a story.

Maybe the third volume is *Aktual*.

Maybe there isn't a third volume.

I need to focus on the panpsychic thing, the fact that all the objects are alive. I'm really neglecting that after the first chapter. I'm thinking I should be exfoliating that all through volume three.

I've put in place the idea that Jayjay is a runemaster because he's aktualized, and that this means he's linked up and down through all the scale levels.

I had been saying there were transfinitely many scale levels, and that the link wraps around in circular scale.

But if I have circular scale, then I don't strictly speaking need for the scale levels to be infinite. Even with finitely many levels, if scale is circular then matter is endlessly divisible.

I came up with the idea of scale linkage because I wanted somehow to characterize the harp and the pitchfork as a different order of being. Initially I'd thought of them as being like supernatural angels. And then I'd thought of concretizing this by having them from the transfinite realm beyond alef-null. And then I had the idea of having them be scale helices.

I'll keep that, but I won't bother with either infinity or circularity. Existing at every level of scale is a heavy enough hit.

I've been worrying about the mechanism for Panpenga's telepathic hook into Jayjay. On Earth, people have a local lazy eight telepathy, and I was thinking this might not work to other zones of the universe. Certainly not to non-lazy-eight zones.

But, come to think of it, maybe you could in fact hook to other lazy-eight zones. That is the route I should use. It's unpleasant and distracting to have two distinct flavors of telepathy in one book.

Before today's realization that lazy eight could work intergalactically, I had been thinking of running the intergalactic telepathy via a subdimensional hookup.

And then earlier this week I was thinking in terms of "scale teep," which is a move a bit like yunching from *Frek and the Elixir*. That is, you merge into the Virgo Supercluster, then focus back down onto some other world. Get big, then get small in a different place. But that's too confusing.

Issues I'll need to face: If Panpenga is just using lazy-eight telepathy, then, if we focus, we ourselves can see Pengö and the Hrullwelt. Why aren't we currently doing that? Maybe we don't know where to look—but once we hear about Pengö, why aren't we all looking there? Have the Peng been looking at us for a long time?

I have such complex, ever-changing, ill-defined desiderata for my telepathy.

(a) *I want Panpenga to be able to hook in to Jayjay.* Suppose we just use lazy eight teep.

(b) *She can't directly manipulate Earth matter, she needs for Jayjay to act as a medium to reprogram the atoms to set up the ioneer tulpas.* Suppose that only humanoids have teek, and that's why she certainly reprogram Earth atoms herself. In this case, the Peng ioneers are only invading lazy-eight humanoid worlds.

(c) *There is something special about Jayjay that makes him capable of being a medium.* Otherwise Panpenga could be using just anyone. And there has to be something that's set Jayjay up for this. Something that his pitchfork vision did to him. Suppose he's gained the ability to move up and down in scale.

I'll to say that only humanoids can reprogram matter, because only we can teek. I can make a big deal of this instead of having it be a throwaway line. *Humanoid teek* is why the Peng can colonize us via tulpas, that's why the Hrull want us a pushers.

Here's a snag: the pitchfork and the harp don't seem to be humanoids, so it seems they shouldn't be able to teek. So that means the pitchfork can't chase off the Peng. Can the pitchfork even cast a rune?

I'm having Jayjay cast runes into matter by shrinking down and kicking the atoms. If the pitchfork can't do this, then how does he aktualize Jayjay? Maybe it's just that he teaches Jayjay a mental trick. Guides him to change himself.

Okay, here's what I did; this involved rolling back some changes I'd made during the first part of the revision.

- * Drop mentions of transfinites and infinities from *Hylozoic*.
- * Drop mention of circular scale.
- * Drop mention of infinite divisibility.
- * Drop mentions of "scale teep." The aliens communicate with us via normal lazy eight telepathy.
- * Panpenga is not aktualized.
- * The only beings who can cast runes into matter beings that are both (a) humanoids and (b) aktualized. Why? (a) Only humanoids can teek. (b) Only an aktualized being can get shrink down funky with an individual atom.
- * Panpenga isn't watching Jayjay every second, that's how he gets the slack to run the reset rune. But he can't block her teep. And after his rebellion she's watching him all the time.
- * The Hrull don't block off teep, they're just really good at camouflage. Only the quantum-mirror -room at Seven Wiggle blocks teep.
- * People can block out their own teep. But the one exception is that Jayjay can't block out Panpenga.
- * Dial back on Panpenga's S&M dominatrix routine with Jayjay.

August 24, 2007. Offer from Tor. Spook Country

I haven't mentioned that I got an offer for *Hylozoic* from Tor a couple of weeks ago; David Hartwell talked to my agent Susan Protter on the phone about it.

They're offering the same advance as for *Mathematicians in Love*. Not all that much money, but I'm tired of ranting about that. It's good to know I can sell the book at all.

Since I'm half done now, and it's eight months since when I started writing in January, I figured I need another eight months. So I suggested that the due date be May 15, 2008.

Then they put Jan 2, 2008, on the contract, but Susan talked to them and we agreed on May 1, 2008.

Also they'd put 150,000 words for the expected length, and I got permission to change that to 90,000 which I know is what Hartwell prefers, and is what I've been predicating my plans on.

While working on the revisions of Chaps 1-4, I read William Gibson's *Spook Country*, and it's humbling. The work is so polished. The dialog, the descriptions and the apercus. Good characterization. Hip. Lots of product placements. You're rooting for all the characters, they aren't contemptible my Jayjay and Thuy threaten to become. There's a simple clear climax that the whole book builds towards. It's not a fucked up mess.

I'm thinking the only path is to finish writing *Hylozoic* to the end, get a rough version, and then go back and polish up the dialog, the descriptions and apercus, and the characterization.

Gibson takes about four years to write a book. Maybe if I polished my book for a couple more years I could bring it closer to G's level. Oh well. Maybe some other time I'll polish a book for four years. Like I told Tor, I plan to do this one in about a year and a half, as usual.

G says something heartening about the classic SF approach: "it had an appealing vintage sci-fi campiness to it, staccato and exciting", p. 126

I blogged about the oddly [large number of overlaps](#) in G's and my obsessions. He even talks about tulpas! Not that I think he's in any way cribbing from me or vice-versa. I just think we're on the same wavelength. This is heartening.

August 27-28, 2007. Aktualization as Scale Linkage

I finished the revision of Chaps 1-4 yesterday, with a double revision of the latter part of Chapter 4. The logic is pretty good now and I have a good word count (46,191 words). I feel better about the book. Almost ready to tackle the first Bosch chapter.

I'm still a little worried about what aktualization is. I do need there to be something that happened to Jayjay to make him a runecaster, and that's aktualization, whatever it is.

Right now I am saying aktualization is a linking up and down the scale axis which goes on indefinitely both ways. I'm no longer pushing for transfinite scale, nor stressing that the axis wraps around like in *Spacetime Donuts*. But I need to clarify what I'm going with the scale.

What concerns me is what I might call a *branching issue*. I have been supposing the thread of aktualization goes down from Jayjay into just one cell, into just one atom, and so on. And up from Jayjay into Earth, the galaxy and so on.

A problem is that I'm supposing that Jayjay is (at least for now) the only aktual human on Earth. And I also want to say that Gaia herself is not an aktual yet. So maybe there should be some kind of difference in the link pattern below Jayjay and above Jayjay, signaling that although he is aktual, the levels above him are not.

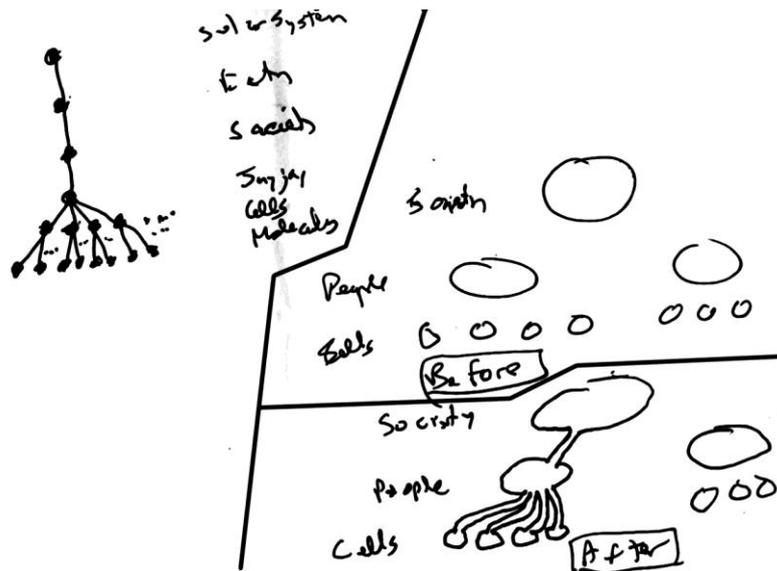


Figure 14. Scale Links. Left shows a linear linkage above, branching linkage below. Right top and bottom show how the individual object strings link up.

Suppose I say that the linkage branches in the downward direction below Jayjay, but is just a line above him. So Jayjay is in fact linked to each of his cells and each cell to each of its atoms, and so on down. So each of Jayjay's cells is actual, just as he is. Call this link pattern a rake link, as the picture looks like the rake I use on my lawn.

I'm okay with the cells being actuals. But note that until every being on Earth is actual, Gaia herself isn't actual. And maybe she's waiting for that to happen.

I'm not sure I can use the rake link. When I consider rewriting Jayjay's vision at the end of Chapter One to include the rake link, I see that it makes the vision too complicated. It's nicer to describe a single line of links that spirals up and down.

The actuals have a special power of runecasting, and I'd been thinking that this might have to do with being free to change size—I currently have the pitchfork shrinking to crawl under a door, and I say in passing that Jayjay casts runes by shrinking to atomic size.

How would Jayjay shrink? It would be nice if there was some connection between having the ability to shrink and being part of a scale tower. I can think of two ways that I might call Spin and Zip.

(Spin) He spins the scale wheel, like rotating all the scales of his components one notch up or down. I think of a ring on a camera lens that you can spin one way or the other. Like a zoom lens. A problem here is that it seems he'd be dragging the size of Earth up or down with him.

(Zip) What if he can shrink by compressing the levels below him. Suppose he can fan out his cells a bit in the fourth dimension so that he can pile them up over a small region of 3D space. (I like this as it's more visual than speaking of overlapping linear state functions.) Note that the Zip method doesn't allow Jayjay to grow, only to shrink. But that might be fine.

Back to the initial question: How would being an aktual enable you do run a Zip on your body's cells?

If I use rake link, then I might say that I have a physical relationship with each cell. If I don't use a rake link, then I might say that, merely by being "identical" to one of my cells, I'm able to use that cell as a foreman to boss the other cells around to fan out.

Pondering this still more, I don't see a real necessity of letting Jayjay shrink in size. I have so many gimmicks already, I really should to ration myself and not add more things in. If anything, save shrinking for a later volume.

I can still have the pitchfork shrink to get under the door, though. He's different.

September 3, 2007. Hibrane Religion.

[[Blogged this](#) entry on Sept, 3, 2007.]

When I was writing *Postsingular*, I thought it would be interesting to have the dominant Western religion of the Hibrane be slightly different from Christianity. So I wrote:

"We like to eat them [cuttlefish]," said Azaroth. "I thought you knew that. Thanks to teeping and omnividence, we fished our own cuttles extinct. Since then, the planetary mind has taught us to be more careful. In any case, our people especially dig eating the Lobrane cuttles since they're so dense and chewy. I should also mention that cuttlefish symbolize a certain holy cuttlefisherman of ancient times. He rose from death on the triangle to found one of our great world religions."

Relative to little Thuy, the single-story shops and houses were as tall as office buildings. The buildings looked to be assembled from naturally grown components as well. Overhead, shells and shiny seedpods hung upon lines stretched across the street; they'd been crafted into representational forms: a star, a candy cane, a cuttlefish holding a triangle—Thuy recalled Azaroth's mentioning that the cuttlefish was a symbol for a Hibrane religious figure. Perhaps these were ornaments to celebrate a holiday.

"What!" exclaimed Gladax, taking the bait. "I told those flowers they have to stay red right through to the end of the Cuttlemas holidays."

This change seemed cute and funny at the time, but now it's coming back to bite me in the ass. Because Hieronymus Bosch's art is loaded with Christian iconography, and the time he lived in was dominated by the Roman Catholic church.

So I need to think of a Hibrane religion that fits with the cuttle/triangle thing and is close enough to Christianity so that my envisioning of Bosch can be comfortably close to my goal, which is our own historical Bosch.

First of all, as a fabulist (and setting aside whatever my realworld religious beliefs might or might not be), I find it interesting to suppose that our religions were indeed founded by otherworldly beings—maybe higher-dimensional, maybe divine.

So the appearance of Christ wouldn't simply be an inevitable historical stage, on a par with the emergence of the alphabet. It would, rather, a somewhat arbitrary and unpredictable irruption of a higher reality in our mundane world. On a par, if you will, with the three-dimensional A Sphere choosing to manifest himself to flat A Square in Flatland.

Or, closer to my novel *Hylozoic*, it might be that some actualized higher being like the harp or the pitchfork made an appearance as Jesus Christ, with motivations that most would suppose to be benevolent, although it could even be that starting a religion serves some arcane alien purpose that we're unaware of.

If we take Christ's life as being the unpredictable intervention of a higher being into human history, then there's no absolute necessity for a Christ to have appeared in an otherwise identical parallel Earth. Things very much like puffballs and oak trees must evolve, but a monotheistic religion based upon the Beatitudes and clinched with the prophet's execution and resurrection—maybe that's not inevitable.

If higher beings are motivated to meddle with our timeline, it's likely that they'd want to poke into the parallel line as well. But they might happen to do it a bit differently there. So we can suppose that the Hibrane has something like Christianity, only different.

In other words, I'm supposing that the harp or the pitchfork or some other actualized higher being did in fact incarnate themselves as a Lord and Savior and founder of a world religion in the Hibrane. Maybe at some point the actuals will in fact tell us about this.

And, on the evidence of *Postsingular*, I know that this avatar was a man who was a cuttlefisherman, and who was executed on a wooden triangle.

What was the Hibrane savior's name?

Jude Christ. According to an online Catholic Encyclopedia, [Jesus had four "brothers,"](#) although the orthodox view is that these were in fact cousins. Their names were Joseph, James, Simon, and Jude. I think I'll use Jude because of the dissonance caused by the echo of Judas the Betrayer, and the positive energies of the Beatles, "Hey Jude," Hardy's *Jude the Obscure*, and my deceased *Mondo 2000* friend [St. Jude Milhon](#), "The Saint of Hopeless Causes, Dubious Cases, and Children's Aspirin."

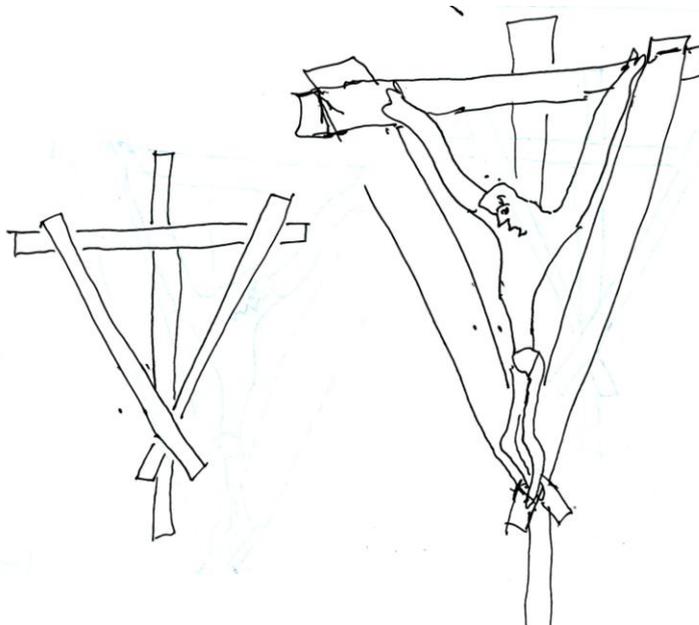


Figure 15: Jude Christ on the Triangle

How exactly was Jude Christ executed on a triangle?

It's similar to crucifixion. They nailed together three boards to make an isosceles triangle with its narrow vertex down. Possibly the construction was backed by a cross—indeed many crucifixes have slanting props. In the Hibrane, people just happened to focus on the triangle.

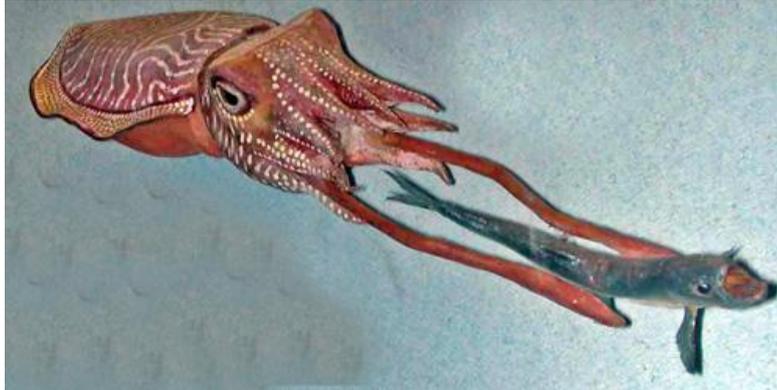


Figure: Cuttlefish

[Photo of a model of the Common European Cuttlefish *Sepia Officinalis*, to be found in the Mediterranean off the Holy Land.]

How can cuttlefish be made a warm and fuzzy religious symbol like the lamb?
He embraces everyone. He reaches out. (Just kidding with that picture.)

September 12, 2007. Finished the First Bosch Chapter (Chap 5)

I blogged this entry on [Sept 13, 2007](#).

I was so buffaloes about how to depict Bosch, and then, somehow I was able to write him. He's a mix of Kurt Gödel, my mother, and me.

It seemed like meeting him should be a turning point for Jayjay, so I had him become a painter and get into true recovery from his Big Pig addiction.

The chapter came out quite fast; nearly 15,000 words in about two weeks. White heat. I'd outlined a lot. Outlining works! It's like I'd just paste the outline into the text like a drawing and then color in between the lines.

The pitchfork showed up, I like the pitchfork.

The day after I finished I started feeling sick: weak and feverish. Maybe it's a virus. Or maybe I depleted myself working on this so hard. I really dug down deep into my psyche. Or maybe it's not so healthy a thing to twink a dead genius like Bosch. In effect, I conjured him up, and I've been dancing with his shade, not being all that respectful to him, either. Teasing him, arguing with him, trying to rile him up.

Today I couldn't write anymore, and I was painting. I started the missing left panel of my *Hylozoic* triptych. And, without realizing this was what I'd do, I ended up drawing a giant beanstalk that has an arabesque curve like the plant in Bosch's Saint John the Baptist, which plays a big role in the chapter: Jayjay sneaks into the cathedral and paints that plant over an image of donor that Bosch has fallen out with.



Figure 16: Bosch's *Saint John the Baptist* (Partial).

Bosch was giving Jayjay lessons on how to paint this vine. And now he's giving me the lessons. Hi, *Yeroon*.

I should mention that in the Hibrane version, that will be a cuttlefish down on the right, rather than a lamb, as over there, the cuttlefish is the symbol of the Savior Jude Christ who died on the triangle for our redemption.

I used to think Saint John is a boring picture, but now I really *see* it, and it's just as wild and rich as a Hell picture. Check out those bizarro insects (locusts!) hanging on the plant. (I think Saint John lived on honey and locusts, no?)

The donor is Jan Vladeracken, a pig-faced man whom Bosch (according to me) caricatured in the central panel of *The Temptation of Saint Anthony*.



Figure 17: Bosch's *Temptation of Saint Anthony* (Detail).

I love St. Anthony's face. I figure Bosch might have had this expression sometimes. St. John looks kind of the same way. Alert.

I had Jayjay drinking out of a flat dish of wine like that too, with a bunch of ergot-poisoned beggars who are losing their limbs.



Figure 18: Drawings of cripples, attributed to Bosch.

For the longest time, I couldn't get into Bosch's world, and now I'm inside it. It was like one of shiny seedpods, and after some 45 years of buzzing around it, I finally found the hole. The seeds intoxicatingly sweet on my mandible mouth-parts.

I'm sad to be done with the chapter, I loved being in that world and feel like I'm just getting to know Bosch now. Well, I can come back to him in Chapter 7, from Thuy's point of view. But now—unless I change my plan—I have to jump back to be with Chu on Earth.

Looking forward to Chapter 7; in there I can describe first hand the coming of the lazy eight change. I elided that change on the Lobrane by having it shake down between the end of *Postsingular* and the start of *Hylozoic*. In Chapter 7, I can do more of a blow-by-blow. And it'll be good to be back to the theme of hylozoism.

I looked at my outline of the remaining three chapters, and the outline isn't very strong. So I'm gonna have to work on that for a week or two. Also I may want to reread Chapter 3, to get back into Chu's point of view.

My current POV rhythm of the book is this:

Chap	POV
1	Jayjay
2	Thuy
3	Chu
4	Thuy
5	Jayjay
6	Chu
7	Thuy
8	Jayjay

Table 10: POV

So it's JTCTJCTJ. Nice and jaggedly off-balance, not too symmetric, and I end up with what I want, which is 3 J + 3 T + 2 C, setting J and T as the main characters.

I'd considered having Chap 8 be Chu's POV, but now that Jayjay's gone through redemption in Chapter 5, we want to see him enjoying his new life in another chapter, so Chapter 8's gotta belong to him.



Figure 19: Plan for Hylozoic Triptych

Right to left, I see three scenes in my Hylozoic triptych that I can use.

- Chap 6: The subbies under the ground. They're actually seen by Chu, and not Thuy as depicted, but the picture stays that way as Thuy is so iconic. They're in the Lobrane where our space is being totally rotted out by Peng runes.
- Chap 7: The Hrull coming to save Jayjay and Thuy with Thuy inside. That's Jayjay holding the brush, and those glowing dots are hylozoic eddies in the air.
- Chap 8: The beanstalk shooting up through the sea between the worlds and mounting clear to heaven/infinity. Jayjay sees that on the (triumphant) flight back from Hibrane to the victorious cleansing of the Lobrane.

In a way, it's a shame the flow isn't the more expected left to right, but if I were to put that right panel on the left, the composition wouldn't work, and today already planned the composition of the beanstalk panel to fit on the left.

It'd be very vibby to instantiate the beanstalk that Jayjay dreamed about in Chapter One. It wasn't really a dream, it was a precog vision. I have been so obsessed with Jack's beanstalk my whole life, I saw a cartoon of it when I was a kid and imprinted on it forever. I almost put the beanstalk in *White Light*, and I hinted around the beanstalk in *Spaceland*, but now I can really do it.

I didn't know I could do it until I started painting it today. Thanks to Jeroen gibbering over my shoulder.

"You may get some better, but you'll never be well no more." --- Skip James.

September 19-22, 2007. Planning Chaps 6-8.

After finishing the Bosch chapter I took some time off for other things. I finished painting that triptych, and rearranged it with the subbie dancers on the left and the vine on the right. I started another couple of pictures too.

Tor has agreed to fund a gallery show by me in SF, November 9-11, 2007, as part of the *Postsingular* publicity. I'm scared to death.

And I put together a new issue of *Flurb*, #4. I decided to make *Flurb* just be semi-annual, it's so much work. A chunk of Chapter 5 went in as my [story in Flurb #4](#), called "Hieronymus Bosch's Apprentice." I just used the middle part, with Bosch onstage.

And now I'm ready to get back to the novel. Sort of ready. I'm kind of avoiding the writing, still. So I'm compulsively revising the outline of the next three chaps, over and over and over. But I know from experience that's not actually a waste of time. The more detailed the outline gets, the easier the chapter is to write.

Here are two questions I thought of right away.

Q: I want Chu to meet up with Duxy and Wobble. Where are they?

A: Recall that Lusky is a big female, Wobble is her small husband, and Duxy is her small daughter. Duxy urged Chu to teleport her to Lusky to escape the Peng. Duxy and Wobble didn't get aboard because Wobble said it was good strategy to split up when reconnoitering colony worlds, just in case one is ambushed. Also they wanted to isolate Chu for Lusky to swallow.

Meanwhile the two Hrull went to hang out at the beach, the Lost Coast of CA, south of Eureka between Petrolia and Shelter Cove, living in a grove on a bluff and seining (like manta rays) the water for brine shrimp and possibly some minnows. Or maybe bigger stuff. Salmon and squid. Or even seals!

They hate the Peng at Yolla Bolly; conversely the Peng would shoot the Hrull on sight.

Q: I want the Peng to redouble their invasion even though their medium Jayjay is gone. How does this play out?

A: Suppose that someone figures out a programming hack whereby tulpas can act as mediums. So that once the matter on a planet has been programmed to generate a single Peng tulpa, this tulpa can now act as a medium and infect the rest of the matter, so that the Peng invasion spreads exponentially, like rot, penetrating even into

the interior of the Earth. It's like a self-referential quantum computation, or self-modifying code. A universal tulpa.

This has never happened before, the Peng never thought of it yet. So it's a big deal, a huge discovery. Who makes it? I don't want it to be Chu, as there'd be no way for him to give the secret to the Peng without seeming bad.

The young Peng Kakar figures it out. He learned some physics by being linked to Jayjay. He's talking to Chu about it. Chu inadvertently helps Kakar, who starts asking him interesting math questions.

The reason Chu is with Kakar is that, after he goes up near Eureka with Glee to hang with Duxy and Wobble, he realizes that he doesn't want to be a Hrull Pusher. And Duxy is pressuring him, and Chu keeps wanting the Hrull gel, so he goes into the Peng Ranch to kick, as that's one place the Hrull are scared to go.

And Kakar is a kindred spirit, as it turns out (I'll have to go back and rewrite him a bit, as he's currently just a cartoon). Kakar is kind of an autistic genius himself. And he's picked up some physics from teeping with Jayjay, and he has a conversation with Chu, where Chu doesn't realize where it's leading to, and, like I said, Chu inadvertently gives Kakar the missing piece, a solution, say, to a multidimensional system.

Of course Chu is guilt-stricken afterwards, and wants to fix things, and that's when he decides to hijack Duxy and fly her to the Hibrane. Or perhaps Duxy tries to snatch Chu and then he hijacks her.

Call Chu's discovery Chu's Hack, or maybe some cooler expression, remember Chu's Knot. What is the discovery like? It's a method for tulpas to reprogram matter, and perhaps later (but not immediately) it spills over to human aktualization.

I think at the end of the novel, everything on Earth will aktualize; we'll have yet another discontinuous change—this seems to be a theme for the trilogy. And this is ultimately the only way to repel the Hrull and the Peng: by a fundamental change. Grow or die.

I really need to develop a better understanding of what aktualization is about. I'll suppose the ability it gives us that we never had is direct matter control.

And in Chapter Eight, Jayjay finally twigs that he can do this. Feeling a tendril of Panpenga's control, he creates himself a helmet coated in whatchamacallit. Quantum-mirrored square-root-of-NOT varnish. Or, fuck the helmet, he just grows that stuff into his skin like pigment.

How is Panpenga so knotted into him anyway, and can't he uproot her for good? Could Panpenga just as easily take over Chu? Maybe it helps Jayjay that, inspired by Bosch's pep talk, he's let God into his heart in order to conquer his gluttony.

What is the name of Glee's home planet? I see it as a sixties world. Summer of Love. Sergeant Pepper. Beatles. Haight Ashbury. Hepple. Hepper. Like Happy and Hep. But kind of New England, that. Happle, too much like **ugh** Apple.

Pepple. That's close to People and Preppy and Pep Rally. All of those are like high school, which is stupid, but good for this context. Pepple is like the lost high-school innocence you can't go back to. The dreamed-of Riverdale High or More

Science High or Rydell High that never really existed, a mythical Eden, a longed-for Arcadia, a legendary Golden Age.

Do Peng and Hrull aktualize, too? Suppose aktualization is something that only humans can do: like teeking. Thanks to our remorse, doubt and fear.

We are the Chosen Racial Category.

If this is the case, then the harp and the pitchfork are in fact transmogrified humanoids. Fine. And—tada!—they come from Pepple. Glee in fact knew them before they were aktualized.

The Hrull learned the reset rune from the harp and the pitchfork, whose real-life Pepple names were, *hmm*, how about Wilbur Tarkington and Glenda Gomes. Or, no, I have it: Groovy Blevins and Lovva Moore. A skanky hillbilly meth-n-acid freak and his flower-child stripper girlfriend. Drop the last names. Groovy and Lovva. Wow.

[Have I had a character based on Lova Moore (= Love + *Amour*) before? I feel like I have. I heard that stage name at the Crazy Horse Bar in Paris, when Sylvia and I saw the strip show. Lova crawled around on the stage on all fours, naked, and on her way into the wings, she doggishly lifted one leg to the side for a moment, thereby flashing pink for the high-rollers at the front tables. The drunken stage-door Johnnies. I'll use two v's in my Lovva to match the two o's in Groovy.]

This is a considerable collapsing of possibilities—busting the harp and pitchfork down from being gods to being people that Glee knew back home on Pepple. But that's what you gotta do to wind up a book, and in Chapter Six I definitely need to be starting to narrow things down. The Big Bang, the expansion, the Contraction, The Big Crunch=The End.

September 23-24, 2007. Actuals and Jootses. Circular Causation.

I recently decided to end PS2 by aktualizing everyone on Earth. So my PS series keeps having these huge apocalyptic changes hit Earth: Nant Day, Orphid Night, Lazy Eight, Aktualization.

And in Chapter 6, Glee tells Chu that everything was aktualized on Glee's home world Pepple, and that the harp and the pitchfork are in fact aktualized people from Pepple, people that Glee in fact knew, named Groovy and Lovva.

Caution: if I aktualize everyone on Earth at the end of PS2, I need to be careful about what aktualization entails. For I can't have it mean that everyone on Earth is permanently changed into a spacetimescale thread like the pitchfork or the harp, still less can it mean that everyone becomes a transfinite god.

For if I totally change what it means to be human at the end of PS2, then there's no good way to write PS3. I want to have PS3 still be on physical, funky Earth—although with some visits to places such as Hrullwelt, Pengö, the Hibrane, Subdee and the Beanstalk Castle (a.k.a. Walhalla).

I'll stick with the terminology I've been using: undergoing aktualization turns you into an aktual. So Jayjay is an aktual, and most of the humanoids on Pepple are actuals, and soon everyone on Earth will be actuals. Fine.

But now I need some stronger terminology than "aktual" for god-like higher beings such as the harp and the pitchfork. If you are an aktual, you then have the *possibility* of becoming something like the harp or the pitchfork, but you're not automatically like that *all of the time*.

I see the transformation into the "god mode" as being of a temporary nature, like donning a costume, or going into a trance. So in PS3, our human characters

might off and on become god-like beings for a time, perhaps meddling in the timestreams of other worlds, but then snapping back to being, like, homemakers, scientists, or street-corner junkies on the nod.

So I need a new word for an aktualized humanoid who is temporarily like a god. Easiest to just say god, but, as I mentioned before, the word carries way too much baggage. A high aktual. A jaunter. A mummer. A *joots* (from Douglas Hofstadter's JOOTS=Jump Out Of The System).

"I'm a joots," said the pitchfork. "Lovva's a joots. We're jootses."

In a way, I'm loath to invent a special word for this category of being, as I already have a surfeit of special words, making up words is something I'm good at, but it's also something I'm prone to overdoing. But, hey, eventually I am gonna need a word for this, as I plan to talk about it some more, so let's just bite the bullet and go with joots.

Alright, then it's the pitchfork and the harp, Groovy and Lovva, and they're aktualized humanoids who are jootses, that is, temporarily like gods.

And they come from Glee's home world Pepple.

What are the motives of these two jootses in messing with our world? Well, let's look at what I currently say they did, putting an H or a P to indicate who did it, the Harp or the Pitchfork.

- H. Unfurled the Lobrane lazy eight.
- P. Showed Jayjay a vision of the beanstalk and the many scales.
- P. Allowed Panpenga to get control of Jayjay.
- P. Gave Jayjay the ability to runecast tulpas into atoms.
- P. Thereby allowed the Peng to invade Earth.
- H. Gave the Hrull the reset rune which undoes the tulpa runecasts.
- P. Helped Jayjay escape the Peng in San Francisco.
- P. Taught Dutch to Jayjay and Thuy.
- H. Unfurled the Hibrane lazy eight.
- H. Showed Jayjay and his pals the beanstalk between the worlds.

Groovy/Pitchfork and Lovva/Harp are like a bipartite god. Manichean. The pitchfork is more negative (Devil), and the harp more positive (God). Maybe Lovva the harp is wiser and more helpful. She's the one who unfurled our lazy eight.

Q: Why do they want us to have Lazy Eight and aktualization? Why would they want to improve us?

A: Because they know that ultimately we're going to do the same thing to them. Closed causal loop.

Q: But why did the Pepple jootses help the Peng invade Earth? Was that completely an accident?

A: I had been thinking it's just that Groovy the pitchfork is something of a fuck-up. And that he was half-assed and let Panpenga hook into Jayjay, so sorry. But now I'm saying he screwed it up on purpose because he was selling out the human race to the Peng who were giving him _____ in return.

I've got it: Fill in the blank with "eternal worship of Groovy by the enslaved human race, worship on a par with what Jesus or the Buddha gets." But the Peng

show no sign of making good on their end of the deal, so the pitchfork starts helping us.

And what about Pepple? Who unfurled lazy eight for them and aktualized them? A different couple from Groovy and Lovva. In fact, I could take another hit off the time-loop bong, and have it be two humans from Earth who unfurl and aktualize Pepple. I can do this right at the end of PS2. (I don't think this reveal is a big enough pay-off to hoard for PS3, I can make up some other big flashes for PS3, best set off all the sky-rockets I've got handy right now for PS2.)

So at the end of PS2, two humans temporarily become jootses and travel to Pepple and unleash lazy-eight and then aktualize the people on Pepple, appearing in joots form as a snake (he) and a sphere (she). It could be Jayjay and Thuy. In parallel to the harp's and pitchfork's roles, the woman unfurls lazy eight, and the guy aktualizes.

Instead of Thuy and Jayjay I could echo the "Coma Nurse" chapter to have it be Chu and Thuy, naw, we don't want to revisit that. Or, looking ahead, I could have it be Chu and Bixie, but again, naw, why pin so much on an untested unfamiliar character in the last scene. Better to do Jayjay and Thuy. Thuy used to be a musician in high-school.

I could do this offstage in a quick paragraph, have them go and come back, seeming to return moments after they left. I could even I put this scene in a 3rd person omniscient POV section that's cordoned off by a section break, like I did at the end of PS1.

On the other hand, I'm planning for it to be Jayjay's POV in the final chapter of PS2, so I could do the transformation of Pepple from his POV. Why not milk it for a few pages, after all. I don't have that much stuff for the last chapters yet.

I'm thinking that *all* the runes have their origins in time loops. Maybe in PS3, we learn that these circles are like raindrop spreading from drips coming down from transfinite heaven.

Walhalla on the beanstalk is a kind of club house for jootses. The pitchfork shows it to the gang on their way across the sea between the worlds. Great name for a bar or a coffee shop: *Walhalla On The Beanstalk*. But I think I'll just call it the castle on the beanstalk. I'm into eliminating double names now, and just having one name for a thing.

Back to the notion of Bixie and Chu appearing as jootses on Pepple, looking like a snake (he) and a sphere (she), I had also thought of a capital letter omega and a book—particularly if I sent Thuy instead of Bixie, she could be a book. The snake can be omega, really. And th sphere can be a crystal ball. A metanovel viewport, fitting for Thuy, like the balls in *Frek and the Elixir*.

Wrapping up this fantastic tale, I feel like Escher trying to make a fantastic impossible landscape at least look consistent. Forget verisimilitude and mimesis, this is about wonder and amazement. Prognostication—*feh!* I just want this wobbly-ass house of cards to hold up long enough so I can "take a picture" and print it as 5,000 books.

September 25, 2007, 2 am. Trying to Start Writing Again.

Working on these notes at two in the morning. I got up from bed, I can't sleep well as I have adductor tendonitis where my left hip meets my groin. Intense pain. I got some arthritis medicine, Celebrex, I wish I had opiates. "I want a shot of heroin," an 18-letter mantra I count on my fingers as the long slow seconds of night trickle past. But the heroin never comes, just another night and day of relentless sobriety. (That kind of talk suggests that I haven't been to enough Recovery Group meetings this month!)

I keep revising and working on notes, and circling around, building up to the point where I can start actually writing again.

As Chapter Six is from Chu's POV, I think I'll revise Chapter Three first. A way to postpone the longed-for-yet-dreaded work for yet another day.

I got the newly published original scroll text of Jack Kerouac's *On the Road*. I was reading the great dynamic description of downtown L. A. tonight. Thinking it would be nice to have my Chapter Six start out like that, with Chu and Glee seeing all sorts of stuff going on in San Francisco right after the Hrull crash.

A cityscape—with *silps*.

September 25-27, 2007. Revising Chap 3; Simplifying; No Aktuals.

A lot of things come to a head in Chapter Three—where the humans meet the Peng, so as I revised this chapter, I had to rework a lot of my basic ideas, leading to systemic revisions throughout the book

Instead of distinguishing humanoid worlds from other worlds, I'll do better to think in terms of RDF worlds being special, where RDF stands for remorse, doubt, and fear. These emotions emerge from our prototypically human ability to imagine alternate worlds, and they potentiate our ability to teleport and to exercise direct matter control (a. k. a. runecasting). But, not to be chauvinistic, I want to leave open the possibility that some non-humanoid beings might have RDF as well. Just not the races derived from birds or manta rays.

To repeat, we suppose that although lazy eight can indeed bring teep to any world (RDF or no), only RDF-worlders can capitalize upon teep to teleport themselves and other objects and perhaps learn to do direct matter control as well.

I have six kinds of aliens right now: Subbies, Hibrans, the Peng, the Hrull, the jootses, and the Pepples. I know that's too many, but, dammit, I need them all!

And I have a confusing plethora of special powers, some of which are enjoyed only by humanoid or RDF beings. (Once again, RDF stands for remorse-doubt-fear.)

Gaaah! Well, think of this trilobitic trilogy as a Bosch triptych with lots and lots of trippy cootie-critters tip-toein' around.

Here's a summary of the special powers.

	Lazy Eight Teep	Local Teleportatio n	Intergalactic Teleportatio n	Aktualization	Runecasting	Projectin g a godlike avatar (formerly called a Joots)
Humanity or RDF Aliens	Yes	Yes, although unimaginative people like George Bush can't.	Yes, but not everyone.	Yes, although a few can't.	Yes.	Yes
Non-RDF Aliens	Yes	No	No	Yes	No	Yes
Silps	Yes	No	No	Maybe	Maybe	Maybe

Table 11: Special Powers

That's way too much stuff. Can I simplify by eliminating the scale element of aktualization? The scale stuff I wrote is quite beautiful and interesting, but why not save it for a different story or book? Well, I might keep it anyway, as a way of talking about getting an infinite mined.

At least I'll get rid of "Virg," the personification of the Virgo galactic supercluster who was supposedly the giant in the castle. We'll say the giant is gone, he moved up into the hills. But maybe in the last chapter he comes back. Hooray, a seventh kind of alien!

Instead of involving scale, aktualization might involve a direct awareness of the accessible point at infinity lying at along of the eighth dimension.

Suppose that the beanstalk grows along the eighth dimension, and that the Walhalla castle is at the eighth-dimensional point at infinity. Normal teep runs up, bounces off the castle wall and runs down. But if you're aktualized you permanently park a part of your consciousness in the actually infinite location of the castle.

Dig: this is an objective correlative of "God consciousness."

This approach would be reasonable as otherwise I am in effect wasting the Zeno nature of the eighth dimension, referring to it only once or twice in throw-away lines.

By the way, the giant's castle atop the beanstalk is always drawn in position $\omega+1$. The stalk disappears into a cloud, which is the ... segue to ω , and then there's a bridge, which is the ω leading to the castle at $\omega+1$.

This is such a basic human thought mode.

And if we set it up like this, then there is the possibility of going past the castle into the foothills, climbing Mt. On., as I'd like to do in PS3.

Q: Do I need the notion of aktuals and aktualization at all?

No. The main thing about aktuals is that they have actually infinite minds.

But, duh, as soon as you get lazy eight, you have an actually infinite mind. You have the infinite spike of memory that you can access in finite time using a Zeno speedup. So now I'm going to remove all mentions of aktuals and aktualization.

Anyone from a lazy eight world can send part of their mind to the castle at the top of the beanstalk. There are lots of folks hanging out there. It bustles like a bazaar, like a walled city.

Q: What gives Chu his ability to runecast ioneer code into matter's quantum computations?

A: Two factors: (a) his teek ability, arising from lazy eight plus RDF, and (b) his ability to carry out an actually infinite mental computation.

Any other human can do the same, but to it takes the pitchfork's encouragement and Panpenga's pressure to get one first human to start doing this.

We can all learn direct matter control, once we learn how to capitalize on our infinite memory spike to think infinite thoughts. For my sense is that physical alterations are in fact infinitely intractable problems, akin to solving the halting problem.

Q: How does Chu makes tulpas that can effectively runecast personality codes?

A: Chu gives the tulpas their ability by converting them into RDF beings. So although the Peng can think infinite thoughts—for instance when they encrypt themselves into runes—they can never achieve RDF and cannot program matter themselves.

Chu humanizes the tulpas. They have infinite minds *a fortiori* as they're patterns in our lazy eight world.

Q: What are the avatars?

A: Suppose that infinity is in some sense the fuel that creates spacetime. So if you go out the back door of the castle—or maybe it's enough just to have a part of your mind in the castle—you can plug into the fundamental nature of spacetime and emerge anywhere and anywhen as an avatar (which I was for a week or two calling a joots).

To be quite literal, I might suppose that in the basement of the castle, there is a data center supercomputer that is computing spacetime. And if you have a presence there, you can stick things into the code to make your icon appear anywhere and anywhen.

And this is open to non-RDF aliens as well as to humanoids.

Q: How did the Peng and the Hrull get lazy eight?

A: Let's suppose they too had a visiting avatar bringing it. A bird god and a stingray god; the races help their own similar worlds. This means I have to rewrite the bit about a "King Orfee" bringing lazy eight it to Pengö; Orfee has to be a godlike bird avatar.

Q: How did the Peng hire Groovy?

A: Suller or Panpenga hooked up with him at Walhalla.

Q: How is Panpenga attached to Jayjay?

A: Groovy points Jayjay out to her, and vice versa. She latches onto him while he's all new and fresh and impressionable.

Better idea. Don't use abstract Panpenga, use one particular secretary bird, Pekka Pekkandottir; she seduces Jayjay, she looks like La Azteca.

Q: The Hrull get the atomic reset rune from the harp. Wouldn't Suller know that this might happen? So why would he then dare double-crossing the pitchfork?

A: Maybe Suller doesn't know jack about Pepple. But he'd kind of suspect they were immune, wouldn't he?

Maybe Suller didn't flat out say no to the pitchfork, but was only stalling him. And he didn't know the harp was going to triple cross him.

Maybe there's a constant attack/counterattack evolution/coevolution fight between the pioneering races and the pusher-travel races. Suller thinks they can handle Groovy's rune. There's a constant buzz of dealing at the castle on the beanstalk. There are inexhaustibly many humanoid worlds in the infinite universe, endlessly many parasitic ioneers, endlessly many pusher-using travelers. The ioneers are like spam, the reset rune is like a spam blocker—a given blocker may or may not work against a particular kind of spam.

Q: In what sense did Waheer invent runecasting?

A: Suppose he was aktualized—perhaps by Orfee once again—and that he was able to carry out the actually infinite process of self-encryption, as described in my [note on the halting problem](#).

Q: Do I really need for the runes to be infinite?

A: Before, I had them be infinite to justify the fact that only Jayjay could be a runecaster, as only he had an infinite mind. But now everyone's mind is infinite, so whether the runes are infinite or not isn't a hurdle either way.

This said, I do want it to be the case, at least for a little while, that only Jayjay of all humans is a runecaster. And presumably this is because he accompanied the pitchfork to the castle on the beanstalk. In principle, any human could already have gone there, but nobody happened to know the way.

And I can suppose that your mental attitude towards infinite thoughts is changed by visiting the castle—and thereby spending some quiet time out past infinity.

If, I *were* to make the runes finite now, then there'd be no obvious reason why any old human can't cast them. So let's keep the infinite info.

So now implementing these ideas, I rewrote Jayjay's end-of-chapter-one vision for, like, the fifth, sixth, and seventh times. This passage is such a nerve-center.

I took out all mentions of aktuals or aktualization, as they are, I have now decided, otiose.

And I decided to have Jayjay under the control of some one specific Peng, rather than the planetary oversoul. Pekka Pekkandottir. That makes it funnier and it seemed odd anyway to have a planetary oversoul in the castle on the beanstalk when I'm seeing everyone else in there as human-being-sized.

I figure there are a number of these birds like Pekka working for Warm Worlds, and Pekka is assigned to Earth. She's just a low-level employee, like a realty company worker, a mortgage broker, an assessor, like that. And she makes herself look hot when Jayjay sees her in the castle, that's how she gloms onto him in the first place, good old sexual obsession, never fails.

Making all these changes, I sent Marc Laidlaw an email embellished with *Mad* magazine hacking-maniac axe-murderer sound effects:

"I keep trying to simplify it now, ripping out things I thought were vital organs, and all the wriggly tubes that were attached to those organs. *Squelch squelch, hunnh huunh.*"

September 28, 2007. Revising Chapter Four

I just did a ton of systemic revisions—eliminating scale, aktuals, and Panpenga—also revised a printout of Chapter Three page by page to get into Chu again—and the process is getting *good* to me, I like the sense of burnishing what I've done, so now I'm gonna revise Chapter Four instead of starting to write Chapter Six.

In any case, I have a bit of a fever this week, as well as an inflamed hip tendon, and don't feel up to starting the new chapter. Revising is easier, though not that easy, as I keep finding inconsistencies I have to fix.

Sept 30 - Oct 2, 2007. Gods, Runecasting, Vision Fix.

So I finished revising Chaps 3 and 4, and I'm gonna leave the revisions of Chaps 2 and 5 for when I take a break between Chaps 6 and 7.

Now to revise the outline for 6-8 again. I have to change a lot of things because of those simplifications I made. And I'm seeing more issues.

Possibly I was too hasty in getting rid of aktualization? Well, I can use it in Chapter 8.

When I'm unsure and switching plans it's very unsettling. Skirting the abyss. Uncertainty. Space walk.

I want to have Glee the pusher, Groovy the pitchfork, and Lovva the harp all come from the same planet, Pepple. It's all about simplifying now.

I need to develop some characterization and backstory for these three, at present they're just, respectively, a junkie, a comedic yokel, and mystic songstress. I need more.

Pepple is like Earth, but people photosynthesize with their skin. And they're weatherproof. So they're more mellow, more plant-like. They have an anarchistic society. They like flickering light-shows; that's their main art form. Maybe they can glow like lightning bugs. They form families like us. The population is very dense, there's not much privacy. They're ruled by an aristocracy.

Glee was pursued by a stalker and she killed him. He was high-ranking in her society so she was in trouble. She ran away with her friend Kenee, not really a lover, just a roommate. He himself was in trouble for being a political agitator. So they let the Hrull take them away.

Lovva is a musician. She played buzzing drones to go with light shows.

Groovy is her boyfriend, he's a carpenter. He builds stands for concerts.

Lovva and Groovy lived next door to Glee.

They went to a concert and got so into the music that they went up to the castle on the beanstalk and they never came back. They became gods. Perhaps they

were led by some gods that they saw (circular causation, these visiting gods were Thuy and Jayjay.)

I think first Glee left, then Lovva and Groovy disappeared.

Q: What are the pitchfork and the harp?

A: I have gone through four answers now. I have variously called these beings aktuals, jootses, avatars, and gods. I'm going to stick with gods.

(1) Initially I thought of the gods as being transfinite beings, whose infinitude arises by being linked to every level of scale.

(2) Then I thought of the gods as being like an astral projection arising by some fundamental tinkering with a remote, central computational reality engine inside the castle on the beanstalk. The projection can pop up at any place or time.

(3) Then I was briefly thinking they should be tulpas, so I don't have two kinds of immaterial beings. A tulpa arises by tinkering with a quantum computation taking place out in the world where the tulpa is to appear. And I like that more than (2), as I like distributed computations better than centralized ones; the notion of a central computer is very stale and 1970s. But if the pitchfork and harp are tulpas, I would want them to be in some sense better quality than the Peng tulpas. I wouldn't want them to be using up gnarl like the Peng tulpas, and casting penumbras of dullness. Perhaps I could also suppose that these avatar-tulpa computations are more lightweight and portable, and that they slide around with the moving avatar-tulpa, rather than being installed on a given chunk of real estate like a Peng tulpa. Perhaps they are subquantum computations, which are possibly disturbing to the subbies.

(4) Finally I decided that I should go back to having them be transfinite gods. And to have it be a one-way transition: when you become a god, you can't come back and be a human anymore. (Although maybe in PS3 we do find a way to bring Jayjay and Thuy back.) This transition may involve the "aktualization" scale link as I had originally thought. The difference is that now, rather than throwing this into the very start of PS2, I will save it for brief mention at the end of PS2, and a fuller exfoliation in PS3. I have enough ideas for PS2, so it's better to push infinity-via-scale into PS3.

Q: What is runecasting?

A: I am thinking in the following terms about runecasting, which another word for direct matter control, that is, the ability to change objects by thinking at them.

runecasting = infinite thoughts + telekinesis.

I require *infinite thoughts*, because of infinitary perturbation theory: if you try and alter one thing in the world, then you have to take into account the changes this makes on other things, and then you have the back reaction of those other changes onto your original system, and you go around this loop endlessly, producing an infinite series you must sum. (A guy called Kenneth Wilson got a Nobel prize for working on the somewhat related idea of using the so-called renormalization group to handle systems where we have contributing factors at every length scale.) I see the ability to have infinite thoughts resulting from lazy eight RAM and Zeno speed-up access, but not just from that, you have to take some other, catalytic step which I'm presenting in terms of a visit to the top of the beanstalk (for Jayjay), or as the use of Chu's Hack (for Chu and, later, for everyone).

And I see the *telekinesis* as resulting from RFD, that is, the ability to experience remorse, doubt, and fear. Why so? Because these emotions involve thinking of alternate worlds as real. The involve quantum coherence, which means

being simultaneously in different pure states. At the quantum computational level this means that your consciousness can become coherent and split across several worlds.

So I'm saying that telekinesis alone isn't enough to reprogram matter, you need infinite thought as well, as the matter changes out from under you as you program it, producing infinitely iterative perturbation loops. So, once again:

runecasting = infinite thoughts + telekinesis.

I could also write this in other ways:

runecasting = top of the beanstalk + remorse, doubt, and fear.

runecasting = Chu's hack + being humanoid.

runecasting = Jayjay's talent + humanity's talent.

In the last, general, formulation, Jayjay's talent is something that the aliens already have, and which Jayjay acquires. And humanity's talent is something that only the human race has. (If I have a big problems with infinite thoughts and telekinesis, I could perhaps realize these desiderata in some other way—though I'd rather not have to change everything and tightrope-walk yet again across the abyss.)

Q: What is Chu's hack?

A: He discovers how to utilize our endless RAM as an aid to thought so that you can in fact think infinite thoughts in a finite amount of time. In particular, he sets up a system where you have a built-in Turing Evaluator.

By using Chu's Hack, any human willing to put in some mental work and retooling can learn how to runecast, that is, how to carry out direct matter control.

The immediate side effect is that this technique reaches the Candler Road Church fundamentalists, and they set to work installing more and more Peng; they are eager to help Pekka.

Chu learns Chu's Hack from his conversations with Kakar. Kakar already knows infinitary logic. Chu is able to duck Pekka, himself. Kakar spreads Chu's Hack to the fundamentalists.

By the way, I don't want to overdo the talk about RDF causing teek. It was, after all, just a Shekley black-out sketch idea, and won't bear overly close investigation. Perhaps I should in fact deflate it by having someone remark that it's really a matter of a peculiar quirk in humanoid neural systems' quantum computations, like we have a peculiar gene that promotes high-level quantum coherence.

I have to rewrite the Chapter One vision yet again. I'm going drop the Chapter One scene inside the castle. But I think I'll still have the pitchfork selling Jayjay out to Pekka. Changes to make:

- * Jayjay and the pitchfork only make it to the top of the beanstalk, and Jayjay sees the castle, but they don't go inside. Save the inside of the castle for Chapter Eight.
- * On the way up, Jayjay reviews the notion of lazy eight RAM, Zenonian memory access, and the use of the lazy eight point at infinity as a universal router.
- * Pekka waylays Jayjay at the cloud level. The pitchfork and the harp were waiting outside the castle to usher him in. The harp is upset that the pitchfork set up Jayjay.
- In Chapter Eight, Jayjay and Thuy actually go into the castle atop the beanstalk, but Chu does not. Jayjay and Thuy are effectively gone

once they go in. We have some Jayjay POV on the inside, and then we switch to Chu POV in the middle of Chapter Eight. Chu goes back to Earth and everything is fixed.

Q: If Jayjay and Thuy end up bringing lazy eight to Pepple, how do they do it?

A: The simplest is to imagine they do it by sound, just like Lovva did it by being a harp. Sound fills space and thus seems capable of altering it. I don't quite see any visual or verbal form as doing this; although perhaps a good teeped poem by Thuy could be the trick. Thuy was a music student, so maybe she can just sing. Ideally, Thuy would be presenting her new metanovel, *Vib*.

October 3-8, 2007. Into Chapter 6.

So I'm finally working on Chapter 6: Chu's Hack. I'm doing what I did with Chapter 5, that is, I'm just pasting in the subsection outlines, and then editing those till they're text. The text is the final revision of the outline. The map that's the same size as the terrain.

So all the work on the outline isn't in vain. In fact, after roughing out subsection 6.1 text, I went and revised the remaining outline yet again. Every morning when I wake up, I think about the outline and, often as not, I think of a hole in it that I have to patch.

TO DO: if Chu is having strong Hrull gel withdrawal problems, then Thuy in Den Bosch should be suffering a little more than I've mentioned.

Q: Did Waheer climb the beanstalk?

A: Waheer didn't explicitly climb the beanstalk (at least not in the current version), but he did (a) think infinite thoughts to encrypt himself as a rune, (b) reach through the point at infinity to find a target runecaster, (c) enthrall and enslave the targeted Brux runecaster from afar.

Q: Have any Peng climbed the beanstalk?

At least some Peng have been on the beanstalk; certainly Pekka is up there, or at least a mental image of her. And Pekka can think infinite thoughts.

Possibly the average Peng don't know infinite thoughts, and they depend on Pekka for coding their desires into infinitary logic that must, in turn, be fed to a teeking runecaster. Or, alternately, infinity comes easily to the Peng.

Q: Why doesn't Pekka just lead the Candler Road faithful up the beanstalk so that they know infinity? Why doesn't she call Chu up it, as long as the Peng are thinking Chu might want to help them?

A: It could be that Suller, Gretta, Kakar, and even Pekka don't know how to get to the beanstalk from Earth. They would know how to get there from Pengö. But the beanstalk itself makes itself hard to find from different spots. The beanstalk is like a sacred path that's only visible to the pure of heart. Yeah, yeah, but couldn't Pekka tell Chu to teleport to Pekka, then go into the interbrane from there, then turn, like, left and climb?

Well, maybe she does suggest this, but Chu doesn't want to take the chance. Note that the air on Pengö isn't breathable.

October 20-25, 2007. Chu's Hack (Chu's Serpent)

Maybe on the Lost Coast Chu talks with the body of the salmon about death.

The Realtors Chick Moon and Duckie Tarrington should come back into action when Chu reaches the Peng Ranch. Possibly President Dick Too Dibbs appears there as well.

Chu's first few attempts at Chu's Hack shouldn't work. Chu rests for two or three days. Thinking. Kicking the gel.

Chu should have a long conversation with a silp while he's kicking at the Peng Ranch before discovering Chu's Hack. Remember, I'd planned for more silp stuff in this chapter.

The silps have qualia. Qualia are chaotic attractors.

Note that there is plenty of time for Chu to lie idle for a few days on the Peng Ranch. He's scheduled to meet Thuy and Jayjay in the Hibrane on their or third or fourth day, and one day in the Hibrane is six days here, so really he could kill eighteen to twenty-four days: two or three weeks, which seems like too much. Well, I don't have to be too precise about the time, as I'm going to allow for Glee to steer them up and down the time stream at will.

I'm not yet satisfied with any of my conceptions of what Chu's Hack actually is.

Chu's Hack for Easy Runecasting.

I started with thinking of Chu's Hack in these terms: "Chu now saw how to let the rune's infinitary terms swallow themselves and spit out quantum-computational fixed points." A finitization of the infinitistic atomic reprogramming that Jayjay used to produce tulpas.

Chu's Hack spreads to the Candler Road Christian Peng Soldiers, and they are popping out Peng ranches all over the place.

But I have reservations.

Problem 1: This seems like *such* a recondite skill. Nobody will understand it.

Answer 1: Make it more visual. More precisely, let's describe the Hack as arising as follows: Just as the PC helped us discover chaotic attractors as geometric objects, QC (quantum computation) will bring a new family of geometrized objects that visually represent processes. Chu's Knot was one of these. And now Chu's Hack involves seeing these hyperattractors in infinitistic logic.

Problem 2: If all along there has been a finite shortcut for runecasting, then why did I drag the readers through all the insanely complex bullshit about the beanstalk and infinity? And why haven't other Peng allies discovered Chu's Hack long ago?

Answer 2: Chu's Hack doesn't actually work that well. The tulpas he makes with it only last for a few days or a week. Chu himself realizes this, but he's tricking the Peng so they'll protect him from the Hrull. Also, he figures it's good if the world sees—on a temporary basis—what it's like to have a zillion Peng ranches. He figures it's a good way to raise consciousness and develop the public's will to fight the Peng.

Problem 3: If Chu does find a short-cut way to runecasting, then why doesn't he cast the reset rune and eliminate the Peng? And if the Peng are preventing him, why doesn't he share this knowledge far and wide so everyone can be eliminating Peng? This should be as easy as spreading the news to the Christian Peng Soldiers.

Answer 3: He can't get the reset rune to work at all via Chu's Hack. The reset rune requires infinite precision.

Problem 4: And now why would Chu need to go to the Hibrane in search of Jayjay? Jayjay's skills would be superseded, no?

Answer 4: No, Chu's Hack is just a stop-gap. He needs Jayjay to come and run the reset rune. Also they will kill Pekka atop the beanstalk.

Chu DMC Scenario.

Chu discovers direct matter control (DMC). He can't learn how to do tulpa programming, as it's too essentially transfinite.

But then, instead of reprogramming the atoms to generate matter waves which create a matter hologram in the form of a moth (or Peng) tulpa, he thinks of a way to change a region of matter into the moth (or Peng like Floofy, another of Suller's girlfriends).

The Peng can then enlist the Candler Road Christian Peng Soldiers to using DMC to create more and more Peng immigrants. If they're not gnarl-sucking tulpas, they aren't actually that noxious

Could Chu use DMC to eliminate the existing Peng tulpas? No, they're not matter.

In this scenario, Chu still needs to fetch Jayjay to run the reset rune.

Dealbreaker Problem: If DMC spreads across the world, then our human way of life is totally transformed yet again, which is maybe too much change. It almost seems like too many magic powers for one book. We've got telepathy, teeking, the infinite beanstalk, turning into gods, and the tulpas. DMC could be a bridge too far. Perhaps I can have some way of limiting the ability to do DMC? No, just leave this for PS3.

DMC And No Tulpas Scenario.

I could greatly simplify the book by having Jayjay doing DMC copies of the Peng from the start. I could still claim it was an infinitary teek process.

Dealbreaker Problem: I'd no longer have the reduction of gnarl. Even if you temporarily used up some gnarl during the act of applying DMC, it seems like the gnarl would return, once the new DMC object is in place, just another object in the world. And I don't think I could give up gnarl reduction, it's quite engrained in the book. The whole idea of parasitizing nature's computation is something I want to hang onto.

Oct 25, 2007. Instead of Chu's Hack I'm gonna call it Chu's Serpent, and I'll model it on Ourobouros. I feel like I mentioned Ourobouros in some other book or story not too long ago, but I don't find him in *Postsingular*, or *Mathematicians in Love* or *Mad Professor*, so I guess it's okay. Maybe I mentioned Ourobouros in my notes somewhere. (I need to get the Google desktop search engine again.)

Anyway, Serpent is vibbier than Hack.

I just read in the *Times* that in China, the state sanctioned music is insipid pop tunes with lyrics like "it's good to be poor and honest." Rock is illegal. This is exactly what I'm talking about with gnarl reduction, and it's exactly why the Moral Majority would support it. It would be good to bring this into relief via a

conversation about mind-control-directed elimination of gnarl. Suppose I have Chu talk to Steve and Julie from Candler Road Church.

Steve: "Well, yeah, but you're only saying that because you're a sinner. I saw you on the Founders show." Julie: "You watched that Steve? Ooo." Chu: "You watched it too, Julie." Julie: "At least I'm not addicted to some alien drug. You need to let the Savior into your life, Chu." Chu: "Lusky the Hrull was my Savior. She died for our sins. I saved a piece of her body, by the way. Want a taste?"

October 29-Nov 4, 2007. Chu and the Fundamentalists

I was reading an article in the *Times* Sunday magazine that the fundamentalist evangelical movement is losing its political force. And I was wondering if it's realistic to have them be a big part of politics in 2038.

At the very least I should alter their emphasis. They could have re-entered the political scene quite specifically by epitomizing a widely felt negative reaction to (a) omnividence, (b) telepathy, (c) intelligence amplification, and (d) intelligent objects ("graven images). Perhaps the silps are regarded as demonic.

Fundamentalists hate and fear nature. They want to live in the echo chamber of their own endless proselytizing. They epitomize human chauvinism, and think of the Universe as created by God for the use of Man. "Humans are the crown of creation." Call them Crownies? Holiness Helpers?

Gnarl reduction would at least reduce (c) and (d) in certain zones.

I need some kind of violent interplay between Chu and the Peng to cap the chapter. They want to kill him, and they sic the Crownies on him.

Suppose that Floofy decays much earlier than expected? And suppose they learn that neither Warm Worlds nor Pekka bothers to remember a Peng personality rune after it's been processed. So if a Peng pioneer gets badly instantiated, that Peng is shit out of luck, as there's not gonna be a second incarnation.

Describe the error-term-accumulation dissolution of Floofy in fresh terms. Before when running the reset rune on them, I had: "The Peng were crowned with ghostly spires, like the pale coronas that flicker from a ship's masts before a devastating electrical storm. Their ruffled bodies grew smoother and more stylized. Sharp cusps formed at the ends of their beaks and claws; the birds' energies were draining off in wavery jets. The Peng were getting smaller; they were dwindling to spiky globs."

I want there to be a dire situation to fix in Chapter Eight, so it would be nice if somehow the Peng and/or the Crownies are able to in fact arrange so that Chu's Serpent does produce stable, finitely describe Peng tulpa runes.

Alternative a: Maybe—how bizarre—the Crownies' cheesy, reactionary perversion of Xianity has in fact given them true knowledge of the infinite. They use their sappy Jesus to help them. Chu is all: "You need to know infinity to do it right," and the Crownies are all: "We're using Christ." And it frikkin' works. But, naw, let's not use the "Xianity=infinite wisdom" move—even if at some level it might be true—for then the trip up the beanstalk is unnecessary.

Alternative b: Let's instead say that Pekka learns to pre-process the runes so that they will in fact yield stable Peng even with the inaccurate Chu's Serpent technique.

So now it seems that, in promulgating Chus' Serpent, our boy has really screwed the pooch. He's sold out the human race.

They rebuild Floofy for starters. I need a personality and a backstory for Floofy.

And then the Peng are pouring in, settling in for good with no decay worries, and Chu is a total outcast, hounded from Earth, with only the silps and the Hrull to help him. Maybe the Peng double cross Chu and want to kill him.

Note that the (Peng rune preprocessing) + (Chu's Serpent) pipeline turns a seemingly infinite personality into a finite algorithm. This is a higher-order kicker than Chu had expected. A Peng—and presumably a person—does have, for all practical purposes, a finite personality. “I am a natural number.”

Chu himself is good with this. He's a neo-Pythagorean.

But later he'll have to go beyond and become actually infinite. The gods are actually infinite.

Nov 15-Dec 7, 2007. Chap 6 Done. ∞ Story: “Jack and the Aktuals”

Today I finished Chapter 6 of *Hylozoic*, and now I have to write a story about infinity for an anthology; supposedly I'll get good money. I mentioned this before, on [July 24, 2007](#).

Last month I sent an academically worded proposal for the story to my assigned editor for the book, the eminent Berkeley set theorist Hugh Woodin. Woodin said the idea sounds fine—I've met him before and we're on good terms. So now so I feel like I can let 'er rip.

I just have to write the story. I'm right at the tricky part, the hard-to-explain bit, where the muse comes to see me.

By way of getting some momentum, I'll start by re-editing my proposal

Although I was trained as a set theorist, over the years I've metamorphosed into a science fiction novelist. I think of my tales as philosophical entertainments or as thought experiments.

The essence of a thought experiment is to suppose that our world is rather different than it's believed to be—and then to tease out the consequences. The process isn't really so different from starting with a set of axioms and deriving theorems.

What I'd like to do for my contribution is to write “The Aktuals,” a short story that does for infinity what *Flatland* does for the fourth dimension. My story will begin with the discovery that we share our world with transfinite beings, followed by the realization that we ourselves are transfinite (or can become transfinite) and a dramatic exfoliation of the consequences.

Georg Cantor distinguished between potential infinities, such as the endless sequence of natural numbers (with order type ω), and actual infinities, such as a set containing alef-one points. When I speak of transfinite beings, I am talking about actual infinities.

In German, “actual infinite” is “aktual-unendlich,” and I plan to refer to my transfinite beings as Aktuals.

As I discuss in my non-fiction book *Infinity and the Mind*, (latest edition: Princeton University Press, 2005), Cantor believed us to be surrounded by the transfinite. Although he doesn't explicitly speak of transfinite beings, he does suggest that we ourselves are in some sense transfinite. Here's a relevant passage:

“The fear of infinity is a form of short-sightedness that destroys the possibility of seeing the actual infinite, even though infinity in its highest form has created and sustains us, and in its secondary transfinite forms occurs all around us and even inhabits our minds.”

— Georg Cantor, “Über die verschiedenen Standpunkte in bezug auf das aktuelle Unendliche,” [Cantor’s collected works](#), pp. 374-375.

I’ll use the symbol Ω to stand for the class of all ordinals. Ω can itself be thought of as a (proper class) ordinal, which Georg Cantor called Absolute Infinity.

Over the years, mathematicians and philosophers have discussed beings able to complete infinite processes. Zeno’s paradoxes, the Thompson lamp, and Hilbert’s Hotel all hinge upon someone being able to carry out an ω -step process. Logicians and set theorists have also contemplated doing logic with transfinite types and with expressions of transfinite length. In my 1980 novel, *White Light* (latest edition: *Four Walls Eight Windows*, 2001), I explored a world containing a certain Mt. On, which is a mountain of height Ω , whose slopes are inhabited by beings able to carry out transfinite processes.

In my story, “The Aktuals,” I’ll touch base with some of the traditional tales about infinity and then, hopefully, explore some new territory. My idea is to use a somewhat unfamiliar notion upon which to base my transfinite beings: the Absolute Continuum, as discussed in my book *Mind Tools* (Houghton Mifflin, 1987).

An Absolute Continuum is a linearly ordered proper class of points which contains embedded within it every possible set-sized linear ordering. An Absolute Continuum is transfinite in the small and in the large; below any set-sized sequence of subdivisions lie more subdivisions, and the levels go up forever as well. An Absolute Continuum has Absolutely Infinite length.

I will suppose that the three axes of the familiar three-dimensional space we inhabit are Absolute Continua rather than mere real number lines.

[Technically, an Absolute Continuum is a [Hausdorff eta- \$\Omega\$](#) ordering, that is, an Ω -saturated ordering, in which you can find more points between any two set-sized sequences or cuts. An Absolute Continuum is a proper class.

Conceivably the Absolute Continuum can’t in fact be well-ordered. But if we have a conventional class-set theory with a global axiom of choice, then the Absolute Continuum can be well-ordered and has, I believe, the same size as Absolute Infinity, as explained below.

To understand the notion of an eta- k ordering, think about the eta- \aleph_0 and eta- \aleph_1 orderings.

The rational numbers are an eta- \aleph_0 ordering, and they have cardinality \aleph_0 . This is the inspiration for the eta- k orderings which are higher-order dense orderings.

For successor cardinals k^+ , we can in general produce an eta- k^+ ordering by looking at the ultraproduct k^k/U , where U is an ultrafilter. To visualize this in the case of an eta- \aleph_1 ordering, start by thinking of the by-end-pieces- $<$ ordering of integer sequences. We can squeeze a function in between any two countable sets of sequences strictly separated by bep- $<$. What the ultrafilter does is to refine the partial ordering bep- $<$ into a total ordering order U - $<$. The size of the eta- \aleph_1 set will be c , which may or may not be the same size as \aleph_1 .

The early work on by-end-pieces orderings of functions was done by Paul Du Bois-Reymond, and he spoke of a linearly bep-ordered set as a *pantachie*. Gödel used that word in his note “Considerations Leading to the Probable Conclusion that $c = \aleph_1$ ” that I lectured on at Rutgers. Gödel thought there could be a pantachie of real-valued functions that served as an eta- \aleph_2 ordering, that is, an ordering with no \aleph_1 under \aleph_1^* gaps, and this was why c had to be bigger than \aleph_1 .

Ω is a limit cardinal, not of the form k^+ . But presumably an eta- Ω ordering can be defined as an Ω limit of set-sized eta- k orderings, and would thus have cardinality Ω .]

I mentioned [Gabriel's Horn](#) in these notes before, but now imagine a proper class sized trumpet of length $k + \Omega^*$ that reaches from Absolute Infinity down to earth, with the angel manipulating a finite handle of length k upon the cloud at the top of the Absolutely Infinite beanstalk.

I can also use some ideas I had about a [spacetimescale continuum](#) during August 10-15, 2007. Here a transfinite being is a spacetimescale cylinder; they're only finitely large to the eye, but they exist at every scale.

There's some possibly usable "aktualization" material in one of my unused versions of [Jayjay's dream](#). But probably it's better to think in terms of a fresh start for this tale.

I could make it a mathematician-friendly story, along the lines of *Mathematicians in Love*. A two character story: a mathematician and a someone else. Start with the mathematician debating the other person about whether there could be real-world applications of Cantor's transfinities.

What are the people like? Fletcher and Harry; Bela and Paul; the straight man and the crazy mathematician. Narrated by the straight man, who might be a physicist, or maybe not even a scientist at all.

Just to make it fresh, maybe I should be politically correct and make one of the "guys" a woman. She'd have to be the straight man. I can't readily imagine a female crazy mathematician, as it's such a male thing to be a number-obsessed borderline autistic math nut (they say the male to female ratio of autistic people is 10 to 1).

This means I'll have a woman learning from, or humoring, a quirky genius—which could be sexist in a Heinlein kind of way. But suppose that I make the woman somewhat mocking and ironic—like how a mathematician's fond but skeptical wife might treat him (like, e.g., how my wife treats me). In fact the characters could be a married couple, a bit like the couple in that short-short about infinity in my *Lifebox* tome. And maybe the woman's empathy adds a key component to understanding and developing the discovery. For instance, the woman might be the one who realizes that the aktual is alive, and that it's talking to them.

I was looking for input in Berkeley and the Mission district of SF this weekend, spreading out my antennae, seining reality for hints.

The curry and coconut udon with grilled chicken soup at Noodle Theory.

The CAPOW light show last night, my inability to keep pace with the music.

Meeting Karen Clark, who sang my words, "Oh man, we are in heaven, for sure, for sure."

The Asian students' food court in the night off Telegraph Ave, a fractal haven.

A black guy in a hoodie yelling at my back after I uneasily pass him, "Look at those fucking white people, they don't fucking care about anyone!" Earlier in the day a couple of crazy street people yelled at me too. Berkeley is confrontational.

Looking out the window this morning, the odd twitching motions of the lower limbs that humans use to move themselves through space (they call it "walking.")

In Modern Times Books on Valencia street, I read a Jim Woodring comic that shifts POV into a higher world with an elephant god (Ganesh?), and the elephant dances through starry space, leaving a multi-layer trail. One layer of the trail is our ordinary reality, Mom and Dad and the kids; another is a cloud of Hindu deities.

Equally unlikely and strange. Closing the book and looking up I see a guy, his head, he's behind a bookcase, and I'm thinking how remarkable to be incarnated here, among the humans.

Now in Ritual Roasters Coffee Shop. Some of the framed art on display consists of memoir-fragments hand-written black on white and framed. The closest talks about padding out on a surfboard at Ocean Beach for the first time in a long time. "I almost cried it felt so good." And I'm like, yeah, I understand. And I'm thinking that in Kyoto I wouldn't be able to read the writing, and if I could read it, the spot mentioned would mean nothing to me. It's nice to be where I know what's going on.

Sylvia seems so warm and beautiful today. I'm happy to have her with me.

Ulla is the wife.

Willy is the husband.

I like that her name starts with U and his starts with double-U. And that both names have double Ls. A real pair.

Outline 1.

Ulla's POV.

Ulla and Willy are debating the use of transfinite numbers. They're a married couple. They're sad, the man is dying of a new plague, a kind of muscular dystrophy—his back and leg hurt all the time like mine do.

Perhaps he's infected by a quantum computational virus that's opening the gate to subdimensional infinity in his particles. Alef arthritis.

He's a set theorist who also teaches computer science.

There are some applications of transfinite math to physics. Quantum mechanics is viewed as an approximation of transfinite underlying forms. Perhaps the Planck frontier was thought to be a barrier like an event horizon, but it's a semipermeable membrane. It's a cut-off (at merely 10^{-35} m) that blocks out actual infinities of the second number class (countable ordinals). The subdimensional zone.

And further on is another cut-off, out around epsilon-zero, say, that blocks out the third number class (that is, ordinals of cardinality equal to alef-one).

We're in the postsingular era, and his computer is a glass of water with a forked nudibranch at the bottom, an artificial organism that resembles the wild horned sphere example in topology. It looks like one of Jim Woodring's critters.

Willy is quantum-entangled with the horned sphere. The iridescent slightly milky fluid has a persistent churning pattern; it's hanging out on a strange attractor. The pattern of eddies summarizes his memories. The fluid is fed via sunlight.

He has an idea for a speed-up. He grows extra tendrils on the wild sphere. Carries out an infinitistic [Turing Oracle](#) calculation to make a really good model of himself that can continue his scientific work.

But then the glass breaks. Saving the actually infinite amount of data makes the tendrils occupy a divergent volume. And the slug is crawling around. It grows wings; it's a little dragon. Willy is scared of it. Ulla realizes she can talk to it—to him. His name is Yinlee. He says he's now inhabited by an *aktual*. His tail goes way down into the subdimensions.

The *aktual* teaches them that the transfinite imbues everything. There's an endless ladder of number classes.

Gabriel's Horn shows up and scares them, like a spy camera. Willy grabs Ulla and they jump into the transfinite.

They see cool stuff and creatures. He solves the continuum problem. They play an infinite game (projective determinacy) falling towards a fractal and taking turns scooting left-right or up-down.

The Horn swallows Willy. Ulla goes in after him. They are in the land of proper classes. Abstract forms. Her loving nature and groundedness brings them safely home.

Payoff: the two learn how to do direct matter control well enough to create a new body for the guy and they port him. Happy ending for them.

And what about for the rest of the world? Is the knowledge lost or does it take hold? For the purposes of this short story, maybe it's lost, thus wrapping things up and pinching it off. But if and when I use these ideas in my novel *Transfinite*, I'll keep the knowledge around.

Transreal themes. Woman saving guy from math. Healing by prayer. My near-crippled current state of constant physical pain in my tendons and muscles.

Nov 21, 2007. Today I'm thinking I might simplify the story set-up. Not bother with the quantum computer, or with quantum computation. Have it be starker, more like the Borges stories, "The Book of Sand," "The Alef," or "The Zahir." More like fantasy and less like science-fiction. Someone finds a strange artifact and, *bam*, shit happens. Maybe Willy finds something in the bank safe deposit box of a relative. Or—Aristotelian unity of place—he just finds it on, what the hell, his desk.

Nov 22, 2007. I decided to change his name to Jack, as in Jack and the Beanstalk. Somehow Willy doesn't have the right Berkeley science boffin vibe.

Outline 2.

Dual POV.

Scene 1.

He's a mathematical physicist in Berkeley. He's in conversation with his wife. She's a painter and yoga teacher.

He's not well, he has a kind of muscular dystrophy—his back and leg hurt all the time. His wife Ulla is urging him to get away from his computer, to come outside and enjoy the autumn. Drive down the coast the Davenport cliffs.

He says he wants to get his work done. He says he's close to finding some applications of transfinite math to physics. In his opinion, quantum mechanics is as an approximation of transfinite underlying subdimensional forms. The Planck frontier is a puritanical curtain drawn at merely 10^{-35} m so as to block out the fact that not only is matter infinitely divisible, but there are infinitesimal subdimensional levels as well. The quantum mechanics think the Planck barrier is unbreakable, like an event horizon, but Jack now believes that it's a semipermeable membrane. He's been feeling things in his body. He thinks he's disease might be "alef arthritis."

"You're hallucinating? Eek. What's that?" A preternaturally smooth glassy eight has twinkled into existence on Jack's desk. An infinity symbol, with lots of reflections inside it and, improbably, a jack that Jack can plug into a port of his computer.

Scene 2.

Jack plugs in the infinity symbol. The machine goes into an endlessly regressing crash sequence of smaller and smaller windows, breaks through a fixed point and shows a system info screen: subquantum computation with alef-null memory and a runspeed of alef-null computations per second.

Jack carries out an infinitistic [Turing Oracle](#) calculation to make a really good model of himself that can continue his scientific work. The program writes his next book. He reads it and learns something. His printer begins printing out his next book, the one he won't have time to write.

The infinity symbol glows bright. The reflections are very intense.

Ulla sees a thought loop pattern in the caustics of the crystal. Something reaches out and speaks to her; a being called Yinlee. Yinlee shows Ulla and Jack how to unfurl their scale and experience the transfinite. They don't shrink or grow, it's a matter of changing focus.

Scene 3.

They are at every level. They see some countably infinite stuff and creatures. And they find a further cut-off, out around epsilon-zero, say, that blocks out the ordinals of cardinality equal to alef-one.

Scene 4.

They bust through it and play an infinite game (projective determinacy) falling towards a fractal and taking turns scooting left-right or up-down.

When they're done, Jack knows the answer to the continuum problem.

Scene 5.

The Reflection Principle swallows Jack. Ulla goes in after him. They are in the land of proper classes. Abstract forms. The Horn was Absolute Infinity, viewed from an odd angle. Absolute Infinity placed the clue, wanting to get more action.

Ulla's loving nature and groundedness brings them safely home.

Scene 6.

Jack learns that he was infected by a quantum computational virus that's opening the gate to subdimensional infinity in his particles. He has alef arthritis. He sees how to cure himself. He goes to tell the world.

November 27, 2007.

I was planning to adapt an unused passage from *Hylozoic*, but I don't think it works. That is, it wastes time. I don't want to get into the linkage of scale thing at all. Instead I want to hop up past alef-null and get going on what the story is supposed to be about! Here's the unused bit.

Each of them experienced what came next in their own way. For Jack it started with a sudden awareness that, thanks to the emanations of Yinlee and the infinity amulet, he was able to dial his attention up and down the size scale. He saw his heart, and a cell and a molecule; looking up, he saw the humanity's group media mind, planet Earth and the Milky Way galaxy. Fine, but what made this vision quite extraordinary was that he felt an immediate mental contact with these objects of every size, no more than a mental contact, he felt a physical connection. He was his heart and his society, he was the atom and the galaxy—all were parts of his expanding identity, as surely as the fingers on his hands.

He pushed himself out along the scale axis, moving up and down at the same time. On the one hand, he was moving towards everything by letting his feeling of spatial immediacy expand around his body to include Ulla, his office, the town, and the sky; on the other hand, he was moving towards nothing by chipping away at his identification with any region of space, sinking into himself and, ah yes, easily dropping below the Planck length.

What made the process bizarre was that he kept thinking he was done, but then he'd realize that he'd started up a new phase by toppling the lead domino of yet another chain. Moving past level after level of scale, Jack felt the fine ecstasy of unlimited acceleration: more, *more*, *MORE*.

At the end, he was seeing himself from a slight remove, as if following in his own wake: he was a flat surfboard with two antennae. He glowed yellow-white against a dull-red sea beneath a darker red night sky.

The wobbly metaself of transfinite scale was like nested Russian dolls or—unkinking himself with a dimensional twist—like a transfinite string of pearls, with Jack was shooting down its hollow axis.

Just then Ulla nudged him. Jack experienced a moment of wild disorientation, then found himself standing on a hillside with Ulla, a hillside nowhere on Earth.

Everything had changed. The aktualization had reconstellated their particles, had redacted their mental computations, had fed unearthly patterns into their memories.

Instead of doing that, I think I'll mine some stuff from *White Light*, just pretty much copy it, the mountain climbing part, and the alef-one part. And then I can do a projective game around alef-two. And then I need a threat or a villain. And they rush up to On. And then they wrap around and emerge undersea (On levels down) and bubble up.

Another thought, they can emerge in a city with transfinite buildings, that'll be fresher than recycling the mountains.

Oh man, this is turning out to be work. I'm going to have to *think*. Sheesh, not *that* again!



November 29, 2007.

Despair. I'm taking so long doing this, and nothing seems right. I need a plot to make the thing be 7,000 words, I can't just do a quick smash and grab short-short.

Ideas: The lazy-eight unfolds into a zero, and two beings step through a demonic crab and a being like a cylinder of light (a talking parsnip standing on its pointy end).

Crab named Elmer. He grabs Ulla and drags her down into the subdimensions.

"Let's go after her," says Jack. But Yinlee insists it'll be better to go up. "We'll circle around." "How do you mean?" "Up is down. Let's go."

The move in hops, each of which is an instance of the Reflection principle, that is, merging with Infinity and snapping back by an act of self-observation.

First hop lands them in Alefville. It's the set of all hereditarily countable sets, also known as $H(\aleph_1)$. The street names run up into the countable ordinals.

Projective Determinacy is a property of $H(\aleph_1)$. Turns out Yinlee is worried about the continuum problem. They hop up to $H(\aleph_2)$ the set of all sets hereditarily of size \aleph_1 or less. If there is a bijection from \aleph_1 onto the continuum, it would be found here. There isn't and they have to fan out to the wilderness of $(P(R))$.

Yinlee should be a more interesting companion, like Franx in *White Light*. Not just a cheerful angel. Maybe she's like a mathematician. Or she could be a guy even. She looks like a dragon or maybe like the Mandelbrot set. She has an ulterior motive.

Jack has an ally called Yinlee, she looks like a dragon, she's guiding him to an infinite city called Alefville.

The crab attacks and grabs Ulla as they are falling towards Alefville. They do an infinitistic game, and the city is the set. Yinlee wants to land in the country where it's open, Elmer the crab wants to be in the city where he can scuttle away. It's a non-deterministic game.

I'd like the antagonist crab to be a finitist, skeptical of infinity. But if he's a finitist, he wouldn't go to Alefville.

What does Yinlee want? A solution to CH? What does Elmer want?

It occurs to Jack to check consistency of some theories. Could we have an issue with non-standard integers? The only theory that's clearly inconsistent is physics.

A branching tree. It has c leaves. We don't limit Alefville to being just countable sets. The higher world isn't stratified this time. Everything's mixed together, all the cardinalities. The branching streets lead to c houses.

The antagonist crab hides. They look in an infinite restaurant, it's more than Escher omega, it's omega to the omega power. The crab gets away, flees to his house

They look for a city directory to locate the crab's house. They find a book of size \aleph_1 but it's not big enough. They find an \aleph_2 -sized book. It's not big enough either. Etc.

Kicker 1: If c has the cardinality of the ordinals, that is, if the power set of omega is a proper class, then the points of the real line could in principle be rearranged to make an \aleph_k set for every k . And I guess it could even be an absolute continuum.

Kicker 2: The paper is gibberish. Or, better, it's a science-fiction story instead of a math paper.

November 29, 2007. Reprieve, I just heard from the volume editor that the deadline's being slipped to the end of January, instead of November 30. That's because all the other authors are academics, who tend not to be rapid writers in any case, and are now entering the busiest time of their semester.

Yesterday for inspiration I read Hugh Woodin's paper, "The Transfinite Universe" two times. Very intriguing and exciting. He is imagining a debate between a platonic set theorist and a skeptic. At the end of the paper, Woodin has an

inspirational proposal: “The construction of L-to-the-infinity would provide substantial evidence that there is a single axiom for V which would yield [an] unambiguous conception of the universe of sets; and provide a starting point for discovering that axiom.” Seek ye the Philosopher's Stone!

Today I sent Hugh Woodin an email including the following. He answered right away, which is nice. It's very cool to know that I've got the world's best set theorist in my corner for this story! And he says that this spring he's using my book *Infinity and the Mind* as the text in an undergrad course at Berkeley.

“I'm trying to do this differently than I did in my novel WHITE LIGHT, that is, I want an infinite world that is something OTHER than a transfinite series of mountains. As I think I mentioned before, I'm hoping to work in an idea that our physical space might be transfinite by dint of being an “absolute continuum,” that is, very highly saturated with respect to linear ordering (a Hausdorff ϵ - k set for large k).”

“QUESTION 1. Do you ever think there might be any use in supposing that the power set axiom is so radically powerful that continuum is as large as the class of all ordinals? Or that the continuum can't even be well-ordered?”

WOODIN'S ANSWER 1. “This kind of approach has been suggested. To me taking the position that the continuum is class large is really a rejection of the transfinite. Taking the position that the continuum is large, as for example would be the case if the continuum is real-valued-measurable (recall that is the assertion that there is an extension of Lebesgue measure to a measure which measures all sets of real numbers), has certainly been proposed. The difficulty here is that such a position seems to create more far ambiguity about sets (even at the level of sets of real numbers). Dropping the Axiom of Choice creates similar issues. Of course one could assume the Axiom of Determinacy but this just defers the problems to sets of sets of reals.”

“QUESTION 2. Another topic comes to mind. If Jack can think infinitely fast, he can readily check which number theoretic sentences are formally unsolvable, and which theories are consistent---simply by running through all finite proofs. But suppose that in his “reality” the natural numbers are non-standard. I'm thinking, for instance, of a model with a nonstandard integer that codes up a proof of a Gödel sentence. Maybe Jack can't really tell if his integers are “standard.” So maybe some of the answers he gets aren't so useful. Can you shed any light on this?”

WOODIN'S ANSWER 2. “Not really, but any universal truths Jack verifies are true--i.e. if Jack sees that a formal theory is consistent then it really is consistent.

Excerpts from *White Light*:

Tiny yellow flowers were growing in the grass around me. I leaned close to examine one. At first it looked like a simple five-pointed star. But then I noticed that at each point of the star there was a smaller star. I looked closer. At each point of the secondary stars there were still smaller stars, tipped by tinier stars, which had... In a sudden flash I saw the whole infinitely regressing pattern at once.

Trembling with excitement I held a blade of grass up to the sky. Halfway down its length it forked into two bladelets. In turn, each bladelet forked into two bladelets. Which branched and rebranched, again and again... With a snatch of my mind I comprehended the whole infinite structure at once. No wonder the grass was springy.

I thought back on the sort of mental twitch I had used to see the infinite complexity of the flower and leaf. Maybe...

"La," I said, "La, La, La,..." I did that thing with my mind and let my voice speed up to a high-pitched gabble. A few seconds later I had finished saying alef-null La's.

Next I tried to count through all the natural numbers, but I got hung up trying to pronounce 217,876,234,110,899,720,123,650,123,124,687,857. I decided to use a simpler system and started over. "One. One plus one. One plus one plus one..." In a minute I was done. I had counted up to alef-null.

I looked critically at the distance between me and the hotel. I sharpened my vision and began counting the boulders dotting the meadow. Sure enough there were alef-null of them to pass. No wonder I hadn't felt like I was getting any closer. If I walked past ten more or a thousand more boulders there'd still be alef-null of them left.

But my tongue had been able to do alef-null things when I'd counted out loud. Why shouldn't my legs be able to do it too? I stood up and started running. Once again there was some sort of head trick I had to do to keep speeding up. The endless energy I needed to keep my body moving faster and faster flowed into me from the landscape around me. I had a feeling that the mountain was drawing me closer, that the air was parting to let me pass, that the ground was forming footholds for me.

A minute to the first boulder, half a minute to the next, a quarter minute to the third... Two minutes later I was standing in the grounds of the hotel, more than a little out of breath. It had been like the trip from Earth, but without the relativistic distortions. I was in a world beyond the physics of Earth.

I riffled through the register, noticing a famous name

here and there among the alien scrawls. I found a blank page and signed my name. Wondering how many pages were left, I began trying to flip through to the end of the book.

I soon became clear that there were infinitely many pages. I went into a speed-up and flipped past alef-null of them. There were still more. I peeled off alef-null more, and alef-null more again. There were still plenty of pages left.

I began picking up clumps of pages, flipping faster and faster... The clerk stopped me by reaching over and closing the book.

“You’ll never reach the end at that rate. There’s alef-one pages.”

I thanked him and hung up. The terrace was reached by passing through the lobby. I spotted Franx up on the ceiling, but hurried past before he saw me. From outside, the terrace had looked fairly standard, with about fifty tables around the circumference. But now that I was on it I could see that everything shrank as it approached the middle...so that there were actually alef-null rings of tables around the terrace’s center.

Already about ten rows in, the tables looked like dollhouse furniture, and the gesticulating diners like wind-up toys. To find Hilbert I’d have to go in better than a hundred thousand rows. Fortunately there was a clear path in, so I could run.

We started up again. This time we did a sort of super speed-up, and started flicking past cycles of alef-null cliffs at what felt like one go. In each cycle of cliffs a more rapid rate of growth was embodied. Once they began to grow exponentially it seemed like I was always kicking or clawing at bare rock with Franx’s wings buzzing steadily behind me. Everything glowed with light and the rocks gave off a dry dusty smell. We kept at it for a long time, folding level after level of speedups into each other, passing infinity within infinity of cliffs.

“I don’t see how we can top that last effort. And even if we fold speed-up after speed-up together, we’re still just going to get some limit of countably many stages. Alef-one can’t be reached by any countable process. We’re never going to get out of the second number class.”

Looking down from alef-one, there was no next lower rock, no first step down, but now it was much worse. No infinite speed-up of alef-null eye twitches could bring my focus of attention from down there to up here. No matter how fast and how far I jumped my reference points I couldn’t pull my attention back up to alef-one. It was pulling me forward. I thought to close my eyes.

“The Reflection Principle is an old theological notion which we use in Set Theory. Any specific description of the full universe of Set Theory also applies to some little set inside the universe. Any description of the Absolute also applies to some limited, relative thing.”

“I became the White Light,” he said finally. “You know what it’s like. It doesn’t faze *you*. I saw the One, I had it in my grasp, but then it all grew gray again, and rough rocks lay before me. I landed at alef-one.”

Franx made a disappointed noise. “You’re just saying that the Absolute is unknowable. That’s the most elementary teaching of mysticism.”

“Yes, but I still don’t think you see how it applies to Mount On. When you go white, and you are no longer really there, then there *is* no individual, and no conception of the Absolute. But the situation is unstable. The Absolute divides, tries to get outside itself, and *wham*, there’s a beetle looking at alef-one.”

Meanwhile Franx kept flying up On. He saw the One, merged in, and then used the Reflection Principle to get to alef-one. I think he’s upset that he couldn’t stay white.”

“If there were a third basic substance...in addition to mass and aether...then we would know that *c* has power at least alef-two.

Now any massive object...such as a rock...can be endlessly cut into smaller and smaller pieces. In the limit one ends up with *alef-null* infinitely small bits of mass. These indivisible bits are called *mass-monads*. In general, then, any massive object is an arrangement of alef-null point-sized mass-monads.

Aether is also infinitely divisible...but even more so! Any aethereal object is to be thought of as an arrangement of alef-one point-sized *aether-monads*. Since we have *c* points in space, and since *c* is at least as great as alef-one, there is certainly room for all these monads.

At any instant, then, the state of affairs in our universe can be specified by stating which of the *c* possible locations in our space is occupied by a mass-monad, and which locations are occupied by aether-monads. To put it another way, space contains a set *M* of alef-null points occupied by aether. The state of the universe at any instant depends only on the properties of the two sets of points *M* and *A*.

Cantor spends most of the 1885 paper describing a special way of splitting *M* and *A* into five significant subsets. He closes with these words: “The next step will be to see if the relations between these distinct sets can account for the various modes of *existence* and *action* exhibited by matter—such as

physical state, chemical differences, light and heat, electricity and magnetism. I prefer not to explicitly state my further speculations along these lines until I have subjected them to a more careful consideration.” Cantor loved italics.

How about, when they’re dropping down on the non-determined set, the set is a spot on Jack’s carpet? And the kicker at the end can be that they were small the whole time. So turn the portal horizontal and have them drop through. Ulla should mention that the shape of the city looks familiar (it’s a spot she made on the rug).

I keep thinking that the way we view the transfinite realm is going to be wholly inaccurate compared to how the aktuals view it. Like trying to imagine denizens of hyperspace, but more so.

I just read W. Hugh Woodin, “The Continuum Hypothesis, the Generic-Multiverse of Sets, and the Ω Conjecture.” Laden with primo buzz words. Near the end he’s hoping for “an onslaught of theorems which reveal the true nature of sets.” The paper is something of a dialog between a transfinitist or platonist and a multiversalist or skeptic.

Woodin thinks $2^{\aleph_0} = 2^{\aleph_1} = \aleph_2$. And that, past that, the GCH is true, that is for higher n , $2^{\aleph_n} = \aleph_{n+1}$.

But maybe the GCH should fail more often. Otherwise, \aleph_0 is special, and generally we expect things to be more complicated than that.

Woodin talks about his Transcendence Principle, which is (roughly) that knowing what’s true in $H(c^+)$ is *not* equivalent to knowing what’s Ω -valid.

[$H(c^+)$ is all sets hereditarily of cardinality less than c^+ ; so it’s got all the reals, the sets of reals and, if $c = \aleph_2$, all the ordinals less than \aleph_3 . And S is Ω -valid if it is true in every forcing extension of every partial universe V_α].

Woodin argues for the Transcendence Principle because he feels that if we bother to believe in the higher transfinite, it must be that there is some statement about $H(c^+)$ which is both true, and not Ω -valid.

He compares adopting the Transcendence Principle to going beyond formalism. He says that formalism is like saying that knowing about the natural numbers (proofs) is the same as knowing what’s true in all the universes above.

Think of $H(c^+)$ as Alefville. Ranges beyond are the larger cardinals. Weather can blow in from there if we have Transcendence Principle. Under Woodin’s point of view, Alefville will have diameter \aleph_3 .

Jack and Ulla meet two Helpers at the start. I’d like to model them on Woodin’s debaters. One Helper is of course the gung-ho platonist set theorist. The other Helper is a relativist who maintains there is no single universe of set theory, he can be what Woodin terms a generic-multiversalist in his paper. (Though I won’t get into the *generic* aspect, I’ll just stick to multiversalist.)

The platonist character (a guy like Woodin) who believes he’ll find the One True Axiom vs. the multiversalist character (a guy like Paul Cohen) who is cynical about it all. Have the platonist and the multiversalist be kind of friendly rivals. They have scooped up Jack and Ulla kind of like the Sun and the Wind picking on a traveler—to see who’s more powerful. Or they’re using Jack and Ulla like the

Olympic gods using Paris, to make a judgment of some kind. Or they're using them for fresh input. Or perhaps using them to provide a definition of standard integers—I could have different notions of the integers in their physical worlds.

In any case, there is a third aktual, a nasty crab, who darts out and grabs Ulla just when they land in Alefville, runs off with Jack's wife in his pincers. He can be like some of the geekier and more robotic mathematicians I've known.

It's hard to be a finitist if they're in transfinite surroundings, but the crab manages, he's in denial, he's a benighted finitist. Yeah, even though the crab *lives* in alef-three-miles-wide city of Alefville, he won't admit infinity is real, that's how messed up he is. So great is this crustacean kidnapper's baseness that also he believes in *quantum mechanics* and denies the infinite divisibility of matter. Heck, I bet he's a red Republican, too. Boil him!

Endless incomprehensible jargon-laded debate between the two helpers in the restaurant trying to figure out how to find the crab, now lying low with Ulla.

Infinite buildings.

Maybe Jack thinks he can prove $\sim\text{Con}(\text{ZF})$. But then Yang notices disgustedly that his integers are nonstandard, so the result doesn't mean Jack.

They need a goal, Anton and Yang.

The crab runs in through the crowded restaurant with backwaters.

They drive to city hall and get a directory.

The weather comes in over the mountains.

They burrow down and find the crab

Jack was in fact correct about his alef arthritis infection. But now he realized that it was by no means a lethal disease. It had been, rather the painful early stages of his unfolding. He felt good now. He went on to tell the world.

December 7, 2007. Last week I finally got going on the story, and I've been working on it every day, and now it's about done. I'll give it one last read-through tomorrow and then email a PDF to the section editor Hugh Woodin and to, I guess, the volume editor, who's doing it as a contractor, and who claims her name is Pamela Contractor. I still don't have a contract from these guys, and hope they're not blowing smoke up my ass. I was careful to write the story broadly enough so I'll have a chance of selling it to an SF venue if the deal falls through; I think that was in fact a good way to think about the story, lest it get all in-group oriented. Sylvia read it today and she likes it.

It came out better than I'd hoped, all sorts of things came together: my notion that there are infinitesimal transfinite in the subdimensions, duality across the Planck frontier, self reference, the Turing Evaluator, a new angle on the Generalized Continuum Hypothesis, a walking-pencil-with-glasses cartoon character that made an impression on my in the Disney *Alice in Wonderland* about fifty years ago, my memories of set theorist Paul Cohen, not to mention the [Szkocka Cafe](#) (Scottish Cafe), a fave hangout for Stan Ulam and other topologist/analyst/set theorist types in Lwów (a.k.a. Lvív, a.k.a. Lviv) in the pre-war 1930s, and home of the famous [Scottish Book](#) of problems! I even worked in SCUBA diving and a cuttlefish, as I'm prone to do. I think the mathematicians might really dig it. I'm happy with how loose and wild I got with the infinities.

The full title is "Jack and the Aktuals, or, Physical Applications of Transfinite Set Theory." The subtitle has to do with the fact that my main character Jack Bohn is

trying to write a serious paper with that name, but when he uses a Turing Evaluator to automatically generate the paper for him, the device in fact writes a transreal SF story, which is in fact the story that I wrote!

December 7-20, 2007. Revising Chaps 1-6 before starting Chap 7.

So Lwów, I mean, wow, I just spent three weeks writing “Jack and the Aktuals,” a story about infinity. I hardly remember what was happening in *Hylozoic* anymore.

Before writing this story, I’d had the notion that *PS3* might be called *Transfinite*, and involve higher infinities. Perhaps I could port some of the things that I came up with just now. I’m not sure I could really flesh out infinity enough to be novelistic. But, wait, I guess I could. I did set up kind of nice world there in my story. Alefville. Heck, when I get to Chapter 8, why not just copy some of the new stuff right over like I’d planned. So far so good...

But first I get to write Chapter 7, which will be Thuy’s POV in s’Hertogenbosch.

I revised Chaps 3 and 4 right before writing Chap 6.

So let’s say I revise Chaps 2, 4 and 5 now, before Chapter 7.

2 was Thuy’s POV, and 5 was s’Hertogenbosch, so those two are a good fit. Chap 4 was also Thuy’s POV, so I might as well have another look at that one too. It’s good to make the effort to give the later chapters extra revisions, as otherwise the earlier chapters get revised more, as they’re around the workshop for a longer time.

Revising chapters 2, 4, and 5 might take a week.

And then I’ll be working on the outline for Chapter 7 for maybe another week, so I’ll be lucky to actually get Chapter 7 started before Christmas closes in.

Looking ahead, I’m planning for 8 to be two POVs, first Jayjay’s POV in the interbrane and the beanstalk and the castle, and then he disappears, and I switch to Chu’s POV on Earth.

I’ll revise Chaps 1 and 6 in the break between chapters 7 and 8.

Dec 11, 2007. I reread the end of Chap 1 and all of Chap 2. I have to improve the focus on Thuy. She’s too much playing the aggrieved wife and the resentful daughter in the most recent draft. I need to get her back her powerful self; remember she’s a metanovelist.

Wheenk was about:

- The big change of Orphid Night.
- Leaving home and moving in with Jayjay.
- Becoming a Big Pig addict.
- Getting over the addiction.
- Getting Jayjay back.
- Blocking the attack of the nants, and nearly seeing Jayjay die.

In order to get Thuy really hitting on all cylinders again, I need to have a notion of what her new metanovel is about. I was, for lack of a better idea, titling Thuy’s new metanovel, *Vib*. As in:

“*Vib*,” said Thuy, telling him the name for the first time.
“As in vibby.”
“Pure genius,” said Jayjay.
“What’s vib?” said Jil irritably.
“A vib is like a kick,” said Jayjay. “A vibe, but faster.”
“A vib is when your mind spreads out, and the world is thinking you,” said Thuy. “Instead of writing *Vib*, I want *Vib* to write me.”
“My best murals are vibs,” said Kittie. “They paint me.”

And that’s hip and snappy, but I don’t think it captures a reasonable notion of where Thuy is actually at. She’s not an addict anymore, she’s trying to write her second metanovel, and to make her marriage work. She’s really interested in the way everything is alive. Thuy’s new metanovel is about:

- The coming of lazy eight and hylozoism.
- The loss of privacy.
- Breaking free of Big Pig addiction.
- The compromises and losses of being married.
- The hope for true love.
- The preciousness of gnarl.

So what’s a title that captures that? Open City? Eyes? *Hive Mind!* This fits as having everything alive makes for a hive mind. The “[universal mind](#)” that arises from the cosmos can be regarded as a hive mind. And telepathy makes humanity more like a hive. And being in a pair with a spouse puts you into a small hive mind. The street notion of hive minds as dull pits hive minds against natural gnarl (although in fact ant hive minds are indeed very gnarly, and humanity’s hive mind is in fact gnarlier than any individual human.)

- The coming of lazy eight and hylozoism.
- The loss of privacy.
- Breaking free of Big Pig addiction.
- The compromises and losses of being married.
- The hope for true love.
- The preciousness of gnarl.

“She wanted to write about the end of privacy, and the beginning of the universal mind. In old-school science-fiction, hive minds were always presented as totalitarian and dull, but maybe that was wrong. The hive mind of an ant colony was maybe more interesting than the tiny mind of an individual ant. Was the emergent mind of human society more interesting than a person’s? Maybe, maybe not. If you thought of society in terms of mass culture and Homesteady politicians, then, no society was dumber than shit. But if you thought in terms of the history of art or the history of science, then maybe the human hive mind was really getting somewhere.”

By the way, an [ant brain has about 300 K neurons](#), as compared to a [human brain’s 300 Gg](#). A million-fold difference.

Infinity descriptions to lift from “Jack and the Aktuals.”

“A preternaturally smooth and glassy figure eight. An infinity symbol. A crystal or a jewel. An amulet. A crystalline lemniscate, its interior filled with reflections and bright caustic curves. The shiny loop brightened. Writhing slowly in his hand, the lazy-eight smoothed away its plug, unknotted itself and became a zero. Floating into the air, the circle grew to the size of a companionway door. He nudged the glowing ring with the sharpened tip of his nose. The ring rotated to a horizontal position and sank down to shin-level, bobbing like a hula hoop.”

I copped a line from Laidlaw’s ending to our story, “Probability Pipeline.”
“*It was quiet up here, so quiet.*”

On should successfully use the Hrull whistle at some point, otherwise there’s no point in Thuy telling it to him. Maybe in Chapter Eight when all the shit comes down.

Also, Thuy should successfully use the stonker gun at some point, otherwise there wasn’t much point in bringing in the guns. Maybe in the Hibrane she uses it? Oh, I don’t want to have to lug the stupid thing along, I’m going to have her pass it off to Kittie, and she can use it in Chapter Eight.

December 15, 2007. I finished revising Chapter Two: The Missing Gnarl last week, and now I’ve revised Chapter Four: Coma Nurse as well.

I’ve been working to build up Thuy’s character, making her feisty and independent, she was too weak and reactive in the first draft. I adjusted the playing out of her sex scene with Chu to make her seem relatively innocent; I can’t have her come across as a selfish pedophile, or the readers lose empathy for her.

Now to revise Chapter Five: Hieronymus Bosch’s Apprentice, and then I can finally start Chapter Seven: To The Gibbet! I can have Thuy save the day here.

It’s incredible how much time it takes to do a revision. The rereading goes very slowly as does the typing in of the changes I write on the printout. I have to think a lot, weighing the options.

December 18, 2007. I read Chapter Five. I need to pump up Jayjay’s motivations and character, just as I did for Thuy. At present he’s too passive, too much the stoner. He has to have a goal. It might as well be going further into the transfinite. And maybe to be a painter.

There should be something very concrete that they want to get from the harp. Jayjay is freed of Pekka as soon as they jump into interdimensional space. So in the Hibrane they are looking for — what?

In principle, anyone with infinitary logic can run the reset rune. And I’m in fact planning to activate that by having Chu climb the beanstalk and cook infinity down to a compact “Chu’s Koan” teaching.

But in Chapters Five and Seven, Jayjay and Thuy don’t know that’s how it’s gonna shake out.

So let’s say they are hoping that the harp will indeed provide a universal infinity teaching for humankind. And the pitchfork has encouraged them to believe this.

December 19, 2007. Okay, I typed in the changes on Chapter 5, and I’ve started revising the outlines of Chaps 7 and 8.

But I feel like I can't remember what happened in Chapter Six: Chu's Serpent. If I'm going to craft the action for Chaps 7 and 8, I think I better read Chap 6 again. And I'm gonna reread the ending of Chap 1 yet again, as that's where all the conflicts come from. And I'm gonna revise Chapter 3, as well, because that's where the runecasting gets started.

In other words, I'm revising the whole book before starting Chapter 7. Partly this is a way of avoiding the yawning terror of embarking on a new chapter. But I do need to have a clear plan before undertaking the endgame.

I also decided it was confusing to have a First Bird Pekka, a god Panpenga, a Realtor Pekka, and a planet Pengö. I eliminated First Bird Pekka, and changed Panpenga's name to Pengö too.

December 20, 2007. Streamlined Runecasting.

Revising chaps 3 and 6, I'm seeing a problem. I've made runecasting too complicated, and Chu's Serpent is like higher mathematics.

At present, runecasting works like this:

- *Object-to-Rune.* Pekka sends the rune to Jayjay. The rune is a description of a Peng pioneer or of some other type of object like a moth or a house.
- *Rune-to-Program.* Jayjay carries out an infinite computation to convert the rune into an atomic matter-wave program. The computation is infinite because space is continuous.
- *Program-to-Atoms.* You have to be a teeker to cast the program onto each atom of the Peng ranch.

The reason I have such a complex process is because I don't want just anyone to be able to runecast. For plot reasons, I require that runecaster has to be a teeker who can think infinite thoughts. Therefore only Jayjay can do it, and that's only because he climbed the beanstalk.

What if Pengö does both the Object-to-Rune step and the Rune-to-Program step. And the program experientially resembles a shape—like I described the moth rune as an endlessly regressing conch shell and the Floofy rune as a Japanese temple (which I will now rewrite to be infinite as well).

We'll suppose that a rune for an object is infinite because matter is infinitely divisible. Of course quantum mechanics says that a material object has only a finite amount of info, and that there's no further divisibility below the Planck length. Well, obviously, QM has to go. Suits me! I hate QM. We'll say that QM is only an approximation and that objects do in fact have an endless amount of info—down in the subdimensional levels. Actually, I already mentioned this in PS1, during Thuy's excursion into Subdee. Fine.

So now the flow is like this.

- *Object-to-Rune.* Pekka sends a rune to Jayjay. The rune is an atomic matter-wave program for generating a Peng pioneer or of some other type of object like a moth or a house. The rune is infinitely complex because matter is infinitely divisible. Experientially you see the rune

as an endlessly graphical object. You need to be able to think infinite thoughts to understand a rune and hold it in your head.

- *Rune-to-Atoms*. You have to be a teeker to cast the rune onto each atom of the Peng ranch.

Okay, that works. In Chap 6 I have Chu find a to do approximate runecasting without having to understand infinity. The flow is as follows:

- *Object- to-Rune*. [As before]
- *Rune-Finitization*. He programmatically converts the infinite rune into a finite form that he can readily manipulate in his mind.
- *Rune-to-Atoms*. [As before.]

Initially I have Chu using a fairly complicated form of Rune-Finitization, involving an “Ourobours” operator chain that converts the infinite rune into a fixed point and an algorithm for a fractal. But nobody but me would ever understand that. So I think I’ll switch to pixelization; basically he just averages out the small infinite details. But he can use some smart averaging method, which is why it takes him two nights to come up with this hack.

At first the results aren’t too good; the resulting tulpas fall apart quite soon. But then Pekka finds a way to make her runes robust against the clipping. This is, however, at the cost of making the resulting tulpas be somewhat crude and simple. Like VR instead of reality. Like plastic photo-mapped wood grain instead of wood. Like a movie instead of a novel.

Kakar is going to be deploring these dumbed down finitized Peng that start showing up. Pekka herself isn’t going to care that much; she’s all about spreading her native race; she’s so much smarter than a mere Peng that she is somewhat insensitive to the difference between the true Peng and the fake Peng.

December 21, 2007 Infinity and the Subdimensions.

Today I had an attack of self-doubt. In my head, I’m playing a tape-loop of a *Locus* critic saying *Postsingular* is written as if I have attention deficit disorder. I’m worrying it’s too much to drag infinity into my trilogy

I got infinity out of my system a little bit with the “Jack and the Aktuals” story, so can that be enough? I worry that for the average reader, it would be more attractive to have PS3 be called *Intergalactic* than *Transfinite*.

A justification for *Intergalactic* would be that I’ve set up three of alien worlds to visit: Hrullwelt, Pengö, and Pepple. And I will probably visit those worlds in PS3. So *Intergalactic* would make sense as a title. But, as a title, it’s kind of a come-down isn’t it? Like switching from punk rock to easy listening. (A medium-grade wimp-out option is that PS3 could be *Subdimensional*, or *Subdee* for that matter.)

And remember that I do have a commitment to infinity because of the ending I added to PS1, that is, the notion of the infinite lazy-eight memory and a teep-reflecting router-like “point at infinity.” And I want to keep my sequence of Jayjay seeing a crystalline infinity symbol at the top (or bottom) of the eighth dimension. It’s a good eyeball kick.

So, nah, don’t give up on infinity, Ru, you’re just being a nervous Nellie. Hang onto your dream of *Transfinite* for PS3. Anything less is like flinching. I’ll keep on staring into that sun until I’m fully blind.

Or...? Am I just being too knee-jerk rebellious and pigheaded. Maybe putting too much infinity in *Hylozoic* really is a mistake.

Well, I'm gonna be rethinking this for a week.

Looking at the scene at the end of Chapter One, I dread drastically revising it yet again. This is only a single novel for which I'm not being paid all that much. Maybe I just need to say it's good enough and finish it and move on.

Trust in the eyeball kicks, and don't worry overly much about the logic or about writing like I have ADD?

What I can do for starters is to blend the infinity with subdimensions in *Hylozoic*. That way I am building on *Postsingular*, rather than totally heading off on yet another tangent. I'd been thinking I need to make another visit to Subdee in any case, so if I blend Subdee with infinity and the beanstalk, great.

In order to integrate infinity with the subdimensions, suppose I have the lazy eight axis (and the beanstalk) point down into the subdimensions. So we're pursuing an infinity in the small. And we do our RAM-access and teep-transmission Zeno speed-ups not by going faster and faster but rather by ignoring the intrinsic scale of the unfurled eighth dimensional axis.

What I mean is that axis itself might be, from our point of view, of a finite (and indeed very small) length. There's a tiny eighth-dimensional whisker going out from each location of space, and *extrinsically* they're, like, only Planck-length long—but *intrinsically* each whisker is infinite. The axis has endless detail due to the infinite divisibility of matter. It's like fitting an alef-null sequence into a finite interval, Zeno style, as with the binary point-fraction 0.1111...

If this is the case, then the notion of the whiskers all meeting at a single point at infinity doesn't seem to fit. My image before was of a bundle of parallel lines meeting at a projective perspective point at infinity. But now I'm thinking more of parallel bristles. But, so as to facilitate teep, I do want their termini to all be in some sense the same spot. So now I think of a bus on a circuit board. This looks perhaps like the cloud on the beanstalk. It's kind of a hyperplane where you are in effect infinitely large, so you can reach any finite distance instantly.

So now I suppose that Jayjay's journey up the beanstalk was really an exercise in shrinking down into the subdimensions. Really he travelled down to the bottom of the lazy eight axis. At the time he doesn't fully realize this, though. He has the impression that he's climbing up, though he has some hints that All Is Not As It Appears.

I'll have him physically sink below the Planck scale, so that, from Thuy's POV, disappears. And when he's returning, Thuy sees him oozing up out of a crack in the floor. Nice eyeball kick.

Still simplifying the Pekka thing. Let's drop the notion of an intermediary bird creature who's an agent of Warm Worlds. Let's say that the planetary mind of Pengö latches onto Jayjay directly. Maybe we'll call the planetary mind Pekka, as I like that name. Gaia : Earth :: Pekka : Pengö.

I can still depict Pekka as a bird, but she has something like a golden thread connecting her to Pengö.

Maybe later in the battle scene, we have Gaia project an avatar into this arena as well. Ladies' Wrestling: Amazon Woman vs. Vulture Demoness!

So what did Jayjay do to set off the invasion? Mainly he let Pekka link into him. But not just anyone can be Pekka's medium, at least not to start with. They have to understand infinity, so as to be able to handle the infinitistic Peng pioneer runes.

So what Jayjay did was (a) become open to infinity, and (b) have Pekka link to him.

I have the idea of the Hrull bringing some countermeasure that we can use to eliminate the Peng: a reset rune. For plot reasons, initially only Jayjay can use this countermeasure, and then Pekka paralyzes him to stop him.

We can suppose that you need infinite consciousness to cast the reset rune, and that a Chu-finitized version of the reset rune does nothing. So although the Crownies can learn to cast approximate, finitized tulpas, they won't be able to cast the reset rune.

What does the reset rune look like?

How about Gabriel's Trumpet, I'd meant to use that somewhere. It's a trumpet with its bell right in your face, and with its mouthpiece infinitely far away. You can see both ends of the trumpet. What makes it infinitely complex is the twisting of the tubing in between. Naah, I want something more infinitistic.

How about a Mandelbrot set? Hard to describe except as a crooked beetle, and I've already had some beetles that were bad things.

How about something yogic. A mandala with every possible object in creation around the rim of it. And a glowing eye in the center. You need to be able to comfortably have a god-like thought of all possible objects to grok the reset rune.

Over in Hibrane, Thuy is going to get infinite mind happening for herself. She'll be meditating in her jail cell, thinking about her trip to Subdee, and she'll flash that matter is infinitely divisible, and she'll have a big Aha experience, she'll understand that when Jayjay thought he was climbing the infinite beanstalk, he was really filtering down to the bottom of the subdimensions.

So Thuy would be able to cast the reset rune when she gets back to Lobrane Earth, but, as it happens, Thuy, Jayjay, and Chu get sucked into a maelstrom to the bottom of the Planck ocean.

Chu gets knowledge of infinity here, and Thuy and Jayjay get side-tracked, they go through the alef-one castle, and go off on their own adventure.

Chu himself learns alef-null and he does make it back to Lobrane Earth, and he drives drive off the Peng, running the reset rune on the whole planet, enlisting the Hive Mind to clean the world.

What are the pitchfork and the harp up to?

There's a complex tangled loop of causation. During their brief (as seen from the outside) interlude down at the bottom of Subdee, Thuy and Jayjay become aktuals, a hollow ball and a corkscrew. The hollow ball brings lazy eight to Pengö a hundred thousand years ago, and to Pepple a hundred years ago. The corkscrew also makes Groovy and Lovva in aktuals: the pitchfork and the harp.

In turn, the harp brings lazy eight to Earth, and the pitchfork makes Thuy and Jayjay into aktuals.

And maybe at the end of PS2, Thuy and Jayjay are back on Earth, and Groovy and Lovva are back home on Pepple.

And Chu and Bixie take off on an intergalactic tour, but not inside a Hrull. They are using runecasting to make their own life support.

December 23-28, 2007. Flounder! ∞ Runes? Atom Charm, Zenohead!

I'm floundering like crazy these days. After Christmas Day, I snapped awake at midnight and sat up awake for two hours writing ideas.

Despite the previous entry's bravado, I do think my idea of making the [runes infinite is overkill](#), a false path, a blind alley.

Instead, I like to think that tulpa travel really *could* work. So I want the runes to be finite quantum-computational programs, as I'd originally planned. If I make the runes infinite, I'm consigning travel via tulpas to the B.S. bin. And thereby I'm needlessly undermining a good idea.

So let's do suppose the runes are finite (if perhaps rather large). And let's say that I only need one rune per tulpa. But I put the same rune on lots of atoms. In other words, I see a rune as like a cellular automaton rule or like an A-life program—a procedure which runs on members of a swarm, and something interesting emerges from the thus-programmed swarm's group behavior.

(By the way, as new atoms enter a ranch, they acquire the rune, and they shed it when they leave. The transition has to do with being surrounded (or not) by rune-programmed atom; it's a conversion behavior like you see with a neighborhood majority voting rule.)

With the runes finite, I still need to find a way to achieve my prime desideratum:

Runecasting requires a special capability that only Jayjay has.

He acquires the capability during his trippy vision at the end of Chapter One—a vision which I keep rewriting as I change my mind about the capability.

Atom Charmer Option (Discarded)

This comes out of a question I never thought of asking before: why do the silps of atoms (or the silps of larger blocks of matter) allow someone to reprogram them? Teeking is one thing—you're just moving the object. But maybe reprogramming is more invasive?

I could just mention atom charming as a skill that people have. Like another form of teek. Or I could act like it's a skill that only Jayjay has. Atom charming is a crisp, binary ability, either you can charm atoms or you can't. Less fuzzy perhaps than whether you are enough of a zenohead to nuke ten tridecillion atoms.

Here I'd have to ask how Jayjay learns to charm atoms. I see him going under the Planck frontier, he's looking up at atoms like a submerged snapping turtle looking up at ducks on a pond, he can grab them by the legs. I hear the shocked, outraged squawk of an atom as I grab it. Why can only Jayjay do this? Does he still go to infinity at all? Or is it really just a matter of getting subdimensional view of things.

And I'd have to ask how Chu and the Crownies' version of runecasting in Chapter Six works if they can't charm atoms? Maybe they spray out a fog of slave atoms that have somehow been zombified. Maybe the slave atoms are the shit and piss and exhalations and sweat of Chu and the Crownies. Nice symbol of pollution/exploitation. And their atoms infect the other atoms, but it doesn't spread perfectly smoothly which means that the tulpas the create are a bit feeble and clunky.

For this to work, we have to assume that you are able to charm your own atoms, so we have a kind of *petitio principis*, which is unsatisfying.

Zenohead Option (Implemented)

This approach is only a slight deviation from what I was saying when I thought runes were infinite. Instead of saying that Jayjay's capability is that he can have infinite thoughts, I say the capability is that he can think quite fast. Call this becoming a zenohead, zenobrain, zenoteeker, a zenobrain teeker, a zenohead teeker—let's go with *zenohead*.

Being a zenohead helps him speed up his mind enough to rapidly program ten tridecillion, that is, 10^{43} atoms in a row. (Possibly being a zenohead also helps you understand the perhaps very large rune. (Later, Chu will round-off the large runes as well as chunking them onto larger sites.))

In earlier drafts, I'd been taking the zenohead ability for granted, but now I should make a big deal about it. Note that if I'm not using actually infinite runes or infinite numbers of atoms, we're not talking about a qualitatively new power, it's just a matter of having a still-more-powerful mind. Another step towards intelligence amplification. I can speak of the Zeno speed-up as a new technique that only Jayjay learns. Carrying out a Zeno speed-up, or even a lesser speed-up is done by taking advantage of matter's infinite divisibility.

Note that if Jayjay actually has to touch all those atoms, there is some fixed cost q per atom, so he needs $q * 10^{43}$ units of energy. Suppose he's siphoning it up from the subdimensions, and that's another part of being a zenohead, the access to "subdimensional energy."

A seeming problem with saying that uniquely Jayjay can think fast is that people are already doing very large tasks by accessing their lazy eight RAM (in principle it's infinite). But we can suppose that they're not actually using such very big data bases.

I had worried that using teep requires a Zeno speed-up, as you're sending a teep signal the infinite distance up to bounce off lazy eight. But your mind doesn't have to make the trip with the teep signal. Perhaps theoretically it's known that the signal does the speed-up, and the extrinsic/intrinsic distinction is known, but actually doing it in your own head by utilizing your body's endless number of levels is a new skill that Jayjay learns when he becomes a zenohead.

What about the scene where I have Chu shadowing Jayjay's mind motions and learning the names of the atoms? Suppose I just drop this. Chu is left in the dust. He can't process that many atoms. He's "almosting" Jayjay's technique of using finer Subdee parts of his mind, but he won't really get that until he's fallen into the maelstrom in Chapter Seven or Eight. It's okay to have Chu not achieving anything special in Chapter Three, as he'll be doing a lot in chapter Six.

In order to make Jayjay a zenohead, the pitchfork took Jayjay into Subdee. At first the path into Subdee looked like a tunnel, and Jayjay is scared. The pitchfork reversed the figure and ground, and the tunnel looked like that vine he thought he climbed. But they only go partway up.

Maybe it's a good idea to have Jayjay not making it all the way to infinity in Chapter 1, and then there's something left for the second time they go out the beanstalk or down the maelstrom; the second time the can co all the way

December 29, 2007 - Jan 2, 2008. Still Floundering.

I don't think I've ever had so much plot trouble on a book!

I did another round of rough fly-by revisions on Chaps 1 - 6, implementing my zenohead notion by rewriting the frikkin' dream sequence in Chap 1 for the umpteenth time, and by searching for all mentions of "infinite" or "reset rune" to try and edit those passages to jibe with the zenohead notion.

CHAP 6 CHU'S SERPENT; KAKAR'S SERPENT

Question: How does Chu achieve an approximation of runecasting which initially fails, but then spreads disastrously across the planet?

Answer. Thanks to Chu it becomes possible to make any rune become viral. A viral rune needs only to be teeked onto one single atom and then it rune spreads out to a space the size of a Peng ranch, allowing the desired tulpa to emerge.

Ironically, the one rune that Chu can't successfully viralize is the reset rune. Chu invents his viralization procedure—he calls it Chu's Serpent—hoping to apply it to the reset rune and create an antitulpa agent. But when he casts the reset rune onto an atom, the atom is healed, but the reset rune doesn't spread. The neighboring pioneer rune-programmed atoms spread the pioneer rune right back into the temporarily reset atom.

Chu convinces himself via an incorrect (!) mathematical proof that the quantum mechanical no-cloning theorem implies that no viralization process can be made to work with complete reliability. And he forms the notion that using the inherently defective viralized pioneer runes can only bring shame upon the Peng. So he takes the seemingly irresponsible step of teaching his viralization technique to the Peng.

They try it with the moth rune, and then they make a Floofy. She lasts half an hour and falls apart. The Peng are mad at Chu; he claims it wasn't his fault.

But now Kakar improves Chu's method—we'll call it Kakar's Serpent now—knotting the Serpent in some kinky birdy way that Chu doesn't quite catch before Kakar slams shut his teep window. Kakar enlists the Crownies to spew out Peng ranches as fast as they can hop. The Peng don't hand out the now-secret Serpent, they simply pass out the viralized runes.

The Peng are worried that Chu may figure out Kakar's Serpent—after all he did have a partial look at it in Kakar's mind—and they want to kill him, as Kakar's Serpent *would* in fact be effective at spreading the reset rune.

CHAP 6 DISASTER SCENE

I want to dramatize a big disaster at the end of Chapter Six. Pekka is explosively and exponentially spreading tulpa settlers across Earth using Kakar's Serpent. All the gnarl is dying. The Peng are everywhere. Gaia is on the point of setting off volcanoes to destroy the planetary crust and break free.

Thousands of Hrull appear in the sky, swooping down and swallowing people, getting teekers while they can, before Gaia destroys the human race. A frantic dogpile scene.

CHAP 7 MATTER CONTROL

Jayjay tries a zenohead vaar move to save Thuy, but he has the rune wrong and he makes thing worse. Thuy hooks into her Subdee memories and become a zenohead too and fixes the goof, but only partially. Then Chu and Duxy save them.

Thuy should talk to Hibrane Gaia.

Perhaps as they enter the maelstrom, they learn there was some upside to the pitchfork's betrayal of Jayjay?

Do I present Jesus as an alien? Naw, don't go there, people are so tense and weird about religion, I'm already touching on it more than enough.

CHAP 8 MAELSTROM AND INFINITY

We'll suppose that Chu goes into Subdee via an Arthur-Gordon-Pym-Hollow-Earth-type maelstrom in the Planck ocean. Duxy gets sucked into it on the flight back from the Hibrane. I'll stress the Subdee aspect. I see the place they go as being like the scary, trippy cave I dreamed about when the dentist gave me Vicodin and I fell into a stuporous nap on my bed downstairs, and I dreamed I was in a cave-like subterranean Hopi kiva room, or a Navaho peyote ceremony sweat lodge, I was there for a hundred years, everything hot and slow, with Tim Leary and Onar Anders from *Freeware*. Also think of the cave where I went when I ate a toadstool in Geneseo, with the puffball-like boy with crumbling flesh (who was also me as a youngster). Also keep in mind the bubble-dome future TV studio that I hallucinated at the Mondo 2000 house. And forget not the Aegyptian temple where Thuy was with the lithops plants.

I'm thinking I might temporarily break away from logic during the maelstrom trip. Have them see all sorts of impossible things.

On New Year's Eve, Sylvia and I watched the second half of Bergman's supreme film *Fanny and Alexander*. There were these Jewish magicians who said something relevant. They said every pebble is alive (hylozoic!). They said that various realities overlay ours, the realities swarm around. And at the baptism at the end, Gustav Eckdahl says that we have our own "Little World" of peace and joy, even though ravaging Evil has broken its chains and is on the prowl. And in the very last scene, someone is saying that anything is possible and life is a story we tell ourselves. I think of Alexander's toy theater at the start.

My point is that I could have some inexplicable things in the maelstrom scene. I could end the maelstrom scene in a blackout and start up again back on Earth.

Question. What is the gain of getting to infinity and becoming an "aktual"?

Answer. An aktual is capable of programming their body's atoms to achieve desired ends. They become a purposefully self-modifying computation. And therefore they can shapeshift. Also they can do direct matter control, which I called femtotech in *Saucer Wisdom* and in *Realware*. I think in both novels they had a tool for this called an *alla*. And in *Frek and the Elixir*, some characters were doing direct matter control with a purely mental technique called *vaaring*. I think I'll reuse that word in the PS series.

One might think that, in principle, a zenohead teeker can already vaar, as a body has "only" ten octillion atoms, so the teeker could readily program each of them. But suppose that it's very difficult to figure out *which* rune to use to change yourself in a desirable way—and that, in fact, the vast majority of reprogramming runes will kill you. That is, it's not easy to figure out what the rune to put onto my atoms so that I look like a Giant Squid or the Wolfman or a pitchfork, harp, corkscrew or egg—just like it's hard to figure out the particular parameters that zoom in on, say, an ant-shape in the Mandelbrot set, or hard to tweak a CA rule to produce Zhabotinsky scrolls.

This is a familiar phenomenon in CS, relating to the unsolvability of most program-classification problems. The only known way to solve these problems is via an ability to carry out actually infinite searches, examining all possible programs and their long term behaviors. An infinite mind could do this, essentially by using a Turing Evaluator.

So that's the aktual's power. Due to their ability to have actually infinite thoughts, they can use Turing Evaluator techniques to locate desirable runes which are tailor-made for a particular purpose.

Question. Why are aktuals free to hop around in spacetime?

Answer. I have an image of an eye looking down into a hollow hemisphere, and each point is a spacetime location, and the eye can instantiate itself wherever it likes. Think of the eye as being at infinity, and suppose that all the subdimensional axes from every spacetime location meet at this single point. Suppose even that the Hibrane and Lobrane axes all meet up here.

I hear a sound, the music of the spheres. I think of Groovy the pitchfork making a vulgar joke about said music being a fart from Lovva's round buttocks. And then I think of Chaucer, *The Miller's Tale*: "'Tee hee,' quod she, and clapt the window to."

PERVASIVE ISSUES WITH TELEPORTATION

I plan that in Chap 7 our heroes are jailed to be executed as sorcerers in Hibrane 's-Hertogenbosch. But—oops!—by default, they're going to have teleportation, as this scene happens after Jayjay unfurls Hibrane lazy eight.

So I have to assume they're in a teleportation-shielded jail of some kind. Suppose that we use the cathedral. The cathedral's dour silp is willing to block teleportation and teep so that people can be tortured and executed in there. Good symbolism for religion's dark side.

I had already mentioned that the Sonic's apartment accepted teep but blocked incoming teleporters. And that the Aztlan taqueria accepted teep input (for placing orders), but blocked teleportation in (to prevent jostling). And the hotel in Charlottesville has the same property.

Question: How is it that silps can block teep and/or teleportation?

Answer: All the particle threads run up through the eighth dimension to infinity. Teep rushes up and bounces back down. An environment might block teep by alertly monitoring what signals go out, and by sending jamming signals in near synchrony, like, a crest for every trough and vice-versa.

As I described teleportation in PS1 and again in the current draft of PS2, it depends on getting an eidetic teep image of the target location. According to what I said, you get an eidetic image of the target locale, become uncertain where you are so as to let your quantum wave function smear out, and then you recollapse yourself into the new location.

Teleportation depends on teep, so blocking teleportation is a matter of blocking a certain kind of teep.

So I think we have to suppose that silps can block all teep if they want, but that sometimes they only block the teleportation-producing kinds of teep.

A silp might recognize a pre-teleportation teep signal because it embodies an intensely detailed examination of a scene.

Question: If quantum mechanics is an illusion (a statistical mechanics resting upon a sea of infinitely divisible deterministic matter) then what is the more correct low-level explanation for the emergent phenomena of (a) quantum entanglement and (b) positional uncertainty (which leads to teleportation)? Note that these answers have to work even in regions where lazy eight remains coiled into a circle.

Answer: Hell, just wave my hands about the details. QM is true as far as it goes, but there's more than meets the eye.

The background of this question is that I'm trying to have it both ways.

On the one hand, I'm using quantum uncertainty for teleportation in PS1 and PS2; also I'm using quantum entanglement for telepathy-like communication in PS1 and for Pekka's control tendrils in PS2.

On the other hand, I'm denying QM because I have a scene set in Subdee below the Planck scale in PS1. And I plan to flout QM even more in PS3 by talking about infinite divisibility of matter.

But I want to stick with the quantum collapse model of teleportation, as it's already enshrined in PS1, and I don't want two separate teleportation mechanisms in the PS series. And I must keep in mind that I have another reason to stick with the collapse model, to wit, that I'm saying that only humans or humanoids can teleport or teek, and this is because of their species-specific weakness for the what-if emotions of remorse, doubt, and fear.

This said, it *had* crossed my mind that I might claim that in a lazy-eight world, teleportation works like teep: by sending a holistic soul-like software copy of yourself to the lazy eight point at infinity as a coded teep signal to bounce back down. But this is a non-starter, for if I made teleportation just a fancy kind of omnivident telepathy, then all the critters could teleport and, objects would fly around and the Peng wouldn't need our teeker help in order to invade Earth.

So I'm stuck with teleportation being fundamentally different from teep. Could I at least get rid of having two separate explanations for teep? My point is that, at present I to have two separate telepathy mechanisms, that is, orphidnet quantum entanglement in PS1 and lazy eight infinity-bounce in PS2. Could I fuse these two teep explanations by claiming that even before lazy eight was unfurled, our thoughts were *already* bounding off infinity, and that infinity was the secret cause of both quantum entanglement and positional uncertainty?

Probably not, as I need for Pekka's quantum entanglement tendrils to be quite distinct from infinity-based teep.

[But if I wanted to force the connection, I'd have to be thinking not so much the unfurled eighth-dimensional lazy eight infinity, as about the infinity that lies below the endless divisions of matter, and I'd say that these infinities might really be the same, and that the unfurling of lazy eight simply made infinity more evident to us, but really it was there all along, mediating our quantum entanglement. And maybe I could even say that harp didn't really unfurl anything, and that we've always had access to infinity via the subdimensions, and that all the harp did was to in some sense redirect the attention of every particle on Earth. But this latter notion is very vague. So I don't think this is a productive line of thought.]

Question: How is the Seven Wiggle quantum-mirrored room different from a teep-shielded room?

Answer: Pekka's connection to Jayjay is something other than teep, it's a direct physical contact via string knotting and quantum entanglement. Teep-proofing won't block out Pekka; this task requires the quantum-entanglement-severing square-root-of-not varnish.

I think I'm stuck with this distinction, as I want silps to be able to block teep but not be able to block Pekka's tendrils, and I'm seeing these as being like a kind of quantum entanglement so that the quantum-mirrored room at Seven Wiggle can block her out.

Re: quantum entanglement, let's use some knot-theory jargon. I read about this quantity called the "writhe" of a knot, it's used in enhancing the invariant Kaufmann bracket to produce the Jones polynomial for strings. I can jabber about the "writhe signature" of the knotted string making up a particle, such a signature being an endless sequence (due to the infinite divisibility of matter). I can also mention that each looped and knotted string is in fact a chain of linked substrings which are in turn chains of still smaller loops. Such endlessly regressing structures are called "wild knots." Here's a picture from the [KnotPlot site](#) of stage three in the construction of the classic wild knot, Antoine's Necklace

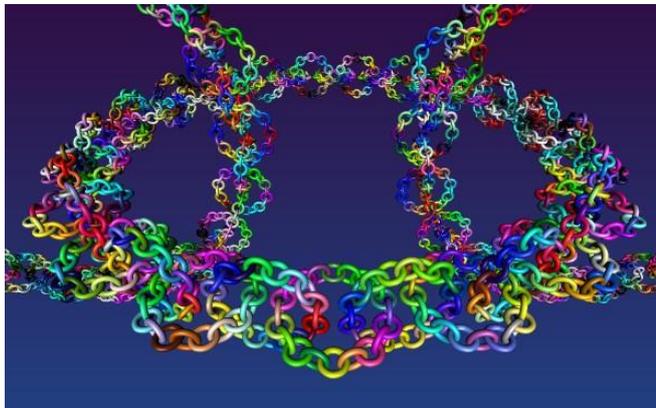


Figure 20: Antoine's Necklace

To Do

(As usual, I put asterisks by the points that I've taken care of.)

- *Chap 1, when giving the description of teleportation as based upon QM uncertainty, mention that QM is now known to be a high-level approximation that doesn't quite work beyond lazy eight infinity or below the Planck length.
- *Chap 1, when contacting Sonic and then Aztlan Taqueria, mention that rooms *can* block out teep as well as teek.
- *Chap 1. Pekka's connection to Jayjay is something other than teep, it's a direct physical contact via a wild knotting of regressing strings—what was formerly known as quantum entanglement. Teep-proofing won't block out Pekka; this task requires the quantum-entanglement-severing square-root-of-not varnish at Seven Wiggle.

- *Chap 2. Thuy tries to protect Jayjay from Pekka with local teep jamming, but it doesn't work. The teep jam can't keep out Pekka's quantum entanglement. And the local silps' teep jam isn't fast and reactive enough to cancel Jayjay's superfast transfemtohertz vibrations.
- *Chap 3. Chu teeks the reset rune onto some atoms. Dramatize teeking, the difficulty of covering enough atoms, and the fact that the neighbor atoms roll back isolated changes.
- *Chap 4. Duxy was blocking teep, and the public only saw Chu and Thuy *in flagrante delicto* after Duxy opened her mouth. Chap 3. The interior of Duxy was blocked from teep view when she was lurking in the field of scree.
- *Chap 4. The Seven Wiggle quantum-mirrored room happens also to be set to block teep, so Jayjay can't cast the reset rune from inside there.
- *Chap 6. Chu makes an unsuccessful effort to spread the viralized reset rune, tests it on an atom.
- *Chap 6. Chu gets a brief glimpse of Kakar's improved version of his operator, Kakar's Serpent. The Peng want to kill him lest he successfully copy the technique.
- *Chap 6 ending. Julie the Crownie shows up in Santa Cruz and casts a set of viral pioneer runes. Gaia decides to destroy the crust. As Chu gets into Duxy, more and more Hrull appear, wanting to get humans while they can. A florid disaster scene, seen from their viewpoint in the sky. Some volcanoes already starting, swarms of Hrull, a spreading red tide of Peng ranches (red like Republikkkkan states in the stolen elections of 2000 and 2004.)

Jan 3, 2007. The Pekka Problem

I had my first full day of work after the holiday break yesterday. It felt so good to be tidying everything up, removing some of the low-level anxiety that nags me when I know there are still holes in my plot. And it was nice simply to be working, back in my own world of thoughts.

Hylozoic is nearing a manageable state. I'm looking forward to finally having the titanium skeleton of story in place—and then being free to mold the foam rubber bulges of characterization, clothe the creation in eye-catching garnishes of scenery and description, and polish up the dialog.

Alas, last night about 3 a.m. I thought of some problems with Pekka. Here's the situation (the axioms, if you will).

(1) The invading Peng birds come from the planet Pengö, which has a planetary mind that's orchestrating the invasion. I am calling this mind Pekka—she's a counterpoint to Earth's planetary mind Gaia.

(2) In the current draft, Pekka appears to Jayjay in the form of a Peng bird on a beanstalk leaf partway out towards lazy eight infinity. In order to enslave Jayjay, Pekka weaves her body's particle strings with the strings of his body, forming a quantum entanglement that can't be jammed or blocked out in the same way that lazy eight teep signals can be jammed.

(3) Not being humanoid, the planetary mind Pekka is not capable of teleporting or teeking (affecting object via mental powers) or vaaring (using runes to

create new objects from thin air). The difference between teeking and vaaring, is that if you can vaar, then you yourself can figure out the proper quantum computational program—called a rune—which will convert some existing chunk of matter into your targeted form. Designing a rune is so computationally demanding as to require, I believe, an infinite mind. Pekka does indeed have an infinite mind so she can design the necessary runes. Her difficulty is that she can't put the runes onto Earth atoms; she needs a local for that.

(4) Pekka has powerful teep (telepathy), and can mentally contact humans or Peng tulpas on Earth.

(5) We may suppose, if necessary, that Pekka has been to infinity and is an aktual and has mental Turing Evaluator abilities, therefore she can design runes to achieve desired effects. But she can't vaar them into atoms herself.

Now to lay bare the contradictions in this state of affairs and to deduce some additional assumptions which will resolve the logical clash!

Question: How does Pekka project a physical presence through infinity and partway down the eighty dimension towards Earth? Isn't this presupposing an ability to teleport to Earth, which is exactly the ability that she doesn't have?

Answer: Pekka didn't produce that body, Groovy the pitchfork did! He vaared it into existence and hooked it up to Pekka's teep. Why, then, doesn't Groovy just vaar all the Peng invaders directly onto Earth? He could, but he doesn't want to, it's too much trouble, and he doesn't like Pekka well enough to carry out a sustained campaign on her behalf. And neither Pekka nor a loyal Peng aktual can do the vaaring work themselves, as only humanoids can teek.

Question: When Pekka did her very first planetary invasion on Brux, did she need a teeker aktual like Groovy to help her?

Answer: Not necessarily. We might suppose that the teeker zenohead Bruni on Brux was voluntarily willing to help Pekka invade. There is no absolute need for a quantum entanglement between Pekka and some given teeker who's acting as her runecaster on a target world. The entanglement is only necessary if the teeker is (like Jayjay) an unwilling slave. If the teeker is an eager cooperator, teep can suffice.

Question: Why didn't Pekka just nose around for a quisling human (e.g. a benighted fundamentalist) to help invade Earth? Why bother with Groovy?

Answer: At the start of *Hylozoic*, Pekka doesn't yet have the Chu & Kakar's Snake operator—which allows any teeker at all to implement a Peng ranch by teeking a rune onto one single atom. Pekka needs to find a native teeker who has also become a zenohead by dint of climbing (or descending) a considerable distance into the subdimensions along the axis of the eighth dimension. And, as the unfurling of lazy eight is still so very new to Earth, there are, at the beginning of *Hylozoic*, no zenoheads at all on Earth. Eventually someone would have found the way, but Groovy proposes that he initiate an Earthling to zenohead status. Perhaps Groovy could have chosen an Earthling who'd be willing to help Pekka without coercion, but he finds Jayjay to be congenial, and it's no serious difficulty for him to vaar an avatar for Pekka onto the beanstalk leaf.

And, *ooo*, I just thought of something else. The Pekka avatar can come down off the beanstalk and do something on Earth, like, say, trying to disembowel Chu lest he learn to spread the reset rune. Like having Hera come down off Mt. Olympus to snapify your ass.

And then Gaia can get an avatar, too, courtesy of Thuy.

Maybe the pitchfork really *is* evil, even though he acts so chatty.

I like these new ideas. It's pleasing to me that I wouldn't necessarily have thought of these ideas on my own, and that it was the process of logical deduction that led me to them. Ah, what a sweet science is logic! I say this to echo a story that my college roommate Greg Gibson loved to recount, about the painter Paolo Uccello, as described in Giorgio Vasari's [*Lives of the Artists*](#):

His wife used to say that Paolo would sit studying perspective all night, and when she called him to come to bed he would answer, "Oh, what a sweet thing this perspective is!"

You might say that for a novelist, particularly for a science fiction novelist, logic plays a role similar to what perspective does for the visual arts. It constellates the events into coherent patterns, and forces the artist into surprising acts of composition.

I'd say that movie screenplays and fantasy novels often turn away from logic. I can appreciate the value of sometimes abandoning logic—if this results from a *deliberate* artistic choice (rather than from incompetence or lack of care). Indeed, I'm thinking of pulling this move in *Hylozoic*'s culminating maelstrom scene (see my remarks re. [*Fanny and Alexander*](#) in the previous entry).

To Do:

- * Chap 1. Groovy vaars Pekka's avatar into existence. It wasn't that Pekka was waiting on that particular leaf. It was just that Groovy sensed they'd gone far enough to make Jayjay a zenohed, and now was the time to let Pekka put the bite on him.
- * Chap 4. At the chapter's end, Groovy is even more apologetic to Jayjay about what he did.
- * Chap 5. A little more discussion and exposition about what Groovy did.
- Chap 8. Pekka shows up on Earth, down from the beanstalk. Kicking ass and planting Peng ranches at a furious rate. (Pekka can't teek, but she has a big supply of atoms pre-dosed with viral runes by the helpful Crownies.) Thuy gives Gaia an avatar so she can go toe to toe with her.

Jan 4, 2007. Do Runes Spread?

Earlier in the current draft of *Hylozoic*, I have the pioneer runes phasing in and out of effect on people as they entered or left Peng ranches. Supposedly there's a "neighborhood majority rule" that the atoms obey, deciding if they carry a rune or not. And I was vague about what happens at the edge of the Peng ranch.

But now I want to make a big deal about viral runes that spread from atom to atom. So I need to specify that the runes were *not* spreading prior to the change.

Before I'd thought of atoms joining or resigning from the group computation as they entered or left the ranch. But now I want to go with the notion that once an atom is rune-programmed, it stays that way, and that clean atoms don't switch to being runic unless someone teeks them or a viral rune infects them.

So now there's not much point in putting runes onto air molecules as they are going to drift away so rapidly, and new living air's gonna come in. So let's say Jayjay doesn't bother runecasting into the air atoms. I'd like to stick with the ten tridecillion atoms in a hundred kilometer cube, so I'll push the cube down deeper into the Earth and have Jayjay standing on one face of it. Dig down 100 km.

What about water? As with the air, there's not all that much point in runecasting into the water. But I make quite a point of the stream on Yolla Bolly being dead and dull right after the change—and the San Francisco ocean's being dead—so I want the water's atoms to be dead. So I *will* have the runecaster convert the local water to start with. Maybe they don't give it much thought, they just pick off everything lower than them.

Note that the stream and ocean behavior will renew itself as living water flows in and the dead water diffuses away—but not so rapidly as the air. I need to think about the precise rate of change. For I have a scene of the first test of the Hrull reset rune being on a still-dead Yolla Bolly waterfall, about eight hours after Jayjay converted Yolla Bolly. (I'm saying he did the Yolla Bolly conversion around 5 a.m. and did San Francisco at 9:30 a.m., returning to Yolla Bolly around noon, and hitting the waterfall about 1 p.m.) Is this okay?

Well, how soon will the living water make it to the waterfall? I'm saying a Peng ranch is 100 km on an edge, so there are fifty kilometers of Peng ranch upstream, and a stream might flow at, say, one or two meters per second. If we say 2 m/sec, that's 120 m/min, 7200 m/hr, 7.2 km/hr, or about 50 km in seven hours, which means the waterfall would be alive after eight hours have elapsed. But if I dial down the stream velocity to one meter per second, I would have a full 16 hours before the living water gets to the center of the Peng ranch. And it could well be that the narrow little tributaries only flow at that reduced rate. So I'm okay in presenting the waterfall as still dead at 1 p.m.

But by the next morning the stream is going to be alive.

What about humans? I'd thought of Jayjay and Thuy as perking up whenever they left the Peng ranch, but I'm not going to be able to keep this. When Thuy and Jayjay go from Yolla Bolly to San Francisco, their atoms are still in a low-gnarl state, still projecting matter waves for the Yolla Bolly Peng ranch.

They can feel *slightly* livelier, though. For one [source](#) says that experiments with radioactively tagged atoms indicate that you replace your 98% of your atoms every year (remember that we're mostly water). Rounding a year up to 400 days, this means that in a day, you replace about one four-hundredth of your atoms. Suppose you weigh 100 kg. Then, in a day you replace 0.25 kg or 250g of atoms. So you replace some 10g of your atoms every hour!

And, so as to have Jayjay, Thuy, and Chu lively for the rest of the book, I can have Jayjay run the reset rune on their bodies when he's trying to kill the Peng at the end of Chapter 3—and then, with a superhuman act of will, he doesn't reprogram them after Pekka makes him redo the Yolla Bolly ranch.

Okay, so that's what I did today, put all those fixes in.

January 7-9, 2008. Plans for Chapters 7 and 8.

I finished Chapter 6 on November 15, 2007, and then I wrote the “Jack and the Aktuals” story.

After that I got into a zillion revisions of Chapters 1-6, fixing the logic.

And now I’m finally ready to get down to writing the end of the book. Two more chapters, 7 and 8, and a total of 20,000 words for these two would be more than enough.

Of course before actually writing the chapters, I need to straighten out what’s going to happen in them. One of the main things I’m worrying about is the interplanetary web of causation.

The causal web includes Earth, Pepple, Pengö, and the Hrullwelt, with the unfurling of lazy eight and (on some) the creation of aktuals.

We’ll make the simplifying assumption that only humanoids can become aktuals. I have the tasks in [this table](#), “Origins of Lazy 8 and Aktualization” indicating who does which task, and when.

To further simplify things, I’m going to start saying that the very first world invaded by the Peng—invasion by the legendary Waheer—was Pepple (before I’d been calling it Brux). So Pepple serves triple duty now: the Peng’s first colony, the home of the pusher Glee, and the home of the aktuals Lovva and Groovy.

By the way, the Peng haven’t done as well on Pepple as they plan to do on Earth, some of the nobles are always killing them off.

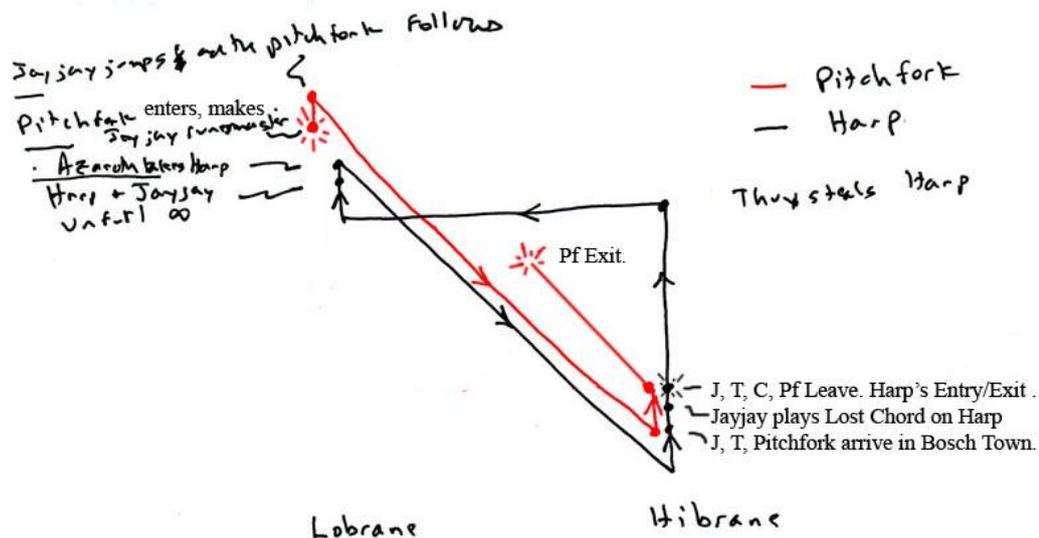


Figure 21 (Figure 11 Repeated): The Harp and the Pitchfork’s Worldlines, Revised

Another change is that I’ve revised my ideas about the [worldlines of the harp and the pitchfork](#). They come in from a higher dimension at the “glowing” points indicated in the figure above. The harp arrives and leaves from the same point, laying down a track that just happens to be a closed temporal loop. She doesn’t mind spending a psychic 500 years on the Hibrane. The pitchfork arrives and leaves at different points, and experiences less of an elapse of time.

I think of the harp and pitchfork as arriving from and returning to the planet Pepple, where they live, and that viewed from by their fellows on Pepple, it doesn't even seem like they were gone for very long, only two days.

IDEAS FOR CHAP 7

Thuy POV, starting in Hibrane 's-Hertogenbosch.

As of the yesterday's version of the outline, I didn't actually have much planned for this chapter in terms of plot. I need plot-relevant action in Chap 7, otherwise my move of visiting Bosch in Chap 5 & 7 comes across as self-indulgent, pointless, and even borderline senile.

I think I need to put the Subdee transfinite sequence into this chapter and—*score!*—have the place look like Bosch's Heaven and Hell. Last time, Subdee looked like ancient Egypt, but that was Luty's influence. This time it can be a Bosch world (*Garden of Earthly Delights*, all three panels), especially if we bring Jeroen along for part of the trip.

7.1 The pitchfork tells Thuy to think of Subdee in terms of a city with two buildings on either side of a street: the buildings are the branes, and the ground level is the Planck sea. We see the sea exposed in between the buildings, but the dividing interface continues under the buildings. In the underground is a continuous maze of passages and carnival-like spook stuff: Subdee. It underlies both the buildings as well as (more obviously) the street.

7.2. A juicy scene showing how the advent of hylozoism plays out, possibly including some flash-back of Thuy's memories of how it played out in the Lobrane.

7. 3. Thuy, Jayjay, and Jeroen are trapped in a teep-shielding church, staving off execution. Thuy gets some kind of insight about her work in progress *Hive Mind*. Also she gets into contact with Hibrane Gaia. Azaroth is actually killed before they can get it together. Thuy, with some effort can teek ten octillion atoms (the number of atoms in the neighborhood of a body) to stymie the executions, and Jayjay wants to zenohead teek to do more, but it's not going so well.

7.4. Chu and Duxy show up to save them. They fly out across the Planck Sea bearing Thuy, Chu, Jayjay, Glee, Bosch, and the pitchfork. They're drawn into a maelstrom. Partway down, Chu has become a zenohead. Pekka's nowhere to be seen.

The pitchfork shoves Jayjay, Thuy, and Bosch out of Duxy's mouth. Thuy and Jayjay tumble down into the core of the vortex; Duxy swoops up and flies back towards Earth. And the pitchfork heads home to Pepple.

7.5. Thuy, Jayjay and Jeroen are aktuals, they look like, respectively, an egg (womb, Hollow Earth), a corkscrew, and a flying bagpipe.

Bosch, playing that bagpipe, brings lazy eight to Pengö and Hrullwelt a million years ago. Why does he do this? He thinks those places are heaven and hell. He's blowing Last Judgment blasts. *Sqwoonk!*

Thuy brings lazy eight to Lobrane Pepple a thousand years ago, and does Hibrane Pepple at nearly the same time. She doesn't have as much trouble with Lobrane and Hibrane as the pitchfork and the harp—they didn't even know about the other brane before they became aktuals.

Jayjay, as corkscrew, aktualizes Groovy and Lovva.

Jayjay and Thuy return to Lobrane Earth, 2038, and Bosch returns to Hibrane Earth, 1496.

IDEAS FOR CHAP 8

Chu gets back to Earth before Thuy and Jayjay. He's able to run the reset rune as a zenohead, and, better, he can now understand Kaka's Serpent, and he cooks it down another few levels so anyone can teek the viralized reset rune. It looks like Earth is okay.

But then Pekka shows up in the flesh, down from the beanstalk, kicking our asses. Gaia is furious, about to pop.

Jayjay and Thuy are back; Thuy gives Gaia an avatar so she can go toe to toe with her.

And then Jayjay and Thuy aktualize everyone on Earth who wants it.

Jan 9, 2008. Dreamers Are Us.

This morning I woke up very early; it was still dark; I was awake because my wife was bustling around packing for a trip. I laid low with my eyes closed for about forty-five minutes, and in my head, I went over all of Chapter Seven, scene by scene. It was like dreaming while awake. I thought of a propaganda phrase from my novel, *Spacetime Donuts*, "Dreamers Are Us!"

When I was done, I told my wife what I'd been doing, and she was like, "Poor Rudy, that sounds like so much work!" And I said, "But I *like* doing it!"

And then, brushing my teeth, I wondered if I could remember all the thoughts I'd had. Odd to think that I can remember such intricate scenarios by means of—what?—circulating patterns of excitation in my neurons? Bulk up synapse connections? Biochemical trails?

I always feel safer after I've written it down. I forget so many things.

Later that morning I went to the physically whipped, but very congenial, Caffè Pergolesi ("[The Perg](#)") in Santa Cruz and typed in my already fading memories of dawn's lovely waking dream.

And then I went to Four Mile Beach with my old pal Jon Pearce. A lot of seagulls standing around on the beach. Jon agrees it would be great to be reincarnated as a California brown pelican.

When I got home, I rewrote the [Chapter 7 Outline](#) and then blogged it as: "[Dreamers are Us.](#)" [Planning Hylozoic Chap 7.](#)

Jan 11, 2008. Trying to Start Chap 7.

I worry that day before yesterday when I blogged my description of what I *claimed* I'm going to write in Chapter 7, it was psychically a bad move, a way of leaving my game in the locker room. And I have this thing of not liking to repeat myself, so if I already told one version of the story in public, then maybe I don't feel like writing it the same? Ah, but think of oral tradition. You tell a tale over and over, thereby polishing it.

But what if I never write Chapter 7 at all?

As always, I'm beginning the next step of my work-in-progress in fear and trembling. It's takes a huge amount of angst to get me off the dime.

In fact I'm still flinching away from the chapter a little. Since Sylvia's out of town I could, in principle, be writing all day long. But I'm having trouble focusing. I get lonely and keep thinking of possible tasks or ways to get together with acquaintances.

Also I'm still doing more revisions on the ending to frikkin' Chapter 6. I feel like I've been fighting through underbrush for two months. Eternally fixing stuff.

When can I break back into the sunny sky of free creation? Probably not today. Chap 6 needs a lot of work. It's a hydra. Two new heads form for every head I lop off.

Also I'm pissing away time on piddly-ass things. (1) I spent hours tweaking the HTML on some web forms to get a site on some new Facebook-like writer's site called [Redroom](#). I don't know why I took this on. Like I don't already waste enough time setting up web pages? (2) I'm working on a paper, "Everything is Alive," for the proceedings of a "What is Life?" [conference I went to in Japan](#) this fall—that would be mid-October, 2007. Few are gonna read this volume, published as a special issue of technical journal as *Progress of Theoretical Physics Supplement*, and I'm supposed to submit my manuscript in LaTeX, yet. But now that I've started, I feel compelled to derive a coherent logical whole from the rhapsodic farrago that I delivered in person. "Take a horse out to the track and he's gonna run."

Yesterday morning I went to [yoga class in Los Gatos](#), and the teacher, Jan Hutchins, was talking about styles of breathing. He said "Breathe in Mountain, breathe out Solidity. Let the solidity of the mountain fill the cracks in your body where pain can seep in." He also suggested "Breathe in Space, breathe out Freedom."

And I was thinking these were good models for hylozoic thought modes. You could do a five element version (including the Chinese fifth element: wood).

Earth	Strength, solidity, groundedness. calm.
Air	Freedom, looseness, non-attachment, driftiness.
Fire	Alertness, intelligence, glow.
Water	Flow, grace, wiggleness.
Wood	Growth, liveness, expansion, socialization (wood cells=trunk).

Table 13: Yogic Meanings of the Elements

I always like class with Jan, he's a hip and funny guy who often coaxes me into a deep meditative zone. Today, at the end, I was seeing the most beautiful spreading patch of blue with my eyes closed.

The yoga room is mirrored on one wall, and Jan often asks questions of the class at large, and often as not nobody answers. So today he says "Sometimes I imagine I'm under observation in a psychiatric hospital, and those are one-way mirrors with doctors on the other side, and there aren't really any students here at all, I'm only hallucinating them, and the doctors are watching this crazy guy who thinks he's teaching a yoga class."

I had a hallucination like that in 1965, I was a college student, and an upperclassman, Swarthmore's First Druggie, had given me a couple of peyote cactus buds he'd gotten by mail-order from a Texas garden supply company. I'd eaten the buds and puked them up, and I was tripping heavily, over at some friends' house, and I imagined their kitchen was amphitheater-like classroom full of students, and that I was giving a lecture on Special Relativity—a subject about which I knew almost nothing. It was a precognitive hallucination, really, for in 1977 I was in fact a somewhat-more-learned professor lecturing on Special Relativity in an amphitheater-like classroom at SUNY Geneseo. The wisdom of the spiny bud. (I wrote about this epic trip in my 1984 Bildungsroman, *The Secret of Life*.)

Near the end of Jan's class, I was tired, and so was the guy next to me, we were off in the furthest corner of the yoga room, and we were slacking, lying on our

mats instead of doing yet another pose, and Jan walks over and says, “What are you guys—the *hoods*? Lying low in the back of the classroom?” And he pokes me. I was delighted. In high-school I always feared and admired the hoods—and at Swarthmore I more or less *was* a hood—at least relative to my gentle, intellectual classmates. Actually I don’t think anyone uses “hood” in the sense of juvenile delinquent anymore. But Jan’s nearly as old as me. (On Jan 14, 2008, I blogged this part of this entry as “[Yoga and the Elements](#)”)

How about this for the first scene of Chap 7. Thuy is in the public bath at the Muddy Eel. There’s no teep yet on Hibrane Earth. But Thuy knows, from her life on hylozoic Lobrane Earth, that in fact every object is conscious. They just don’t have memory yet. And maybe she flashes that objects *do* have memory in the One Mind sense. God is the universal RAM, if you will. This mode of thinking is in fact central to the argument in that “Everything is Alive” paper I’m working on, so maybe that’s not a complete waste of time. (I finished the paper and blogged it as “[A Formal Proof of Panpsychism and Hylozoism](#),” on Jan 21, 2008)

Jan 16, 2008. Started Chap 7.

Finally I’m into Chap 7. The outline had gotten to be almost enough to work from, and I drew some pictures and got 7.1 done. It’s bawdy and medieval and funny, I got right into the *As Above So Below* mindset, and even drafted two characters from that book: the promiscuous Anja and the menacing Rood Rockx soldier.

Now for 7.2.

I’d thought I would write more when my wife was out of town, but I think actually I wrote less. Yes, it’s distracting to live with someone, but it’s even more distracting to live alone—I found myself each day worrying about how to achieve some socializing, also worrying overly about small housekeeping chores, and sometimes just feeling too bland and lonely to work at all. Friction makes a vivifying warmth. I don’t envy my friends whose wives died or left them.

January 22, 2008. Harp and Pitchfork Worldlines

I’m thinking about the worldlines for these aktualized critters again, following up on my “[The Harp and the Pitchfork From Infinity](#)” entry.

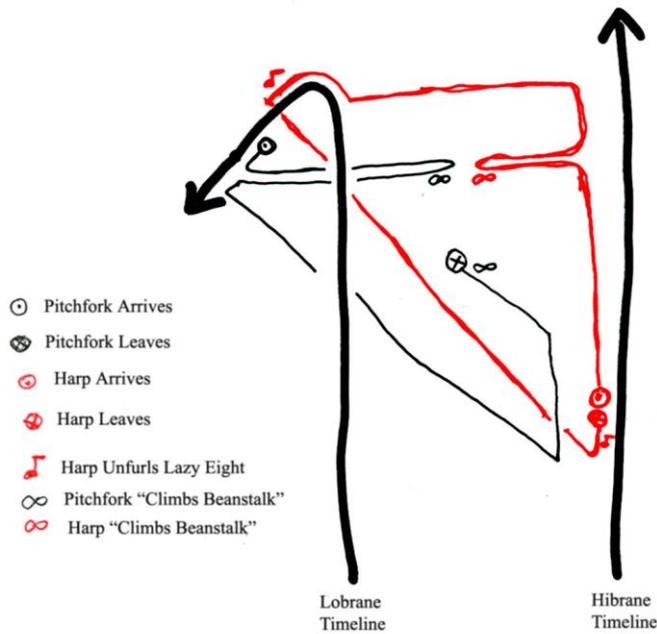


Figure 22: The Harp and the Pitchfork's Worldlines, Version 3

The diagram keeps getting gnarlier! The way I see it, they arrive and leave from Pepple, which is a Lobrane planet more or less contemporaneous with us, but I don't draw those travel lines as it would make the picture impossible to decipher. They come and go via infinity in any case, so it's more like they jump up.

The note marks indicate the two spots where Jayjay plays the Lost Chord on the harp. As I currently have it, the harp arrives with the knowledge of the Lost Chord, which she's presumably gotten from infinity. There will still be a circular kicker, in that it's Jayjay who will propel the harp and the pitchfork to infinity via aktualization.

The upper infinity mark indicates when the pitchfork carries Jayjay partway up the beanstalk and meets the harp there. At this point, the pitchfork doesn't know where the harp is, and she has to tell him.

The lower infinity mark indicates where the pitchfork sends Jayjay, Jeroen, and Thuy down into the maelstrom to infinity (it's an "inside out beanstalk").

Note that the Lobrane timeline has a kink in it; in my earlier ["The Branes Timelines"](#) entry I had the idea that this is because the Hibranners managed to push our timeline away. I may leave it kinked for good, so that jumps from our time will typically go to Bosch's time, alternately, they might bend it back in PS3.

January 24-25, 2008 Change to the Harp Painting?

I'm doing the scene with the harp today, I need to dig up that harp that Cheryl Ann Fulton lent me, and put it next to my desk.

On the harp in my story there's a painting of two lovers like Jayjay and Thuy, serenaded by a small blue demon who looks like Bosch. On p. 284 of the hardback edition of *Postsingular*, I describe the picture thus, "The flat inner side of the soundbox bore a masterful oil painting of a teeming garden of Eden. Two lovers were listening to the music of a winged, pale blue demon playing his own little harp."

As I discussed on [Jan 7, 2008](#), I'm thinking that at the end of Chapter Seven, Jayjay, Thuy, and Jeroen get actualized. Jayjay looks like a corkscrew, Thuy like an egg, and Jeroen like a bagpipe. I don't want to have Jeroen be a harp, as that would be repetitive.

So in the painting's prefiguring of this, it would make more sense to have the pale blue demon be either playing a bagpipe or look something like a bagpipe. So as not to confuse the readers by mentioning too many Bosch paintings, in *Hylozoic* I imply that the image comes from *The Garden of Earthly Delights*. But I'm really thinking of a particular image from *The Haywain*.

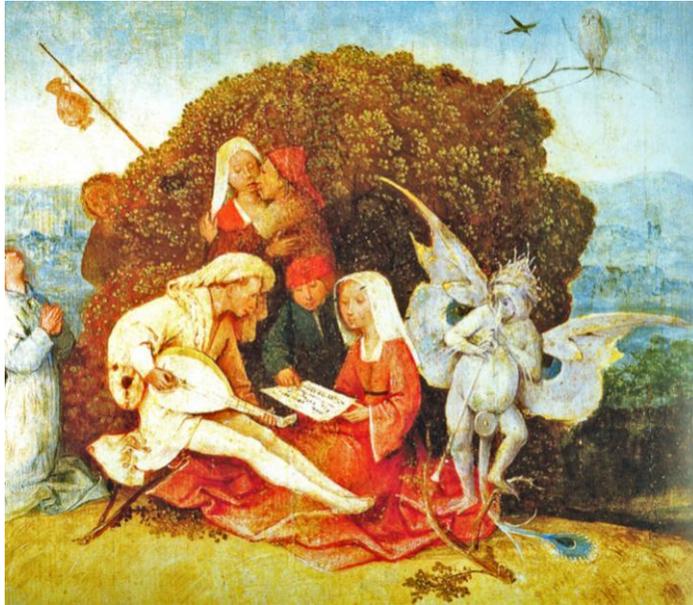


Figure 23: Detail of Bosch's *The Haywain*

I saw a sculpture of this demon at the Bosch Art Center in 's-Hertogenbosch. He looks a little like Shiva, actually. The way he's lifting his leg to dance (in the painting) seems very Indian or Deadhead. But I guess there's only so many ways to jig.



Figure 24: Bosch Art Center Sculpture of Demon from *The Haywain*

I can change this in *Hylozoic*, but I'm stuck with that bad version in the hardback of *Postsingular*. What I can do is change *Postsingular* in the paperback edition; also I could can it in the electronic versions. I'd just change "own little harp" to "nose like a horn" on p. 284, at the start of the fourth line from the top. Would that fit (ideally, for layout, they can paste the fix in as a label, though of course they could just paste over a few more words or lines to make it come out right.)

Jan 25, 2008. I decided just to leave a harp in the painting. And for my kicker that harp has the same painting on it, so we get an infinite regress with the triangular gleaming white light eye of God at the center. I'll just have Bosch can just turn into a bagpipe with no prefiguring.

Another thing I changed is that Jayjay doesn't teach the harp the Lost Chord at Bosch's house. Instead he's going to teach it to her when he's the corkscrew and they're in the aktualized transfinite zone.

I had a sentence something like this, describing Thuy's dream right before the harp plays lazy eight:

"Quite abruptly, all the letters all fired at once, filling the world with a blaze of flame."

I decided it would be cute to make this sentence into a [pangram](#), thus having the form echo the notion of all the letters doing something together.

"At the end of the long, hexed night, the quacking, jumpy letters spoke a magic word and fired in unison, enveloping the world in a blaze of flame."

But, later, on Feb 26, 2008, I decided the sense of the sentence wasn't right, and I changed it to: "At the end of the long, hexed night, the zany, quacking, jumpy troop sang a phrase as one, enveloping the world in a bright flicker that—" This is better as the explicitly artificial and Scrabble-board look of "zany, quacking, jumpy" calls attention to the letter-level qualities of the sentence, matching the substance of the dream.

I just learned that the [St. John's Church](#) in 's-Hertogenbosch was not, strictly speaking, a *cathedral* until 1559, when 's-Hertogenbosch got their own bishop. Before that, they were under the bishop of Liège. Well, I think I'll call it a cathedral anyway, as "church" doesn't bring up the proper image of a big stone church with towers.

January 26-27, 2008. Done Chap 7. Wrapping It Up.

I'm going to break off *Chapter 7: To the Gibbet* after they get saved by Duxy in 's-Hertogenbosch. So that means I'm done with Chap 7. Pickin' up the pace!

The reason I'm breaking it here is that there's such a big jump between the Gibbet and the Maelstrom, they kind of need to be in different chapters. And I'd like to have one more chapter from Jayjay's POV.

Okay, so whose POV do I go to?

One possibility would be to switch to Jayjay's POV for a *Chapter 8: The Maelstrom* and do the whole trip to infinity and back, and to then switch to Chu's POV for a *Chapter 9: Vaar Day*.

But what might work better would be to *leave out* the part about Thuy, Jayjay and Jeroen going out past infinity. Save that for *PS3: Transfinite*, and maybe do it there as a flashback. (I wouldn't want to start PS3 with that, as it requires too much

background to understand; it's better to start a novel with something fresh that doesn't require excessive backstory.)

But I think I'd also at least summarize what happens to Thuy and Jayjay beyond infinity in a conversation in PS2 as well. And Chu asks to hear more, and they're like, "We'll tell you more later."

As well as leaving out the trip to infinity, I think I'd save the planet wide Vaar Day for PS3 as well. Jayjay and Thuy can vaar for a few minutes only. They vaar a Gaia, to match the Pekka the Groovy vaared onto the beanstalk. Also they vaar a copy of Kakar and Floofy, who can be comic characters in PS3. But their vaar power wears off with their aktualization wearing off at the end of the book. Universal vaar is a goal to strive for.

So, okay, I can break off Chap 7 right after the Hrull leaves, then I switch to Chu's POV, follow him through the Maelstrom and back to Earth and have the battle of Pekka vs. Gaia, and that's the end of the book. *Chapter 8: Battle of the Titans!* I'll make Pekka and Gaia be a hundred feet tall.

Note that Chaps 7 and 8 are shorter than the other chapters. That tends to happen. (a) I'm tired of working on the book and I want to be done and (b) I now have about enough words to hand it in.

Another way to think of it is that Chap 7 and Chap 8 are really two parts of one long chapter; after all, I'd only planned for seven chaps in the first place. I needn't flail myself with worries that I'm giving short weight.

Jan 31 - Feb 5, 2008 Gearing Up for Chapter 8

So now I'm gonna reread the last twenty pages of Chap 6, and reread Chap 7. A bit tedious, but I need to do these extra revisions, otherwise the later chapters don't get revised early enough, and this comes back to bite me in the ass during copy edits. That is, if I don't revise enough now, later on, the copy and proof edits are gonna be extensive and perhaps even messy enough that I have to send in many successive versions of the manuscript. I know from experience that if I do that, there's a fair chance of the book being set from the wrong version, like almost happened with the *Postsingular*.

I'm ambivalent about revisions. On the one hand, there's the growing sense of panic when I keep finding more and more things to fix, iteration after iteration. On the other hand, there's the painterly joy in touching up the prose, elevating it to yet higher levels of gloss, thinking about rhythm and alliteration, about people's accents, about gestures, about tiny eyeball-kick descriptions, about collapsing gassy repetitions into a simple and transparent phrasings, about finding the *mot juste*. A highlight with the tip of my brush.

Feb 1. Finished the revisions today, so now I'm looking at the outline some more. I had too much in the outline for Chapter 8, I'd just thrown in a lot of things because I wasn't sure what to do. I already have my 85,000 words, so Chap 8 really doesn't have to be long at all.

Really what I want to do here is wrap things up fast. I'll just build up the maelstrom scene and wrap it up after that. I was thinking of having a "Battle of the Titans," pitting an incarnation of Gaia against the incarnation of Pekka—but that's corny, a comic book double-spread, it drags on too long. The book's complicated enough, I shouldn't be adding more than necessary to Chapter 8. Just be mopping things up.

I will have to do *something* about that incarnation of Pekka in the subdimensions, though. I had her lurking there so she could entangle with Jayjay; it was Groovy who made her. She never managed to get incarnated on Pepple, which is why there's only a few Peng on Pepple; the descendants of Queen Ulla make them in small lots.

I have Jayjay, Thuy, Chu, Bosch, Groovy, Duxy, and Wobble all inside of Duxy—what a big boatload! Suppose she freaks and spits them all out except Father Wobble.

And then they see Pekka in the maelstrom wall, and it's up to Groovy to kill Pekka, he owes us that. If he does that, then he'll seem like a (somewhat) good guy, and later in *PS3*, Thuy and Jayjay can hang out with Groovy and Lovva and fondly reminisce.

Yeah, Groovy kills Pekka's incarnation as his last act in the maelstrom before flying home. Groovy can, like, *call* Pekka. He'll use Jayjay for bait, she'll want to knot into Jayjay again. I'll impose imperfect knowledge on the others, so at first they think it's another double-cross by that prankster Groovy. Hookin' and jabbin'!

Feb 2, 2008. Today right after I woke up I had a good idea. I've been wondering what to do with Glee. It would be sad to have her continue with the dead-end life of being a pusher. If she moves to Earth, then that's an extra character I have to deal with at the end. The best would be if she could go back home to Pepple.

So far she has not returned because she murdered an aristocrat (teeked off his head and fed his body to the vorks). But what if Groovy takes her back home.

Suppose that Groovy always had a thing for Glee, and even though she's now 20 years older than before (relative to him), he still likes her, and, what with her boyfriend Kenee dead, he figures she could settle into a threesome with him and Lovva. I can prefigure this. So he asks her to come home with him.

But Groovy is going to be returning only three days after they left. This poses two problems. First of all, Groovy would somehow need to avoid having the aristo execute Glee as soon as she gets back.

Secondly, I was saying that Glee has been in contact with Pepple friends over the last twenty years, so wouldn't she have heard that somehow an older version of her has moved back to Pepple? Well, let's drop this constraint. Let's say that Glee was in touch only once, when Lovva teeped her about how to find Earth, and that Lovva didn't teep her again because Lovva's always been a little jealous of her, and didn't want her to come home. Let's say that Glee was scared to teep home as she feared the aristos would get her. So she never found out about the revolution.

Solution 1: Groovy, while in pitchfork form, alters Glee's body so that she looks like someone else. Like Vlinda, say, a pusher woman whom Glee remembers from Pepple. "Lately it seems," sings Groovy, "In all of my dreams—I walk with my arms about Vlinda." But I hate to see Glee live a lie, and this is very hard in a telepathic society. I could have Groovy changes her memories so she thinks it was Kenee who actually killed the aristo. Or I could change the story so that Kenee really *was* the killer.

Solution 2: Groovy and Lovva have toppled the aristos from power. This way Glee gets to be the strong killer of her attacker, and she doesn't have to live a lie. Also this toppling prefigures Earth's coming elimination of all political leaders. Here, however, I have the problem—if it is a problem—that Glee could know, from teep, that the aristos are gone so that it would in fact be safe for her to return. Rather than

accepting that, I'll suppose Glee has been fully out of touch. So she's cared to go home. And even if she knew it was safe, she would hesitate as she is out of the loop and feels shame—and she's an addict.

So, okay, Duxy spits out Jayjay, Thuy, Bosch, and Chu. She doesn't mean to spit out Glee, but Glee jumps out. Duxy and Wobble leave, using the accumulated teep energy in Duxy's teeker cone.

The pitchfork is floating in the water with them, they're spiraling down into the maelstrom, but not all that rapidly.

"Kick your legs real good, Jay," says Groovy. "You're my angleworm. I want Pekka to smell you."

"What! You bastard!"

The huge incarnated Pekka bird heaves into view in the watery walls. She's intent on Jayjay again. Groovy darts forward and stabs her to death.

Jayjay and Thuy thank him. Groovy flips them and Bosch out into the air and they tumble down towards God's eye at the base of the maelstrom.

So now it's Groovy, Chu and Glee. And Groovy says he hates to leave Glee. And then he changes her body to Vlinda's. And they fly home.

So now it's just Chu. He drifts for a day or two, maybe he picks up zenohead skills during this time. Then the egg/Thuy and/or corkscrew/Jayjay appears and takes him home.

All the Hrull have been driven off by the Peng, and Duxy jumped straight back to Hrullwelt.

They give Gaia a runic immune system to keep off the Peng tulpas for good, and they give Kakar and Floofy flesh bodies. The birds pass over the secret of how to grow an antigravity plexus. And at the end they're flying: Jayjay, Thuy, Chu, and Bixie.

I like having Thuy see Lova turning herself into the harp and then turning herself back into a humanoid in Bosch's attic.

This implies that when Chu sees Thuy and Jayjay coming back from infinity they could look like glowing humanoids instead of like a tornado and an egg.

So, in the transfinite zone, people look like glowing copies of themselves, not like a pitchfork, harp, egg, tornado, bagpipe, etc. So I need to change Groovy's remarks about meeting "the corkscrew and the egg".

[Note that in the end of the [next entry](#) I decide that Jayjay will look like a crow when he is aktualized and visits Pepple.]

I had Lovva's humanoid form appear and disappear in globs of light, but a higher-D rotation might be more accurate? Or something more infinitistic? How, in general, do I depict hops?

I did describe the pitchfork as seeming to "turn sideways," when he hops for the interbrane.

It would be good to characterize what you see when someone teleports into our out of your presence, and describe this early in the book in some detail, and then be able to play on that later on. A simple transition from a glittering in space to a ghostly image to the solid person and then back through translucent to spectral to dying twinkling dots of light like the last bubbles in a glass of champagne.

Should the big hop across the interbrane look the same? No, I think we could characterize this more as a higher-dimensional rotation.

And the arrival of an aktual from infinity will be different, yet again—even though I worry I'm overdoing by having have three separate entrance effects. When someone comes from infinity they are growing up out of the subdimensions. From the inside I'd like it to feel like a giant falling off the beanstalk. *Thud!* Flat on your back.

I still don't have anything really vibby for Thuy to do. How about this. She looks like an egg, and the egg *hatches*, and out pop Kakar and Floofy. Where's Thuy? The scraps of shell pull together, and huzzah, it's her.

Nah, why would Thuy care enough about Kakar and Floofy to do this? It has to be Chu who's responsible for saving those two Peng.

Due to his experience in the maelstrom, Chu is a zenohead, and he can think fast enough to program a body's worth of atoms. So if he had a blueprint for the bodies of Kakar and Floofy he could teek copies together.

I have been supposing that finding a blueprint for an object is hard enough to require an infinitistic Turing Evaluator search method, which is why mere zenoheads can't vaar.

But what if we suppose that the viral runes encoding Floofy and Kakar runes can be used as blueprints. Seems reasonable. Chu can instantiate a rune as a physical object.

Kakar is begging Chu just before Jayjay unleashes the runescrubber. Chu and Kakar have a basic affinity as they're both low-empathy math geniuses. So Chu makes Kakar and Floofy. And this way we have two vibby extra characters for the next volume.

Should they really bring Bosch along, out onto the interbrane sea, and down into the maelstrom to the transfinite realm? Well, I'm supposing that he's in charge of unfurling lazy eight on Pengö and on Hrullwelt—although this is to some extent make-work, and not really essential to his nature. Another thing he does is project *Temptation of Saint Anthony* images into the Subdee landscape. And if I write some scenes in *PS3* about Thuy and Jayjay in Alefville, it might be nice to have Bosch along. Given that they have vaar and shapeshifting bodies, I could even have him be the same size as them, which would make him a better traveling companion.

I don't yet have the timing and sequencing right for all this. Here's an attempt:

Chu is alone in the maelstrom. The maelstrom begins talking to him. It's similar to how the beanstalk talks to Jayjay in Chapter One.

Just as Chu nears the bottom, the maelstrom chuckles, smoothes out and bubble forms at the center. It's Jayjay. He's glittering. He helps Chu jump to the Yolla Bolly ranch.

Thuy is on the ranch, glowing, she's still infinitistic, she spreads the reset rune, all over Earth and thinks she's cured it, but the viral runes grow back just a bit faster than she can teek Earth's atoms—like the hay growing back as you mow a large field—and by the time she finishes Australia and Antarctica, the Peng have grown back on Yolla Bolly.

Jayjay and Chu get to work designing the runescrubber. But suddenly Pekka takes over Jayjay again. Thuy delves into him and finds Pekka, she's actually in the

dirt at Yolla Bolly. Thuy grows her out and fries her with her eyes. Suller almost kills Thuy, but Kakar stops him.

Now they get the runescrubber ready.

“I know that you’re going to win, Chu,” says Kakar. “Let Floofy and me stay, please.”

While Jayjay spreads the runescrubber, Chu does something with his head. He makes meat Kakar and Floofy bodies.

The world is cleansed. Thuy and Jayjay want the Peng off their ranch.

Kakar teaches Chu how to fly, possibly he infects him with a certain biological parasite. Flight lice. (Why didn’t we already pick up flight lice from the Hrull?)

The flight lice are universal parasites, they can live on any life form. They are quantum computations. They roll up gravity force lines. They flatten out spacetime curvature. They let you be weightless. They evolved on the Hrullwelt so the Hrull can alter their gravitational mass, the better to track their orbits. The flight lice were transferred to Pengö when some early Pepplese pushers steered a Hrull from Pepple to Pengö in order to visit the planet where their Peng colonizers came from.

The Hrull keep their flight lice close via teep, they weren’t giving them out to Earth.

Feb 5, 2008. Maelstrom and Beanstalk

What if Jayjay’s actual form is that of a tornado, not a corkscrew? A process, a vortex, a whirlpool. And, get this, the maelstrom in some sense *is* the actualized Jayjay. He is that silp. We might even see Jayjay ahead in the ocean and he stretches out his arms and becomes the maelstrom.

Talk about circular causation! He falls into a maelstrom, travels back in time a bit, and installs himself as the maelstrom that he fell into.

Pushing this, might we have only one maelstrom? That is, could the interbrane near-Lobrane-Earth maelstrom be the same as the tornado that Jayjay makes on Pepple, and could it be the same as the beanstalk he sees in Chapter 1?

I sketched some of these ideas in the figure below.

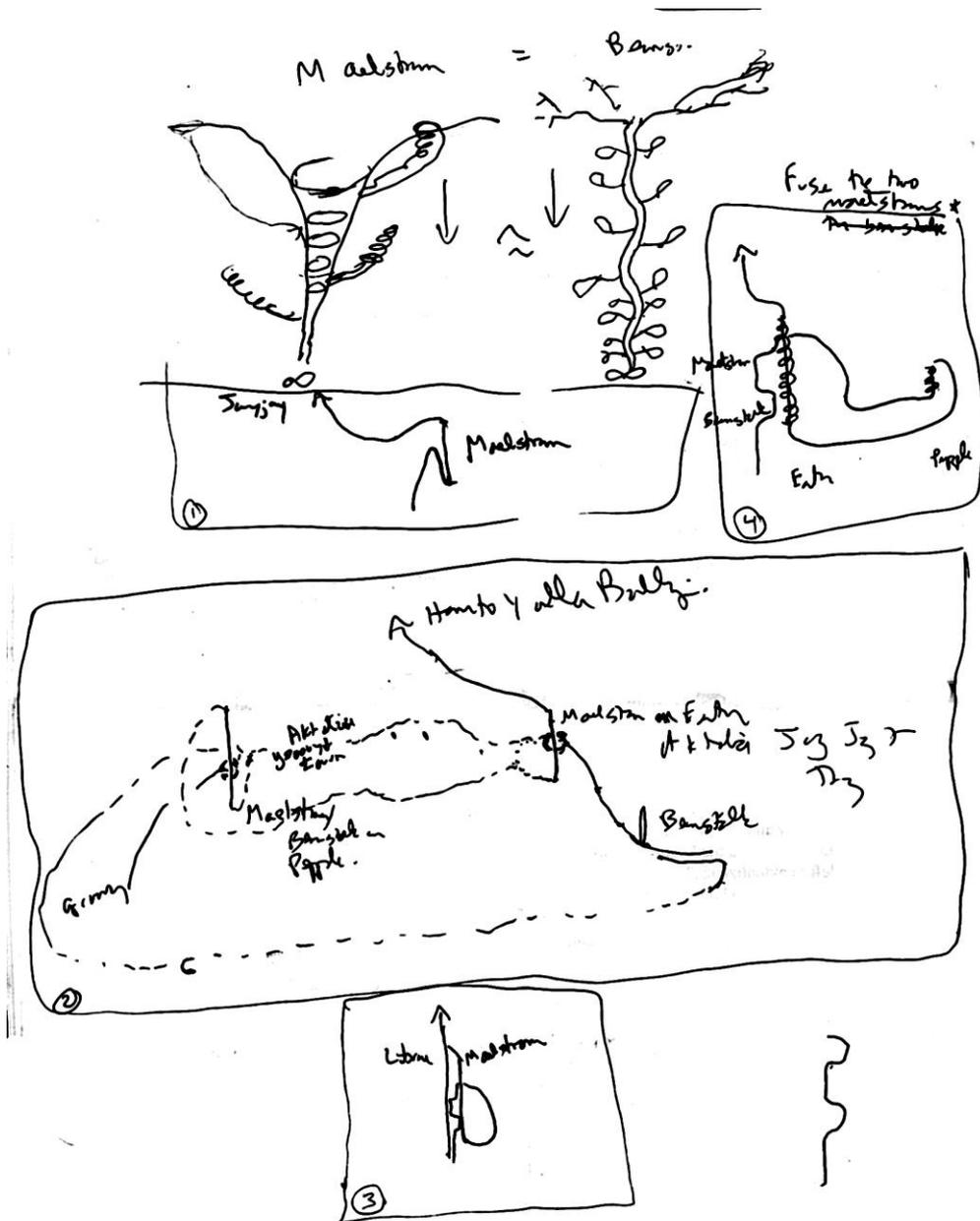


Figure 25: Maelstrom and Beanstalk

A few words about each of the four numbered sketches in the figure.

(1) Could the same phenomenon look like a maelstrom and like a beanstalk? Perhaps we could equate the leaves of the beanstalk with subsidiary eddies off the maelstrom.

(2) shows Jayjay's worldline starting at the lower right. He has a bump on the beanstalk, then encounters the "Maelstrom on Earth Aktualize Jayjay & Thuy" event which lifts him to infinity. His worldline becomes a dotted line. He reaches Pepple and himself becomes a vortex at the "Maelstrom/Beanstalk on Pepple" event and the carries out the "Aktualize Groovy and Lovva" event. He then circles back to Earth and becomes the maelstrom in the interbrane. Having aktualized his past self, he lets the maelstrom die down, becomes his old self and teleports home to Yolla Bolly. In this figure we also see Groovy's worldline, starting out on the left, becoming aktualized and traveling to urge Jayjay up the beanstalk.

(3) Here's a Jayjay timeline in which he encounters his vortex self as a beanstalk, encounters it again as a maelstrom, travels back in time to become the vortex, then returns to his old self.

(4) Jayjay encounters his vortex self as a beanstalk, encounters it again as a maelstrom, becomes aktualized, creates a vortex on Pepple, travels to Earth's past, and creates a vortex which is the beanstalk and the maelstrom, then returns to his old self.

If Jayjay were *all* the vortices to infinity, then he'd be the God of Aktualization. What would the others be the gods of? Lovva is unfurling, but so is Thuy and Bosch. The pitchfork is trickery?

One reason for wanting to equate the beanstalk with the maelstrom is that Groovy seems to have hidden a flesh copy of Pekka on a "leaf of the beanstalk," and I was thinking of having Groovy stab this Pekka copy while in the maelstrom.

I'm not sure I can make this work, topologically. If the beanstalk were a dual of a maelstrom, with subsidiary eddies being leaves, then Pekka would be inside a "leaf" rather than upon it.

If I don't equate the two, I might still suppose that Pekka finds her way laterally across the subdimensions from the beanstalk to the maelstrom.

Alternately, I might let Thuy kill off Pekka. Perhaps Pekka emerges on Earth, and Thuy takes care of her. That would be better for the story than having Gaia be incarnated to fight Pekka. And it gives Thuy something forceful to do in the last chapter.

Alternately, Pekka has been living in the subdimensional matter within Jayjay's own body. That would be very dram ["dram" is my new slang word for "dramatic"]. Pekka crawls out of his chest. But, wait, if Pekka is inside Jayjay, then when he goes to the Hibrane, she goes with him, and she still controls him. So Pekka better be in the dirt at Yolla Bolly.

What *about* that beanstalk? I like the way it looks, and feels. But for the average reader, I think it would fly in the face of common sense to insist that the beanstalk is "really" a tornado as viewed in some "dual" mode where space is solid and solid is space.

But the road to infinity goes through the subdimensions, and I often view them as a sea. I guess we could have a submerged beanstalk—like a kelp stalk. But, come out think of it, in *PS1*, Subdee was a desert under a sandstorm sky.

The beanstalk could be in some sense the handle of the pitchfork.

One distinction between the maelstrom and the beanstalk is that the beanstalk is a tube within subdimensional space, projecting towards the eighth dimension, and the maelstrom is more like an Einstein-Rosen bridge whose surface is the Planck sea. I should mention the eighth dimension when I talk about the maelstrom.

I can to some extent "punt" on deciding what the maelstrom and beanstalk precisely are and either leave it vague for good, or give a little more detail in *PS3*—by which time I might have a good angle on these things.

For now, I'll just keep it simple and not overcomplicate or overcommit.

I would like to somewhat reconcile the fact that the maelstrom goes down and the beanstalk and the tornado go up. I would prefer not to do this by talk about solid/void duality. Maybe I can just say that the subdimensions can appear to be like air or like water. Or, once again, not try to overexplain the beanstalk at this time.

The pitchfork conjures up the beanstalk and the pitchfork conjures up the maelstrom. Jayjay invokes the tornado on Pepple that seemingly lifts Lovva and Groovy above the sky. I speak of “invoke” or “conjure up” as I am beginning to see these tunnels to infinity as being independent aktuals.

That is, I suppose that the beanstalk, the maelstrom, and the tornado are independent transfinite beings. They are *native aktuals*.

This means that when Jayjay goes to Pepple, he himself is not the tornado as I'd earlier been thinking. He calls up the tornado. He himself looks like, say, a crow. He can remark in Chapter One that he likes crows, and that they are his totem animal.

Thuy might say that she might like to be an egg, though that sounds lame and passive. Maybe she shouldn't be an egg. A dragon? Maybe as an Asian, she really digs dragons. I think she did play the violin. And she likes heavy metal rock and roll, too. A cricket? An electric guitar?

February 5, 2008 To Do Before Chapter Eight

Here's a *To Do* list of changes to make to the text so that Chapter Eight will fit in:

- * Describe early in the book how it looks if someone teleports into our out of your presence. When a person leaves, you see them turn translucent to spectral to dying twinkling dots of light like the last bubbles in a glass of champagne; when they arrive you see glittering in space followed by a ghostly image and then the solid person.
- * When you see someone hop into the interbrane, you see a higher-dimensional rotation, as if “turning sideways.” Can mention when the pitchfork leaves Bosch's attic.
- * When someone comes from infinity they are growing up out of the subdimensions so we see them as puffing up. Thuy sees Jayjay do this in the cabin, Thuy sees Lovva do this in Bosch's attic, and Jayjay sees this when the pitchfork first appears.
- * In the transfinite zone, people look like glowing copies of themselves, not like a pitchfork, harp, egg, tornado, bagpipe, etc. So I need to temper Groovy's remarks about meeting “the corkscrew and the egg”. Also, Jayjay's going to look like a crow, not a corkscrew. Also I think Thuy should be a dragon. Jayjay needs to mention in Chapter One that he digs crows, and she says she likes dragons. Not a cliché. A rock'n'roll dragon.
- * Jayjay glimpses Duxy upstream near the gallows field while he's on the Dommel, but he doesn't know if he's hallucinating.
- * In Glee's reminiscence about Pepple, she mentions that Groovy was hot for her, and she for him. A three-way marriage with Lovva would feel natural, but Lovva is jealous. Glee says she's been scared to go home because of the aristos, also she's hung up by being an addict.

- * At the end of Chapter 6, have there be a sisterliness about Bixie's hug of Chu. He realizes Bixie will just be his friend. "That was all it would ever be. And that was fine."
- * Flight lice are what enable the Hrull and the Peng to fly.
- * When Groovy makes a sample whirlpool in tub, he mentions calling upon the native aktuals for a full maelstrom.

February 6, 2008. *Voices of the Native Aktuals for Grisaille.*

All done with the To Do list, and I revised the outline a few more times. I'm getting to be like those old masters who'd paint a whole picture in grisaille before putting the colors on top.

Today I did my last runthrough on the outline of Chap 8—finally it seems clear and makes sense; I can see the light through the brush and trees. Now I'll paste the outline into my Novel document (as grisaille) and keep revising it until it's the actual text.

As part of the grisaille, I'll also paste in (and then massively edit) my two swatches of [Poe](#), giving him a credit in the book's *Acknowledgements*. And, so as to have some chatter from native aktuals, I'm going to see if it works to paste in some cutups of a few passages from my story "[Jack and the Aktuals](#)." I'm thinking I could use (further-edited) versions of these swatches in *Hylozoic* whenever someone has to hear the voice of a native aktual.

(For when the beanstalk talks to Jayjay in Chapter One):

"As soon as you're aktualized you'll be working with absolutely continuous matter, with alef-null bytes activated, and alef-null mental cycles per second. We're transfinite beings; we call ourselves aktuals. Uncountable numbers of islands crowd our shores. The Planck hobgoblin has no force in Alefville. Each tree's branch has an endless number of jiggles—as many forks as the natural numbers. Every possible path through the twiggy maze ends in a leaf. There's two to the alef-null leaves. The cardinality of the continuum. The stories of my apartment building don't stop after a single run of alef-null levels. The count starts up again after the first alef-null, and then again, over and over, infinities mounting beyond infinities—making alef-one stories, yes. Most of the buildings in Alefville are that size. You don't notice at first because the buildings' upper floors are compressed into the infinitesimal subdimensions. The town itself has alef-two streets, by the way. Otherwise we'd have a terrible traffic problem. And my full name is—" An intense, skritch sound filled Jayjay's ears. It was like hearing someone hand-write an endless Library of Babel in a fraction of a second.

(For when the maelstrom talks to Chu in Chapter Eight, Sample 1):

"The rain's intensity redoubled some alef-one times in a row. In the fireplace, the burning sticks had alef-null branchings, but the subtler flames had alef-one forks. The wood and flame merged into alef-two infinitesimal eddies of smoke. We found a nook with an unexpected trove of alef-three tables, with alef-one chairs per table."

(For when the maelstrom talks to Chu in Chapter Eight, Sample 2):

"I drifted past a mauve sea-fan that branched alef-four times, with alef-five polyps waving from the fan's fringed rim. Whales beat their way past, singing alef-seven-toned songs; sea-monsters gestured with alef-eight arms. I found that the

powers of the successive alefs obey no uniform pattern at all. And of course the transfinite numbers should be as quirky and individualistic as the finite integers. Why would set theory be simpler than number theory? Why wouldn't the march of alefs be an inexhaustible source of surprise?"

(For when the maelstrom talks to Chu in Chapter Eight, Sample 3):

"The natural world is filled with infinities of all sizes. If you lose touch with the transfinite, you get alef arthritis in your back. You can see it and feel it: levels below levels, down past alef-null, alef-one, alef-two, on and on. Can the higher levels of infinity can affect the low-level sets? Once I reached the first measurable cardinal, and overhead arched the vault of the sky, an unblemished cobalt dome, curiously low. In an instant, the blue dome became crazed all over with cracks—and fell apart, revealing a much higher range of mountains, stretching up towards a mighty sun. Open your mind ten tridecillion fold."

"If you shrink far enough into the physical absolute continuum, you can flip viewpoints between above and below. I was there, in the subdimensional zone for true, passing the reciprocals of alef-null, alef-one, and more."

"Is two-to-the-alef-null the same size as alef-one? No, here in Alefville, the size of the continuum is alef-two. But two-to-the-alef-four equals alef-five. That means that if you had a tree with branches alef-four forks long, you'd get a canopy of alef-five leaves. It's hard to walk alef-two blocks. You have to meditate upon Absolute Infinity—and realize that you've fallen short."

February 9-11, 2008. Finished the Ending!

Yesterday, on Feb 8, 2008, I finished the first draft of *Hylozoic*. I put in the Poe stuff and then, huzzah, I pushed on and actually finished the first draft of the ending. In other words, as of February 8, 2008, my latest strand of spider silk reaches across the void! Yeah, baby!

I'm still thinking a bit about the timing of what happens while Jayjay and Thuy are gone. But I'll have them be coy/vague about this so as to leave my options open for PS3.

Feb 11, 2008. I've been revising the ending for the last few days, and will do it once or twice more before printing out the whole thing to revise.

I ended up with a 7,000 word Chapter 7 and a 5,000 word Chapter 8. I think I'll keep them separate as each has its own climax and its own POV. I am slightly tempted to fuse them into a duplex chapter broken near the middle by a "****", so that all the chapters are about the same length. That way, critics might be less likely to say, "Oh, he rushed the end." But it's kind of nice to have the last chapters shortish to give a more rapid and staccato effect. Also, if I'm really worried about criticism re. a rushed ending, what I need to do is fill out the ending enough so that it doesn't feel seriously rushed.

February 12, 2008. Draft 1. "My Small Success Has Imprisoned Me."

I revised the ending of the first draft a lot today, lying out on a hilltop in Almaden Quicksilver Park near Guadalupe Reservoir. I'm tired of staying inside on these nice spring days, I feel nostalgic for the freedom I felt I had earlier in my retirement, or when I wasn't working on this book. I gave Bosch a line to this effect

in Chapter Eight: “It’s refreshing to put my life into upheaval. As a youth I dreamed of being a penniless wanderer. My small success has imprisoned me.”

Working on the book feels particularly pointless this week, as *Locus* passed over *Postsingular* in their “Notable Books of 2007” list. And the Times Book Section skipped over me to review, sigh, Mieville and Gaiman.

Today I revised:

Chapter Eight again, and printed it to revise again tomorrow.

Jayjay’s dream in Chapter One yet again.

Glee’s description of Pepple in Chapter Six.

The viral rune stuff near the end of Chapter Six.

Things I noticed to do later (as usual, I put * by an item after I take care of it).

- *Sand down and simplify the presentation of Ouroboros and drop the Runic Divergence Theorem. As it stands, it’s too complex. Being a mathematician/computer scientist, I find it amusing, but for Joe Reader, it’s geek slobber. But simplifying should be enough. Ouroboros may in fact be the best way to achieve my desiderata, and I don’t want to reinvent this wheel yet again. I worried about it a lot on [Oct 20, 2007](#), and [Dec 20, 2007](#) and [Dec 29, 2007](#), and I’m sick of thinking about it.
- *Maybe I drop the brain-freeze thing (search for “autonomic”) in Chapter Six to speed up the flow? No, it’s just two paragraphs and it’s cool, and it’s a nice example of how people might use their lazy eight memory, so I’ll keep it.
- *Shorten the discussion of Zeno speed-ups in Chapter One, as we don’t do much with that, although I did mention Zeno speed-ups in PS1, so it’s worth going over them a little.
- *I changed “zenohead” to “zedhead,” and named the beanstalk and maelstrom aktuals Art Zed and Beth Zed respectively. Later we’ll learn that they’re married and that they have alef-three children. Since it means you can think to ten tridecillion, I considered “trideccy,” but “zedhead” is cooler.
- *If I’m keeping Floofy around for PS3, I should build up her character a bit more in Chapter Six.
- *I should build up Kakar and Chu’s friendship in Chapter Six so I can cash in on it at the end of Chapter Eight.
- *In Chapter Eight, I need to mention Ouroboros 2.0 when they’re searching for the viral reset rune. Suppose they throw away that approach and search more directly for the rune they want, instead of searching for an all-purpose operator.

February 14-25, 2008. Working on Second Draft.

I printed out the whole novel and am going through it from beginning to end.

As I’ve mentioned before, I’m always shocked how very many things I find to correct. It feels good, like picking scabs off your skin or sanding a peeling wall. But for me there’s always an element of anxiety as well. Is it fixable? Are the changes ever going to converge?

I correct at various levels. Some of the things I deal with: avoiding overuse of the same word, making it clear who’s talking both by attribution and by editing their

style of speech, making harmonious phrasing by mentally reciting each sentence aloud and fixing rhythms and alliteration, putting in smooth segues so the reading flows without a hitch, supplying character's motivation and showing it in their expressions and pauses, balancing underexplanation vs. overexplanation, livening up dialog so it's fun to hear, toning down my overly idiosyncratic and ranting viewpoints, foreshadowing things to come for a unified effect while making sure the more startling plot turns are still a surprise, ferreting out and repairing any logic flaws or science inconsistencies, checking the time sequencing and "stage blocking" of characters in space and time, putting in plenty of ambient descriptions of smells/sights/sounds, filtering out stereotypes and received ideas, trying for some really funny jokes, etc.

In some of the chapters I'm finding so many corrections that I'm doing a double or even a triple pass. The second half of Chapter Two needed three passes. I can tell that I still need another pass if the pages are completely covered with markups; in that case I print out and reread a fair copy after typing in the changes—hoping to see that it's finally smooth.

I'm cutting out some dumb jokes, some groping and, above all, repetitions. I changed the chapter lengths by these amounts between Draft 1 and Draft 2.

Chapter	Change in Word Count
1	-700
2	-1600
3	-400
4	-600
5	-400
6	+150
7	+350
8	+2100
Total	-1900

Table 12: Chapter Length Changes from Draft 1 to Draft 2.

My experiences with Bruce Sterling on "Hormiga Canyon" were very instructive. Maddening as it was, Bruce really did teach me about cutting fat. He'd do it to me, then I'd do it to him, and in the process I got a better eye for repetition. Don't say the same thing twice; don't say the same thing twice.

So the book's shrinking as I revise it. This should be okay, as I started with 91,000 and would be happy to have as little as 85,000 left at the end—also I might be expanding the somewhat telegraphic ending of Chapter 8.

I'll accumulate a To Do list here.

- *Leapfrog Ond's too-trad notion of electricity from trees; instead think of a world where electricity isn't needed.
- *As the 3 guns come from 7 Wiggle Labs, mention weapons when Thuy and Jayjay go there to hide from the Peng.

- *Why isn't the Pekka incarnation continually watching Jayjay? I need to stress that (a) she naps sometimes, and (b) Pekka herself sometimes gets busy elsewhere.
- *In Chapter Six, I mention Glee glowing (search for "thalo" to find the passage). I think I'll just drop this so I don't have to keep talking about the Pepplese glowing.
- *How to reconcile these:(i) When Thuy and Jayjay travel from the Yolla Bolly Peng ranch to free San Francisco, they quickly feel their personal gnarl come back. (ii) Jayjay is able to runecast the reset rune onto Thuy to free her of the pioneer runes. (iii) Water that flows into the ranch isn't stricken with the rune. I'm going to claim that when you leave a Peng zone, the effects wear off. But it doesn't set in on you when you come back. But if you jump from a Peng zone to a Peng zone, you don't get any reset effect.
- *Replace "Pekka's incarnation" by "Pekka's demiurge." Sounds more concrete.
- *In Chapter 8, Thuy regains face, that is, she's no longer a pariah and a laughing-stock for the sex scene with Chu.
- *Maybe use this in Chapter 8 when describing Chu's view through the maelstrom walls: "See the ship morphing into a stork? And that wooden bridge looks frikkin' *drunk*." (Don't need it).
- *I had given the Hrull a spitty voice in Chapter 3. Later it's more gargling and choked sounding. Drop the spitty sound.
- *Mention Bosch's narrow tongue again in Chapter Eight.
- *I mention in Chap 3 that Kakar was a cliff carving artist. Maybe have him doing some more carvings in Chap 6 or 8.
- *Thuy talks a lot about ants in Chapter 1 and 2, but not again.
- *Mention Glee's anemone-tendrils and pearly teeth in Chapter 6. Also mention those thumbs for Lovva in Chapter 7. *Or just drop them.*
- *Mention Chu's purple pants and green t-shirt later in Chap 6 and in Chap 8.
- Rather than talking about "Gaia," I prefer, in many cases to talk about the human mindweb. Currently I mention mindweb in Chapter 1, and then forget to mention it again till the end of Chapter 8.
- Don't forget to mention fancy skin-patterns on the Hrull in later chapters. Wobble has leopard spots, Duxy pink spirals.

Feb 26, 2008. Thuy's Baby or Babies

This morning I was pondering what kind of child or children Thuy should have. I was going to make it a son, but now I'm leaning towards a girl, to avoid the same-old, same-old sexism. I've gotten to like writing about Thuy Nguyen, she's my favorite character, and her daughter could pick up where she left off.

As for paternity, the baby *could* have been Chu's child, but I'll have her be Jayjay's, otherwise Thuy comes off as an adulteress and Jayjay as a cuckold, and I don't want to do that to them or to their marriage.

I can see using the daughter as a main character in PS3. In that case, I'd set that story twenty years further into the future. Thuy and Jayjay's daughter could find Thuy's metanovel about Thuy and Jayjay's trip to Alefville, and then she herself

could go there, perhaps in search of her parents who have, in the meantime, mysteriously disappeared. Uncle Chu takes care of her.

As I have twin granddaughters as of July, 2008, I did think of having Thuy be pregnant with twins. Not that this particular trilogy is the kind of story where I'd want to model the characters on my granddaughters—they're too good for that! I see them in a sweeter world, like the *Frek and the Elixir* universe.

If Thuy did have twins, they could come with dual paternity, like Darla's Joke and Yoke in *Freeware*, that is, both Chu and Jayjay could be fathers. But this would make Our Dear Lady Thuy look slutty, and would introduce one too many characters for me to have to integrate into PS3.

So I'm thinking keep it simple: one child, a girl, with Jayjay the father.

March 6, 2008. Send Second Draft to Tor.

I finished the first round of second draft revisions on February 27, 2008. And then I went over Chapter 7 one more time, and Chapter 8 about five more times. I finally got where the last few pages weren't black with inked corrections after I marked them up. So today I emailed the PDF to David Hartwell at Tor. I called it "Version 1" on the copy I sent, although at this end it's the second draft.

Last night someone asked me how it feels to finish a novel you've been working on for about a year and a half. I said, "It's like I was in a concentration camp, and the war ended and the guards left, and now I can just walk out."

As well as the relief, there's a bit of post-partum depression in finishing a novel. This thing that lived inside me is gone. So what do I live for? Vacation, Ru, vacation. And don't even think about my inevitable recidivism into the next camp up ahead, which would be volume 3 of the *Postsingular* series. Or a full-length non-fiction book explaining my ideas about [RR vs. VR](#). For now I'll just fool around with some short stories. And ride my bike. And paint a little.

March 11, 2008. Starting "Tangier Routines"

[I wrote this up, then used it for a [blog post](#).]

I've been rereading *The Letters of William Burroughs 1945-1959*, edited by Oliver Harris (Viking 1993). I'm focusing on the letters from Tangiers, Tangier, Tanger, Tangers as it's variously spelt—these run from 1954 to 1958, and a lot of them are to Allen Ginsberg. This particular edition came out in 1993, and I read in it then. It's a nostalgia trip for me, reading this stuff, fitting as spring itself is a nostalgic season. The return of youth. The drifting blossoms. I've been into Burroughs for almost fifty years, I first read him in my brother's copies of *Evergreen Review* when I was 12 or 13.

I read a lot of these letters in an earlier collection, *Letters to Allen Ginsberg*, edited by Ron Padgett and Anne Waldman (Full Court Press, 1982), I remember reading that in my office on Church St. in Lynchburg, Virginia—I'd set up as a freelance writer there in fall of 1982, and was greatly heartened by Bill's depression, frenzy, and hysterically funny turns of phrase.

In October, 2006, I wrote a story, "The Imitation Game," in which Alan Turing escapes being murdered by the British secret service on June 8, 1954, and makes his way to Tangier, disguised as his Greek boyfriend Zeno. Turing has actually grown a copy of Zeno's face which he's glued to his face—and he left behind a copy of his face glued to the cop-poisoned Zeno's face so that the Pig thinks they've offed Turing himself. That story is supposed to come out in *Interzone* magazine next month, the editor meant to put it out sooner, but lost track. I posted an [MP3 audio file](#)

of me reading "The Imitation Game" at an *SF in SF* event I shared with Cory Doctorow on May 16, 2007.

In his letters, Burroughs talks about his work in progress as being called *Interzone*, a phrase he probably coined because Tangier was at that time an International Zone, governed by France, Spain, Britain and Italy. This amalgam of "routines" became *Naked Lunch*.

By a routine, Burroughs means something like what we'd now call a rap or a rant. It's kind of a vaudeville term. He starts talking about routines in his early 1950s novel, *Queer*. In a letter from June 24, 1954, he says a routine "is not completely symbolic, that is, it is subject to shlop over into 'real' action at any time (like cutting off finger joint [which Burroughs once did to impress a lover] and so forth)."

The routines are compressed short stories, long on affront, very in-your-face, often very funny. If you've read Burroughs you know what I mean. "Like snap, wow." A phrase he uses a couple of times—a bit ironically of course—in one of his happiest and longest letters, written Oct 29, 1956, when he's temporarily off junk and swinging with Miss Green. Even the threat of jihadist attackers amuses him. "It's like the sight of someone about to flip or someone full of paranoid hate excites me. I want to see what will happen if they really wig. I want to crack them open and feed on the wonderful soft stuff that will ooze out." Like snap, wow.

On Nov 1, 1955, once again after kicking junk and having a few words with Miss Green: "Watching a glass of mint tea on a bamboo mat in the sun, the steam blown back into the glass top like smoke from a chimney. It seemed to have some special significance like an object spotted in a movie. I was thinking like a book you read which also has pictures and accompanying music. Of course couldn't approximate life itself which is seen, heard, felt, experienced on many different levels and dimensions..."

This dovetails synchronistically with the recent posts on [RR vs. VR](#)

On Feb 18, 1955. He writes about an SF theme he hopes to weave into *Naked Lunch*. "...an anti-dream drug which destroys the symbolizing, myth-making, intuitive, empathizing, telepathic faculty in man, so that his behavior can be controlled and predicted by the scientific methods that have proved so useful in the physical sciences." Not so coincidentally, this is a theme in *Hylozoic*, where I write about the Peng siphoning off the world's computational gnarl.

Der Meister's words hitting me like tracer bullets. Synchronistically again, this is a theme in *Hylozoic*, where I write about the Peng birds siphoning off the world's computational gnarl. I push it a little further, in that I don't see a big distinction between the deep creativity of humans and the computationally irreducibility of matter. In Burroughs's time, people didn't yet realize that the physical sciences can't in fact predict jack in terms of actual details, like which sand grain goes where in a slide.

In a letter of April 22, 1954, he mentions knowing Brian Howard, a dissipated graduate of Christ Church, Oxford, who might have known Alan Turing. Howard is in town for a cure of his (perhaps imaginary TB). Howard himself mentioned Burroughs in a letter, see *Brian Howard: Portrait of a Failure*, edited by MJ Lancaster, 1968, which quotes a letter from Howard mentioning Burroughs. I found a [page online](#), from the letter to his friend John Banting, in March, 1954: "a nice, if slightly long-winded, ex-Harvard creature of forty who is endeavoring to cure himself of morphinomania by taking this new medicine which the Germans invented during the war. There are several trade names for it. He uses two. Eukodal and Heptenal."

If I fudge the dates a bit, I can suppose that Howard was still in Tangier in mid-summer of 1954, when Alan Turing hit the town. I want to write a story about him meeting Burroughs. I think I might write it in the format of “lost” letters from Burroughs. I’ll call the story “Tangier Routines” and publish it in [Flurb](#). *Flurb* will print it for sure—I sleep with the editor, hell, I even wipe his ass.

It could be significant for the end of my story that Burroughs’s grandfather founded the Burroughs Adding Machine Company, later [Burroughs Corporation](#), which was just beginning to get into computers in the mid-1950s.

To really emulate Burroughs in the composition of “Tangiers Routines,” I need to be pasting the thing together from scraps in letters. Or scraps in blog posts. Or journal entries.

Perhaps Alan finds a way to form himself into something like a slug. He crawls across the room and shlup, he assimilates Burroughs. Or rather merges with him. In any case, the process ends with only one eccentric forty-year-old in the room. Feeling very full, Alan/Bill went into the outhouse in back and took a seventy kilogram dump — eliminating redundant parts. Like a corporation that’s “right-sizing” after a merger. And then home to re-organize the Burroughs Corporation!

Or maybe they’ll be wearing ruffs of shelf-mushrooms on their necks. And I want a Happy Cloak routine (more on that later). If it’s routines, then I don’t have to choose. It can all come down.

Dear Allen...

And with that, I started writing the story.

March 12, 2008. Jonesin’.

I really miss having the novel to work on. What do I do with my time now? Yeah, I’m working on “Tangier Routines,” but it’s such a tiny project. It’ll be done before I know it. I won’t get to see the characters in it mutate and grow. The nostalgia of thinking about Burroughs is a little painful in any case.

This said, I absolutely can’t face starting *Transfinite* yet. For one thing I need to be sure that Tor isn’t going to yank the rug out from under me, make sure that they’re okay with *Hylozoic*. For another, I got so tired of being in the jail of work. I’m taking care of little things I’d let slide. Do the tax forms, see the doctor for a check-up, get my car serviced, fix the grout in the shower, like that. Imagine a life of doing nothing but errands.

Yesterday I killed the morning by breaking something on my computer and then fixing it. I’ve been thinking of getting some OCR software and scanning a couple of my out-of-print novels, *Spacetime Donuts* and *The Sex Sphere* in particular. If I wrestle them into electronic files, then I can design books and have available as POD (print on demand) or online files, these latter possibly for sale, unlike the release of *Postsingular*. The other alternative would be to get them reprinted just in facsimile form which would not in fact be hard to do.

March 21-27, 2008. Transreal Press?

I’m over the jonesing stage. So glad *Hylozoic* is done. We were in [Big Sur](#) for a great four days.

More on the theme of self publishing. Tachyon Books doesn’t want to reissue *Spacetime Donuts* anytime soon, so I might do that as well as *The Sex Sphere*. I had an offer from John Douglas and Richard Curtis at [E-Reads](#), but they wanted to own

all rights for a number of years. But they weren't going to charge me a startup fee, rather they would give me a nominal payment. Maybe.

First I wanted to look at DIY. Start my own press, call it Carp Press (like my poetry pamphlet in Lynchburg) or, better, Transreal Press.

I was inspired by an article "[Book Yourself](#)" by Kevin Kelly in Make #12. He gave a link to a site, [PayLoadz](#), that lets you sell downloads of things (that is, ebooks). And a site [Lulu](#), where you can put your own publisher name, and sell a 6" x 9" perfect bound black and white 150 page trade paperback for \$7.50. If it's 200, the price is \$8.50. And I charge as much over the production price as I like.

Plus \$100 start-up fee to get ISBN listing for, like, Amazon. Kevin also gives a link to a detailed description of [how to get on Amazon](#). If you actually mail them the copies, you get 50% of the cover price.

An alternate Amazon option is their [BookSurge](#) program, under which I send them a print-ready PDF and they do the print on demand publishing. But they want \$299 for doing this, and you get 35% royalty.

Another option is to join Authors Guild for \$99, and they will republish [facsimile editions](#) of my out of print books for no cost to me via iUniverse.

Today I feel tired, and this all seems like a huge hassle --- starting with scanning the books, running some OCR (optical character recognition) software on them (I'm about to get Acrobat Pro 8.0 which might work), and then proofing the results—recently I went to visit one of my ex-students who works at Adobe, and he's gonna get me a deal on the wares; now that I finished Hylozoic, I have time for all sorts of things. The Beatles song: "I'm taking the time for a number of things that weren't important yesterday."

I screwed around researching all this for a few days, and posted my findings on my March 27, 2008, blog entry, "[POD and Ebooks](#)".

May 15, 2008. What Next?

Hylozoic (PS2) is done, so if I plow on and write the third volume next, that is, PS3 or *Transfinite*, what kind of timeline might I see?

PS1 (*Postsingular*) took July, 2005 -- Sept, 2006, PS2 took Jan, 2007 -- March, 2008. If I follow the pattern, PS3 will take July, 2008 -- Sept, 2009. Fourteen months of writing per book, with four months off in between---makes a year and a half per book.

In any case, I can't properly start on PS3 yet, as I'm waiting for David Hartwell at Tor to read *Hylozoic* and make his suggestions so I can do the final revisions. I think during the revisions would be a good time to list some of the threads and leads that I might pursue.

I hope Hartwell makes his suggestions pretty soon, as I'll be traveling a lot this summer. He's had the manuscript since March; my worry is that he doesn't get it back to me until the end of June, right when I set off on a road trip to Wisconsin, a beach trip to Virginia, and a four-week trip to the South Pacific in rapid succession—and then he'll be "I need the thing back by September 1," I will have a couple of weeks in July free, and I can always push him back till October 1.

There's some strategy I think of when I start worrying, what is it again, I saw it on the wall in a hospital meeting room where I chaired a meeting once, it had these steps, like, (a) Are your worries really rational and well founded? (b) Even if your worries are to some extent reality-based, what is the worst that could actually happen?

(c) If the worst happens, how can you in fact cope? Something about “cognitive,” ah, Google tells me it’s Cognitive Behavioral Therapy.

My point being that if, worst case, Hartwell gets *Hylozoic* back to me so late that I don’t get my edits done till the end of October, and Tor can’t do a Spring 2009 publication, then so what? They can do it in Fall, 2009. Whatever.

I’m also waiting to get scanned optical-character-recognition (OCR) versions of my early novels *Spacetime Donuts* and *The Sex Sphere* from John Douglas at E-Reads. I sent them two old paperbacks to tear apart and feed into the machines. They’re going to do print-on-demand (POD) editions of these two books for me, and I’m going to go over the electronic files and correct for scan errors and do some minor revisions. I painted covers for the two books and photographed them with my new Canon 5D camera (which kicks *ass*).

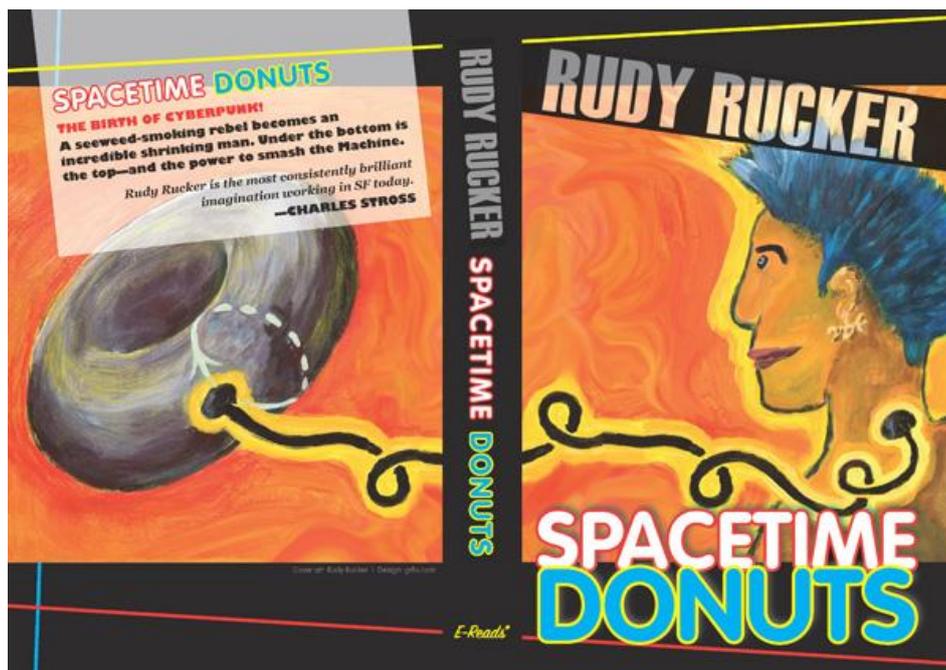


Figure: Spacetime Donuts Cover Art

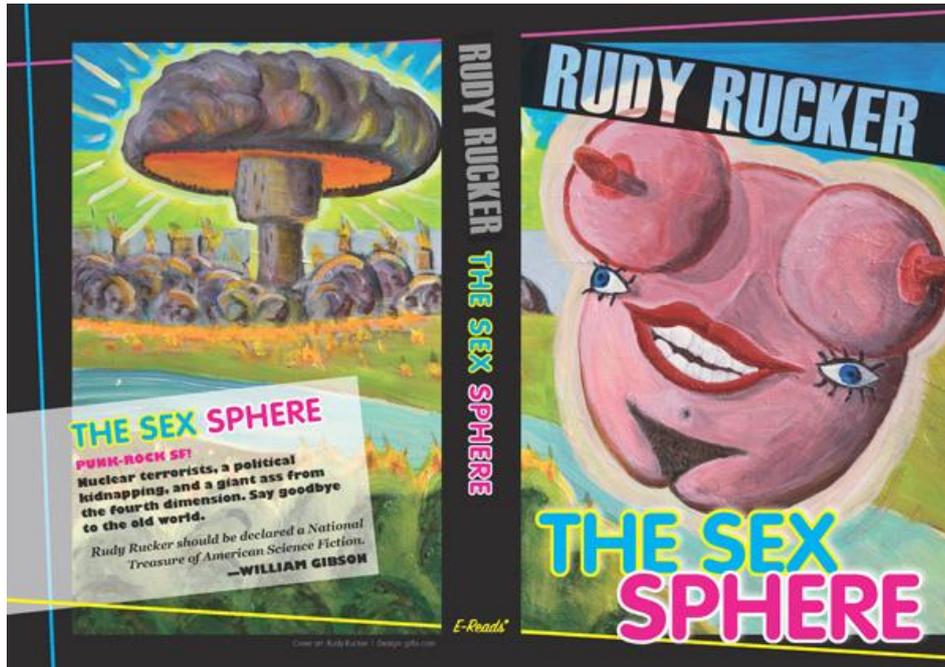


Figure: The Sex Sphere Cover Art

My daughter, Georgia, is going to do the full cover design. It should look awesome. A lot of POD book covers have generic grayish purple public-domain art with hideous Ren Faire fonts.

The *Postsingular* copies are not flying out of the warehouses. Tor printed 5,000 copies and they've only shipped about 3,500 copies, despite all the publicity push I did with the free PDF version online.

By the way, Hartwell remarked that at least *Postsingular* wasn't selling worse than my usual level, that is, the free ebook release didn't *reduce* sales. He thinks, though, that since it didn't actually help sales, we shouldn't do the free e-book release of *Hylozoic*. Maybe we've hooked enough people with the free *Postsingular* that they'll pay to get the sequel. I enjoyed the bit of web splash that I got from doing a Creative Commons release of *Postsingular*, but Dave does have a point. The basic idea is, after all, to sell books. Lest we forget.

Today I'm wondering if I really feel like writing *Transfinite* next at all. What if I took a break from the series and wrote something else first? Like what? Maybe a sequel to *Frek*. Maybe something new.

Maybe that autobiography I've been putting off? I wonder where I could publish my autobio?

I think I'd rather be writing SF, anyway. Really, what I'm jonesing for is transcendence, not navel-gazing. Driving in the car yesterday, listening to my iPod, and these various great guitar sounds (Zappa, Neil Young, NOFX), I had this flash that I often get, that when I really dig into the SF or into, for that matter, any intense writing, it has that feeling of picking up an electric guitar and wailing.

I guess I'm hesitant about *Transfinite*, as I don't quite see what goes into the book. And I have this ongoing worry that I'll be losing more my audience with each volume in the trilogy. Like the opposite of a snowball that gets fatter as it rolls

downhill. CBT: (a) I have no strong reasons (other than the disappointing sales) to believe that's true (b) If it is true, it just means I sell a few less copies (c) Worst case is Tor won't publish me anymore. Hmm, that's not helping.

It looks like the best-selling of my recent Tor books was *Spaceland*. It's earned out the advance, and I'm getting a faint trickle of royalties. Though maybe *Mathematicians in Love* will catch up once the paperback comes out in July.

If I were to do a one-shot SF novel right now, what would it be about? I'll think about that.

May 22, 2008. I wrote some cover copy for the books:

=====

THE SEX SPHERE

Punk-rock SF!

Nuclear terrorists, a political kidnapping, and a giant ass from the fourth dimension. Say goodbye to the old world.

Rudy Rucker should be declared a National Treasure of American Science Fiction. ---*William Gibson*

=====

SPACETIME DONUTS

The birth of cyberpunk!

A seaweed-smoking rebel becomes an incredible shrinking man. Under the bottom is the top---and the power to smash the Machine.

Rudy Rucker is the most consistently brilliant imagination working in SF today.--- *Charles Stross*

=====

Also I used Photoshop trickery to stretch the *Spacetime Donuts* painting so it will still be long enough to wrap if Georgia makes it thinner so as not to have to put the text over the dude's face.



Figure: Stretched Spacetime Donuts Cover Art

May 16, 2008. Stories. "To See Infinity"

I've been writing some short stories.

- “Tangier Routines” for *Flurb*, a pastiche of Wm. Burroughs letters that serves as a sequel to “The Imitation Game.”
- Part of the first chapter of *Hylozoic*, called “After Everything Woke Up,” which I sent to *Interzone*.
- A new 5,000 word story, “Qlone,” which I sent to *Asimov’s*.
- A 1,000 word short-short “Message Found in a Gravity Wave” which I sold to *Nature Physics*/
- A story with Bruce Sterling, still underway, working title “Colliding Branes.”
- I have an idea for “To See Infinity” with Paul DiFilippo.

All of last three have to do with the [Steinhardt-Turok Cyclic Universe](#) model that I’ve been [blogging about lately](#).

I’m partly coming out from under the cloud of a cold that I’ve had for four weeks—I don’t know why I get these horrible six-week colds twice a year, it’s like my immune system is shot. I like to complain about this to my 75-year-old neighbor friend Gunnar, I say that I have AIDS, or that I have such intense postviral depression that I’m going to hang myself. I’m feeling like getting active now, though my head is still stopped up. I want “the narcotic moment of creative bliss,” as the John Malkovich artist-character says in *Art School Confidential*.

Possibly I might ask Paul Di Filippo to help me get up to speed quickly on a story. Or maybe it would be faster and less trouble to do it myself. Two collabs at once could get too manic, though I’d love to work with Paul again soon.

I’m thinking of yet another take on the Cyclic Universe, although staying well away from the Big Splat aspect, as I don’t want to repeat the same thing a third time.

An angle I haven’t touched yet is that our space might have infinitely many planets right now. I want a story that somehow assuages my frustration over our seeming inability ever to see the infinitely many other planets that are right there right now. The problem is that we had this space-filling Big Flash 14 billion years ago, and we can’t “see” through that. Also everything was wiped out by the flash.

But what if there are somehow surviving signals from the more distant zones, signals from previous cycles. SF element: the signals come through the subdimensions (which of course Paul and I are experts at).

Let’s say the working title is “To See Infinity.”

I think about a Golden Age story, James Blish’s “Beep” of 1954, (later expanded into *The Quincunx of Time*, 1973) in which the spaceships have some kind of faster-than-light radio (called a Dirac transmitter), and messages end with this annoying beep, and they’ve found a way to edit out the beep most of the time. But then some guy fools around with the beep and realizes it’s a compressed version of all the messages from all future times, the scientific justification being that, in special relativity, faster-than-light messaging is logically equivalent to sending messages backwards in time. [Gregory Benford mentions the story in his article “Time and Timescape” in *Science Fiction Studies* #60, see [abstract](#).]

In ““To See Infinity” the characters are messing with subaether radio. And the compressed message could be incoming radio telemetry from the previous cycle of the universe, call it cycle minus one, and these signals come from a spherical shell of space with inner radius one trillion light years and outer radius of a two trillion

light years. And there's a subtler overtone type beep from the two to three shell of cycle minus two, and yet another still more rarefied signal for the three to four shell of cycle minus three, ad infinitum. (Actually the shells are in some sense bigger than a trillion miles thick, now, due to the stretching of space, but they were that thick when the messages got into the subaether.)

How to narrate it? I was watching the *Amadeus* movie last night, and thinking what a brilliant device it is to have Mozart's rival Salieri narrate his life. So we have this somewhat ordinary guy (who we relate to) telling us about the genius. And we don't know enough about music to appreciate why Mozart is so great, but Salieri explains it to us, not as if he's explaining, but as if he's drooling over the upstart's work. By the same token, people can't appreciate math, but if we had a narrator talking about a young upstart, he could in passing give us a flavor of the upstart's math.

Math? Well, maybe it's a futuristic combination of math and music. And I'm supposing that the upstart is in some way tuning in on the messages to do his work. And maybe the big reveal is that he's using infinity.

I have a fondness for the *Amadeus* movie as when I went to a *Flatland Centennial* conference on the fourth dimension at Brown University in 1981, I met Tom Banchoff and Kee Dewdney there. I was in my old wild-man conference mode, drinking a lot, ecstatic, gabbing, smoking pot with Kee. I was maybe a bit like Mozart compared to Tom's Salieri, not that Tom was ever anything but kind to me. I think of the simile because another attendee actually made that remark to me—"Did you see *Amadeus*? The Mozart character reminds me of you."

So the Salieri-type narrator could be this somewhat plodding guy describing the disappearance of a wilder, younger Mozart-type guy. And the narrator is disturbed, as he blames himself (not without some justification) for the young genius's death.

The emanations from the higher cycles might be perceived with your subtle body. Perhaps generation to generation, each old brane migrates to a higher brane.

Initially I wanted to use the title, "The Starry Crow," as the other day I was looking at a crow, admiring how black and unreflective he is, and it struck me that it would be cool if the black was full of stars. Or it could be "The Upstart Crow", which was a name for Shakespeare. But, come to think of it, Arthur Clarke has utterly burned to the ground and made un-reusable the conceit, "it's full of stars."

Paul is up for this, and we exchanged a couple of sentences for the start, but then I told him I had to set it aside for awhile, as the Sterling collab, "Colliding Branes" is taking much longer than I expected, I have the *Hylozoic* revisions looming, and I'm about to go on a series of trips. We may not get back to "To See Infinity" till September.

May 22, 2008. David First Suggestions

So Dave read the first hundred pages and had his assistant, Stacy Hague-Hill, fax me a PDF of nine marked pages, mostly indicating spots where I might add chapter breaks. His cover email:

Finished the first hundred pages of the ms, which took longer than expected, and so I am sending them now. The book really has to be re-chaptered, I think, with shorter chunks of text that match POV shifts. This is a particular problem at the

front of the book, and I have marked potential breaks that I'd like you to consider. Secondly, there has to be some cutting or condensation at the start because the story doesn't begin for a while, and all the catch-up on the characters will turn off at least some readers, and we shouldn't want that.

At any rate, I asked Stacy to mail the first hundred pages (just the marked ones) today, so you might get some work done in the next week. I expect to finish the ms by next week, but then lots of roadblocks have slowed me so far.

So I'm looking it over this morning. He'd suggested four different spots where I might break Chapter 1, but I think I'll only break at two of those spots, turning it into three chapters: "After Everything Woke Up," "Moving the House," and "Jayjay and the Beanstalk."

I sent this email back:

I just spent a couple of hours with my *Hylozoic* ms, and I think I'll use two of the first-chapter breaks you suggest, but not the other two. This way the first chapter breaks into three (rather than five, which would be, I think, excessive, although I will reconsider when I do a read-through).

1a: "After Everything Woke Up"

1b: "Moving the House"

1c: "Jayjay and the Beanstalk"

As you suggest, I'll put in appearances of aliens or some other foreshadowing of the book's real story at the ends of 1a and 1b.

I'll have Jayjay see the Hrull flying manta rays at the end of 1a and they want to talk to him, but he flees down to San Francisco.

And I'll have Kittie see Hieronymus Bosch at the housewarming party in 1b --- but it happens off stage, she just tells Thuy about it, and Thuy isn't sure if she can believe her.

And then I catch the reader off balance when Jayjay meets a completely different set of aliens (pitchfork and Peng) in 1c.

Before long, I'll print out a fresh copy of the book and read through it, seeing what I can cut so as to speed up the beginning. Maybe I should jettison the character Mabel, for instance, as she hardly does anything.

As I mentioned on the phone, for me it makes more sense to have all your suggestions before I start on a full read-through, so I think I won't start the read-through quite yet. In any case, this week I'd like to finish my story with Bruce.

I'm planning a complicated summer schedule, with three separate trips. What will be the final deadline for getting the full corrected manuscript back?

PS: By the way, the chapter breaks I'm definitely putting in are the ones you marked on p. 21 and p. 43. Re. the

breaks you suggested on p. 29 and p. 35, I think I'll just do these as "****" subchapter breaks. Just to see if it were possible, I didn't put "****" subchapter breaks into the manuscript this time, although now I can see that this isn't reader-friendly. Readers do like digestible chunks. On the full read-through I'll put in "****" breaks, so please do point out spots where these might be in order as well as the spots that might merit full chapter breaks.

Dave's answer (to the PS): "OK, sure. This is an exercise in making the book more pleasant to read."

June 5, 2008. I Start Revising Hylozoic

On June 4, I got the rest of the revision suggestions from Dave Hartwell. He wants lots more chapter breaks, and suggested some spots. So I put the chapter breaks in before rereading it, as the breaks are easy. Right now I've got it up to 19 chapters (counting an epilogue) instead of 8.

He also said "Bosch isn't a character & needs revision." That one's tough. I guess I made Bosch too abstract, too saintly. I'm so much in awe of him. I'll have to think of ways to humanize him other than the obvious possibility of making him a sexual horn dog.

I'm revising the book now. My first task is to make the beginning run faster. I split the first chapter in three, added a preliminary wow at the end of each of the two new chapters like I discussed in the [May 22, 2008](#) entry, with Jayjay seeing the Hrull at the end of Chapter 1a, and Kittie seeing Hibrane Bosch at the end of Chapter 1b.

Today I'm working on the old Chapter Two, which I'm splitting in two, and trying to shorten.

I'm finding too much explanatory rubble that accumulated while I was writing the later chapters and casually putting in what I thought were good pre-figuring sentences. I'm taking a lot of that out.

It all feels painfully clumsy and slow, and, as usual I'm anxious. I hope things start rocking in the old Chapter Three, when the Peng show up.

Chap New # (Old #): Name	3rd Draft Word Count	2nd Draft Word Count	~Net Change
Chapter 1 (1a): After Everything Woke Up	4,948		*
Chapter 2 (1b): Moving the House	5,769		*
Chapter 3 (1c): Jayjay and the Beanstalk	3,802		*
<i>1+2+3 (Old 1)</i>	<i>14,519</i>	<i>14,427</i>	<i>+100</i>
Chapter 4 (2a): The Missing Gnarl	4,560		*
Chapter 5 (2b): Alien Tulpas	4,366		*
<i>4 + 5(Old 2)</i>	<i>8,926</i>	<i>8,553</i>	<i>+400</i>
Chapter 6 (3a): The Peng	6,727		*
Chapter 7 (3b): The Hrull	4,861		*
<i>6+7(Old 3)</i>	<i>11,588</i>	<i>11,493</i>	<i>+100</i>
Chapter 8 (4a): Coma Nurse	5,826		*
Chapter 9 (4b): Live Sex	5,444		*
<i>8+9(Old 4)</i>	<i>11,270</i>	<i>11,825</i>	<i>-600</i>
Chapter 10 (5a): Ergot	6,421		*
Chapter 11 (5b): Hieronymus Bosch's Apprentice	5,535		*
Chapter 12 (5c): Painting the Thistle	3,581		*
<i>10+11+12(Old 5)</i>	<i>15,537</i>	<i>15,627</i>	<i>-100</i>
Chapter 13 (6a): Glee and Chu	5,913		*
Chapter 14 (6b): Viral Runes	5,951		*
<i>13+14(Old 6)</i>	<i>11,864</i>	<i>12,176</i>	<i>-300</i>
Chapter 15 (7a): The Magic Harp	5,737		*
Chapter 16 (7b): To the Gibbet!	2,319		*
<i>15+16(Old 7)</i>	<i>8,056</i>	<i>8,033</i>	<i>Same</i>
Chapter 17 (8a): The Maelstrom	4,747		*
Chapter 18 (8b+New): Transfinite	4,051		*
<i>17+18(Old 8+New Material)</i>	<i>8,798</i>	<i>7,558</i>	<i>+1300</i>
Total	90,747	89,876	+900

Table 13: New Chapters

June 8-9 2008. High Anxiety About Hylozoic

I've revised though the old Chapters 1, 2, and 3, and I'm having some doubts about the novel. It's slow to start and I think I made it too complicated. I think I can speed up the start okay, but I'm worried about the complexity. I had a feeling *Postsingular* might be too complicated already, but *Hylozoic* is more so. Imagined criticism: "*Hylozoic* makes the mind-breaking *Postsingular* look like 'Goldilocks and the Three Bears.'" Maybe for some readers that's a good thing? Said the crazy old man wistfully.

I think part of the problem is that I have been seeing *Hylozoic* as the middle novel of a trilogy. On the one hand, a lot of complex back-story sloshes over from *PS1*, and on the other hand, I'm trying to foreshadow some story and plot ideas for *PS3*.

I worry that the main thing I really wanted to write about, that is, *hylozoism* (everything being alive) doesn't come through as strongly as I wanted.

Today I was despondently thinking, "Well, one of my books has to be my worst book, and maybe *Hylozoic* is it." I saw the phrase "career death spiral" in some essay in the *SFWA Bulletin*, and immediately began worrying that publishing *Hylozoic* as it is will send my career into a death spiral. What if it's viewed as incomprehensible, is a huge flop, and I can't be able to sell anything else? Hmm, what was that I was saying a few days ago about CBT (Cognitive Behavioral Therapy)...

I'm thinking right now that I don't want to go onto PS3, I want to bail from this bad trip and cut it down to a two-novel series. Or at least postpone PS3 till further down the line. Don't write that book next in other words.

By way of possibly cutting the series down to two books instead of three, I might add a chapter or two describing in more detail what Jayjay, Thuy, and Bosch actually do after they're actualized.

Are there any viable ways to simplify *Hylozoic*?

Why the Pekklet?

It might be nice to get rid of the "Pekka's demiurge" or "Pekka's agent" creature, whom I've also been calling "the Pekklet" in my revisions just this week.

The problem is that, with Pekklet, we have an indirect connection between Pekka and Jayjay, and it feels clumsy. Like an epicycle instead of an elliptical orbit. So why the Pekklet?

A *first* reason for having the Pekklet was that I think people can block out teep, and I didn't want Jayjay to be able to block out Pekka. And I want Pekklet to be talking to Jayjay via an unblockable quantum entanglement. Not everyone will understand this. Could I just suppose that Pekka has very powerful teep, or that she's so smart she can work around any block? If Pekka uses teep, why doesn't Gaia block her? Maybe Gaia does block her off and on, and that's when Jayjay and Thuy get their chances.

A *second* reason for the Pekklet is that I want Thuy to do bloody battle with a physical enemy at the end to decisively oust Pekka. Thus she kills the Pekklet. And since Pekka can't teek—and I think this has to be an absolute rule, otherwise she'd just be teeking pioneers directly—then it seems like only way she can have a non-tulpa avatar, such as Pekka, is if some aktual with direct matter control (such as Groovy) builds the avatar for her. And it's hard to see Groovy making a Pekka right at the end of the book, as by then he's gone, also by then he's friends with the humans. I suppose Pekka could get some extraterrestrial humanoid slaves to reach out to Earth and perhaps work together to build a Pekka.

A *third* reason for the Pekklet was that I don't want it to be easy for Pekka to start up trying to invade Earth via someone else's mind right away. Killing a late-arriving physical Pekka avatar wouldn't make for a clearly decisive break with Pekka's ability to control Earth, not in the same way as killing a specifically control-oriented there-from-the-start Pekklet.

A *fourth* reason was that I wanted Jayjay to see a physical thing taking him over when he's on the beanstalk. It could just be a vision, of course, but it's heavier if it's physical.

What About the Pepple/Earth Connection?

What do I gain by having the humans bring lazy eight and aktualization to Pepple and having Pepple bring it to us? It certainly complicates things.

But if I don't do the interlocking causal loops—which are, after all, kind of sense-of-wonderful—who does aktualize Groovy and Lovva? I guess it could be some anonymous world, we could postulate an endless domino chain where someone topples Pepple, Pepple topples us, and we then topple some other random world.

But we take the linear dominos approach, how did the Pepplese find Earth? Perhaps we do get a bit of a time loop here? Jayjay got high, went up to lazy eight, and the aktualized Pepplese saw him there and went down to Earth? But, wait, they already knew about Earth before that because they're the ones who unfurled lazy eight. I guess it would just have to be that if you're aktualized you can look down and see worlds like yours, which is reasonable.

In fact I could use that in either case. Up in heaven, Jayjay, Thuy and Bosch see this dome of possible worlds, and they pick out a humanoid one and, lo and behold it's Pepple.

Restore the Vision of Infinity?

In some of the earlier drafts of Jayjay's dream, he goes past lazy eight and sees infinity as a glistening lemniscate-shaped crystal, and stands on clouds, with a Jack and the Beanstalk giant castle in the background, which was visually nice and fun to read about.

I backed off from this because I wanted to save it for *PS3*, also I felt that if he goes to infinity, he would become an aktual. I had him only go out ten tridecillion levels to become a zedhead.

But suppose that he does go out to infinity, which, as I said is more visual, and has the bonus that it's likelier that Pekka would find him there. And say that if you stay there for only a little while you don't become a full actual. But you get some power.

Or...if I decide to wrap up this book a little tighter, in a new closing chapter, I could use the infinity crystal and the giant's castle on the clouds.

No Alefville

I think I shouldn't have the aktuals talking about Alefville at all. Kill that. It just spilled over from my story, "Jack and the Aktuals," and is confusing in *PS2*, and overly constrains what I do in *PS3* or in the final chapter (should I indeed condense *PS3* into a part of the last chapter.)

Maybe in *PS2* the aktuals should be more like plants or like tornadoes, and not very communicative—or, better, potentially *very* communicative, but not in a form that a non-aktual can understand.

Drop the Pengö/Pepple Connection?

I had the ancient Pepplese Queen Ulla finding a tunnel to infinity in a cave, and getting zedhead power from it, and making Peng tulpas due to teep from Pekka, and her descendants do the same thing.

But why wouldn't the Peng have taken over Pepple utterly, that's the way they are?

And would there have been a Pekklet in Ulla's cave? And who put the tunnel there?

Now, I could just drop all this and have Waheer go somewhere else entirely.

But what if I keep Ulla and the Pepplese Peng. That way Groovy knows about Pekka up front. But to explain the low number of Peng on Pepple, we might assume that there is not a Pekklet on this world.

Pekka can in fact send a tulpa directly to a human, assuming that they're enough of a zedhead to be a runecaster. It's just that, if the connection is via direct teep, it's blockable. So the use of a Pekklet is an improvement, from the point of view of Pekka and Warm Worlds Realty.

But, with Pepple being the site of the earliest tulpa colonization, we can well suppose that Pekka did it without a Pekklet.

How is it that Ulla is a zedhead? Perhaps there are naturally occurring actual connections? But if this is the case, then we wouldn't really need for Jayjay (as crow) to bring the tornado-actual to get Lovva and Groovy. Could it be that Ulla simply is a zedhead as she is? Maybe the aristos have some kind of intelligence enhancement treatment quite different from climbing a beanstalk to infinity.

I'm unsure what to do next. When I started writing this entry, I was sure I was going to rip out the Pekklet, but now, after revising this entry twice, I'm thinking I'll leave Pekklet in. Play it as it lays. Get it over with. It'll be complicated, but at least I can make it gleam. But I might put in the extra material about Jayjay, Thuy, and Yeroon in Infinityland. That way I'd be less committed to a PS3.

If I were to really revise a lot, I might not have time to properly work on the revisions right now, as I'm about to leave for a two week trip to the Midwest to visit my daughters, followed by a week in Virginia with my in-laws, followed by four weeks in Micronesia.

June 10, 2008. Talk to Hartwell, Plan Extra Chapter, Kill PS3

Yesterday I phoned David Hartwell and see what he thinks about *Hylozoic*. All day yesterday, and this morning, I've been revising this entry, and today I actually [blogged a version of this entry](#) as "Revising *Hylozoic*."

Hartwell didn't seem to think the book was too complicated, as I've been worrying. But he did feel that it doesn't really pick up speed until Thuy and Jayjay get to in 's-Hertogenbosch. He likes the Chu character, he said he was surprised how well he worked, and that it was very rare to find an autistic character in an adventure novel were stuff is happening—as opposed to being a family-relationship novel.

He repeated his remark that Bosch doesn't seem individualized enough to work as a character; I agreed that I had trouble with him as I think him as almost a saint.

He sympathized with my anxiety that if *Hylozoic* bombs, I won't be able to publish a third in the series, and agreed it would be wise to round off *Hylozoic* so well that the two books can stand as a completed whole with no need for a third volume. "And then I'd be free of this thing," I added, and he laughed sympathetically.

I suggested that I effectively add a chapter to the end of *Hylozoic*, filling in the missing stuff about what happens to Jayjay, Thuy, and Bosch at infinity. I asked how this would work with the schedule, keeping in mind that adding a chapter is likely to take me a month.

He said they'd been planning the book for May, 2009, and to hit that deadline, I'd need to get the manuscript done in August, which could be hard given my travel plans. But he said he could slip the book to Fall, 2009, and then I'd have more time to work on it, and that way he might also go over it and edit it a bit more.

So I think that's what I'll do. I'll stick to the plot machinery I have, polish the first half some more, and add an account of the trip past infinity. What I think I can do is insert Thuy's account of their trip past infinity into the last chapter, effectively writing a new chapter—which would have been Chapter 9 in the old numbering scheme, but which will be Chapter 19 in the current new numbering system.

The current chapter list I have in mind is as follows, paragraphed according to parent chapter. (See [Table 13: New Chapters](#) for my final (and different) version of this.)

Chapter 1: After Everything Woke Up. Chapter 2 : Moving the House.
Chapter 3: Jayjay and the Beanstalk.
Chapter 4: The Missing Gnarl. Chapter 5 : Alien Tulpas.
Chapter 6: The Peng. Chapter 7: The Hrull.
Chapter 8 : Coma Nurse. Chapter 9: Lusky.
Chapter 10: Ergot. Chapter 11: Hieronymus Bosch's Apprentice.
Chapter 12: Painting the Thistle.
Chapter 13: Hrull Gel. Chapter 14: Viral Runes.
Chapter 15: In the Stew. Chapter 16: The Magic Harp. Chapter 17: To the Gibbet!
Chapter 18: The Maelstrom. Chapter 19: Beyond Infinity.

I might write Thuy's flashback material in the first person, as she's reporting it to be her metanovel, this would be a nice change in the prose texture, and might be fun to write.

I'm thinking I can frame it with something like the following:

"Tell us everything that happened while you and Jayjay were aktualized," said Bixie to Thuy once they were underway—with *Founders* sponsors' ads trailing in their wake like blimps.

"Well, the dramatic details are going into my third metanovel," said Thuy. The summer air fluttered the loose gown she wore over her growing belly. "I'm not going to give everything away in advance. I'd like to get some really good sales for once."

"Oh, please?" said Bixie. "Don't be stingy. Think of our viewers."

"Oh, all right," said Thuy, never loath to work a crowd. "In a way, I'm surprised nobody asked me about this before."

"They're all scared of you!" said Bixie with an elfin smile.

"But not you, huh? Okay. What the hell. I'll teep it to you as I remember it." [Insert Thuy's long, first person account here, setting it off with *** before and after]

"It's all tangled up," protested Chu, who'd been brooding about the muddled chain of cause and effect. "It doesn't make enough sense."

"It's what it is," said Thuy. "And now that I've told you this end part, I'm not gonna bother writing it up as a separate metanovel. Everyone can teep in to hear what I said. This story's done right now, just as it is."

I emailed Dave this letter:

It was good to talk to you on the phone today. The HYLOZOIC revisions are moving along well, and I appreciate your encouragement and advice. I'm working on tightening up the book with cuts and by breaking the chapters into smaller chunks, also I'll see about making Bosch a more individualized and vivid character.

As we discussed today, I think it would be a good idea for me to add about another chapter's worth of material to the end of HYLOZOIC, a chapter in which I describe in more detail what happens to Thuy, Jayjay, and Bosch when they travel out past infinity, crafting this in such a way that no loose ends remain.

If I do this, then POSTSINGULAR and HYLOZOIC can stand as a finished and self-contained pair of books, rather than as part of a trilogy.

I no longer think this pair of books needs to be a trilogy. Of course, it could still be that eventually I revisit that world or those characters with a fresh adventure. But this way, I'm free to take on something different for my next novel.

As we discussed, given that it will probably take me an extra month to write the extra chapter for HYLOZOIC, it will work better to schedule HYLOZOIC for Fall, 2009, rather than Spring, 2009.

I'm also wondering about the paperback of POSTSINGULAR. It seems like it might be good if Tor can publish the paperback of POSTSINGULAR in Spring, 2009, so as to help set the stage for the HYLOZOIC release in Fall, 2009.

I checked with my publicist on the phone, and *Postsingular* is in fact scheduled for February, 2009 in paperback.

June 30, 2008 Done Third Draft Except Extra Chap

Okay, today I finished reading through the book and correcting it for the third draft. I did a lot. I could do even more, but hell, it's just an SF novel that maybe ten thousand people will read. Enough's enough.

Also I'll get to reread it and mark it up a bit more during copy edits.

The one big thing I still have to do is to add Thuy's reminiscence about Alefville, so I don't have that hanging over my head as something that has to appear in a third volume of the series. Even if there were to be a third volume—which there might not be—I wouldn't want to have to set it in Alefville. So I need somehow to wrap that up.

Dave Hartwell says that they need the final version by early August, as the book is now scheduled for Summer, 2009. So I'll have to finish off the Alefville scenes before my Micronesia trip on July 24. We'll be at the beach with the kids July 5-12, so that only gives me three or four days now, maybe a little work at the beach, and then two weeks. I guess that's enough.

July 1, 2008 Thuy's Rap about the Transfinite

So today I start writing the missing piece. To get going, I took a piece of my old [Jayjay vision, Version E](#) and rewrote it:

So the alien pitchfork flung me, Jayjay, and Jeroen Bosch out into the core of this endless whirlpool. We fell for a long time, like Alice down the rabbit hole. Even though we were speeding up, it felt like we were going slower and slower, drifting down like petals.

Near the end, I was seeing this converging forest of bright lines—as if I was staring up into the redwoods. I was seeing the sheaf of Earth's parallel lazy-eight memory axes, all arrowing in on infinity—which was shrouded in luminous haze. Teep signals were flicker up and down the lines like beads on wires.

The mysterioso glowing cloud wasn't something I'd been aware of before, even though we use it all the time when we teep a signal off the point at infinity. But ordinarily, it's like a hairpin turn, a hiccup, a click of static. You zoom up, you zoom down, and you don't see the scenery. But now we were drifting down onto infinity like slow cherry blossoms. I could hear this faint fractal hiss from the glowing cloud, an intricate buzz like every silp in the world whispering to me at once.

So, okay, we hit the bottom and squirted out of the tip-ass pointy end of the vortex funnel into the glowing cloud. It had this fibrous texture like cotton candy. Jeroen was yelling that we were at God's throne. I grabbed hold of the cloud-stuff with both hands, I didn't want to face whatever was making it glow.

But, like it nor, there it was, nestled in the fog: infinity. It wasn't a point like some people say, and it wasn't a triangle like Jeroen expected. Instead it looked just like I'd expect—and maybe that was because I saw it first—it looked like a preternaturally smooth figure eight, a crystalline lemniscate with its interior filled by reflections and bright caustic curves. I could sensed the ghostly fusillade of Earth's teep signals bouncing off the loop's central crossing, bouncing off this nexus where everyone's lazy eight axis met.

We three stared at it for quite some time, letting its quiet, irregular hum percolate into our minds. I could feel my thoughts opening up just from looking at it—the infinity amulet was teaching us to use Zeno speed-ups at will. Jayjay laughed and looked at me, and he counted through all the integers from zero to alef-null. Out loud. And then he did a backwards speed-up and counted back down.

Jeroen wasn't quite satisfied, so he started digging further through the cloud. Digging up, I guess you'd say. If I'd gotten through the cloud first, we might have seen a Jack and the Beanstalk castle and a mountain range, and Jayjay said he was expecting to see this Los Angeles type sprawl city called Alefville. But it was Jeroen who made it up there, and the scene crystallized into his particular view of things. We saw a sky-high triptych with a dogpile of weird creatures running around on the clouds in front of the panels, jumping in and out of the frame whenever they liked.

And now I rewrote that a bunch of times, and today I think I'm done. I'll sleep on it, and email it Tor in a day or two.

July 10, 2008. Mailed in the Third Draft.

So I mailed in the third draft today. I'd just about finished it on July 1, and then that evening I was in the hospital for a week. Scary. I still don't feel a hundred

percent. But I reread the last few pages of the book a couple of times in the meantime and tweaked them a little bit more, and I think I'm done, it's as good as it's gonna get.

I'm ready to work on something else. I've been thinking what I *would* like to write next would be my literary autobiography. I've been putting it off for years, but if I'm going to start visiting the hospital, maybe I need to gather ye rosebuds while I may. Yes, I know, I need to rest and not worry about what to write next, but thinking about that stuff is what I like to do. I wonder if John Oakes at Atlas Books would publish my autobio, or if not him, maybe Jacob Weisman at Tachyon Books--or if all else fails, I could just PDF it online, not that I'd get very many reviews that way.

I should live so long. Lost in the fog.

Actually, I think I'd rather stick to novels.

August 14, 2008. Fourth Draft.

We ended up having to cancel the August trip to Micronesia as I had a health problem, which is now pretty much healed.

Meanwhile I got more editorial suggestions! My editor, Dave Hartwell, liked the third draft, he says having more sections and chapter breaks gives the reader a chance to rest, as the book is at times fairly intense in terms of information content. But he came up with some additional suggestions, so now I need to do a few minor edits to get to a fourth draft.

I talked to him on the phone today. A main point he mentioned was that the "To the Gibbet" chapter has maybe too many things happening in it: all the objects in the s'Hertogenbosch market have just woken up, the locals are trying to arrest Jayjay and Thuy and Jeroen and Azaroth, a smelter falls into a vat of molten metal and his skeleton keeps on screaming, the authorities trap our heroes, they awake in the cathedral which is being used for torture and execution, Thuy saves Jayjay by bursting her chains and slashing his hangman's rope, the pitchfork appears and makes the soldiers sick to their stomachs, Duxy the giant alien manta ray appears and our characters climb inside to escape, leaving Azaroth because he wants to stay.

Can I cut out any of this?

Another thing he mentioned is that it might be better to have the characters almost always thinking of Bosch as just a weird artist guy, rather than as The Master, as the latter is distancing, and we want him to be more of a character who blends into the mix. Perhaps just have one of them be thinking of him as the Great Artist, and only doing that a little bit, maybe Thuy can do this as, I believe, she's the one the most familiar with his work—or maybe it should be Jayjay?

He seemed impressed with the new "grand finale" ending, where I sketch the better part of a book in a few thousand words.

He says he'll be gone on vacation the last week of August, and he'd like to have Draft Four by the start of September, like right after Labor Day, which gives me two weeks, so that shouldn't be too hard to do. I might even get on it today.

Okay, I dug in and pretty much finished the final revisions today (Aug 14, 2008). I'll mull it over a little more, and send Draft Four to Tor next week.

October 14-18, 2008. Copy Edits

I got the copy edits and am reading them over. This is a different copy editor than the one I've had lately. I'm rolling back a few of the changes, despite a certain schoolboy anxiety of having a ruler rapped across my knuckles.

The copy-editor wanted to capitalize “Champagne,” the drink, which many people would write lower case. The upper-case usage is, in my opinion, a case of publishers caving in to a pressure group, in this case the French wine makers of the Champagne district. My worry is that if you see Champagne capitalized four times on a page, it feels like you’re reading an ad. I don’t think usage should be determined by economic pressure groups. Searching on the Web, I find indications that lower-case usage is still acceptable, see, e.g., the Merriam-Webster online dictionary entry, “[champagne](#).” I’m gonna roll back this one.

Rereading the book, I had the feeling it was a little too slow in the second and third chapters. But it really picks up after that.

One issue I’m unsure about is that the copy-editor replaced my “***” section breaks with simply an extra skipped line. I’m wondering if it would be good to have some kind of colophon in there to really show the breaks, giving the reader some ledges to perch on. I designed a colophon graphic that they use, as I did with *Mathematicians in Love*.



I’m thinking of a small cloud of variously sized dots to kind of symbolize the idea of teeming life being everywhere. Alternately I could make them haloes...



So that’s it!

Am I going to write a third volume in the *Postsingular* series? Maybe, maybe not. As I mentioned in here before, as a kind of perverse joke, I stuffed in the entire outline of a projected Volume III as a quick speech that Thuy Nguyen makes at the end of *Hylozoic*. So I don’t really need to write that third volume. But it could be that some day I’ll feel like picking up the action a little further down the line, like after Thuy and Jayjay’s daughter grows up.

In any case, what I’m going to be writing this coming year is my memoir, with the working title, *Nested Scrolls*.

December 15, 2008. Page Proofs

I got the page proofs and mailed in my corrections. They used the first of those two dot patterns above as spacer symbols, which is nice. All done now.

February 25, 2009. Posting the Notes.

Actually I wasn’t quite done in December. Early in January, 2009, the sharp-eyed Tor proofreaders found some logical inconsistencies and sent me a set of queries about them. Big gaping logic holes, oh no! I emailed in the fixes—which then got lost in cyberspace. On Feb 17, 2009, I got a frantic “please answer today” email about the proofreaders’ queries, and I sent my answers again, and now all is well.

Today I’ll slightly expurgate these notes—removing explicit financial information and angry rants against fellow authors—and get ready to post the PDF on the web for a [Hylozoic website](#).

Oh, one more thing, I got an image of the *Hylozoic* cover from Tor. At first I didn't realize that those blue things are images of a manta ray, but, *yeah*, there they are, the Hrull.

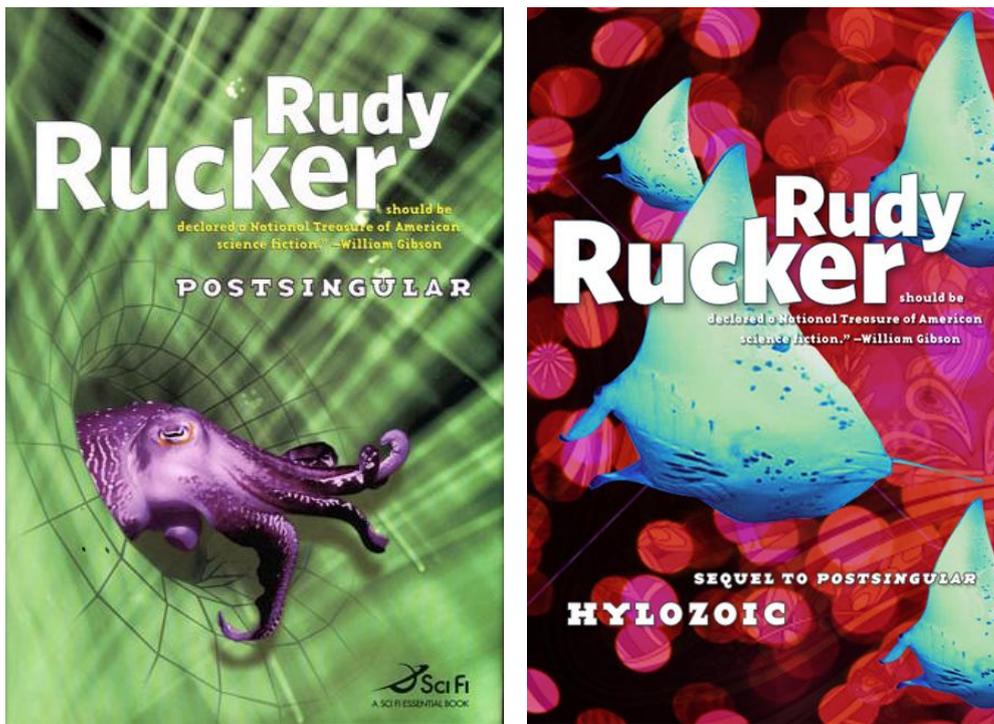


Figure: The Two Book Covers

I suggested that they drop the “Sequel to Postsingular” line from the *Hylozoic* cover, as that kind of phrase might be off-putting for a reader who hasn't read *Postsingular*. And, I would argue, one could perfectly well read *Hylozoic* on its own. Hartwell agreed with my suggestion, but we'll see what actually comes out the factory door.

I was surprised that the font of the book title was so small, but, looking back, I see that the title was even smaller on the *Postsingular* cover. I'm happy that my name is printed large, which indicates that my “brand” has become a good selling point. And thank god for good old Bill Gibson's solid-gold blurb.

Farewell, *Postsingular* and *Hylozoic*.

I liked this world a lot, maybe I'll be back some day.

But right now, having finished the first draft of my memoir, I'm busy with my next SF novel, *Jim and the Flims*...

---End of the *Hylozoic* Notes---