

# *Notes for my Sixteenth Novel,* **Mathematicians in Love**

by Rudy Rucker  
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## Goals

### October, 2004, Version of Goals

- (1) Write a slipstream novel, that is, science fiction that can be marketed as *mainstream*.
- (2) Mutate my memories of the weird mathematicians I have known and heard of — creating funny, touching *transreal* representations of archetypal crazy mathematicians.
- (3) Whang the *power chord* of reality modification, doing it with two-dimensional time rather than with time travel and branching universe. Have fun with good aliens in the form of giant cockroach mathematicians from Galaxy Z, and bad aliens in the form of subdimensional cone shell mollusks.
- (4) Carry out a *thought experiment*, involving the ideas in Stephen Wolfram's *A New Kind of Science*. I think his ideas are correct, so it's not so much a matter of imagining a Earth in which Wolfram is correct, as it is in imagining (a) a Earth in which there are practical tech applications of the ideas and (b) imagining a counterfactual Earth in which (unlike ours) Wolfram's ideas *aren't* true, so as to bring out the import. These ideas are much on my mind, as I'm just about to publish a similar book on reality-as-computation, entitled *The Lifebox, the Seashell, and the Soul* (Thunder's Mouth Press, 2005).
- (5) Explore, in a speculative *McLuhanesque* way, the social meaning of blogging.
- (6) Give the novel an *archetypal* romance structure along the lines of Orpheus and Eurydice.
- (7) Press forward the *revolution* by showing how society could return to the Glorious Sixties; provide a template for how it could happen again.



### **March 10, 2005, Version of Goals**

- (1) Incorporate a *love story* echoing the myth of Orpheus and Eurydice.
- (2) Dramatize the notion that everything in the world can be thought of as a kind of computation; this new idea is the main theme of my recent non-fiction book on *reality-as-computation*, The Lifebox, the Seashell, and the Soul (Thunder's Mouth Press, 2005).
- (3) Carry out a thought experiment imagining what it would be like if we were able to easily *predict* the outputs of naturally occurring computations like the weather, the stock markets, and our mood swings.
- (4) Play with the paradoxes and puzzles of *reality modification*.
- (5) Use the popular science-fictional notion of a computational *singularity* as the engine which allows the characters to jump out of our spacetime and into another world.
- (6) Explore the social meaning that *blogs* will take on as they expand to include video and are syndicated in webcast form as *vlogs*.
- (7) Create amusing representations of archetypal *crazy mathematicians*. Some of the aliens will be crazy mathematicians as well, which means they'll have something in common with the human characters.

### **Proposal Summary, March 15, 2005.**

A wild, funny tale. Crazy mathematicians compete for the love of two women across space, time and logic.

Berkeley grad students Bela Kis and Paul Bridge have discovered the mathematical underpinnings of ultimate reality. But then they begin fighting over the beguiling video-blogger, Alma Ziff.

First Bela gets Alma's interest by starting the wildest rock band ever. But then Paul undertakes the ultimate computer hack: altering reality to make Alma his. The change brings more than he bargained for: Alma is swept away into a higher world of mathematician cockroaches and cone shells bent upon using our world as an experimental set-up for deciding an arcane point of metamathematics.

It's up to Bela to bring Alma back, repair reality, stop the aliens, and, most important of all, discover the true meaning of love.

#### ***The Characters***

Bela Kis, a surfer mathematician. Paul Bridge, a classic geek mathematician from Kentucky. Alma Ziff, a punkish rhetoric major from Santa Cruz. Cammy Vendt, a serial reality-show star.

#### ***The Story***

Bela falls in love with Alma, loses her to Paul, and then wins her back. Tragically enough, another girl named Cammy is in love with Bela as well, and she kills herself when Alma takes up with Bela again. Paul and Bela find a way to alter reality by jumping down into an underworld called La Hampa. Paul makes a tweak to flip Alma back to him and to save Cammy. But he goofs: although the alteration saves Cammy, it seemingly kills Alma.

In this second version of our world, Bela realizes that the original Alma isn't actually dead, she stayed behind in the underworld of La Hampa. Even though he has

the love of Cammy, Bela is bent on rescuing Alma. Like Orpheus in search of Eurydice, Bela ventures back into La Hampa, despite his worries about what will become of this new Cammy that he's abandoning.

Seemingly Bela meets with success. He brings Alma back into a third version of our world. But now the fickle Alma goes back to Paul again! Bela finally realizes that his true lasting love is the patient Cammy.

### ***Theme and Ideas***

Reality is fundamentally computational in nature, and completely diverse phenomena can be used to predict each other.

Our entire spacetime is the logical outcome of a single extra-dimensional seed. The seed has the form of a dancing Shiva, to be found in an underworld called La Hampa (after the Spanish for "the underworld," in the "gangland" sense of the word). There is a different sheet of spacetime for each posture of Shiva's dance.

In a few years, we'll have webchannels broadcasting reality shows of people's lives: lifeblogs. Our character Bela is one of the first lifeblog stars. Some strange kinds of ultra-Howard-Stern web channels will emerge. A lifeblog may serve as a simulation of the person it documents.

Quantum computation can lead to a method of hampajumping from our world out into the underworld of La Hampa. The human brain carries out parallel, entangled quantum computation.

The one thing we can count on talking about with aliens from other galaxies is mathematics. One of the book's running jokes is that a human mathematician has more in common with an alien mathematician than with a non-mathematical human.

## ***Design***

### ***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

I definitely want this new novel to be on the shorter end of the spectrum. For one thing, I need another SF book rather soon so as to keep my presence in the field — having dropped out for a year to write *Lifebox*. And in any case, I'd like something light and quick, similar to *Spaceland*. So I'd like to bring it in at about 90,000 words.

If I do nine chapters, that's 10,000 per chapter. But I'm finding my chapters are closer to 12,000 words, and now I'm thinking I might only do eight chapters. So it looks like the book might be 95,000.

Table below assumes I started on Oct 27, 2004. I only started keeping this table on March 6, 2005, after finishing the first three chapters. I'd thought I didn't want to bother with the bean-counting this time out but then, in kind of a black spot between chapters, I once again found it's soothing to make this little ant-nest for myself. Something to play with other than the tangled void of the plot to come.

The last column of the table (estimated days to finish) is based on my current assumption about the target length, which depends on the number of chapters and the average number of words per chapter. On March 6, 2005, I thought the length might be 95,000, and on April 20, 2005, I changed the estimate to 110,000. On May 5, 2005, I figured it as 8 x 13871, which is more like 111,000. On May 14, 2005, I realized I could wrap it up in 7 chapters instead of 8, with the average chapter length now a bit longer, which makes the length 7 x 14300 = 100,000. On June 14, 2005, it looked like 7 x 15000 = 105,000. Actually it was 106,700.

(Started October 7, 2004.) Dates mark finish of 1st draft of each chapter	Ch ap	Word Count on that Day	Days In	Current word counts of each chap. Average is 15148	Recent Words/Day	Average Words/Day	Estimated Days To Finish
Nov 12, 2004	1	11807	15	12841	787	787	118
Feb 6, 2005	2	24459	82	13432	189	298	276
Feb 28, 2005	3	38690	104	14922	647	372	183
Apr 20, 2005	4	54946	155	17163	319	354	146
May 17, 2005	5	72498	184	17717	605	394	87
June 28, 2005	6	95229	225	18803	554	423	27
July 28, 2005	7	106706	255	11159	383	418	0

**Table Caption: Was tust du für die Front, für den Sieg?**

[The table caption is from a WW II German war poster mentioned in Pynchon's *Gravity's Rainbow* at the start of section 1.12 of his book, meaning "What are you doing for the front, for victory?" The full Pynchon quote is: "In Germany, as the end draws upon us, the incessant walls read WAS TUST DU FÜR DIE FRONT, FÜR DEN SIEG? WAS HAST DU HEUTE FÜR DEUTSCHLAND GETAN?" The additional question means "What have you done for Germany today?" I always think of this slogan when goading myself to work on my current book. Not that I'm a Nazi, of course, but I am part-German, and the mother tongue is evocative to me. And I'm piqued by the desperate life-and-death urgency of wartime propaganda posters. My usage of the phrase is somewhat ironic, you understand. My current book is always my nation, struggling to win a war.]

### ***Voice and Tense***

The default idea for the book is a first-person, past tense, two guys story with a woman involved.

Bela's point of view throughout. He's telling you what happened. This is how I have been visualizing it all along, so why complicate things?

A no-brainer style in other words. I used first person past tense for *White Light, Sex Sphere, Master of Space and Time* (a two-guys story), *The Hollow Earth*, *The Hacker and the Ants* (with elements of a two-guys story), *Saucer Wisdom*

(actually this one has a subsidiary first-person in Frank Shook's notes), and *Spaceland* (several guys and a woman involved).

Possibly I could switch over to Paul Bridge or Alma first-person in some chapters, but I don't think I want to do that. I want the book to be relatively simple and intense, so just let this one guy tell it. A tall tale, a recounting of a fabulous adventure or life-changing crisis.

Possibly I could go for present tense this time around, to make it cinematic and arty. Present tense might possibly be appropriate given the many flashbacks and time-jumps I anticipate. Particularly if I get into time travel present tense might have a use. Because past tense imposes an order, it assumes that you know what's now (when you're telling the story) and what's then (what you're telling about). Or I could do the narrative in present tense and the flashbacks in past tense — but that's a hassle for reader and for writer.

I do recall that I wanted to write *As Above, So Below* in the cinematic present tense, and both John Oakes and David Hartwell found this off-putting. And, I don't think I really will be doing time travel. I will, rather be moving sometimes forward in time, sometimes forward in hypertime. So I'll stick with past tense.

[Given that I have two dimensions of time, a hypertime as well as regular time, I could get all experimental on your ass and invent a new conjugation. Time tenses: had walked, walked, was walking, walk, will be walking, will walk, will have walked. Hypertime tenses: hadhad walked, walkeded, was walkinging, walk, will be walkinging, willwill walk, willwill have walkeded. And then you'd have variants for combinations, such as a later than present time located in an earlier hypertime. And I'd sell, like, seven copies of the book.]

### **Sequencing**

Suppose that I have Bela narrating a story in the past tense. How about the time order of events? String of pearls: tell the story straight through along a time-line? Or use flashbacks?

I'm seeing two main time elements at present. The set-up or back-story, and then the crisis and resolution. The back story spans something like ten or fifteen years. The crisis and resolution occupy the bulk of the book and could span only a few days.

The *string of pearls* idea is just to line things up and tell them in the right order. Easy to write, easy to understand. But sometimes my critics say that my books are too stylistically simple, albeit with too many ideas and events.

The *flashback* approach would be to dribble out the crisis and resolution with the back story interleaved. Sometimes people like this; there's little revelations when you get some back story info that explains how the characters have been behaving. And it makes the story seem more complex. I did this a little bit in *Freeware*, I think, or one of the other *\*Ware* books. Otherwise I haven't used this technique.

An advantage of the flashback approach is that you can begin *in medias res*.

As a practical matter, I could in fact write the first draft in string of pearls style and perhaps later cut and paste it into flashback style.

In other words I don't have to decide yet.

Although, looking ahead, if I have both time and hypertime, it would be best, I think, not to complicate things by introducing a third (spurious) narrative time. Match the narrative time to Bela's personal time, and show how this time includes some stretches oriented in the hypertime direction.

### Number of Chapters

Right now I'm thinking it would be fun to have a Sierpinski gasket structure. Three acts of three chapters each, possibly with each chapter having three scenes.

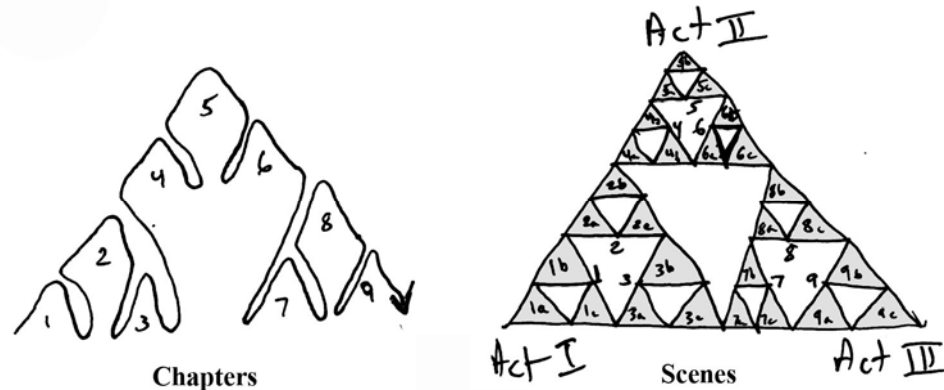


Figure 1: Sierpinski Gasket Plot

Perhaps it's too much to expect each chapter to have a three scene structure, but I'll see if I can do it. It would, after all, make sense for a novel about mathematicians have a crazily precise formal design.

It would be particularly fitting to use this pattern if I end up calling the book *The Sierpinski Love Triangle*, although that might not be so great a title.

### Title

I had been thinking of the title as *Crazy Mathematicians* for about a year and a half, indeed this title idea in some sense led to the book. At first I had this idea for a nonfiction autobiographical *Memoirs of a Crazy Mathematician* — it was at Esalen after my disastrous hike with John Shirley — and then thought I didn't want to call myself a C. M., but that I might use that mocking sobriquet for some characters in an SF novel.

But now, October 21, 2004, as I start to bond with my characters, I don't want to insult *them* either. My characters and I aren't crazy — we're right! Solidarity! "Let all men and women of science band together." I was already brooding over this yesterday, in my October 20, 2004 writing-journal note. Calling the book *Crazy Mathematicians* makes me feel like a carnival geek, gets my back up and makes me not want to write the book at all. But maybe that's just today.

Certainly *Crazy Mathematicians* does seem like a catchy title, and I know people do enjoy the idea of crazy mathematicians. But maybe I should *show* that instead of *declaring* it? And, look, the hit movie title was *A Beautiful Mind*, not *A Hopeless Nut*.

In any case, my book isn't so much about the craziness of the mathematician-heroes as it is about reality modification, the adventure of traveling through three parallel worlds, the aching sorrow of aging, and the madness and ecstasy of love.

Yeah, yeah, but can you think of anything fresher and more to-the-point than *Crazy Mathematicians*?

*Reality Hackers* is relevant, but too old-Mondo to be contemporary.

*Reality Surfers*, *Surfing Reality*, *Spacetime Surfers* capitalizes on the fact that Bela will be a surfer, but its trying too hard, and misleading, to put this in the title.

*Love Triangle* is good. Has a math thing and a love thing. Suppose I push the mathiness just a bit, and voilà:

*The Isosceles Love Triangle.* I like this one, although I do have a bit of trouble spelling it, I always want to leave out that second “s”. Searching the web, I see others have used it. There was a show, *The Isosceles Love Triangle*, put on by the Austin Commedia Society in 2002. There was an 1996 episode of Season 4 of the John Larroquette TV show with the same title. But it seems not have been the title of a story or a novel. Maybe it’s a bit corny and obvious.

*The Sierpinski Love Triangle.* This is a title I dig. The standard best-seller title pattern: *The (Proper Noun) (Noun Phrase)*. And this one isn’t listed on Google, it’s unpolluted by wiseguy screenwriters. A Sierpinski triangle is the infinitely regressing shape you get if you start with a triangle, divide it into four subtriangles, remove the center subtriangle, and then do the same process to each of the remaining three subtriangles. It’s the simplest fractal in the plane. And I’ve always loved Waclaw Sierpinski, the Polish set theorist. You write that “l” with a little line through it, actually, like Waclaw, which makes a letter that’s pronounced like the soft “w” in wake. And of course the w’s are pronounced like v’s. So Waclaw sounds like Vahkwahv. Use him for a character in La Hampa.

*Hyperbolic Love Triangle.* I tested the Sierpinski version on some people, and they’re like, “Huh?” or “Ugh.” My old SJSU woman mathematician friend, Tatiana Shubin (formerly Deretsky), suggests I use “hyperbolic,” and have the triangles’ angles sum to less than a hundred and eighty degrees, which could be symbolic of *something*.

*The Things We Do For Love. Love and Fame. Love or Logic. Heart and Soul. The Best Of All Possible Worlds. Mektoub.*

Now that I think of having each jump age Bela by fifteen years, I get into titles involving aging. *Lost Time.* Could get really down on this. *The Fading of the Light. Where Did The Time Go? Soon We’ll All Be Dead. How I Got Old. The Passage of Time.*

Need something more bittersweet. *Autumn Rhapsody. Falling Leaves.* Maybe a seasons of man thing. Have a fourth act, where he dies and ends up in Hampa for good. Could have Hampa look like a summer landscape the first time, and like an autumn forest the last time he goes there, and then maybe he dies and it’s winter in Hampa.

*How Math Ruined My Life. Math Isn’t Fun.*

*Three Times Love. Love To The Third Power. Love Cubed.* Maybe it’s too tendentious for the title to say the book’s about love, and it’s telegraphing the punch to say in the title that there’s three worlds. I rebel at those claims.

*What Is Reality? Shreds of Meaning.*

Maybe I’ll just go back to *Crazy Mathematicians*. First thought, best thought. Trust the muse. But my friend Pearce doesn’t like it.

How about *Mathematicians in Love*. I remember my writer friend Terry Bisson had suggested I call my Bruegel novel *Bruegel in Love*, which probably wouldn’t have been a better idea than *As Above, So Below*, but I was too pig-headed and proud to use it. There was a Thomas Berger novel *Reinhart in Love* years ago. “Love” is more commercial than “Crazy.” It’s sweeter. The book’s about love, Ru, not about craziness.

**Always the Same Book?**

I have a bit of sense that in some ways I write the same book over and over. Here are some repeated themes that I noticed this time around.

<b>Theme</b>	<b>Earlier Use</b>
Flying Mollusks.	<i>The Hollow Earth.</i>
Wormhole Reality Bridge	“The Last Einstein Rosen Bridge”. <i>The Sex Sphere. The Fourth Dimension. Realware.</i>
Faithless Woman	<i>As Above, So Below. Spaceland.</i>
Computer Biz Tycoon Pal	<i>The Hacker and the Ants. Spaceland.</i>
Scale as a Dimension	<i>Spacetime Donuts.</i>
Hero who is an unsuccessful academic.	<i>White Light. Sex Sphere.</i>
Miscellaneous animal-shaped aliens with ethnic accents or weird speech patterns.	<i>Realware. Frek and the Elixir. Spaceland.</i>
A higher-dimensional world which is the body of a god.	<i>Realware.</i>
Our hero ducks his own assassination.	<i>The Secret of Life.</i>
Streamers of light emanating from a concave “sky”.	<i>The Hollow Earth.</i>
Hoax frame-tale casting the book as a found manuscript.	<i>The Hollow Earth. Saucer Wisdom.</i>
Recipe for the Gobubble goo.	“Aint Paint”.
Jimbos: insubstantial aliens based on sunspots, they fly through your head to read your thoughts.	Combines the Orpolese and the tweets of <i>Frek and the Elixir.</i>

Is it bad to repeat? Bad or not, it seems to be inevitable. I write what I know, and by now, what I know is my novels. Repetition doesn’t automatically entail hack-work; think of Picasso forever drawing bullfights and artists with their models. Or Arneson with his monumental self-sculptures. Or Borges with his “discovered manuscript” hoaxes. Bosch’s little Grullo-creatures. A falling-off of novelty, but perhaps a gain in craft. And, after all, some of my themes are so very outré that perhaps there’s no harm in airing them several times. I invented some of these gimmicks, I might as well get some use out of them.

**Plot Picture**

I plan for the book to have nine chapters, which form three acts of three chapters each.

I have a love triangle involving the narrator Bela, a woman named Alma, and Bela’s friend/rival Paul. In the figure below, I label their world-lines as, respectively, B, A, and P. The heart-marked lines indicate Alma’s changing affections. The P’ line is the version of Paul they find in Earth-3.

The plot involves two excursions into a kind of underworld called La Hampa, and in the labeling here, “In” means “Into La Hampa,” and “Out” means “Out from La Hampa into a sheet of spacetime.” Here’s my first version of a picture, drawn in October, 2004.

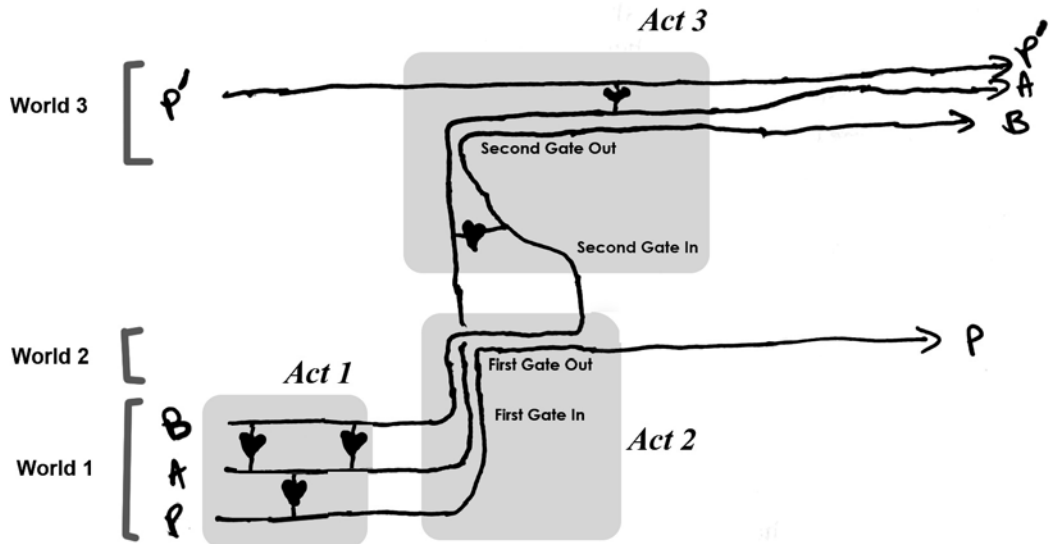
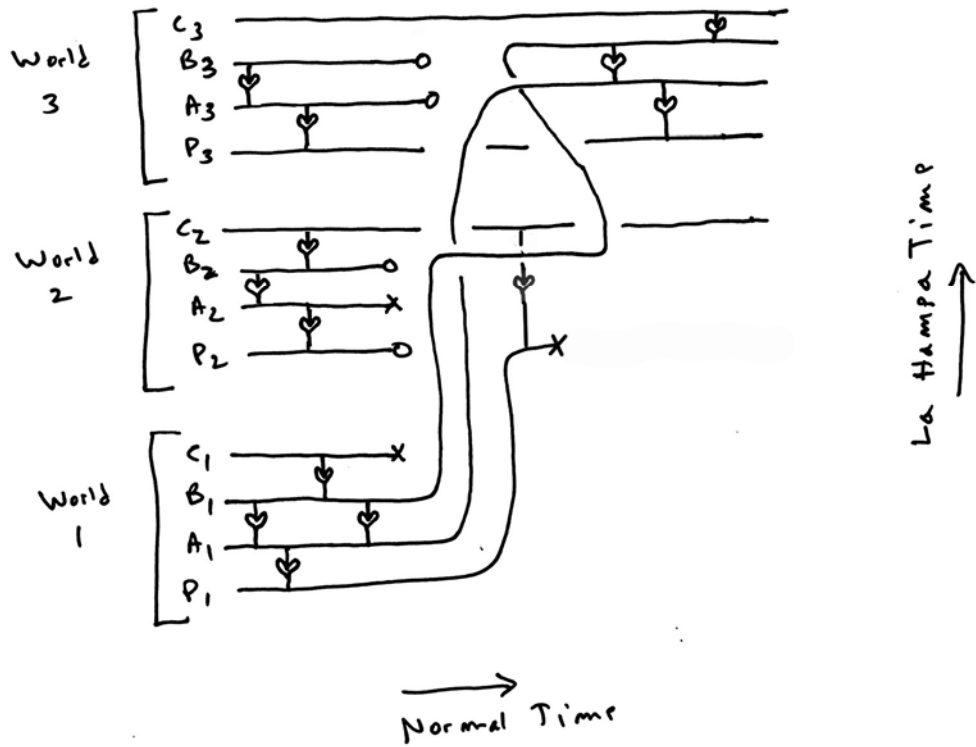


Figure 2: First Diagram of the Character Worldlines

And here's my second version of the plot picture, drawn January 13, 2005.

This shows a love quadrilateral involving the narrator Bela, his friend/rival Paul, and the two women Alma and Cammy. I label the life-lines with their initials, and add subscripts to indicate the world the character originates in. The hearts indicate love, the Xs are deaths, and the circles are spots where a person is bounced out of a world by an arriving copy from a parallel world. The horizontal direction is normal time, while the vertical direction is the otherworldly time of La Hampa.



X = Dies.  
 O = Bounced Into another world.  
 ♥ = Love of A or C.



**Figure 3: Second Diagram of the Character Worldlines**

### *Plot Outline*

La Hampa and the Earths have different time directions. The entire history of any one Earth matches one day on La Hampa. On La Hampa, the different Earth times match different La Hampan scale levels.

June 3 on La Hampa matches Earth-1.

June 4 on La Hampa matches Earth-2.

June 5 on La Hampa matches Earth-3.

There's an omphalic fixed-point match up in that June 3 on Earth-1 happens to match the Nanonesia level of La Hampa where the jellyfish god lives.

### **Calendar**

I see the year as 2004. Why?

At first I didn't think it had to be any *particular* year, although I did want to pick a specific year so I'd know the days of week matching the dates. Originally I had picked 2010. But then constraints set in.

I wanted it to be a presidential re-election year, so at first I made it 2012, but then I realized that my little hoax frame-tale requires that Bela shows up here on Earth in my life while I'm writing this book, so it has to be 2004.

But of course I don't mention the year in the book, as I wouldn't want to date it.

<b>Date</b>	<b>Action</b>
April 6, Tuesday	<i>Earth-1 &amp; Earth-2</i> : Paul meets Alma, fights with Haut, discovers the theorem with Paul <i>Earth-3</i> : They don't discover the theorem, but get enough for a weak thesis for Bela and a better one for Paul.
May 14, Friday	<i>Earth-1 only</i> : Haut tells Bela about seeing cockroach aliens.
May 17, Monday	<i>Earth-1 only</i> : Bela and Paul visit Haut in the nuthouse.
May 21, Friday	<i>Earth-1, 2, 3</i> : Commencement. Alma leaves with Paul. Begin Bela's vlog. Washer drop
May 22, Saturday	<i>Earth-1, 2, 3</i> : Bela spends the night in jail.
May 23, Sunday	<i>Earth-1 only</i> : Bela out of jail, meets a bum who saw a cone shell set the fire at the YWCA.
May 25, Monday	<i>Earth-1, 2, 3</i> : Bela meets with Math. Dept. chair, hears charges have been dropped. <i>Earth-1, 2 only</i> : Gets a band together: Naz, Jen3, and Cammy Vendt.
May 28, Friday	<i>Earth-1, 2 only</i> : Bela performs at Ma's restaurant. Paul, Alma and Veeter are there. End Bela's vlog. Bela spends the night with Cammy. <i>Earth-1</i> : Bela doesn't fuck Cammy. <i>Earth-2</i> : Bela fucks Cammy.

May 29, Saturday	<p><i>Earth-1, 2:</i> Begin Cammy's vlog. Bela and Cammy visit Paul and Alma in Palo Alto and see the Gobrane. Ramirez's car secretly ferries Sandoval to Palo Alto to kill Cammy.</p> <p><i>Earth-1:</i> Cammy fucks Paul, Alma leaves with Bela, a gardener kills Cammy. Begin Henry Nunez's vlog. Paul is using meth and contacts Haut.</p> <p><i>Earth-2:</i> Cammy doesn't fuck Paul, Alma stays with Paul. Sandoval fails to encounter Cammy. Bela and Cammy go to Berkeley. Paul doesn't contact Haut.</p>
May 31, Monday	<p><i>Earth-1:</i> Veeter scandal breaks. Paul goes underground the Tang Fat Hotel.</p> <p><i>Earth-2:</i> Paul, Bela, and Veeter perfect the Gobrane human and social prediction technology.</p>
June 1, Tuesday	<p><i>Earth-1:</i> (Off camera) Cammy's funeral. Paul calls in Haut.</p> <p><i>Earth-2:</i> Doakes is promoting the Hundred-Percent campaign. Promises Veeter the Veep spot.</p>
June 2, Wednesday	<p><i>La Hampa:</i> Cal and Maria jump to Earth-1 from La Hampa.</p> <p><i>Earth-1, Earth-2:</i> Washer Drop concert for Cammy Vendt at The Globo Club, featuring Jutta Schreck.</p> <p><i>Earth-1 only:</i> Bela sees Cal and Maria. After midnight, Haut, Paul, Bela successfully test Haut's paradox. Haut goes to La Hampa, a cone shell comes in.</p>
June 3, Thursday	<p><i>Earth-1:</i> Paul and Bela drive to Cruz in the wee AM, sleep with Alma, talk to the cone shell, drive to Miller Beach. Alma and the boys do the hampajump a bit after noon. Cal and Maria hampajump back with them.</p> <p><i>Earth-2 &amp; 3:</i> Paul, Alma, Bela and Paul go on a double date surfing at Miller Beach.</p>
June 3, Thursday on the Earths, although watches say June 4, Friday, in La Hampa	<p><i>La Hampa:</i> Alma and Bela talk to the Nataraja jellyfish. They hampajump back to Earth-2, arriving on the same time they left, which is pegged to the Nanonesia size scale. Alma veers off to Paradisio.</p>
June 3, Thursday	<p><i>Earth-2:</i> Paul and Bela arrive at Miller Beach, finding a dead Alma-2. Cammy-2 is there. Learn of Heritagist hundred-percent campaign and the Gobubble. Veeter tells Paul the recipe. Bela rehearses with Washer Drop, sleeps with Cammy.</p>
June 4, Friday	<p><i>Earth-2:</i> Bela makes friend with Pete Ziff, learns that assassin Roberto Sandoval works for Vice President Frank Ramirez. Cammy sleeps with Waclaw of AntiCrystal. Washer Drop rehearses again. Bela sleeps alone.</p>
June 5, Saturday	<p><i>Earth-2:</i> Bela visits Paul in Palo Alto, Paul can make thousands of Gobubbles. Big Washer Drop and Anticrystal Concert at Heritagist Park, crowd of thirty thousand. Bela, Paul, Pete and Pete's posse distribute ten thousand Gobubbles. After the concert, Bela and Paul go to visit Ma. They're disguised, they overhear people on the train</p>

	playing with Gobubbles, placing bets, trying to predict each other. The go by Ma's, Heritagists already denouncing them. Heritagists are saying Gobubbles are Satanist. Bela and Paul lie low at Aunt Mabel's house in East San Jose, stay up late drinking with her.
June 6, Sunday	<i>Earth-2:</i> Bela and Paul distribute the recipe on the Web. Paul and Bela can't get Haut's Paradox to work. On TV, Heritagists are losing ground, violent demonstrations at the White House. Ling-Ling Woo stop's by Aunt Mabel's blows their cover, Bela calls Cousin Gyula. Gyula takes them to Van's house on Skyline Boulevard. Sandoval kills Paul and Van, wants to frame Bela. Bela kills Sandoval. Figures out how to make hypertunnel, jumps to La Hampa.
June 10, Thursday, on La Hampa, although relative to Bela it's June 6, Sunday on the Earths.	<i>La Hampa:</i> Bela, Alma, Paul-2, and Bela-2 in Paradisio. Maria, Kal and the helicopter pilot. Nordal from the future. Quite a few other people there, it's like a resort.
June 11, Friday, on La Hampa, feels like June 7, Monday for Bela remembering Earth, but Paradisio matches June 6, Sunday, on Earth.	<i>La Hampa:</i> Bela, Alma, Nordal, Paul-2, and Bela-2 are swimming. Sorting things out. Suddenly a whirlpool draws Bela and Alma down through the surface, they fall to the Nanonesia level of La Hampa. The jellyfish is about to go nova. She needs to consume the bodies of Bela and Alma, but she can send their minds to the final Earth. She blows up into light, beaming Bela and Alma's minds to Earth-3, embedding them in the minds of Bela-3 and Alma-3 on the evening of Sunday, June 6.
June 7, Monday on Earth-3	<i>Earth-3:</i> Alma-3 remembers her old self, tells Bela-3. They're staying at Ma's looking for apartments. They're engaged.

## Final Plot Outline

The chapter outlines are broken into time-and-place chunks by the \*\*\* symbol and I put this break symbol into the novel text as well. I don't always put a hard break symbol into the text for a time-and-place jump, as sometimes I can smoothly flow the transitions. Conversely, if there's a break in the flow of the action, I may put in a \*\*\* even if there's no jump in time or place.

In other words, although I didn't always think of it this way while writing, the \*\*\* match the scene breaks. (When writing, I think of a scene as holding completely developed action, and it in fact sometimes include more than one time-and-place chunk. But I've revised the notes so the \*\*\* breaks match the scenes.)

The scene *numbers* are just for use in the notes, to help me think, but I don't want to burden the reader with them. In general, I think it's good to have fairly many scene breaks \*\*\* in the text as it breaks the text into easy-to-gobble nuggets.

I try and get each chapter outline filled out to the level of scenes before writing the corresponding chapter, and, between scenes, I often go back and revise the chapter outline of the scenes to come. I don't always go back and rigorously match

the outline to the actual scenes and chapters that I end up writing, so the outline may not always be a perfect match for the novel. (In the end, the novel *itself* is the perfect outline of the novel.)

Generally I only put in a date when it's new date, or if I'm starting a new scene. If a scene is undated that means it has the same date as the previous scene.

### ***Chapter One: Paul, Alma and Me***

#### *(1.1) Bela and Paul.*

(April 6, Tuesday.) Open with Bela Kis working on his thesis in the field of universal dynamics. All he has is gnarly drawings of mathematical diagrams.

Bela and his roommate Paul Bridge are both trying to prove a big morphic classification theorem, they're sharing their work, they're friends. Paul's approach is analytic, Bela's geometric. Bela is a Californian; he surfs and plays guitar; Paul, on the other hand, is a math geek from Kentucky.

Bela walks to campus. There is a tight congressional election coming up the next day, a Republican computer exec Van Veeter vs. a Democrat Karen Barbara.

\*\*\*

#### *(1.2) Alma and the Fight With Haut.*

At Evans Hall, Bela runs into a woman Alma Ziff from Santa Cruz, an undergrad at Berkeley, she's majoring in Rhetoric with a concentration in Public Discourse. She's at the math building asking about universal dynamics; she's working on a story about it in for the local e-zine, *Buzz*, which her roommate Leni Pex publishes. Alma is filming her interviews as she goes along.

Bela brings Alma to his adviser's Roland Haut's office, and gets in a fight with his adviser who "fires" him. Without permission, Bela takes Alma to Haut's universal dynamics lab. He shows her Haut's well-known prediction of orchid blossom shapes based on a simulation of water splashes. And then he finds a secret prediction of the Veeter/Barbara election, based on a simulation of hoarfrost. It predicts the Democratic candidate Barbara will win by a narrow margin of 79 votes. Only now does he find out that Alma is webcasting this realtime. He fears he'll be expelled.

\*\*\*

#### *(1.3) Surfing with Alma.*

Bela votes at the polling place at the YWCA, and then he and Alma go surfing at Ocean Beach. Alma wears an electric pink and green wetsuit that Bela remembers seeing off Steamer Lane in Cruz. Afterwards Bela has coffee with Alma at the Java Beach coffee shop on La Playa. They're falling in love. He invites Alma to come for supper, she actually lives in the same apartment complex.

\*\*\*

#### *(1.4) Dinner with Paul. Bela and Alma Make Love.*

Driving back they notice that there's been a fire at the YWCA. The votes cast there will be lost. Bela's suspicious that the Republicans did it.

He's busy thinking about math, though. Seeing the frost/vote demo broke some dam in his head and now he's getting some thesis ideas. He finds Paul in the apartment, Paul saw the demo, too, and is also full of ideas. They work out the basics of the so-called Morphic Classification Theorem.

Alma and Leni show up for dinner. Drop a faint (false) hint about Leni possibly being involved in the fire. She says she's gotten some funding for this reality web TV show she wants to do, people "vlogging" their lives in real time using "blog-rings."

Alma spends the night with Bela, and asks him if she can move in with him. She doesn't have rent for next six weeks.

\*\*\*

*(1.5) The Big Theorem.*

*(April 7, Wednesday.)* In the morning, Paul and Bela have finished the paper. They decide to cut Haut in on the paper so that Haut will forgive Bela. Go to see him. Their main result is the Bridge-Kis-Haut (BKH) Theorem, their Morphic Classification Theorem. The deal works. Bela and Paul will get thesis credit for this paper. The election went to the Republican Veeter. Bela and Haut are both suspicious about the fire.

**Chapter Two: Cone Shell Aliens**

*(2.1) Paul On Meth, Goin' To Stanford!*

*(May 14, Friday.)* Bela and Paul are working hard on the thesis. Paul is using methedrine to work faster, which Alma disapproves of. But Alma is drifting away from Bela. Haut says he saw cockroach-people in his mirror talking to him.

\*\*\*

*(2.2) Haut In The Nut Ward.*

*(May 14, Monday.)* Haut flips out, says he saw a cone shell outside his window, reflected in a mirror. He smashed his window with his office chair. Bela and Paul have to go see him to get his signature on their dissertations.

\*\*\*

*(2.3) Commencement Day. Alma Goes With Paul.*

*(May 21, Friday.)* Paul and Bela graduate. Paul has a job at Stanford, they're giving him a summer grant and free housing. He has it sucked. Bela has no job offers. Haut is blackballing him. The chairman says maybe he can help. But the bad news is their theorem is the property of UC Berkeley, thanks to the terms of Haut's grant. Berkeley freakin' patented it. Haut wanted them to, it makes him look good and justifies his grant.

After the ceremony, they're standing around drinking wine with Bela's mother, sister, and brother-in-law, getting a little buzzed. Bela pours the wine from glass to glass, watching the splashes, says this is a stock-market simulation. Infinite precision, but you have a "codec" problem of how to code your question into the analog system and then decode out your answer. How would you code a certain specific stock price into, say, a swirl of wine. Haut claimed, by the way, that he'd solved the codec problem just before he saw the cone shell, and that then he forgot the answer.

Alma graduates in the afternoon, Bela gets there near the end. He meets Alma's parents, Gary and Sarah, who are stoners. Gary actually wants Bela to smoke a joint with him, much to Alma's disgust. He says he puts bug powder in it, because he's a termite exterminator, Bela declines, but Gary shotguns a bit of the smoke at

Bela anyway. Alma is freaking out. She tells parents Gary and Sarah to get lunch and meet her at Rochdale later, she doesn't want to be around her parents.

Bela walks Alma back to his apartment, she's wearing a white gown and a mortar board, she looks cute. She's testy, displeased with Bela's lack of success. "You're going to live with your *mother*? In *San Jose*?"

Paul's new camper van is outside the apartment, he got an advance from Stanford for moving costs. He's going to leave today. The apartment lease runs out in nine days.

Paul is inside waiting. He's been mooning over Alma, more all the time, horn-dogging on her, surprising her in the bathroom, like that. He gives Alma roses. It was all set up. Alma is leaving with him. Bela pukes. They're gone.

\*\*\*

#### (2.4) *Bela Sees The Cockroach Aliens. Pete.*

Bela gets a pack of cigarettes, and sits watching the curling smoke in the air, wondering about codec, about how to initialize the smoke's computation.

He turns on guitar and begins playing some heavy feedback solos, matching the sounds to the leaf shadows, to the breeze, to the thoughts in his head. Music is everything. He feels like he's seeing things before they happen. He's doing codec, turning his thoughts into sounds, letting the sounds do feedback and nonlinear overlap, then turning the sounds back into thoughts. The music is thinking for him. He has a sense that something is coming. [Because a La Hampan intervention into our space time will change the past as well as the future, it's to be expected that one has powerful foreshadowings of an arrival.]

He figures out how to get Alma back: get famous, and lead Paul into cheating on Alma with another women. He figures out the solution to the codec problem.

Bela looks in the mirror. "I could see the reflection of my window, and the reflected window view of Haste Street with the Berkeley citizenry truckin' on down the line as ever and aye. But now I noticed a couple of real screwballs out there, guys with heads covered with big tendrils. Like cockroaches, a bit, but with a few too many tendrils. Like Mandelbrot set buds." He *knows* they are cockroach mathematicians from Galaxy Z. Then they're in the mirror-reflected room with mirror-Bela. They telepathically explain the solution to the generalized codec problem, but Bela doesn't fully remember it later.

The visitation ends when Alma's brother Pete shows up looking for her, Gary and Sarah are down in the van waiting. Bela does what he can to sic Pete on Paul.

\*\*\*

#### (2.5) *Bela Gets a Vlog, The Washer Drop Incident.*

(*May 21, Friday*). Bela goes to a party at the Bulkington student co-op, where his math friend Danny Nguyen is a proctor. Leni is webcasting the party as a reality show. She's with her gay friends Lulu and Dorothy. The *Buzz* viewership is way up.

Bela tells Leni how he saw aliens talking to him. Leni is livecasting this. Leni's mysterious main backer sends in a message in that she should stay with Bela.

"This is great stuff, Bela. Why don't you be a regular. Wear this blog ring and we'll give you a weekly salary plus cut of the clickthrough stream." A realtime reality show of Bela's life, to be called "The Crazy Mathematician." So Bela agrees to wear a temporarily non-removable vlog ring for a week.

He gets drunk, takes up with three young skaters, and inadvertently vlogs them dropping a washing machine off the dorm roof onto a neighbor's parked SUV.

\*\*\*

(2.6) *The Day After.*

(May 22, Saturday.) Bela wakes up on Danny's couch. Lulu spent the night with Danny. She tells Bela that Leni's backer is Van Veeter.

**Chapter Three: Rocking with Washer Drop**

(3.1) *Bela Goes to Jail With the Skaters*

(May 19, Saturday.) Bela's vlog ring has a visible display he can watch, it's like the Earth is saying "hot" or "cold" according to what he does. The color ranges between blue (boring) and red (interesting). He adjusts his activities to increase his hits.

Back at his apartment he finds the cops. Leni sicced them on him for the news. The police book him as a material witness and an accessory to the washer drop, he spends a night in jail. The skaters Naz, Thuggee and Jen3 are in there too, Naz and Thuggee in fact in the next cell. They talk about starting a band together, Jen3 sings and Naz plays the drums.

\*\*\*

(3.2) *Out of Jail; Paid by Leni; Bela Meets Leroy*

(May 23, Sunday.) The next morning, Sunday, Buzz pays Bela's bail to get him out. They have a half million downloads of the washer drop. It's in the papers. Buzz wants Bela out and doing stuff.

Bitter at Leni, Bela goes to get his week's vlogging pay in advance from her. Then he accuses her and Van Veeter of starting the polling-place fire at the YWCA. But Leni and Veeter have iron-clad alibis. They didn't do it.

That evening Bela plays his guitar, thinking about making a band with Naz and Jen3, and a bum named Leroy comes to his room, attracted by his vlog. Leroy says the reflected image of an alien cone shell the size of a dog made him set the fire.

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(3.3) *The Chairman Won't Help. Washer Drop. Cammy Vendt.*

(May 24, Monday) Bela meets with Math. Dept. chair, hears that because of the washer drop publicity the chairman isn't going to help him get a job, in other words, Bela has no future in academia. UC Berkeley is buying off the owner of the ruined washer-dropped-upon SUV.

Bela goes and meets Naz, Thuggee and Jen3 getting out of jail; they're definitely going to start a band together. Name: Washer Drop. Bela plans to make the most of his vlog publicity while he's got it. He wants to get famous to win Alma back. Bela on guitar, Naz on percussion and synthesizer, Jen3 is vocals. Thuggee is the roadie, though he dances with Naz while they play, almost Motown style.

Naz uses a drum kit, but is also using body as the transponder. He's wirelessly wired. He dances the drum and synth. Virtual keyboards. Skates the music.

They need a bass-player. A woman named Cammy Vendt hears about it on the vlog and shows up to volunteer. Cammy plays bass quite well, is starting her career, lives in the Mission, is looking for ways to promote herself. Cammy is a brunette, has good presence, is sexy, not beautiful exactly, more like very approachable. She rocks. She resembles Chris Novoselic, the bassist of Nirvana, or

Chrissie Hynde of The Pretenders, or Keith Richard, for that matter. Teeth sticking forward a bit, pushing lips out, kind of a trashy look. She has a nice friendly smile. She's also done a little burlesque show work.

Cammy and Bela are hitting it off. But really he still wants Alma. He has in the back of his mind to sic Cammy on Paul.

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### (3.4) San Jose Washer Drop Concert

(May 28, Friday.) Big Washer Drop concert at East Vest, the restaurant of Bela's mother Xiao-Xiao. Xiao-Xiao tells him to give up on math, to get a good job at a computer company. Bela's band is gonna play in the parking-lot outside his mother's restaurant to draw in customers.

A surprisingly large crowd shows up, due to the vlog publicity.

Bela's cousin Gyula Wong turns up. He's the chauffeur for Van Veeter at Veeter's company Rumpelstiltskin, they've been watching Bela's "Crazy Mathematician" show so they know about the concert. Paul is in Gyula's limo as well as Van Veeter, also Alma, not looking too happy with Paul. Stanford is boring, Paul's back on meth. Alma's impressed by the crowd there to see Washer Drop, and flirting with Bela a little.

Veeter says he bought the patent for the BKH theorem from Berkeley. Has Paul on a consulting contract already. He's hope to pick Bela's brain for free from watching the vlog, but now he wants to just pay Bela a consulting fee. He plans to put his company into trusteeship soon, as he's about to enter Congress.

Bela's vlog week is almost over now, and Cammy offers to take over the vlog now, which is okay with Leni and Veeter. They bill her show as "The Stripper Musician."

Wild, great concert. A drunk guy tries to climb onstage.

During the concert, Bela sees cone shells, but only as reflections on his guitar. (All through Part I, the aliens can only be seen in mirrors.)

Cammy and Bela spend the night at Bela's mother's house. Cammy would sleep with Bela but he unwisely rejects her because Alma phones at just the right/wrong moment.

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### (3.5) Cammy Seduces Paul.

(May 29, Saturday.) Bela and Cammy visit Paul on the way back to Berkeley. Cammy is wearing the vlog ring.

Thanks to Veeter, Paul is into physics and quantum computation. Veeter has mounted a Q-chip in a metal teapot. Paul is high again. He absorbed Bela's vlog where he talked about his alien-inspired solution to the codec problem, and Veeter has used these insights to solve the codec problem by using quantum computation on the Q-chip.

The little teapot is like a magic lamp, a universal hypercomputer, Veeter gets the boys to help him set it up to predict memory chip prices so he can make a big buy before going into office as a congressman.

Alma has mentioned that she's stopped having sex with Paul. Bela encourages Cammy to have sex with Paul, and she's wearing the vlog ring. She agrees to perhaps for the hell of it, but perhaps to make Bela jealous. The deed happens in Paul's van, Bela and Alma see the van bouncing.



Alma is furious, she gets Bela to drive her up to Berkeley with him, she's moving back in with Bela. Bela leaves Cammy at Paul's.

#### ***Chapter Four: Hypertunnel at the Tang Fat Hotel***

##### *(4.1) Cammy's Murder.*

*(May 29, Saturday).* A change in tone, things get darker. A Latino gardener's assistant named Roberto Sandoval murders Cammy in the street outside Paul's house. The images are on *Buzz* for an hour. Sandoval were drawn to the Washer Drop concert by cone shells, he and a friend saw them in the rearview mirror of their minitruck driving by the concert, and the cones mentally harpooned them and got them to stop. They got drunk, and Roberto got thrown out for trying to climb on stage. He stalks and murders Cammy outside of Paul's the next day. The video of the murder and Alma's body lying there are up on Leni's site for a while, and they spread all over the web.

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##### *(4.2) Fighting with Alma*

*(May 31, Monday)* Bela is having breakfast with Alma, watching news on TV.

They discuss the fact that the public views it as scandalous that Van Veeter was at Paul's half an hour before the murder. Cammy's pre-murder vlog shows Veeter walking by *while Paul is having sex with her*. And he smiles and waves. Also Veeter's big chip buy has caused some waves. There are calls for him step aside and not take office.

Veeter is going to tough it out. He's politically ambitious, and not actually such a good person after all. He has a successful meeting with the truculent and manipulative President Joe Doakes. They stage a press conference on TV. He mentions developing new anti-terrorism technology.

Bela figures the government or maybe just the Republican party will want to control the paracomputer. He quarrels a little with Alma, tells her he encouraged Cammy to seduce Paul.

Alma says she wants a break, she's going down to Santa Cruz, to get away from Bela for a couple of days. Bela tells her he plans to drive down, pick her up and go surfing in Big Sur at dawn on Thursday, and she's good with that. She's riding to Cruz there with Leni, who needs to visit a guy in Watsonville, the newly-picked *Buzz* vlogger.

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##### *(4.3) Cammy's parents, Jutta Schreck*

Bela drives down to Palo Alto alone, he has to make a statement to the cops. He meets Cammy's parents, Dagmar and Klaus Vendt, discusses putting on a benefit concert. He phones Rubber Rick who runs the Singularity, a club in the outer Mission, it's set that Washer Drop can play a memorial concert there in honor of Cammy. Rick says this famous woman bassist Jutta Schreck from a German band AntiCrystal wants to sit in.

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(4.4) *Bela Hides Paul at Tang Fat.*

Before leaving Palo Alto, Bela goes to see Paul. Paul has figured out Veeter's chip architecture and has simplified it. Paul has not seen the cockroach aliens but believes the aliens exist. Haut's told him that maybe there is a paradox that can tear a hole in spacetime and open a tunnel to the aliens. Paul has figured out a really clean design for a paracomputer. It has a voice interface now.

Bela feels horribly guilty about Cammy, and Paul does too, though mainly Paul misses Alma. They discuss a Southern belle theory of Alma's personality.

Bela wants to keep working with the paracomputer, he has a hope that it will let them go back in time and save Cammy. Paul is unsure. He feels he's about to make even bigger discoveries, but he doesn't want to get in bad with Stanford, he's supposed to start going to his office. The drive for security is about to win out over the gonzo-math-instinct. But then Bela gets Paul to ask the paracomputer what's going to happen, it says that Veeter has sent agents to confiscate it, U S Secret Service agents led by Gyula Wong in his limo. The Secret Service is involved because it's being cast as a computer security issue.

So they take off with the machine to hide it. Bela sees Gyula on the way out, Gyula winks lets him get away just this once. He wets his index finger and marks an imaginary tally in the air. Like, "You owe me one." Bela drives Paul to San Francisco on Route 1. Should they stop at some random motel? Credit card registration, license plate, would tip the feds. Paul prefers the city, more interesting. Paul thinks of Chinatown, of the Tang Fat Hotel, he has a cousin Jack Wong who works there. Bela talks Chinese to Wu, who runs the hotel.

(4.5) *Gyula and Owen. Rehearsing with Jutta.*

Bela goes back to his apartment. Gyula there with a Chinese thug called Owen, and Veeter's lawyers, Veeter's not gonna pay Bela any money at all. The lawyers, Cauchy and Schwarz threaten to sue Bela, they say they'll soon serve papers on him to start the suit. Gyula privily mentions that he wants \$300K for letting Bela get away with Paul, he figures Bela and Paul are playing the market. Bela says it's not about money, meaning this.

Knock on the door, it's Naz, Jen3, Thuggee and Jutta Schreck, smoking a joint.

Jutta is a big-time woman bassist from a heavy-metal band called AntiCrystal, a German, she's gonna play for Cammy. She's robot-faced, platform black boots, strawberry blonde hair, bod that won't quit, imperious face, you can hardly believe you're talking to a woman like this, but now and then laughs *tjachz, tjachz*.

Jutta is like, "Let's get down to it. Let's rock." They smoke hash and rehearse. Jen3 has written a song about Cammy's murder: "Leaf Blower Man."

Later that evening, in a burst of (stoned) creativity, Goaded by the fact that his paranoia was justified, Bela goes online and posts his ideas about the specs for the paracomputer. Axiomatizes how a paracomputer has to behave. And he imagines that any sufficiently complex naturally occurring replacement can be used instead of a Q-chip. He uses some ware called Pollinator that spreads it all over the web in such a way that Veeter can't take it down.

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(4.6) *Memorial Concert for Cammy.*

(June 1, Tuesday.) Bela realizes there's logical holes in his post. Oh well, maybe Paul will fix them.

Phones Alma, has a pleasant chat, she's looking forward to having him pick her up very early Thursday morning in Cruz, she's sleeping in the Ziff garage, her father and brother are annoying.

Bela goes to Cammy's funeral, Cauchy and Schwarz try to serve papers on him, he runs away.

(June 2, Wednesday). Backstage right before the Washer Drop memorial concert, with the band and Rubber Rick, waiting for Jutta Schreck to show up.

Jen3 is bitching that she's not the new vlogger on *Buzz*. At Veeter's behest, Leni has given the vlog ring to someone quite different, a young Latino executive at Q-Bit, whose plant is in Watsonville. Perhaps his motive is, in some oblique way, to counteract the Sandoval scandal, like to be involved with a good instead of a bad Latino.

Cammy's parents are at the bar, Dagmar and Klaus Vendt, Dagmar a little drunk and potentially explosive, Klaus nervous, solemn, fiddling.

Jutta shows up, Rick goes to usher her in.

Some alleged government operatives show up to talk to Bela, they're like real-life men in black, but I avoid modeling them on Dana Scully and Fox Muldaur of the X-Files. They call themselves Ken Smith and Mary Jones. They say they're from the NSA, National Security Agency. They get the rest of the band to leave the room. (Later we'll find out that they're the Stanford mathematicians Maria Reyes and Cal Kweskin, who do in fact have a grant from the NSA and good contacts there.)

They show Bela video of his guitar at the outdoor concert, also video of dead Cammy's sunglasses. Reflections in Bela's guitar show the cone shells at the Washer Drop concert, the reflections in Cammy's sunglasses show two cone shells hovering around her severed neck, reaching into her spinal cord. They give Bela a laser-pointer, and tell him to point out any aliens he sees during the show, so that the agents can fire an electric-net-gun at the area to try and capture them.

Onstage, Jutta Schreck is loaded on smack, I'm thinking Kim and Kelley Deal rolled into one. Thuggee has a baseball bat. Doesn't go well at first. The monitors aren't working, like Cammy had warned him about, it's like a sign. Hard to play, but it's a good show.

At the end, as they take their bows, Thuggee is hugging Jen3, and Veeter's lawyers jump onstage to serve the papers to Bela. Bela points at them with the laser pointer, the agents' electrified net catches them, Bela leaves out the back door

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(4.7) *Bela and Paul Test Haut's Paradox at Tang Fat.*

Bela in Chinatown; it's after midnight. Stockton Street outside the Tang Fat Hotel is fairly empty in the wee hours, Bela bumps into a Chinese woman on the stairs, it's Haut in disguise, bringing back some food from an Italian restaurant in North Beach.

Haut has it back together, more or less. He has invented Haut's Paradox. He's been staying with Paul, speculating and working on a math paper.

They've been losing money in the market, Bela sets them straight, Paul makes a quick million on Bela's credit card. Now Bela wants to test Haut's Paradox.

Haut's Paradox implies that the Q-chip computes above the Margolus-Levitin limit if you have it predict itself doing certain computations. You get a self-amplifying computation which bootstraps its own activity to a Singularity, reaching impossibly high levels in a finite amount of time, creating a computational rate that cannot theoretically exist in our spacetime. But if the computation *does* exist, the lamp must therefore bulge out into some higher dimension.

Veeter shows upon the laptop screen, he's been watching all along. He says don't do the paradox, they turn off the laptop and do it anyway. Haut figured out you don't need a program, just need to zap the Gobrane in this certain golden-mean-type spot. (Note: I recall seeing the golden ratio pop up as an eigenvalue of a Markov series years ago when I was teaching Finite Math.)

A test object, a steamed artichoke wearing a wrist-watch (surreal touch) goes into the tunnel. But the experiment makes a hole in the ceiling, and Owen busts in and Haut freaks out and jumps towards the tunnel and Bela doesn't see what happens but then Owen, Haut, and the paracomputer are gone.

By the way, time will go faster, the closer you are to the tunnel. So if you are near the tunnel the things further than you seem to be running slow (you're faster than them), while the things closer to it than you seem to be running fast.

They decamp with no lamp, amidst jabbering Chinese.

Gyula is at the garage. He says Veeter wants to cut them loose. Bela promises Gyula money for his paracomputer, and Gyula throws in his gun.

They drive off in Bela's car with the two surfboards in back.

### ***Chapter Five: Mathematicians From Galaxy Z***

#### *(5.1) Three-Way Sex in Cruz.*

*( June 3, Thursday before dawn. )* Bela had been planning to go to Big Sur with Alma, picking her up in Cruz. He decides to follow this plan anyway. Paul comes, he wants to see Alma. Paul and Bela talk a bit on the way down to Cruz.

Paul has deduced that our universe is the result of a seed off in the other world, it follows from the nataraja stalk that he noticed running out to one side of the hypertunnel to La Hampa. He figures the stalk is creating all of reality according to John Cramer's transactional interpretation of quantum mechanics. He deduces, possibly from something about the spacing of the bands of light, that the time of the other Earth is the alteration axis of our hyperverses of spacetime sheets. He believes therefore that it really should be possible to use the other world to alter the past.

He says it's to bring Cammy back, and Bela wants to help. (Secretly, Paul also wants to get Alma back for himself, but Bela's too thick to realize this.)

Paul also remarks that it would be good to make the tunnel inside the shelter of a natural bridge. The mass would stabilize the hypertunnel, unlike the one at Tang Fat Hotel, which didn't last long enough. Would be safer with more mass. Would be nice if the tunnel stayed there long enough so that you can use it to come back.

Bela proposes the natural bridge at Pfeiffer Beach. It would be cool to surf the tunnel. What they'll do is to set up the paracomputer on a ledge inside the bridge, then back off and surf through.

But what about Paul's important meeting Thursday afternoon (today). Paul says he's more concerned now about seeing Alma. And he's stoked about altering the past. Will change the world anyway. They won't be coming back to the same

universe anyway. “We won’t?” “No, there’s a bunch of parallel worlds. Has to be, or we’d have a paradox.”

In Cruz, Bela gets in bed with Alma in the garage, it’s a double fold-out couch. He tells Paul he has to sleep on a single bed that’s also there, and Paul pretends to go to sleep. Bela hears digging in the garden, goes out to check, can’t see anything, back to bed, and by the time he comes back, Alma has let Paul into her bed naked! “Let’s all three of us have sex,” says Alma. “Just this once. I’ve always wondered. You won’t think badly of me?” In the course of things Bela even touches Paul sexually a few times. It’s okay. “What had I been so scared of all these years? It was just another man’s stiff dick. Same as mine.” They fall asleep, deliciously entangled.

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### (5.2) *The Cone Shell Attacks Gary Ziff*

( June 3, Thursday late morning. )Wake up and it’s broad daylight, eleven AM, Gary Ziff is standing there glowering, sneering, gloating. He’s wearing the same heavy gold chain dog-collar that Owen had, the one with the X-eyed Smiley Face medallion.

Gary has found a pile of bones near the pumpkin patch and wants to know what the hell is going on. The chain was on top of it. He’s threatening to call the cops, he’s home stoned, he’s been laid off, he calls Bela a fag. Bela starts mind-gaming him.

Paul notices the siphon of the cone shell sticking up from amidst the pumpkin patch. The snout. The cone shell emerges, Gary runs for the house. The proboscis snakes out of the snout, a long orange tentacle heading Gary’s way. It fastens upon him, injecting something. And sends a puff of white in the air. A sour-sweet scent. Gary is raving stoned now.

Alma, defends her Dad. The cone shell starts talking in a woman’s voice with a heavy Chinese accent. Calls herself Rowena. Learned to talk from Owen/Yuwan’s brain. Voice is somewhat slobbery due to her big floppy mouth. She calls herself Rowena. (Private joke: Rowena = Owen inside Ra, which could be the creature’s native name.)

She wants Bela to make it through the tunnel to La Hampa. “Come to our world, we can change the past.” Bela has questions about Cammy’s death. Rowena disclaims responsibility but admits he and her sister took the opportunity to poke into Cammy’s brain to get her program. They have made a bet with another alien called Oskar. The cones are betting that a human mind is a kind of computation and is therefore predictable. So now they want to bring Cammy back to life in a parallel world and use her program to see if her actions are predictable.

They leave for Pfeiffer Beach. Pete shows up as they go, says to take care of Alma or else. He has a vlog ring, turns out Leni/Veeter is giving away vlog rings now at Monogrub (= MacDonalds). People cheerfully carry out their own surveillance. It’s the *One in a Million* show.

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### (5.3) *Hyperspace Surfari at Pfeiffer Beach*

Alma and Paul are squabbling. Paul falls asleep. Bela tells Alma that he and Paul will be gone from this universe for good. Alma agrees to come along. The boys won’t be coming back to this particular spacetime and Alma loves at least one of them.

Veeter sends a pursuer: Henry Ngyuen from Watsonville who runs Membrain, which is handily on the way from Cruz to Sur. Car chase down the Big Sur highway. They try and cut into the Coast Road before Bixby Bridge, Bela fucks it up slides off the cliff to the right, Rowena swoops down and gloms onto the station wagon and uses antigravity to tote it to Pfeiffer Beach.

People on the beach run away. A black helicopter appears, with the so-called NSA agents. Paul identifies them as the Stanford mathematicians Maria Reyes and Cal Kweskin. Rowena shrinks the chopper to the size of a seagull. It will fly through the tunnel as well.

They park the paracomputer on a ledge in the arch, set Haut's paradox running on it, then surf into the resulting tunnel. Henry Nunez shows up on the beach at the very last minute, yelling for Alma in particular, but he's too late to stop them.

They surf in, a really big wave comes up then behind them with three people on it, like copies of them. There's a rumble like an earthquake. They do the jump.

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#### *(5.4) The Alien Ex-Pats of La Hampa.*

*( June 3, Thursday just past noon. )* La Hampa resembles Micronesia, but some of the islands will float in the air. That is, you'll see lots of small muffin islands like you see off Palau, but some will be floating above sea level, up in the sky like clouds, and other islands are wholly submerged in a giant air bubble that fills the inside of the spherical sea. And the sky itself is the inside of a water bubble with a sea on its surface and so on. We have little suns inside each size bubble, so there's no determinate scale at all, it's a fractal that goes forever up and down.

They emerge through a natural bridge. The helicopter that snuck through grows to normal size, flies up, crashes into the sky, pieces of it drop down, but three human figures can be seen swimming away from the impact site in the sky.

Overhead is an enormous ball of water with an island in it and a lagoon on the island. Other balls of water in the distance. Two suns. The ball of water they're on has a bubble of air in it. Bela swims down through the water, hits the bubble, tumbles through the air a bit, Rowena fetches him back. He notices that the fish are changing shapes, morphing.

On the island is Rowena's Asian sister Jewelle, Oskar the Noo Yawk cockroach alien and his wife Tanya, also Malvane and Vulma the Brit "Dragons of Blueland" lizard couple. And a self-effacing mystic nudibranch named Unger. They chat about number theory, topology, infinity. The aliens mention Rowena and Oskar's bet. They're like math professors.

They feed upon telepathic worms that taste how you like, these are larval natarajas, who enjoy being eaten, there are plenty of them to go around. The worms are a stage in the nataraja life-cycle. All of La Hampa is one organism, the body of God.

Eating the flesh of the nataraja teaches you hierophantics. The more you eat, the better you know it.

The alien races aren't originally native to La Hampa, their races migrated up there from other locations in normal reality. They've been there for generations. La Hampa is a paradise, a lovely place to live.

They say they could see our Earth in flesh of the jellyfish that makes us.

The suns are getting dimmer. It's night now.

The cones and roaches talk about having bothered our world for two reasons.

*Secondly*, so as to get a map of Cammy's mind and see if they can predict her. They got a good map of her brain after Sandoval killed her. They did this to settle a technical dispute about whether the conscious beings of Earth are equivalent to computations. If people unpredictable, then this shows that consciousness lies beyond the reach of computation. Why can't the aliens this on themselves? Because they do their predicting at a higher level, using an advanced mathematical technique they call hierophantics.

*Firstly*, they just want to welcome humanity, as once one member of a race finds the way to La Hampa, many more will come.

They mention that there was another person who came through, this would be Haut. He is living on the island down below that Bela almost fell to, the one inside the ocean bubble.

The roaches live in a tunnel in the hillside. The nudibranch and the cone shells live in caves in the wall underwater at the lagoon's edge. The lizards live in a kind of pillbox structure with slit windows. There are some children, baby cone shell boys, and instars of the roaches, and a clutch of lizard eggs. A little academic housing complex as it were.

The sun dims, they eat some worms, which turn into any kind of food you want. Alma gets a marijuana joint as well.

The island has already bulged up a hut for Paul, Bela and Alma, like the wood cabin at that hotel, The Villages, on Pohnpei in Micronesia. It knew how from making Haut a cabin. Alma insists on three separate beds. She's kind of drunk and stoned. She falls asleep.

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### *(5.5) Jellyfish Lake*

The boys go up to the ridge with Tanya the cockroach and look down at Jellyfish Lake. One of the glowing creatures hovers above the water and calls telepathically to Bela in a woman's voice. But he doesn't go to her yet.

They walk down to the hut; they hear someone moving in the jungle. Bela and Paul go to bed. They feel sick to their stomachs from eating the worms.

Bela says the jellyfish talked to him. Paul tells Bela to ask the jellyfish to undo the meth he took in Palo Alto.

Then Paul stays up, doing math.

## ***Chapter Six: The Gobubbles***

### *(6.1) Nataraja jellyfish.*

*(June 4, Friday)* Bela has bad dreams. Near dawn he sees things turn over in the fourth dimension. He dreams of the jellyfish teaching him, and of the Tarot deck Hierophant card. He is the Hierophant. He snaps awake, thinking that hierophantics is to him as math is to a person who doesn't know math. Paul isn't in his bed, he's outside talking to someone.

Paul comes in, says he's been puking, he seems a little evasive. Says he was talking to himself. Thanks to hierophantics, Bela realizes that Paul was talking to Haut. He doesn't mention this to Paul, as he wants to keep the upper hand.

Paul says he's worked out the theory of hampatime vis-a-vis Earth time; that the Earth reality changes as hampatime elapses. He says size is really a dimension, in fact size in La Hampa matches time on Earth. The helicopter flew up to a higher

level, and Haut appeared in the sky of the lower world, which indicates a relationship between the Earth time and hampascale coordinates. *Hampascale is our time*. Paul also feels that *hampatime is otherness*, the axis along which Earth changes. So they should go back quite soon after Bela makes the wishes, otherwise, Earth will have changed again.

Paul says he'll work on the hypertunnel, and Bela can talk to the jellyfish. Paul repeats that he doesn't want to be a meth-head. Paul goes out to talk to the roaches and the cone shells, the lizards aren't around and the nudibranch has a hangover. The lizards are awfully quiet today.

Bela talks to Alma about the wishes, but in a general way. He doesn't want Alma to hear that he wants to change things so he fucked Cammy. The hierophantics are kicking in for her as well; she's preternaturally smart and quick on the uptake.

For the first time they discuss the fact that they'll have to shove aside their Earth-2 selves to settle in. It occurs to them that Paul won't want Alma to make it back into Earth-2. Paul will be hoping that if Paul-2 was off meth, Alma-2 may not have left him. So Paul-1 can move right in with Alma-2.

They agree they should stay in La Hampa longer, as it's interesting here. They fuck, go outside. Alma flashes that Haut killed the lizards. The other Nanonesian aliens are mad, they say they have to leave right away. Paul sets out with Jewelle to wait by the natural bridge.

Alma and Bela go to Jellyfish Lake. Alma and Bela get in naked. Bela's jellyfish appears again. They go inside. It's like in the Book of Revelations. A queenly dancer steps down from a great white throne surrounded by an emerald rainbow and begins to dance upon an endless glassy sea. Joy. Wise and kind. God. God says they are one flesh, one seeker. You can see the tendril which stretches away from God's dancing arms to Earth.

God says there's many wishes in Bela's brain. He has to commit, he has to say his wishes out loud. "I wish I'd fucked Cammy at my mother's house after the Washer Drop concert in San Jose. And that I hadn't left her alone in Palo Alto." Bela isn't planning to make Paul's wish for him at all, but the jellyfish notices it in his mind, and singles it out.

Alma is mad. She's not going to Earth-2 if she can help it.

Rowena turns up and says they have to paddle out to the natural bridge.

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### *(6.2) Kill Haut. Jump To Earth. Alma Killed*

They paddle out towards the big lacy natural bridge. Tide is running, surf is rising. They can glimpse the cable from the jellyfish. Jewelle tells Bela he has to ask for the tunnel. He has to pray, say certain words, a kind of magic spell that comes to him hierophantically, Paul says Bela is speaking the unknown tongue of Charismatic Pentecostalism, which he knows from Kentucky, his father being a minister of such a sect. A whirlpool forms and whips up a hypertunnel. There's a thunder storm, with lightning, and the lightning is focused on the natural bridge like the energy rays towards the center of a plasma sphere.

The cone shells keep expecting Haut to pop out, and he doesn't show, and finally they want to shove the three humans into the tunnel, and Alma is bitching and hanging back, and Paul is maneuvering to not let her into the tunnel, and just then, lit by a big flash of lightening, crazy Haut pops out of the water in the tunnel wearing tiny gossamer gnat wings on his back. He fires an energy bolt, missing Alma, the energy distortion ray ends up whirling around the tunnel.



Jewelle stings Haut and eats him just as Bela and Paul slide into the tunnel, with Alma still trying to get away, and the bolt echoing around the tunnel. It's such a wild situation that the boys can't tell for sure if Alma came with them or not.

(*June 3, Thursday just past noon.*) They're back at Miller Beach, back to the same time when they left, the time that matches the Nanonesia scale level, they shoot out of the little bridge towards the sea, surf washes over them, it's the same kind of weather they left, sunny and a bit windy and rough. There's a low rumbling noise.

Up ahead are three surfers: Bela-2, Paul-2, Alma-2, who are about to surf in *past* the natural bridge on the right. Bela shoots out in *front* of them, Paul floundering in his wake. The three Earth-2 surfers turn to avoid hitting Bela, and end up being diverted into the hypertunnel's mouth.

The rumbling gets louder as they go into the tunnel, there's a localized earthquake, perhaps triggered by the hypertunnel. A big chunk of rock boulder drops off the inside of the natural bridge. Bela and Paul paddle in to see, there's Alma dead, dangling from her surfboard.

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(6.3) *The Hundred-Percent Campaign, the Gobubbles.*

Bela and Paul tow her ashore on her board, very bummed. They're fairly sure it's Alma-2, but some uncertainty may haunt them.

A little girl on the beach has a vlog ring, they're being given away by Monogrub burger shops as part of a *One In A Million* contest. She's obnoxiously vlogging dead Alma. An ambulance takes Alma's body to the Steinbeck Memorial Hospital in Monterey, with Paul riding along.

Neither Cammy nor Henry Nunez is vlogging here, vlogging is for goobs, for Heritagist data-mining, it's been made into the Monogrub *One In A Million* show.

Bela's car is in the lot, rather than on the beach. The car marque isn't a Gran Torino, it's a Golden Mullet. But wonderfully, the car-key from Earth-1 works.

Bela can tell by kissing Cammy that he did sleep with Cammy at his mother's, and that he and Cammy are lovers.

Cammy drives. She thinks Bela is tripping on, of all things, conotoxins, which must be a fad on Earth-2. She's gonna drive him to Monterey to pick up Paul and take them home.

Bela tries to tell Cammy the truth about being from another world, but it's so weird and scary she doesn't believe him, she prefers to think he's high on conotoxins.

On this world, Berkeley, a.k.a. Humelocke, is known as Klownetown after Willem Klowne, early California settler.

Washer Drop has another gig in two days, on Saturday, they're opening for AntiCrystal at Heritagist Park in San Francisco — the Heritagist party bought the naming rights for the baseball stadium when they kicked off their hundred-percent campaign in the winter, says Cammy.

Cammy turns on the radio, and Bela hears that the Heritagists all about the hundred-percent campaign. Joe Doakes is maneuvering to become dictator for life. The plan is that every senator and congressman, ever governor, every governorship, every member of every state assembly will be a committed member of the Nationalist party. The U. S. will vote itself into a perpetual dictatorship. Doakes is planning an amendment to remove term limits on elective offices. He'll also be planning to impeach all non-Nationalist-party-line judges. Goal is a hundred-percent Heritagist government! Bring about the hundred-percent system that our great people deserve.

Cammy is like, “So?” This is quite familiar to her. It’s been going on for months. People are inured to it. But only recently has the campaign been getting traction. Why? They’re using news manipulation and ads in the style of the laser-accurate Swift-Boat-Veterans-for-Truth-style ads. Veeter has orchestrated it somehow.

When they get to the Steinbeck Memorial Hospital, Cammy and Bela find Paul and Henry Nunez, who’s got Lulu in tow, and Tito, who’s on his best behavior now. Nunez is a good guy after all, he seems to be on good terms with Paul and Bela. They’ve been working together with Veeter, developing a personal/social prediction tool derived from the Gobrane. He shows Paul and Bela the latest model, a sphere called a Gobubble. The Gobubbles are soap bubbles of a special long-lasting kind of soap. You can’t actually pop one of the bubbles, you can just split it in half. You talk to it and tell it what you want to know, it picks up information off the wireless web, you see patterns in its colorful surface reflections.

The Heritagists are using Gobubbles for the hundred-percent campaign. Bela gets the picture, his hierophantics is kicking in a bit.

Bela tests his Gobubble by loading Pete Ziff, who’s gotten himself a vlog ring, and he sees that Pete is on his way to indeed kill Bela, having seen Ashley’s feed of Alma’s body.

Lulu was there with Nunez, and now she leaves with Bela, Paul and Cammy, she wants to glom onto Paul. Women in front, men in back. Cammy avoids Pete by going down through Monterey.

On the drive up, Paul and Bela discuss the hundred-percent campaign in terms of the story about Kurt Gödel’s worry about just this result, telling Cammy about it.

Waiting at Paul’s house are They mention that Haut is being excluded as he’s so Common Ground.

Veeter turns up at Paul’s house just as they arrive. He has a hushbrella inside which he gives the boys secret info. Tomorrow he’ll be anointed as the veep candidate. Supposedly Ramirez is angry about it. Cal Kweskin and Maria Reyes definitely are NSA, their job is to report to Ramirez’s wing of the government. Veeter tells more. Doakes offered the slot not because Veeter has been so much help, not so much to keep the help coming (Kweskin and Reyes could step in) but because of some Gobubble predictions regarding Ramirez’s unpopularity.

Paul and Bela are, like, why don’t you drop it, leave the hundred percent campaign, but Veeter feels he can keep the system better by staying in. “At least you’ve got *me* in there.” But he sounds a note of warning. There are straws in the wind. Ramirez may kill them all.

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#### *(6.4) Cammy Cheats, Pete On Board, Sandoval With Ramirez.*

*(June 3, Thursday)* Back in Humelocke, that is to say Klownetowne, Bela rehearses with the band.

After they leave he finally fucks Cammy.

*(June 4, Friday)* Bela wakes up, Cammy’s gone to see Waclaw about borrowing some amps.

Bela tests the Gobubble, finds it can predict him. Trying to make himself unpredictable by thinking hierophantically he unexpectedly comes up with the idea that Cammy is fucking Waclaw Smorynski right now.

The Gobubble predicts this is in fact the case, and shows him a simulated image.

He hears a motorcycle, remembers Pete is after him, has the Gobubbles simulate Pete so he can test out some strategies. “The Heritagists did it,” seems to work. Bela follows that up with showing Pete how to use the Gobubble, and tells Pete to agree to help distribute thousands of pirated Gobubbles at the stadium concert on Saturday. Pete leaves on good terms with Bela. Alma’s funeral is slated for Tuesday.

Bela is sad he’s losing Cammy, begins worrying about Sandoval. Bela looks for Sandoval in the Gobubble, can’t find him. He phones his sister Eva, says some bullshit to get her to talk. She Roberto never takes the train, she says that a car from Vice President Frank Ramirez picked up her brother last Saturday.

Bela calls Paul, they agree to meet..

They rehearse again. Cammy doesn’t spend the night.

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### (6.5) *Paul Clones the Gobubbles*

(*June 5, Saturday*) Bela drives to Paul’s. Paul has extended the hushbrella concept to make his whole house into what he calls a taz, a temporary autonomous zone. He has weird music playing, maybe Frank Zappa, or no, just white noise. He has his microwave oven sending jamming waves through the kitchen. There’s aluminum foil neatly laid onto the walls and ceiling and floor.

The big news is that, thanks to Veeter telling him the recipe, Paul knows how to make Gobubbles. It’s a matter of blowing bubbles of this certain kind of goo. (Similar to the stuff that I used in my story, “Aint Paint”.) Bovine pancreatic juices mixed with kelp-stem pulp and a bit of hog melanin are just the thing to catalyze a color-creating activator-inhibitor process in a gelatin, glycerin and detergent base. Traces of magnesium and gallium provide the wireless access. Chemistry was Paul’s first major in college.

To make the bubble-blowing work, one extra step is needed, you have to feed a microwave-frequency electromagnetic signal into the bubble loop; this sets up long-term resonant vibrations in the membranes. All the bubbles show Paul, they’re drafts of Special Paul.

Paul has made himself unpredictable by using his Gobubble to set up a prediction of himself that’s continually being pseudorandomized and having its state fed back into the Web. He refers to his warped simulation as “Special Paul,” and Bela’s is “Special Bela.” (Like when I got my friend Eddie’s wife to start calling him “Special Ed.”) “Special Paul is gifted,” said Paul with a wry smile. “He’s so bright it’s frightening. Yeah, I’m borderline autistic, but Special Paul is over the edge. He uses intermittent chaos to simulate hissy fits.”

They discuss their surprise at how well the Gobubble works. Bela is doubly surprised that he wasn’t able to outdo it with hierophantics. “This is a docile world, too,” says Paul. “Naw, hierophantics doesn’t matter. You’re still working with the same hardware, all you changed is the software. If you’re in a docile-physics zone, Nature doesn’t care. Things just aren’t as gnarly as they could possibly be. The fact that the Gobubbles work means there’s always been computational short-cuts but we just didn’t notice before. I wonder what a non-docile world would be like. A fierce world.” Both Earth-1 and Earth-2 are in a computationally calm zone where naturally occurring computations just so happen to be class two. A docile zone.

What about using the Gobubble for an Haut’s Paradox? Paul hasn’t quite figured that out. Let’s say that the spheres do something to damp down any software form of Haut’s Paradox. It can’t be programmed in. The self-emulation wraps

around the ball and cancels itself out. The zap could still be done, Paul thinks, but he isn't quite sure how. A slight difficulty in zapping it is that the Gobubble doesn't have the built-in coordinates that the Gobrane had by virtue of having two edges and a lower left corner that you could call the origin, and call the edges of unit length. But Paul isn't interested in the paradoxes very much just yet. But he doesn't want to call Haut. We'll let Bela solve this one on his own a little later one, he'll figure out a three-point zap.

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### *(6.6) The Stadium Concert*

*(June 5, Saturday)* Paul is at the Heritagist Park concert with Lulu, blowing bubbles. Also Pete and his posse are there: Prescription John, Jeremiah, Big Wave Jose, Lizard Girl. On the alert for Sandoval, who doesn't show up.

The concert goes well, Washer Drop does the first set, but they keep back "Hundred-Percent Asshole" for the encore jam.

Mention Zappa's line about how cool it is to move tons of air with your finger on your guitar string.

Bela starts pumping out the Gobubbles near the end of the concert, when the bands are onstage together for a "Chainsaw Crying Clown" jam, followed up by "Hundred-Percent Asshole."

After the concert, Gobubbles are lying all over the steps and grounds, with all the different people's visions in them. Heavy objective correlative to human diversity. The wind off the bay picks up, blowing the bubbles through the holes in the right-field wall. Homeless people outside are collecting the bubbles.

Bela melts into the night.

## ***Chapter Seven: The Best of All Possible Worlds***

### *(7.1) The Gobubbles Take Hold.*

*(June 5, Saturday)* Bela and Paul ride the train to San Jose. They're disguised. They planned this. Bela has shaded his skin paler, he's wearing a concert AntiCrystal T-shirt, and colored his hair green, is wearing black lipstick and black eye-shadow — a typical AntiCrystal fan look. Paul looks like a Washer Drop fan, he's dyed his hair black and spiked it up into a Mohawk, he's wearing a Washer Drop T-shirt, has a clip-on piercing in his nose, is wearing prescription shades with spiderweb cracks in the shatterproof lenses. They overhear people on the train playing with Gobubbles, placing bets, trying to predict each other. (1) A smooth-talking backwards-baseball-hat guy and a olive-skinned beauty. She has a Gobubble, he doesn't. He: "Let me stay over tonight. I don't want to be apart from you. We'll go to the beach in the morning." She looks in her Gobubble, seems him the next morning, sneaking out before she wakes up. She: "I don't think so." (2) An Asian Indian boy like my student Nithan Reddy, studious, thoughtful, slow-moving, is playing on-line poker on a pocket computer, while watching himself in his Gobubble. He's in synch with the Gobubble, betting big when it predicts he'll bet big and win a pot, betting small when it predicts he'll lose. "Why don't you try doing the opposite of what it predicts?" asks Paul. "Why would I do that?" says Nithan. "I'm winning." A self-reinforcing loop says Paul. (3) A Mexican guy is looking at the Pick 3 drawing tomorrow, also the Fantasy Five. He jots down the numbers. Then he tries to see next Friday's MegaMillion. But it's cancelled! Tomorrow will be the last day for

lotteries, says Paul. (4) A business-obsessed guy, lean and dark is honing his Monday morning pitch on the Gobubble. “You need Monkeybrains because...” Bottom line, end of the day, long story short, cut to the chase. (5) Two Santa Cruz stoner kids are loudly playing Scissors-Paper-Rock. The Gobubbles keep changing their predictions on the basis of the other one. No contradiction here, but also it’s not helpful. The ongoing changing input is screwing up the prediction. (6) Two grad-student type guys are watching them, he sets up a paradox: “In one minute you’ll be white or red. I’m going to ask you to do two things: Predict what color you’ll be in one minute, and set your color to the opposite of what you predict.” “I can’t do that,” says the Gobubble, “It would be a contradiction.”

Paul figures that the Gobubble operating system blocks the possibility of Haut’s Paradox in software. Bela thinks there should be a hardware work-around, he describes tried a three-point stim workaround. Bela figures that the gimmick is to stimulate *three* points on the sphere to get Haut’s paradoxical state. The first two play the role of setting up axes, or a model of Truth.

They go by Ma’s, Heritagists are watching the place. They use their Gobubbles to sneak in. They come in by a fondly remembered boyhood backyard shortcut Bela knows. Bela manages to talk to Ma at the garage. The Heritagists are already denouncing them on Ma’s TV. AntiCrystal are being deported. They make their way to distant cousin Mabel Wong’s house, which isn’t being watched, and the boys lie low there.

(*June 6, Sunday*) In the morning, Bela and Paul distribute the recipe on the Web, using Pollinator. The formula for the goo, plus Veeter’s operating system. Also they spread the tapes of Doakes saving Osama. They’re a bit paranoid of being caught soon, though, so they’d like to have the hypertunnel option working. They go ahead and test a few ideas for making an Haut’s paradox — they test out Paul’s posted recipe. It works, modulo an update that Paul Pollinates. Or Paul has some Gobubbles to spare, so don’t care that much if they lose a bubble into at tunnel, even if they’re not quite ready to go. They try the three-point stim, but it doesn’t work. So they’re puzzled.

Mabel Wong wants to make a trade on the Shanghai stock exchange, but then it closes down. Demonstrations at the White House.

The leak about Osama makes the evening news. The Heritagists are losing ground, violent demonstrations all over the country. All day people have been talking about the *real* future that the Heritagists have planned. The scales have fallen from their eyes. The song “Hundred-Percent Asshole” has really caught on.

On the TV evening news: A special on the Heritagist Park concert. The Heritagists are in disarray. The polls are at an all time low.

Doakes gives a press conference. He’s deported AntiCrystal, he makes wild claims against the Gobubbles, he’s like a wounded shark snapping at its own dangling guts. Incredibly the lapdog lackey news media are finally turning against him. The newscasters run a crawl under Doakes’s ranting face. “100% A-Hole?”

Bela and Paul are thinking soon it’ll be safe for them. But now they’re found out. Ling-Ling shows up selling raffle tickets for her band to go to Hawaii for a band contest at Christmas, the prize is a weekend in Reno. She’s wearing a vlog ring. She sees Bela. They’re gonna have to bail.

Bela calls Gyula, speaks to him in Chinese.

(7.2) *Paul and Veeter Are Murdered. Bela Unmasks Ramirez.*

(June 6, Sunday) Gyula shows up at the lumber yard near Mabel's he takes Paul and Bela to Veeter's. Gyula has a bunch of weapons and ammo in the back seat, on the way to Van's they shoot down a helicopter, shoot out the engine-block of a cop car, and flame-throw a roadblock. Veeter's compound has robot guards and even Tomahawk missiles.

Paul and Gyula go inside, Bela refuses. He waits outside in the car, and figures out how to make the hypertunnel work. He hears gunfire.

He checks on his Gobubble, Paul and Veeter were murdered by Sandoval. It's a set-up so it looks like Bela was Paul's gay lover and he killed Paul and Veeter for fucking each other. Bela is to be framed. There's even a bloody pentacle on the wall.

Bela gets the drop on Sandoval coming out, he kills him.

Inside the house are Owen and Tito. Bela makes friends with Owen, gets Tito to confess in front of a live vlog ring that Vice President Frank Ramirez sent Sandoval to kill Veeter and Paul and frame Bela.

Bela is ready to leave for La Hampa.

(7.3) *With Alma in Paradisio.*

(June 10, Thursday, La Hampa Time) He arrives on La Hampa, in mid-air above an island on a water planet of the Paradisio level. He plunges into the sea, goes past some drifting helicopter wreckage, goes down far enough to see what looks like Nanonesia, its very dim down there. He floats back up, swims ashore.

A butterfly/hummingbird thing buzzes him. A Jimbo. Jimbos are hologram-like magnetohydrodynamic aliens from the Sun, symbiotic with humans, they act as cell phones and computers and eat our excrement and enjoy our thoughts.

He gets to shore, sees five cabins and a patio with a few people. Sees Paul-2 first, sob of joy to see old friend, he's got a busty blonde future woman with him, Duxie, they're playing chess. Nearly a week has elapsed in La Hampa, it's June 10, Thursday on La Hampa. This place is the Paradisio level, one La Hampan level up the scale from Nanonesia.

Bela-2 is in his cabin playing music with a future Indian girl, Chockra, they're playing sitar and tabla. He comes out took, talking to his self is very pleasant. When Bela-2 and Paul-2 learn that Alma-2 died, Paul gets a little hostile. They also say Alma-1 isn't interested in them.

A bit down the beach are the "NSA agents" who are of the actual Stanford mathematicians Maria Reyes and Cal Kweskin, accompanied with their helicopter pilot Ricky Phillips, a black guy. Maria is hooked up with a black guy from the future called Erman, Cal is with Ricky, they're gay, and Alma is with Nordal from the future, an angular guy, very fit, always says "No" three times. "No, no, no." Super-annoying.

The futurians are from the 23<sup>rd</sup> century, they came as couples: Nordal + Duxie, Erman + Chockra. Chockra is a jealous of Alma. The Jimbos guided them here, they were curious to see the earliest Earthlings. They tell Bela just a bit about how things on Earth-2 worked out. The Heritagists lost. There have been a number of higher-up-the-hampascale hypertunnels made by beings from the futures Earth-2. (Not sure about from Earth-1). The futurians are airheads, sexual tourists, they call themselves hampa-roamers.

In order of appearance, we have: Bela, Paul-2 + Duxie, Bela-2 + Chockra, Erman + Maria, Cal + Rikky, Alma + Nordal.

Five couples and one odd man out, the odd man being our Bela. Eleven people, four of them from the future, five from Earth-1, two from Earth-2.

Each person's Jimbo is different in appearance. They fly around all the time and they can read you thoughts by flying through your head. Each Jimbo is symbiotic with one human. The Jimbos landed on Earth in 2200. They never say anything but Jimbo. Like those Pokemon things that only say their names.

Nordal is a dull, kind of a yuppie. His hair is like sprayed-on felt. He has a perfect build, as do Erman, Duxie, and Chockra. Alma is smarter than ever from eating nataraja, she's very powerful in hierophantics. Alma is still mad at Bela for wanting Cammy; and mad about Paul for trying to block her from making the jump. Bela-2 and Paul-2 don't care that much, they're interested in their girlfriends from the future, Chockra and Duxie, which Bela kind of envies. But, like it or not, he's still obsessed with Alma-1. And he tries to sweet-talk her and win her back over. It doesn't work. He sleeps with Chockra and the other Bela. He's starting to wonder if maybe he's gay.

*(June 11, Friday, La Hampa Time)* The next day they're having a swim in the ocean — Bela + Alma, Paul-2 + Duxie, Bela-2 + Chockra, Nordal + Maria, Erman + Rikky, and Cal + Cassie — they're paddling happily, six couples, twelve Jimbos hovering over them like dragonflies. Suddenly a whirlpool draws Bela and Alma down through the surface, they fall to the Nanonesia level of La Hampa. They're doomed to end up together.

The sun down there is almost out.

And now the jellyfish herself comes flying down over the ridge and swallows Bela and Alma, then flies up into the sky, ready to become a sun. They can't fight it. The jellyfish confirms that she wants to make them go back to an Earth, she has to in order to complete a meta-causality circuit, for Bela and Alma are the first two (still alive) to have made the trip to La Hampa. [And never mind the tag-along Stanford trio.] The Jimbos don't come along, the jellyfish kills them.

The jellyfish says there's no need to make wishes, she will find them the best Earth of all. A non-docile world. "Trust in God." It's the End Times, not for Earth, but for her. The jellyfish reaches apotheosis and becomes a sun. She vaporizes Bela and Alma and sends their minds across to blend into the minds of Bela-3 and Alma-3 on Earth-3.

Creating the final Omega Earth exhausts her; it requires more computation than usual, as she's making one of those rare  $P \neq NP$  non-docile or fierce worlds in which exponential searches can't be collapsed and predicting humans is impossible and reality is truly deeply chaotic and gnarly and class four.

#### *(7.4) Blending With Bela-3 and Alma-3*

*(June 6, Sunday, Earth-3)* Bela and Alma came back, as mind rays during the night, embedding into Bela-3 and Alma-3 as they sleep.

*(June 7, Monday, Earth-3)* Over breakfast, Alma-3 remembers her old self, she tells Bela-3. They're staying at Ma's looking for apartments. They're engaged.

At the same time, wow, all those old Bela-1 memories coming up in his Bela-3 mind.

Bela has a job starting at SJSU in the fall. Alma never left with Paul. Bela never started a band. Paul-3 is at Stanford. Cammy is in a band called Aternal. Bela and Alma go to see Aternal at the Bottom of the Hill Club in SF. They aren't that great. He talks to Cammy asks if he can join the band, they say no.

Bela remembers the Gobubble recipe, he tries to make one, he gets a sick-smelling long-lived iridescent bubble, but he doesn't have the operating system for it. There is no Van Veeter in this world to help, no Rumpelstiltskin, no Membrain.

Bela writes up the Morphic Classification Theorem from memory, as that's not what the Earth-3 Paul and Bela wrote their thesis on. He goes to see Paul at Stanford, Paul finds a big hole in the proof. Odd as it seems, different worlds can have different mathematics.

Really, *nothing* is a computation in this world, it's like every object has free will. Things have changed because our nataraja jellyfish made this world so fierce with the extra energy she got from turning into a sun. La Hampa is no longer accessible.

Bela now knows that he really is unpredictable. Somehow this galvanizes him. He doesn't have to stay in San Jose. He decides to move to Palau.

## Some Earlier Chapter Outlines

### *September, 2004, Short Chapter Outline*

(1.1) Our narrator Bela Kis is a U. C. Berkeley grad student in mathematics. He's relatively cool-looking for a mathematician; he surfs. He meets a cool woman named Alma Nguyen. She's political, she's a Rhetoric major. Bela finds her wonderful. They have a brief fling, but then Bela's fellow student Paul wins Alma away from Bela for a time. Paul is brilliant and geeky.

(1.2) Paul gets a good job teaching math and patents an all-purpose prediction algorithm based on his Morphic Classification Theorem. Bela has been forced to work for a computer company where some of his cousins work, he convinces the company to buy Paul's patent. Paul thinks now he'll get rich. Alma believes it and marries him. But in fact the company screws Paul, and Bela begins getting rich. He is dating a programmer woman called Geena Grover.

(1.3) Paul becomes the star of a reality show called "One in a Million" in which one person in the country is selected as being interesting. Some unflattering revelations about Paul appear on "One in a Million," such as his relations with the porno-reality star Cammy Vendt. Alma leaves Paul for Bela, displacing Geena in Bela's affections. The heartbroken Geena disappears, leaving no traces.

(2.1) Paul dreams up a scheme for altering reality to get Alma back. He plans to go with Bela into another world called Hampa from whence reality can be manipulated. That is, on the basis of his Morphic Classification theorem, Paul has been able to deduce (i) the existence of Hampa, (ii) the alterability of reality by tweaking a seed in Hampa, and (iii) the correct location and time for getting to Hampa by "surfing" a soliton spacetime singularity. To get to the other world, Paul will surf through a natural bridge at Pfeiffer Beach in Big Sur at a particular time. Since he can't really surf, he must take Bela with him. And despite Paul's wishes, Alma comes on the trip as well.

(2.2) They encounter interestingly diverse aliens in Hampa, mathematicians from all over the cosmos. Giant cockroaches. They find a "seed room" where Paul can alter the seed that generates spacetime. This means that when they return to normal spacetime, they're returning to the altered second world which is different from the one they started in. In this world Alma will still be with Paul. They plan to



shove aside their Earth-2 selves and settle in. But their reentry causes an explosion, and Paul and Bela find a dead Alma in this new world.

(2.3) The news is worse than that. The trip to this second world has aged Bela and Paul by fifteen years. The selves they replace were about forty years old. Bela finds himself in an unhappy contentious marriage with Geena Grover. Paul finds himself a widower, and in this world he never proved his big Morpnic Classification theorem. Bela figures out that the real Alma stayed behind in Hampa. There are real problems in this world. Someone murders Paul, and Bela's life is in danger. He returns to Hampa both to find Alma and to select a more congenial world. He realizes this may age him by yet another fifteen years, but the threat to his life is such that he has no choice.

(3.1) A trek across Hampa is required; on the way Bela encounters Bela-2 and Paul-2, the versions of their selves they ousted from that second world.

(3.2) Bela finds the same Alma who left world-one with him, they go to the seeding room, and select for yet another world, a third world. They manage to jump in there without Bela-2 or Paul-2 pushing in as well. They survive the jump but, yes, it ages them so that now they're both 55. They find themselves happily married in this world. Geena Grover seems to have committed suicide years ago in this world.

(3.3) But now Alma falls in love with Paul all over again, this Paul-3 being 55. Here too, the Morpnic Classification theorem was never proved. Paul's a rather unsuccessful mathematician teaching part-time at small schools. But Alma love him. Bela consoles himself by writing up the Morpnic Classification Theorem and publishing it. But then someone finds a big hole in the theorem; it was never completely true. He's sad, but then he ends up with Geena again. She's better than nothing. Yes, Geena-1 actually arrived in Earth-3 a week before Bela and Alma did. We learn that Geena did the first hampajump of all, and that this set up the whole sequence of events.

### ***October 28, 2004, Long Chapter Outline***

#### **Act I**

#### **Chapter One**

Open with Bela Kis having just found a big hole in his thesis. He keeps thinking he's proved a big result and having it be false.

Our narrator Bela Kis is from the Camden neighborhood of San Jose. He went to Leigh High School, and did his undergrad work at U. C. Santa Cruz. He's a quarter Chinese, three-quarters Hungarian, he dies his black hair blonde. He's studying in the math department at U. C. Berkeley, working on his Ph. D. thesis in universal dynamics for with Roland Haut as his thesis adviser. His thesis isn't going very well.

At Evans Hall, he runs into a woman Alma Nguyen from Santa Cruz, an undergrad at Berkeley, she's majoring in Rhetoric with a concentration in Public Discourse. She's at the math building asking about universal dynamics; she's working on a story about it in for the local e-zine, the Berkeley Buzz, which a friend of Alma named Leni Pex publishes. Alma wants to enhance the expose by filming some interviews, she's wearing viz glasses. She's taking courses in Advanced Argumentative Writing and Rhetorics of Sexual Exchange.

Brings her up to his office and shows her the universal dynamics lab. They glimpse Paul Bridge engrossed in conversation with Roland Haut; Paul is also a thesis student of Haut's. Haut had suggested two approaches to the Morpnic Classification

Theorem, and Bridge happened to pick the good approach. Haut doesn't like Bela anymore, he stinks of failure.

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The test-bed predictor is predicting good surf at Ocean Beach, it's a continuous-valued CA.

Bela and Alma go surfing at Ocean Beach. Alma wears an electric pink and green wetsuit that Bela remembers seeing off Steamer Lane in Cruz.

Afterwards Bela has coffee with Alma at that place on the Great Highway. He tells about his past a little bit. A reality show is playing on the TV at the coffee shop. Alma mentions her roommate Leni's dream of "One In A Million." U. S. is at war.

Bela brings Alma back to his room in Rochdale Apartments, hoping to "close the deal," but his roommate Paul Bridge is there, doing something weird and math-y. Bela and Paul are to some extent competing in trying to prove a big Morphic Classification Theorem, although it's pretty clear that Paul is way out ahead. Paul has made a model using Legos and spaghetti, talking about string theory and topology. He's a dweeby toad. Bela wants him out, but has a hard time getting him to leave, and then Alma leaves right after Paul leaves. Bela looks out the window and sees Paul and Alma walking together.

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Party scene at Leni Pex's, celebrating the new issue of the Berkeley Buzz. Leni is webcasting the party as a reality show. Leni herself doesn't appear in her shows, she's "gooned-out," that is, software replaces her by a Casper the Friendly Ghost kind of image called a goon. She needs anonymity as she plans to get into the biz of reality webcasting.

Leni interviews Paul and Bela about universal dynamics. Paul says he's close to proving the big Morphic Classification Theorem. He just needs a little push. He has a Mickey-Mouse predictor made of a kitchen breadboard with some springs. "Universality" means this can work.

Prediction: who will Alma leave the party with, Bela or Paul. It predicts Paul, but Bela notices Paul is cheating by pulling a spring, he objects, but Alma goes with Paul anyway. It's a turning point.

Bela tries to hit on Leni. "Duh? I'm gay."

## **Chapter Two**

Bela is home visiting his mother a few days (months?) later, his thesis isn't going well, the hole is unfixable, he has nothing at all, he's had another unpleasant scene with Roland Haut, which took place while Bela was trying to give a colloquium talk.

He's sitting in the restaurant kitchen eating stuff, he's discouraged about math, depressed, sits there talking to a Chinese cook and a Mexican vegetable chopper.

Bela's mother Xiao-Xiao is there too. She tells him to give up on math, to get a good job at a computer company called Rumpelstiltskin. Bela's mother's Chinese-Hungarian cousins founded it, a pair of brothers, Gyula and Géza Wong.

Bela gets a phone call from Paul. Paul has the big result. Bela can hear Alma in the background. He forms a sudden plan to go to Rumpelstiltskin and help make money off Paul's discovery. Says he'll commercialize it. Paul says fine, just make sure they buy the patent rights from him. He's already filed.

\*\*\*

Bela begins work at Rumpelstiltskin, they buy the rights to the Bridge's Morphic Classification Theorem. Initially it looks as if Paul is very successful and rich. Bela gets a stock option finder's fee from Rumpelstiltskin as well.

Bela begins dating a programmer girl called Geena Grover. Meanwhile he also moves into a warehouse in Alameda with Leni Pex. Leni is scoring with the Berkeley Buzz, and has been hired on to work for a new TV show called "One In A Million."

\*\*\*

Alma marries Paul. Bela is the best man and Leni is matron of honor. Leni is webcasting it, using viz glasses, the webcast is part of the "One In A Million" network.

The wedding is down by the San Francisco Bay in a park at Kirby Cove in the Marin Headlands. Bela has to remind Paul to take off his knapsack for the wedding. Paul has used his Morphic Classification Theorem to set the time and date so that there will be a rainbow. Amazing. It works.

Bela warns Paul about Rumpelstiltskin. He's found out that they screwed Paul in the contract. Bela himself has better stock options and feels a little guilty about it. But Paul isn't worried. He's gonna get a professorship at Stanford.

### **Chapter Three**

The "One in a Million" show picks up. Bela is eliminated, but Paul rises to the top. Bela is stiff, he can't forget himself. But Paul always forgets the camera is on. He's getting better at making predictions. We see the first glimpses of the cockroach aliens.

\*\*\*

Some unflattering revelations about Paul appear on "One in a Million." The revelations have to do first with Paul's dallying with "One in a Million" groupies, and the straw that breaks the camel's back is when he unwittingly appears on a pay-per-view webcast of sex with serial-reality-show star Cammy Vendt.

\*\*\*

And then it comes out that he was gypped by Rumpelstiltskin. Some kind of killer app has developed. Bela is well off, the Rumpelstiltskin stock is way up. Alma comes into Bela's arms, which breaks Geena's heart. She disappears, totally drops out of sight.

### **Act II**

#### **Chapter Four**

Paul is talking about altering reality. Paul has a secret scheme for altering reality to get Alma back and fix his Rumpelstiltskin deal. He plans to go with Bela through a gate to an underworld (that I'll call Hampa) to alter reality.

The gate is the arch at Pfeiffer Beach in Big Sur. Paul predicts the hampajump will be there. They're going to surf in through the arch at a particular time/date when the arch is a door. Paul's motives in bringing Bela are first of all because Bela can help Paul surf. Secondly, he wants to gloat to Bela and teach him a lesson, and thirdly he doesn't want to be all alone in the new universe. But Bela doesn't realize until he gets to Hampa the actual purpose of the trip.

\*\*\*

Paul definitely doesn't want Alma to come, but at the last minute she finds out his plan and tags along. She has a board, too. She's cuts in on them and in fact leads the way. they are not coming back into this spacetime and she loves at least one of them, to the extent that she loves anyone. She's not so cold-hearted after all.

## **Chapter Five**

They meet cockroach aliens in Hampa. Friendly, lively and talkative, like my Asian CS students.

\*\*\*

They glimpse Bela-3, who's going to land in Earth-2 after Bela enters and then exits it. They don't realize any of this, and aren't sure it's him, as this other Bela is 55.

\*\*\*

They find the seed room and change the seed from a pair of palm trees to a hunchbacked camel/giraffe. Paul does the tweak, Bela tries to butt in as well.

## **Chapter Six**

When they come back — to world two — Alma is lagging behind. Bela and Paul each shove aside their Earth-2 counterparts, making way for themselves.

There is a localized earthquake or explosion just then, as a result of the disruption, and the arch collapses, killing Alma-2. Paul thinks it is Alma-1, but Bela notices a slight difference on the corpse, a different tattoo, it is Alma-2 who died. Paul's so out of it that he doesn't precisely remember the tattoo. Bela is sure that Alma-1 is still in Hampa. Bela doesn't tell Paul. He secretly plans to go after her. Paul would like to leave this reality as well, but Bela talks him out of it.

Even more shocking, it turns out that they're all fifteen years older. Somehow they screwed up and jumped fifteen years into the future, and their bodies for some goddamn reason timebaked themselves to match. They're forty years old now.

\*\*\*

Back in town, it turns out that in this world, Bela was the winner of "One in a Million," not that it's widely remembered. Faint recognition at best. He's in a contentious marriage with Geena Grover.

In this world, Alma is married to Paul. Although married to Geena Grover, Bela is having an affair with aging Cammy Vendt, they hooked up at the "Ten in a Million Reunion" show five years ago. He has to watch archives of his reality show to figure out who he is. He digs Cammy, up to a point, but she's vain and boring. But Geena is very angry.

\*\*\*

The prediction technology has screwed things up. Soured by jealousy, Geena Grover has posted the secret Bridge-Rumpelstiltskin algorithms to, like, sourceforge, and everyone is using them. With everyone predicting everything, the Earth is dull and non-gnarly.

OR, maybe better, in this world the Morphic Classification theorem was never proved.

Someone murders Paul. And the murderer is after Bela as well. Maybe it Geena. He's got to run for his life. Although he hates to risk losing another fifteen years of his life, he's gotta jump again. He's running for his life. Also he can't stop thinking about Alma.

## **Act III**

### **Chapter Seven**

Bela finds the gate to Hampa at a rock concert at the Avalon Ballroom in San Francisco. He skateboards up a quarter pipe to get off it. It's pushing it for a forty-year-old to be doing this, but Bela goes for it. "Hampa!"

\*\*\*

This time Bela comes out very far from Alma, and has to make quite a journey, meeting many of the alien math cockroaches and sentient slimers from Dimension Z. (Our time direction is a space direction in Hampa.)

Another complication is that Bela encounters the forty-year-old Bela-2 whom he ousted from the second reality. They have a quarrel over which of them gets to go into Earth-3, but Bela wins. Bela also encounters Paul-2.

He doesn't burden Bela-2 and Paul-2 with knowledge of the timebake effect. He feels uneasy about the really old Bela-3 he saw the first time in Hampa.

### **Chapter Eight**

He finds Alma, and they tweak the camel/giraffe seed into a Dancing Shiva, then hampajump to Earth-3. Shit, they're all 55 here, what a bummer.

\*\*\*

There's a Paul-3 in this world three, not so successful. Bela is married to Alma but now Alma falls in love with Paul again. Maybe she tweaked it in Hampa so it would work out that way. It's a kind of Orpheus-Eurydice move for Bela.

Bela publishes the Morphic Classification Theorem, Bela gets credit for it. At least Bela has the theorem.

Geena seems to have killed herself years ago in this world.

### **Chapter Nine**

Now it turns out that the Kis Morphic Classification Theorem isn't true. Bela takes early retirement from his job. He wonders, though how he made the trips?

\*\*\*

Final twist: Geena-1 shows up, she hampajumped to Earth-3 a week before Bela and Alma. She told Bela-3 and Alma-3 how to leave, to get younger. Bela now realizes he was able to switch reality because he was pushed, and that there is a single cascade of his selves wrapping twice around hampatime and that there are in fact only three worlds. The Morphic Classification Theorem had nothing to do with it. But no further jumps are possible. There's only three worlds, and further jumps would violate the a priori fact that one can't have contradictions. He realizes now that Bela-2 got to go to Earth-1 and be 25 years old. Fuck. He's wasted his life. Mektoub. He settles down to enjoy his remaining years with Geena Grover.

### ***January 23, 2005, Short Chapter Outline***

(1) Our narrator Bela Kis is a U. C. Berkeley grad student in mathematics, close friends and roommate with fellow math student Paul Bridge. Bela is a Californian; he surfs and plays guitar; Paul, on the other hand, is a math geek from Kansas.

Bela and Paul are working in a field called *universal dynamics*, the study of how naturally occurring forms develop and evolve. They share the same thesis adviser, Professor Roland Haut. Professor Haut feels one can use diverse processes to emulate and predict each other: water splashes to predict flower blossom shapes, frost crystals to predict election results.

Bela and Paul prove a so-called *morphic classification theorem* to the effect that natural phenomena exhibit a surprisingly limited number of forms and behaviors, thus confirming Haut's expectations.

Meanwhile Bela falls in love with an attractive fellow student named Alma Ziff, who is a Rhetoric major and an amateur reporter for an experimental webchannel called *Buzz*, which is hosted by Alma's roommate Leni.

Roland Haut has used his studies in universal dynamics to create a secret prediction of a contested local election; Bela shows Alma the prediction; Alma webcasts it, the leak allows the more conservative candidate Van Veeter to win the election, and Haut is enraged.

Alma and Bela go surfing together, and Alma spends the night with him. In fact she moves in with Bela; her roommate Leni is evicting her so as to expand her webchannel. (We'll later learn that Van Veeter, who is a computer exec, paid Leni to hack into the machines at a local polling place and overload them so that they catch fire.)

To mollify Haut, Bela and Paul agree to let him be listed as a co-author of their ground-breaking paper on their morphic classification theorem. But Haut remains somewhat angry about the leak, and resents Bela the more because Bela has also proved a principle of *morphic uncertainty* that shows it will in fact be very hard to find any practical or commercial applications for the morphic classification theorem. The accuracy of Haut's election prediction was just a matter of luck.

(2) Bela and Paul finish their dissertations. Paul uses methedrine to help himself work faster, which Alma greatly disapproves of. Their advisor Roland Haut has black-balled Bela, and Bela has no hope of getting a job in academia. His near-term plan to move back home with his Chinese mother in San Jose and help in her restaurant. Paul, on the other hand, is getting a professorship at Stanford.

On graduation day, Paul, who's given up speed now, confesses to having fallen in love with Alma, and asks Alma to leave Bela and come with him. Alma seems to be giving the offer serious consideration.

The evening of their graduation party, the stressed-out Bela has a possibly hallucinatory encounter with a pair of cockroach-like aliens who beam a ray at him. For a short time his brain seems to be operating in a new fashion, carrying out what he terms a *denormalized* computation. It seems to Bela that any volume of matter, in this case his brain, can enter a singular state in which normal limitations are circumvented by carrying out a massively parallel computation in his head, a computation which bootstraps its own activity to unlimited levels in a finite amount of time, creating a kind of *local singularity*.

In his denormalized state, he plays feedback on his guitar and he is able to predict and even influence the motions of bits of dust with the music, driving the dust, and in fact making it stick to the wall in hieroglyphic patterns resembling mathematical symbolism. Still denormalized, he goes to a party hosted by Leni, the producer of that Buzz webchannel. He thinks he's playing the people's moods as he plays the guitar. Although maybe he's simply having a breakdown from overwork and anxiety about Alma.

He tells everyone about the aliens and denormalization, but only Paul takes him seriously. Leni is webcasting Bela's ranting in real time, and one of her backers (Van Veeter) sends in a message in that she should stay with this guy and, in other words, begin webcasting a realtime reality show of Bela's life. She gives Bela a camera to wear like a ring, and thus begins *Bela's Lifeblog*, that is, a video-based blog about Bela's life. The denormalized sensation is wearing off, and Bela is having trouble exactly recalling how it worked. And now he notices that Alma has left with Paul. He goes back to his room and sadly stares at the symbols on his wall, trying to understand them, no longer able to, but webcasting the images anyway.

(3) Bela is back in his normal state, and somewhat depressed to boot, living with his mother in San Jose. There's a steady trickle of interest in *Bela's Lifeblog*,

and Bela is paid an hourly wage depending on how many hits he gets. He adjusts his activities to increase his hits, he even has a visible meter he can watch, it's like the Earth is saying "hot" or "cold" according to what he does.

He ends up playing guitar in the parking-lot outside his mother's restaurant to draw in customers — and then a few people show up to join him, attracted by the lifeblog. Kind of a flash crowd. And he starts a band. His new drummer is a sexy woman named Cammy Vendt, who turns out to be a serial reality-show star, not averse to a porno performance now and then. She can't really play drums very well, she just has a drum-machine deck, but Bela writes an algorithm to help make Cammy's drum feed interestingly chaotic, and the algorithm catches on, greatly improving rave music. Cammy and Bela are kind of hitting it off. He keeps thinking he's too smart or classy for her, she'll suddenly do something smart or noble. But really he still wants Alma.

Meanwhile Paul has been overworking himself, trying to find a repeatable method to achieve Bela's denormalization in a reliable fashion. He's obsessed with deciphering the hieroglyphics that Bela embossed on his wall. Paul feels denormalization has to do with using quantum computation. And then he too has a vision of cockroach-like aliens, and he's able to produce a local singularity not in his own brain, but in an apple, which becomes a spacetime cusp that *dzeents* away, necking off into infinity right in the middle of the lab bench. While he's carrying out these experiments, Paul begins taking speed again, and Alma leaves Paul for Bela.

Bela welcomes Alma back. Cammy kills herself in Paul's laboratory.

(4) Paul studies his partial results and dreams up a scheme for altering reality to get Alma back. He tells Bela, though, that the task is to save Cammy's life. He plans to go with Bela into another world called La Hampa from whence reality can be manipulated. That is, on the basis of his work and his partial success with denormalization, Paul has been able to deduce (i) the existence of La Hampa, (ii) the alterability of reality by tweaking a seed in La Hampa, and (iii) the possibility of reaching La Hampa by "surfing" a denormalized zone of matter. To get to the other world, Paul will surf through a natural bridge at Pfeiffer Beach in Big Sur. He wants to be under the natural bridge so as to draw on all that mass of stone, and to damp the radiation with the water. Since he can't really surf, he must take Bela with him. He guilt-trips Bela into coming, saying he has a plan to prevent Cammy's death. And despite Paul's wishes, Alma comes on the trip as well. She too feels guilty about Cammy.

(5) They encounter interestingly diverse aliens in La Hampa, mathematicians from all over the cosmos. The same cockroach aliens whom Bela glimpsed before. The freely confess to having tweaked Bela and Paul to get them to come talk with them in La Hampa.

They find a "seed room" where they can alter the seed that generates spacetime. The seed is like a dancing Shiva. You dance with her and change the world. This means that when they return to normal spacetime, they're returning to an altered second world different from the one they started in. Paul picks a Earth in which he didn't forget Alma's birthday. A Earth in which Cammy is saved — Alma will remain with Paul. They plan to shove aside their Earth-2 selves and settle in. But their reentry causes an explosion, a kind of tidal wave of reality displacement, and Paul and Bela find a dead Alma in this new world.

In the moments when reality is displaced Bela sees another kind of alien, some beings like cone shells, with snouts reaching out to touch our world. Or maybe he sees the cone shells in the seed room.

(6) Bela figures out that the *real* Alma stayed behind in La Hampa. The body of the dead Alma in Earth-2 doesn't match the original Alma. Not really trusting Paul anymore, he keeps this to himself.

The jumps to La Hampa and back have aged them couple of years. In the second world, Paul is marketing denormalization-based prediction devices, independently of Van Veeter. I explore the effects of predictability on the world. Van Veeter has it in for Paul. Paul finds himself a widower, who is being stalked by Alma's vengeful brother, who's egged on by Van Veeter.

Bela has become a star of a new medium: the bloglet. People buy copies of his personality, he's like an electronic pet that lots of people have. A kind of pet rock star: a bloglet. In his Earth-2 life, he's in a somewhat contentious marriage with Cammy Vendt.

Alma's brother murders Paul, and it comes out that he was indeed put up to this by Van Veeter. Bela fingers the murderers and publicizes their identities via his bloglets. Then they come after him. Bela returns to La Hampa both to find Alma and to select a more congenial world. He expects to lose another couple years of his life to the hampajump process, but what can he do.

(7) This time Bela makes his hampajump via a door in rock concert venue in San Francisco. A trek across La Hampa is required; on the way Bela encounters Bela-2 and Paul-2, the versions of their selves they ousted from that second world. More adventures with the cone shells and cockroaches.

(8) Bela finds the same Alma who left world-one with him, they go to the seeding room, and dance with Shiva to tweak yet another world, a third world. They manage to jump in there without Bela-2 or Paul-2 pushing in as well. They survive the jump. Bela and Alma find themselves happily together in this world, and Cammy is still alive, but single, and Paul is single too.

(9) But now Alma falls in love with Paul all over again. Denormalization doesn't work at all in this world. And in this world, Paul and Bela never proved their theorem at all. Paul's a rather unsuccessful mathematician teaching part-time at small schools. But Alma loves him. Bela consoles himself by writing up the morphic classification theorem from memory and publishing it. But then someone finds a big hole in the theorem; it's not true at all in this world. Odd is it seems, different worlds can have different mathematics. They're stuck here for good. Bela ends up with Cammy Vendt again. He realizes she was the right one for him all along.

### ***May 13, 2005, Long Outline of Chaps 6-8***

#### *Old Chapter Six: What If Everything Were Predictable?*

##### *(6.1) Meeting God in the Nataraja jellyfish*

Bela has bad dreams. Like seeing things turn over in the fourth dimension. He dreams of the Hierophant teaching him. Endless regresses loop around. Perhaps hierophantics is taking hold. He sees the Tarot card woman lecturing him.

Snaps awake, thinking that hierophantics is to him as math is to a person who doesn't know math. There's a noise outside. Paul.

Paul comes in, says he's been puking, he wants to go see Jellyfish Lake now. Bela mentions hierophantics, Paul doesn't feel anything.



How does Paul convince Bela not to wait till daylight? Some paranoia trip about the aliens? Or --- maybe they DO wait till daylight? Why not, after all. The aliens won't prevent them from going to the Lake.

Paul tells Bela to ask the jellyfish to have him not be a meth-head. And he tells Bela not to bring Alma.

"It'll be easier to make the wishes if she doesn't butt in," says Paul.

Bela is dubious, wakes Alma up, has a nice conversation with her. Paul is outside, perhaps he is talking to Haut some more, faint noises.

As Bela and Alma talk, for the first time they discuss the fact that they'll have to shove aside their Earth-2 selves to settle in. They realize that's why Paul doesn't actually want Alma to make it back into Earth-2. Paul's hoping that if Paul-2 was off meth, Alma-2 may not have left him. But Alma doesn't want to stay in La Hampa.

Bela agrees to fix the Henry Nunez thing for Alma. Let her have options. Says he'll call her if the tunnel opens up.

A wild pig goes past, or something like a pig. Bela thinks he sees someone watching from behind a tree. Haut?

They go to Jellyfish Lake, which holds a million luminous jellyfish. "How do we know which one is ours?"

By the way, some of them are disappearing, due to the removal of the suns.

"I'll talk to you now," said your jellyfish rising up from the water.

Like the Lady in the Lake legend.

"Only to Bela. I am a gate designed for one seeker." S/he mentions Kafka's parable of the gate, "Before the Law." There can only be one wisher. Bela is the wisher.

You can half see the tendril which stretches down into an air bubble and through a natural bridge back to our world.

\*\*\*

Dealing with the nataraja is a bit like going into a king's court. Like in the Book of Revelations. A king/queen dancing. The sea like glass. Bow down before the throne. The king/queen's face is female on the front of her/is head, male on the back. Wise and kind. Uncountable fingers trailing off in a knotted skein towards the hypertunnel. What's his/er name? "God, call me God." You dance with God to tweak the world. White light. Could look like anything, chooses to look like a person. "Like your avatars, your prophets, your saviors."

God eats the energy of the universes. In a good way. She eats dark matter and shit energy and regular matter. Think of yin/yang, the dark and the light.

She tells Bela he's already begun to know the hierophantic language.

Bela wishes that he fucks Cammy after the concert. This means he'll still visit Paul and Veeter, but won't leave with Alma, he'll take Cammy home. This means that Veeter won't have the murder scandal, so he won't fire Bela and Paul, and the Gobrane will move forward.

I'm not sure how hierophantics fits in. Maybe Bela can use it to solve the codec problem in his own way for natural systems. So you can ask a tea cup about the stock market. There would still be the data issue, though.

Bela also wishes, as promised, that Paul can be free of his meth habit. He doesn't realize that this means that Paul won't finish his thesis. Another fallout from this wish is that Paul won't phone up Haut, and he won't learn about Haut's Paradox,

so the Earth-2 people won't have the tunnel to La Hampa, which is a reason why it'll be hard for Bela to get back.

And finally Bela also wishes for Alma to have her date with Henry Nunez.

Nataraja maybe wants something from Bela. But probably not. After all, what favor could a person do for God? If she wants Bela to do something, she's just setting it up.

(6.2) *To Earth-2. Dead Alma .*

After the tweak the nataraja makes them a tunnel on the spot.

Despite Paul's urging to forget it, Bela goes to find Alma, but she's gone from the cabin. He yells for her. And then someone starts shooting at him. Haut? He runs up the hill to get Paul, and Paul shoves him into the hypertunnel. The hypertunnel is like, a moving flaw in the ground, following Paul around.

The result of their wishes is that in Earth-2, Paul-2, Alma-2, Bela-2 and Cammy-2 are on a double date to Pfeiffer Beach. It's evening, and they're by a campfire. The girls go to piss by the cliff. Bela-1 and Paul-1 send a tunnel down to the spot; it vacuums up Paul-2 and Bela-2 and Bela-2 and Paul-1 replace them. There's an earthquake from the reality disturbance. A rock falls on Alma-2's head and kills her. The boys will need to ask Cammy what's been happening, she'll need to fill them in. She realizes something is amiss, maybe this alienates her from Bela. Bela, e.g. won't have any memories of how the fuck at Mom's house went down. Cammy: "You seem different."

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(6.3) *Cammy Goes to Paul.*

Back in town, Bela is still in a band with Cammy Vendt. The band's fame is growing fast. And Paul and Cammy have a relationship, but Cammy is annoyed that Bela is mooning over Alma now. More love stuff. And now in fact Cammy starts up an affair with Paul, who's making a great show of mourning for Alma.

Joe Doakes is dictator for life.

\*\*\*

The NSA guys crop up, still curious. What is their real goal?

\*\*\*

Use the band for something important in terms of the plot.

(6.4) *Hierophantics. Solution of the Bet.*

Bela uses the hierophantic approach he learned from the nataraja to make a paracomputer from water with a self-solving codec. No, Veeter already has the Gobrane working so this is nothing. My hierophantics is good for *evading* being predictable by the oracles.

Bela keeps trying to make a prediction about Cammy so he can get her back, but he keeps being wrong. Oskar the cockroach was right, people really aren't predictable. Rowena and Jewelle were wrong.

Some spoiled prediction by Bela makes him do something so annoying to Cammy that she can't stand him anymore. She fires him from the band.

Bela gets rich with his paracomputer. He doesn't plan to unleash it on the world after all, but Naz does.

Consequences of oracles: gambling, sports, relationships. Planning construction, like, if I put in this concrete footing will it make the road drain into my garage?

People begin carrying around vloglet models of each other.

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*(6.5) Paul is Murdered.*

Lots of people are making Haut Paradox tunnels. Haut-2 in this Earth is proud to take credit. Lots of cone shells coming in.

More and more people are disappearing into La Hampa. They don't come back, as if they do return, it's to a different world. Kind of religious frenzy.

Lots of cone shells are coming in and eating people. Also other kinds of beings.

Maybe the Republicans are going over there to harvest natarajas already. Bela has caused the problem that the La Hampans warned him about.

Paul disappears. It's supposed to look like he hampajumped or like a cone shell ate him, but Bela figures out that Pete murdered him. But it could also be Henry Nunez.

Bela is scared, also he has set his heart on Alma again. He decides to make another trip into La Hampa.

*Old Chapter Seven: War Against the Vandals*

*(7.1) Gate to La Hampa.*

Bela sets up a tunnel to La Hampa at a rock concert by his former band-mates at the Avalon Ballroom in San Francisco. Cammy looks great. But she still can't stand Bela. Bela skateboards up a quarter pipe to show off, and flies into La Hampa.

*(7.2) Journey Down La Hampan Scale Looking for Alma.*

Bela comes out much larger than the Alma they left behind a few months ago, for our time direction is the scale dimension in La Hampa.

There are some hostile manta-ray-like aliens.

They talk about how Rowena shrank the helicopter. Say that size is really a dimension, in fact size in La Hampa matches time on Earth.

He gets magic berries and shrinks down to the right size to find Alma. More about the ongoing conflicts/problems in La Hampa. The evil robot-like purushas at the larger scale. More and more natarajas are disappearing. Oskar the cockroaches thinks there's an ultimate nataraja that creates even La Hampa, and that if a Purusha eats that he'll become God.

*(7.3) Conversation with Our Nataraja. Fear of the Purushas.*

Bela finds the same Alma who left Earth-1 with him, she's gone native, looks like a Micronesian. She's with Roland Haut. He convinces her to return. They find an instance of our hyperverses' nataraja and go into the court. The nataraja says she's almost ready to turn into a sun. She's been energized by the many hypertunnels made by Earthlings. It's a natural phase; when some race in your hyperverses learns to tunnel, you can just about cap things off and become a sun.

Alma has become a staggering genius, thanks to having stayed in La Hampa so long. From eating so much nataraja, she's very powerful in hierophantics.

But our nataraja is anxious, as the purushas are eating the suns. And when a sun is eaten, every instance of that nataraja disappears including instances located anywhere on the size, space, scale, or hamptime axes.

They grow up and peek at the large scale depredations. And then they shrink back into the pond where their own nataraja lives.

Bela tweaks our world to bring Alma back, and Shiva adds a tweak to close off the tunnels. Haut-1 prefers to stay on in La Hampa. He will save Bela's ass at some point.

Maybe Alma still does a tweak to get Henry Nunez.

*(7.4) Problem with Bela-2.*

On the way back to the tunnel, a complication: Bela encounters the Bela-2 whom he ousted from the second reality. They have a quarrel over which of them will get to go into Earth-3, struggling right up to the last minute.

Bela and Alma jump into Earth-3; it's not clear if Bela-2 comes along.

### *Old Chapter Eight: My True Love*

#### *(8.1) In Earth-3 Alma Leaves Bela.*

Bela and Alma find themselves living together in this world. In this world, Paul and Bela never proved their theorem at all, the washer drop never happened, and Bela never started a band. This Earth is the final draft.

Alma is a genius mathematician, or could be. But she doesn't like the vibe. She becomes an abstract painter instead.

Bela is an indifferently successful mathematician teaching at San Francisco State. (Where I'm headed with this is that Earth-3 is the actual world we live in.) Paul has a good post-doc at UC Berkeley thanks to Haut.

Alma falls in love with this Paul. She doesn't like Henry Nunez after all, only Paul is smart enough for her.

#### *(8.2) Bela's Theorem No Longer True.*

Bela consoles himself by writing up the Morphic Classification Theorem from memory and publishing it. But Alma, Paul or the local Haut-3 finds a big hole in the theorem; it's not true at all in Earth-3. Odd as it seems, different worlds can have different mathematics. Really, *nothing* is a computation in this world, it's like every object has free will. Things have changed because our nataraja has turned into a sun. La Hampa is no longer accessible.

#### *(8.3) Bela-2 Turns Up*

Bela tries to look up Cammy. She's not that into him.

Bela-2 turns up on Bela's doorstep. (Transreally, it's my fictional character bothering me, shades of Frank Shook.) His existence in this world destabilizes things once again. Bela had a dream vision of the nataraja.

#### *(8.4) Last Battle. Bela Back To Cammy.*

One last hypertunnel opens up. The purushas are about to eat our nataraja-sun, and all of our hyperverses will never have existed. With a supreme effort, Cammy and the Belas exterminate the purushas, aided by Haut-1, who's still in La Hampa. Either Bela or Bela-2 dies heroically in the struggle, though it's a little hard for the surviving Bela to be sure which one he was. What's the difference, after all?

And now Bela ends up with Cammy Vendt for good. She was the right one for him all along.

Thanksgiving dinner with Alma and Paul. They've all found themselves.

## ***Characters***

### ***Two Guys and a Girl***

I'm thinking of the two-guys pair as being like Fletcher and Harry. The somewhat normal-looking smart guy and his dweeby genius friend.

The girl oscillates between liking one or the other. Her attraction to each is equal, thus we have an isosceles love triangle. If there were in fact more and more copies of my characters being split off, we'd end up with a Sierpinski love triangle.

## **Bela Kis**

Bela Kis is from the Camden neighborhood of San Jose, those flat, identical tract houses that cost \$700 K apiece. He went to Leigh High School, and did his undergrad work at U. C. Santa Cruz. He's a quarter Chinese, three-quarters Hungarian, he dyes his black hair blonde. He's studying in the math department at U. C. Berkeley, working on his Ph. D. thesis in universal dynamics for with Roland Haut as his thesis adviser. His thesis isn't going very well.

I see Bela as having a more surfer-like appearance than most math students. More of a golden boy. Like that gene guy Kary Mullins who invented the PCR reaction they used to map the genome. Surfer-like, but a rough gem, and fundamentally a mathematician and therefore fundamentally other-worldly. He has black hair, due to his Chinese blood from his mother's side, but he dyes it blonde. Only, being a mathematician, he doesn't dye it very systematically.

Use Eric Lyons's story about the salesman showing up with the klystron tube.

I just read that there are a lot of Chinese in Budapest now, for a time under the Communist regime there were no visa requirements, and quite a community grew up. Suppose Bela is a quarter Chinese. His cousins are gangsters, Gyúla and Géza Wong, they're children of his mother's brother, Zsoltán Wong. His father Tibor Kis was pure Hungarian. They live near San Jose in Camden. Tibor had a job as a mechanical engineer at Intel, but he got laid off and then he had a heart attack and died, he didn't have good health care. He was a tyrant. Bela's his Chinese mother Xiao-Xiao Kis runs a noodle shop in a strip mall on the Saratoga-Sunnyvale road.

Suppose Bela is dominated by emotion. Unlike my usual characters who are mostly thinking about ideas. Suppose Bela is always talking about his emotions and his feelings. This will make a good foil for the somewhat abstract ideas in the book.

He wants to get a Ph. D. in universal dynamics. Maybe Lie algebra. He loves waves. Hilbert's Nullstellensatz. Minimal surfaces and knot theory. His adviser Roland Haut had suggested two approaches to the morphic classification theorem, and Paul Bridge happened to pick the analytic approach, Bela the geometric. Haut doesn't like Bela anymore, he stinks of failure. Haut "fires" him, and even though he manages to publish a paper with Paul Bridge, and eventually gets a Ph. D., he can't get a teaching job, he's more or less black-balled. He starts teaching CS at community colleges.

Can't actually program worth shit, but ends up having to teach Java programming and maybe even \*ugh\* server-side programming. He's a freeway flyer. Computers annoy him, although his mother wants him to study that.

Drifts away from that into a job in industry at a company called Rumpelstiltskin.

What makes Bela a natural for vlogging is that he *always* forgets the camera is on.

## **Bela's Family Tree**

Xiao-Xiao and Zoltan Wong were born to a Chinese father and a Hungarian mother in Budapest.

The father had a first cousin named Shirley Woo in San Jose. Shirley and her husband Wah Woo raised Xiao-Xiao and Zoltan.

Tibor and Zsuzsa Kis were born to Hungarian parents in San Jose.

Tibor married Xiao-Xiao and Zoltan married Zsuzsa.

Tibor Kis + Xiao-Xiao had Margit Kis and Bela Kis.  
Zoltan Wong + Zsuzsa Kis had Gyula Wong.

Shirley has a granddaughter named Ling-Ling Woo.  
Mabel Wong is the wife of Wing Wang, deceased. Mabel is the sister of Wah Woo, the husband of Shirley Woo.  
Mabel and Wing had Jackie Wang.

### ***Paul Bridge***

Gosper. Wolfram. Me. Hellerstein. Hugh Woodin. Kurt Gödel.  
Paul is a geek, a Harry Gerber type. Harry Gonshor. John Myhill.  
Where's he from? Maybe Kansas.  
Alma sees him jacking off while viewing images on [www.cammyvendt.com](http://www.cammyvendt.com).  
And then Cammy shows up and he's filmed doing it with her.  
He hates the Copenhagen interpretation of quantum mechanics.  
He has a Ph. D. in Math, in algebraic geometry, but he's also into sheaf theory, operator theory, infinite dimensional analysis, non-commutative algebra, mathematical physics, string theory, and cellular automata.  
Gets a professorship at Stanford.

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"Hey, it's the crazy mathematician. Paul Bridge."

Possible responses: (a) "I'm not a mathematician, pinhead, I'm a digital philosopher." (b) "Mockery is the tribute mediocretinism pays to prolateness." (c) "That's what your wife said this afternoon — right before she sucked my dick."

### ***Alma Ziff***

She's an undergrad Rhetoric major at Berkeley. She's from Santa Cruz, where we bought the pumpkins two years ago, on Broadway off of Seabright (?) Road.

I like the last name Ziff because it's like Zipf as in Zipf's Law. We knew a Ziff family on Rudy Lane, growing up. Also this way we have A to Z in her initials. Kenny Turan new a girl named Phyllis Ziff, which made "syphilis" when called roll-call-style in reverse order, I don't think I'll use that. Call her parents Gary and Sarah.

Her brother is Phil? No, avoid the corny pun. Have him be Pete. He looks like Joey Ramone and has a friend called Jeffy's who's mean. Maybe they help Gary Ziff kill Paul in revenge for Alma-2's death.

She surfs, has an electric pink and green wetsuit. A board decorated by that S. C. artist Philips, with an Aztec idol on it.

Alma mentions a memory of Pete getting busted. The cherry ball flashing across the drapes. She watched from the hall. Have Pete be older. Sarah doesn't deal with the crisis, just says, "Okay kids," after Pete's taken away.

Alma isn't a totally nice or sincere person. She gets a kick out of jerking guys around. She's fickle. Still doing the high-school girl thing. A Circe who turns men into pigs. Opportunistic, out for the main chance. Think of the cute girl at the counter at the pizza parlor in Los Gatos, the boys flocking to her, her face so full of smiles and flirtation. But then she's yelling at the older Mexican guys making the

pizza, "You're ruining my life." The Mexican guys don't betray any emotion at this, by the way.

Of course Alma also has to have a human side, she needs to grow a heart, so that we care about her.

She's majoring in Rhetoric with a concentration in Public Discourse. She's taken courses in Advanced Argumentative Writing and Rhetorics of Sexual Exchange.

She has this belle quality, she always flirts heavily with men, and they all fall for her, but there's the one man she's loyal to at any given time, and this is Bela. Think of a Southern belle who's fundamentally insecure. Like the Jen character in *Spaceland*, not that Jen or Alma are Southern, but I know the Southern type from my upbringing in Kentucky. Come to think of it, Paul could comment on this.

### ***Leni Pex***

She helps skew the "One in a Million" show to help Paul and Bela. She's a lesbian, trim and pleasant. Plays a lot of tennis. Rooms with Bela for awhile.

She majored in Mass Communications with a minor in LGBT Studies (Lesbian, Gay, Bisexual and Transgender), also called simply Queer Studies.

I like that Pex is like Pecks, as in pecking away. Hungarian too? Pex could be related to Pécs, a town in Hungary.

### ***Cammy Vendt***

Maybe Cammy has a porn background and wants a new life with mathematician Bela. Like Marilyn Monroe hooking up with Arthur Miller.

The name has "came and went," and "vent" is of course a reference to bodily orifices, and "vend" is to sell. "Cammy" has a connection to "Pammy," as in Anderson.

I'm also thinking of that cute cellist, Madigan, who lived with the kids near Islais Creek. Frisky in her boots.

### ***Jutta Schreck***

I'll give her the laugh *tjachz, tjachz* attributed to Pig Bodine near the end of *Gravity's Rainbow* (p. 742.)

### ***Van Veeter***

### ***Roland Haut***

## ***Social Ideas***

## **Vlogging**

### ***Reality Show***

Bela stars on a reality show.

A “Crazy Mathematicians” show? That would be a cute self-referential notion, mirroring my book as a reality show inside the book, but maybe too precious by half. And, really, who would watch such a TV show.

Leni Pex is on the staff, she went to Berkeley too, a freshman when Paul and Bela were seniors, or perhaps a student in Bela’s Calculus class when he and Paul were in grad school.

What could be the reality show hook? Consider some examples. Paris Hilton in *The Simple Life*: looking down on common people and on socialites both. *Fear Factor*: seeing people suffer and degrade themselves, sadism. *Survivor*: watching a social microcosm, gossip. *The Bachelor*: social microcosm, sexual titillation. *The Apprentice*: money, sadism. *Do You Want To Be A Millionaire?* (in a way a quiz show is a reality show): money.

Suppose we have people competing to be interesting. One in a thousand (1 K) or maybe one in a million.

“1 K”. A thousand channels tracking a thousand people, and you tune in on the interesting one. How to select? You use reviews and reviewer ratings to self-organize a rating system. The one who is watched the most wins. They have rounds. I can see a thousand, visualize it as a square grid, start with  $32 \times 32$ , keep dividing the edge of the square by two, 256, 64, 16, 4, 1. Six rounds, keeping only a fourth from of the contestants from each round.

“One in a Million” is a nicer name for a show. And more wild as a concept. But hard to see how to manage it. So many contestants. Like one in every few hundred people in the country is a contestant. Maybe have a thousand local contests of a thousand people each, one contest in each tiny market in the U. S. Everyone spying on each other like mad, and loving it. It’s a huge complicated thing, but it’s feasible.

So we have six rounds in each of the thousand markets to get a thousand finalists. And then six national rounds of them. The process takes a year. Can I connect this to Paul’s consciousness-breakthrough technology?

It’s going to turn out that Leni Pex has rigged it so that Bela wins. He’s certainly a strong candidate in any case. But he wouldn’t have actually won the last round unless Leni had intervened with Trojan horse mail-engines. Maybe she hired the gangsters from Rumpelstiltskin to do it for her.

I don’t think I’ll actually have a contest, as what we’ll be doing will be very early on in the medium and more informal.

## **Vlog**

Vlog stands for video blog.

I see my character Bela as wearing a ring with a camera in it, and that’s how he gets famous. The win with putting the camera in a *ring* (as opposed to a brooch) is that then the users can see the lifeblogger. Just have a fisheye lens in there, and trust the blogware to run some Eric-Gullichsen-style anamorphic algorithm to flatten out the image or, better yet, to let the user put their virtual eye at the ring and look all over the place. (The anacam blogware routine was originally developed by pornographers, natch, and possibly Cammy Vendt had some experience with this.) Generally it’s wise to wear the blogging on the opposite hand from the hand that you use for the more intimate duties — *like wiping your butt or jerking off, hunh hunh hunh*. “Oh, hello there, Beavis.” Uneasy rests the hand that wears the blog-ring.



And now strum a classic SF god-chord: Bela's lifeblog wakes up and starts *doing* things. And now change fingering to bring out the natural follow-up chord: the lifeblog starts infecting people who then think that they're Bela.

"There's a roving troop of Chinese-Italian hawkers selling up-to-the-nanosecond toys around Milano. This woman had radio controlled robot cars that do flips and were covered with flashing lights. She explained the robot to me in Italian, which I don't know. Then one of her cohorts held a ball of flashing lights up to my face and Bela Kis's blogware entered my soul," reports Jane Q. User.

### **Hosting Costs**

I asked Rudy, Jr., this question:

In this novel I'm working on, a girl is running a web reality show, contestants are uploading movies to her server and viewers are downloading it.

What is the cost of running a thing like that in terms of paying for internet traffic.

Suppose that first there's a pilot project ten uploaders and a thousand viewers and then a big show with a thousand uploaders and a million viewers.

His answer:

Uploading is free, you only have to pay for downloading. In fact, if you get enough uploading, you can do peering deals with other companies and get FREE bandwidth. The whole Internet is an odd scam, where ISPs connect wires to one another, send traffic between each other for free, and then charge their customers!

Back to the question:

\$50/Mbps is the cost for downloads! MonkeyBrains would be charging her at least \$75/Mbps to pay for \*ahem\* the scam known as the Internet. That is MegaBitsPerSecond.

Note, I am doing 35Mbps...

So, let's say people are getting 128Kbps streams, and you have a million viewers per day.

The movie is 20 minutes long, the usage pattern is normal for East Coast to Pacific Coast time zones (note the lulls in the graph at the link above: that correlates with people sleeping)...

So, let's say the viewing is consistent over 20 hours and not being watched over 4 hours at night.

$(1M \text{ views} * 20 \text{ minutes} * 128 \text{ kbps})$  divided by 20 hours =  
2.133 Gbps (Giga Bits Per Second)

[ NB: Bits not Bytes are used to measure bandwidth. If you screw that up, your bill is 2^3 times bigger than you expect! ]

Let me revise the cost! At that volume, MonkeyBrains.net is proud to offer a high usage discount. You can get a 1 Gbps fiber drop for about \$10,000. ... you would need 3, so let's say bandwidth is \$30,000 /month.

You would need 40 servers to push that kind of bandwidth... that is how many you can fit in one rack with two 20 Amp circuits... Tack on \$2000 for hosting the machines. Each web server costs \$1000 to buy, if you need that number as well.

\$35,000 month to host, \$50,000 to set it all up.

### **Rumpelstiltskin**

The stunglasses company. A multinational company, Rumpelstilzchen AG.

They give Paul and Bela gold, but they want something from them.  
Or they're run by Hungarian-Chinese gangsters.

### ***Gödel's Constitutional Insight***

Mention the story about Kurt Gödel's belief that, under our constitution, the U.S. could become a dictatorship. He studies the constitution as only Gödel could study a logical system. Drives down to Trenton with Albert Einstein and Oskar Morgenstern, who are trying to distract him, Morgenstern driving, Einstein telling jokes, Gödel all worked up. They get there, the judge wants to rubber-stamp it, he's happy to be meeting Einstein, he says, to Gödel, "You've been a German citizen up to now." G interrupts him, "Excuse me sir, Austrian." "Anyhow, you were under the same wicked dictator! But fortunately a dictatorship is impossible in America." "On the contrary," interjected G, "I know exactly how that can happen here. Let me show you." All three joined forces to restrain G so as to turn to the routine examination.  
<http://www.csus.edu/indiv/m/mayesgr/einsteingodel.htm>

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The following is quoted from Hao Wang, *Reflections on Kurt Gödel*, p. 115f:  
<http://www.sm.luth.se/~torkel/eget/godel/constitution.html>

In connection with the interview for his US citizenship, he once told me that for this occasion he had studied how the Indians had come to America. Einstein and Oskar Morgenstern were his witnesses, and Morgenstern has told different people about aspects of the event. The following account is given by H-Zemanek and E. Köhler (see Zemanek's report, *Elektronische Rechenanlagen*, vol. 5, 1978, pp. 209-211). Even though the routine examination G was to take was an easy matter, G prepared seriously for it and studied the US Constitution carefully. On the day before the interview G told Morgenstern that he had discovered a logical-legal possibility of transforming the United States into a dictatorship. Morgenstern saw that the hypothetical possibility and its likely remedy involved a complex chain of reasoning and was clearly not suitable for consideration at the interview. He urged G to keep quiet about his discovery.

The next morning Morgenstern drove Einstein and G from Princeton to Trenton. Einstein was informed; on the way he told one tale after another, to divert G from his Constitution-theoretical explanations, apparently with success. At the office in Trenton, the official in charge was Judge Philip Forman, who had inducted Einstein in 1940 and struck up a friendship with him. He greeted them warmly and invited all three to attend the (normally private) examination of G.

The judge began, 'You have German citizenship up to now.' G interrupted him, 'Excuse me sir, Austrian.' 'Anyhow, the wicked dictator! but fortunately that is not possible in America.' 'On the contrary,' G interjected, 'I know how that can happen.' All three joined forces to restrain G so as to turn to the routine examination.

## **California Lotteries**

The Daily 3 is drawn twice a day, I think at noon and 7. You pick three numbers between 0 and 9, and the prize is pari-mutuel, it's the same old "numbers" of yore. Pays a few hundred bucks.

Daily Derby is drawn at 6:35. Pick 3 "horses," I'm not sure how many there are.

The Fantasy 5 is drawn at 7 PM every day. It's a pick 5, can pay up to \$200K.

## **Consciousness**

### ***The Sixties Redux***

I'd really like to bring back the spirit of the Sixties. To write something that would help make it possible for this to happen again. Whatever "it" was.

The feeling that the old society really didn't matter anymore. We're getting there these days. I think it was the Vietnam War that made it seem as if we really had nothing left to lose. They were shipping us off to be killed. Maybe I could have an ongoing Iraq-style war in the background of Crazy Mathematicians. That would give it some of that gravitas and grief. The heaviness of Nam.

LSD and grass had a lot to do with the Sixties, too. What if there were something that people could experience or see (rather than a drug they take) that would change how they perceive the world.

For me there *is*: cellular automata. I never got over seeing the CAM-6 at MIT in 1984. It changed me as profoundly as taking LSD. Most people don't get it, though. Suppose three-dimensional cellular automata did the trick. Holographic display is dull, let's suppose they're displayed by a kind of utility fog of colored gnats? We might even say we're looking at 3D cross-sections of 4D CAs, though not describe it that way. Suppose people started finally getting it, really understanding, e.g., Wolfram's *New Kind of Science* (NKS).

How the city opened up. The Haight, Carnaby Street, the Village, even Suydam Street in New Brunswick. "Psychedelic dungeons growing up on every street," as Zappa sang, "Come to San Fra-han-cis-co-ohhh-o!" In his intro to *Dhalgren*, Gibson speaks of the Sixties as a city that was extended all over the world, and sometimes you were in it, and sometimes you weren't.

...a city came to be in America ... This city had no specific locale, and its internal geography was mainly fluid. Its inhabitants nonetheless knew, at any given instant, whether they were in the city or in America. The city was largely invisible to America. ... There may have been those who wished to enter the city ... but who found themselves baffled, and turned back. Many others ... rounded a corner one day and found it spread before them, a territory of inexpressible possibilities, a place remembered from no dream at all. ... Down one half-familiar street, and then another, and perhaps we came to a park.

It proved to be possible to die in the city ... Many survived there, but did not return. ... But for those who remained, something else gradually happened: the membrane eroded, America and the city seeping into one another...

I've always longed so much to go back there, and instead of doing a nostalgia time-travel trip back to the Sixties, I can instead recreate it in the near future.

### ***Consciousness Transformation***

I'm looking for some means of consciousness transformation.

Show three-dimensional CA patterns, and people can't get enough of watching them. They're changing lives.

*Demo.* Have a name for the demo. Spot Stops. Cowness of Cow. Tuckahoe Drawbridge. Meat Cartoonery. Blossoming Airtime. Fast Coral. Zombie Loplop. Sherlock Dinobone.

The demo is a little like the eponymous movie in *Infinite Jest*, but in a good way, not a bad way. You see it and it changes your life. Maybe you get hung up on seeing it over and over. Or maybe you just see it once and you're different for good.

A demo is better than a movie, anyway. It's not always the same. It's a four-dimensional cellular automaton, is all.

*Stunglasses.* Make you feel real wiggly. Flicker induces liminal states.

*Drug.* Really the best is a drug. A drug is cheap and easy to take. Even dummies could take LSD. No preparation required. That's what people actually want to read about. I can't be so prissy and puritanical about it. Hell, I used to worship drugs.

On the other hand, I really do like the idea of finding new, clean ways to get the high.

### ***A New Drug***

To make it new, give the drug some odd effect. Maybe its like a virus that chelates metals into your brain stem so that you can pick up mental signals. Telepathine.

Conotoxins would be very good for a new drug.

Or something that has a quantum-computational effect, like dreak in *Wetware*.

## **Miscellaneous**

### ***Institutionalization For Mental Problems***

Link for [5150 info](http://www.leginfo.ca.gov/cgi-bin/displaycode?section=wic&group=05001-06000&file=5150-5157) <http://www.leginfo.ca.gov/cgi-bin/displaycode?section=wic&group=05001-06000&file=5150-5157>  
72 hours, but Sat and Sun don't have to be counted.

## **Slang**

Rudy's girlfriend Penny teaches at a high-school in Oakland, and on Father's Day, June 19, 2005, she told me some of the slang her kids use.

*Bud* as a generic second-person name instead of dog, dude, or man.

*Hella* is the standard intensifier, or *hecka* if they're not allowed to curse.

*Bootsy* or boosy is bad. "That's hecka bootsy you giving us so much homework, you feel me?"

"*You feel me*" replaces "you understand" or "know what I'm sayin".

*Hoochie* is trashily sexy. "She's a hoochie mama."

## *Science Ideas*

### **Reality Hacking**

#### *A Hypertime Stack of Spacetimes*

I want many universes so that Paul can accidentally remove Alma from reality and then Bela and Paul can try and restore her. I'm going to use the early *Mondo 2000* phrase "reality hacker" to describe beings who tweak the universe.

[An original title of the *Mondo 2000* magazine was in fact *Reality Hackers*; it's possible that I myself suggested this title to Queen Mu and R. U. Sirius — hard to be sure back in that hamptime fog.]

Whenever you have reality hackers who can change the universe, you have to have some kind of multiple universe model. Why?

The grandfather paradox is an *a priori* argument, not a paradox. If I change the universe so that I'm never born, then reality alters and I disappear (either I disappear right away, or when I try to return to the normal universe). That's only a contradiction if I insist that the before and after are one and the same universe. Rather than accepting a contradiction, we conclude that there must in fact be two realities. Since we can talk about them both, they coexist at some level, separated by some higher dimension.

If universe A is transformed into universe B the dimension separating the two must lie outside of A or B.

The name of this dimension? I think of it as timelike, in the sense of having a direction: "First A, then B." So I'll give it a timelike name. Metatime, transtime, hypertime, supertime, pigtime, dreamtime, othertime, pseudotime, paratime. I like dreamtime, which has the resonance with the Australian Aboriginal myths of a dreamtime that came before the history of the world. Or, no, since I plan to call my underworld La Hampa, I'll call it hamptime.

Note that I *don't* want to have a multiverse in the "all possible universes" sense of quantum mechanics. Paul DiFilippo's *Fuzzy Dice* grappled with the multiverse, and did as well as is possible. But I'd rather avoid this route. Multiverses feel 1970s to me; that old Everett-Wheeler thing. As a practical matter, they're hard to shape into a plot, for if everything is possible, nothing matters. Subtextually, the many universes are a symbol of the writer's freedom to create any world, so if you set your book in a multiverse, you give the impression of not being able to make up your mind. [Later I started to think maybe the multiverse is simpler and thus better. Occam's Razor.]

So, yes, I need to have multiple universes for my story, but not *all possible universes*. [Oh, why not.]

My character Paul Bridge has a personal animus against the multiverse, by the way. He intensely believes in one reality, and despises quantum mechanics.

With hypertime, I have a stack of spacetimes, a limited style of multiverse. I'll assume, that you can't go backwards in hypertime: there's no "Undo" control. If you hack reality and don't like what you get, you can hack some more, but there are no accessible Akahasic records (if you will) of the former realities.

For each  $t$  in hypertime, we have a spacetime,  $U(t)$ . The  $U(t)$  might be like successive drafts of a novel. Getting better and better. The Hegelian notion of

history. The universal mind perfecting itself. Shiva's dance becoming ever lovelier.  $U(t)$  can engender a later  $U(t^*)$  in the sense that some reality hacker from the  $U(t)$  universe makes an alteration, changing the universe to  $U(t^*)$ . And then presumably the reality hacker continues life in  $U(t^*)$ .

I think of the stack as being like a can of Pringle's potato chips with the chip shape on the bottom differing from the shape on top. Suppose, e.g. that the chip on the bottom is a standard hyperbolic paraboloid saddle with two dents, but that the chip on top is a so-called monkey saddle, with three dents (one for the monkey's tail.)

*Why* must the universes fall into a linear hypertime order? Particularly if lots of reality hackers are active. We enforce a linear time order by having but one locus where the reality hacking takes place. A tweakable seed. I don't want to deal with branching time as that leads to the so-what-everything's-possible multiverse.

I'm going to think of this seed as being in some kind of underworld. It's in, like, a boiler room in some cosmic basement. In, like, the innermost circle of the underworld. A reality hacker goes to the underworld, tweaks the seed, returns to a normal spacetime.

I might as well mention now that I'm going to call the underworld Hampa, and I'm going to refer to its time axis as hampatime. Hampatime is the same as the hypertime I've just been discussing.

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I'd like a word for a stack of spacetime sheets. It's not a multiverse, as a multiverse is used, at least by physicist and science writer David Deutsch, to represent a principle of plenitude situation, with every possible universe. Metaverse was used by the bullshitting prick Stephenson. Laminaverse. History. Metahistory. A spacetime sheet is like a page in a book, or, better, like a draft of a novel. Revision History.

Hyperverse. uni-verse. verse means turn? Polyverse. A segment. Let's just say hyperverse for now.

### ***Digital Hampatime?***

It would be dramatic to have hampatime be digital at a coarse and noticeable scale. It may well be that our native time is digital, but the ticks are so small we really can't notice this. But it would be cool to have hampa time move in ticks of, say one second. So you see your hand moving in jumps, as if in a strobe light. And you can in fact move your hands through each other, provided their motion gaps match.

Each tick of hampatime brings a new spacetime potato chip.

Very stony in Hampa.

### ***Growing Spacetime From a Seed***

In *The Lifebox, the Seashell and the Soul* I talked about a model for a digital CA-like universe. My notion was inspired by John Kramer's transactional interpretation of quantum mechanics.

We suppose the evolution of our universe is controlled by a reversible CA called, say, Sherlock, and suppose that time is discrete. Reversibility means that given two successive frames Now and Then, we can compute the entire past and future.

After Now = Sherlock(Now) - Then

BeforeThen = Sherlock (Then) - Now

To further collapse the information, we suppose that the Now/Then pair can be grown from a Seed using a not-necessarily-reversible CA called, let us say, DinoBone. The action of DinoBone on the seed is cognate to the process by which paleontologists build up a velociraptor from a claw — thus the name.

Now try and visualize this clearly for our three-dimensional space. What is the seed like? What is the action of DinoBone like?

For the seed, set up two small frame patterns, with a view to growing them out to fill all of space to get a full Now/Then pair. I think of the following four examples of seeds.

(1) When Izzy and Rudy used to play Nintendo Mario, in between the levels they'd see a map with palm trees gaily dancing in a two frame animation, with peppy music. So Nintendo Palms could be a first notion of a seed. Cheerful, peppy, pixelized pair of dancing images.

(2) In terms of two small space patterns as a pair of computer images, I also think of a less wholesome model for a seed. To wit, an animated gif image on a porno site: a woman doing something sexual. In/Out/In/Out/In/Out. That is, I can think of, harrumph, a Blowjob Girl seed. Possibly I must needs use a euphemism for this. Sex Yum? I think that's worse. [I never want to sound like John Barth, who in one of his later books has a woman character repeatedly say, "I'm lushing," to mean her vagina is getting wet, and it comes off so senile and doddering and slimy. More often than not, a writer's Yum is the reader's Yuk. People's erotic tastes are incredibly narrow and specialized.] Oh, I know, I'll say *Porn Star* instead of Blowjob Girl. And, hubba hey now, I could have the Porn Star actually be a character who turns up. Cammy Vendt. And model the seed on Cammy. I am having fun yet.

(3) As a third option for visualizing the seed, use one of the cute animal-cracker shapes that appear in the spacetime pictures of the 1D CA rule 45. They look like giraffes, elephants, camels. Imagine them as bumpy and knobby in 3D. And now let's call my seed a *Knobby Giraffe*. It has a faint echo of the erotic, since "knob job" refers, in low circles, to a canonical oral-genital act.

(4) As a fourth option, think of a many-armed *Dancing Shiva*, and the universe flowing out of her dance. Spacetime trails from Shiva like a veil waving from her arms. Dancing Shiva is vogueing — that old dance style of moving jerkily.

Maybe I should allow all four kinds of seeds, the Nintendo Palms, the Porn Star, the Knobby Giraffe, and the Dancing Shiva. Maybe different reality hackers use different ways of visualizing the seeds. Maybe Paul speaks of Porn Star, Bela of Knobby Giraffe, Alma of Nintendo Palms, and the reality looks most of all like Dancing Shiva.

Paul uses the Porn Star seed example to explain how the DinoBone function would expand a seed into a full spacelike Now/Then pair. The reality hacker builds up the bedroom around Porn Star's lipsticked mouth sucking a rather odd-shaped penis (a knobby giraffe!), he imagines her body, her bed, her carpeting, her house, her suburb, her county, her state, her country, her world, the solar system, the galaxy. All of it dancing Then/Now/Then/Now...

Each successive pair engenders a distinct spacetime.

As you're growing the Porn Star into a now/then cosmos, if you see anything you don't like, you go back and adjust her a bit. More lipstick. Move a strand of hair. Mouth open wider. "Say aah." Tweakity-tweak until you get a nice two-frame animation of what looks like a reasonable universe. Then *ker-whump*, you apply Sherlock and get the past and future.

	/ Future	
Knobby Giraffe ----->	Now/Then <	
	\ Past	
<i>DinoBone</i>		<i>Sherlock</i>

Summarizing:

(a) Start with a small Now/Then Seed that I call a Knobby Giraffe. This will be my default name for the seed. Note that K. G. are the initials of Kurt Gödel! Whoah.

(b) Grow the Knobby Giraffe out to a pair of spacelike slices, called Now/Then. Use a (possibly) irreversible CA called DinoBone to grow the slices; DinoBone is perhaps as arbitrary as the Knobby Giraffe. So Now/Then = DinoBone(Knobby Giraffe, time), for a large step-count time.

(c) Apply Sherlock forwards and backwards to the Now/Then and get the entire past and future.

Think of this as “reality hacking.”

A better way to think of the hacking process might simply be that you dance with Shiva, ride the flexing Knobby Giraffe, shake the Nintendo Palms, or fuck the Porn Star. The reality hacker vogues with Shiva and tries to exit the Hampa Portal while the spacetime potato chip is flexed the desired way.

Maybe there isn't a *ker-whump*. Maybe, as the hampatime lapses, you're continually passing on to new spacetimes. *You* aren't applying Sherlock or DinoBone to the seed. That happens on its own.

As the hypertime elapses, it may be that your chances of getting home to an inhabitable — let alone familiar — universe grow ever slimmer, indeed at some point there's no longer any hope of making it back out at all.

What you just did with the Porn Star, how you just danced with Shiva — it changed everything forever and there's no going back.

### ***Where is the Seed?***

I see two options. (1) The seed — call it a Knobby Giraffe — is in some sense *inside* our normal space, or (2) it lies *outside* spacetime in a hyperspace.

Before considering the two cases, let me specify a desideratum: one must be able to hack reality starting from anywhere in space or time, as we don't want to leave any Galaxy Z cockroach and cone shell mathematicians out of the loop. The Knobby Giraffe is accessible everywhen and everywhere, if only you can find your way to it. And the tweaking changes all of space and all of time, including you.

#### *1. Knobby Giraffe Inside Spacetime.*

Here a spacetime globally affects itself. Imagine a person reaching an arm out of reality, fumbling around and finding the seed, tweaking it, and having the whole reality become different. A slightly different rendering of the same image: spacetime bulges up, a tentacle forms, branches, becomes a pair of scissors, snips out a bit of spacetime, flips it over, glues it back and a change propagates instantaneously out of this.

Suppose the seed is actually inside space, perhaps a physical component of, say, every atom. If we could tweak the seed in *any* frame of reference, we have a contradiction resulting from the relativity of simultaneity. For if A and B are moving rapidly away from each other, then we can have an event ATweak and BTweak such



that (i) A believes BTweak to be in A's past, so that ATweak should override BTweak, and (ii) B believes ATweak to be in B's past, so that BTweak should trump ATweak. So does the common future of the two look like ATweak or BTweak? There's no way to reconcile this.

The contradiction is, once again, an a priori proof that either (1a) there is a standard "absolute" frame of reference you have to be in harmony with before accessing the seed, or (1b) the seed isn't inside spacetime after all. Resolution (1a) wouldn't be practical, as you'd have to, e.g., speed up to 0.9 the speed of light in a certain direction before being able to drop through the "grating" of the absolute-rest time-lines to get at the Knobby Giraffe.

Instead I'll go for the resolution (1b) of putting the K. G. outside of spacetime, which is just our option (2). And we'll assume here that when you stem off into the underworld of the K. G., you'll automatically adopt a standard velocity.

## *2. Knobby Giraffe Outside Spacetime.*

Knobby Giraffe floats in a higher dimensional space like an astronaut connected by an umbilical cord (or by invisible entanglements like a cone shell proboscis) to the parachute of spacetime above/beside/vout from it, and tweaking the K. G. changes the spacetime, it's like using a keyboard to change a display.

Here we have the person descend to an underworld, a kind of hell or Hades — we're calling it Hampa — and stay there doing things as hampatime elapses, tweaking the Knobby Giraffe, then return to the altered reality. You changed the new reality but you bring your old body and memories with you, as I'll discuss in a later subsection.

In Hampa the K. G. dances like Shiva. The cockroach and cone shell mathematicians from Galaxy Z are there as well. And perhaps later they come into our world to appear in a faculty lounge, in traffic, at a punk rock concert, in a corporate conference room. They tweak reality so as to "invade Earth."

So as to have ubiquitous access to the K. G, we will have Doors to Hampa everywhere. Have the single Hampa locale where you go to stand on line and await your audience with dancing Shiva, a.k.a. the Knobby Giraffe, a.k.a. the Porn Star, a.k.a. the Nintendo Palms. Due to the waiting-line, there's no ambiguity in the ATweak vs. BTweak time order.

I'm seeing the reality hackers standing on line to get at the Knobby Giraffe. Sailors buying tickets to dance with Shiva. What a trippy DMT vision, to see the Giraffe bucking, and the whole of spacetime flexing like a Pringle's potato chip.

Deadhead spinners, dancing the universe into a new shape.

Anyone can change reality at any time, but only if they find a door to the place where the seed lives. It's that one scene you gotta go to.

I have the Sixties theme in mind, and I'm visualizing being hip in San Francisco and going to see Dancing Shiva at the Avalon Ballroom, one of the doors is around there, it could be a 4D CA light-show, or it could be a graffiti-covered metal panel in the base of the building. [Like earlier this year when I went with Penny and Rudy to the Avalon Ballroom thirty-five years too late, but got there anyway, saw the punk band NOFX and smoked so many cigarettes to look cool that I was coughing and feverish for six weeks which pushed me over the edge into retirement.]

### ***The Phenomenology of Reality Hacking.***

[January 24, 2005. ]

Initially I was talking about it in terms of altering the seed (dancing with Shiva) and then letting the Sherlock  $\lceil$  DinoBone computation generate an altered spacetime.

But it would be more visual if beings could alter the spacetime directly. What I have in mind is that, from the hampatime standpoint, you reach down, touch the spacetime surface like a finger dipping into a pond. The surface couples to your finger, and as you wriggle it, the whole surface deforms and alters, seemingly instantaneously in hampatime. And when you like what you see, you remove your finger. And then perhaps you try and jump into the new world you made.

A problem here is that once you've got the world fixed the way you like, when you jump in, you again make a change in it by putting your timeline flat down into the spacetime. Cannonball! Also (and probably not as big an issue), it will be that before you manage to jump in, some hampatime has elapsed and the cosmos will have evolved a bit further, so you end up in not quite the exact spacetime you targeted.

The cannonball effect will be what leads to Alma2 on the beach unexpectedly dead, slain by the reality tidal wave of the boys cannonballing back into spacetime.

How does it feel, phenomenologically speaking, for a person to be in a spacetime where a La Hampan is tweaking it? If we suppose that the tweak process has some hampatime duration, then you might be in any stage of the tweak-sequence of worlds. Think of a series of veneer slices taken from a piece of lumber containing a knot. But let's limit our focus to one particular world.

When you see the intervention it has already cascaded its effects through the past and the future, so that it has an inevitable feel.

Can the intervention be animated in your time? That is, can you see the twiddling aliens talking, can you see the cone shell siphon waving? Well, I see no reason why the tweak intervention can't be a spacetime patch.

Indeed, it can even be that the tweak involves "jumping vinnto" the spacetime, doing something, and then "jumping vout." When you jump vout, you're no longer present in the spacetime, do the effects of your intervention go away as more hampatime elapses? My sense is that the changes will persist. For there is a continuity among the spacetime slices, so even if you remove the splinter of you from one spacetime, the scar of the splinter will still be in the following spacetimes.

If we were doing the tweak simply by changing the Dancing Shiva/Knobby Giraffe seed, then the persistence of changes over hampatime would be clear.

If we want to have both Dancing Shiva and the reaching-in methods, we would need to suppose that there is a back-reaction so that tweaking the spacetime causes the seed to match it. So I would want the compound function Sherlock  $\lceil$  DinoBone to be reversible. I already expected Sherlock to be reversible, so now I'd require that DinoBone be reversible as well.

One reason I might prefer for DinoBone *not* to be reversible is that I'd like to have a rather small and simple seed producing a rather large and complex pair of spacelike spacetime slices that can be fed to Sherlock to produce the entire spacetime. Usually in reversible CAs you don't see growth? Well, maybe sometimes you do. I could sweep this one under the rug, I think, if I really need reversibility for the back-reaction.

Writing this stuff up I sometimes imagine that I'm doing "real science." I mean, looking at Newton and Leibniz's letters, things are very idiosyncratic and cruffy, too. My one constraint is, once again, a priori logic.

Back to the task at hand. For novelistic reasons, I'd like it to be that a cockroach or cone shell in La Hampa might alter our spacetime by appearing and saying or doing something.

Like the cockroaches pop up in Bela's room and fuck around until they see the effect of him and Paul hampajumping into La Hampa six months later. They screw around till they say just the right thing.

From Bela's single spacetime point of view, assuming we're narrating the world where he *does* hampajump, he just sees the one appearance that really works.

Later, when the shoe is on the other foot (foo is on the other shoet), we'll have the boys in La Hampa wanting to change our world. And possibly they can do this by jumping in without bumping anyone, which would more exciting than "dancing with Shiva." Dancing with Shiva could *lead* to that, e.g. Paul's phenomenological experience of dancing with Shiva might be, e.g. that he goes into his lab and throws out his meth stash so that he doesn't alienate Alma. Shades of Heinlein's great *The Door Into Summer*.

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I'm allowing Dancing Shiva cosmic creation and what we might call cowboy universe alteration. Cowboy interventions back propagate to Shiva. If she gets pissed off maybe she kills the cowboy. This would be a good scene. The sharif comes a-gunnin' for *conus magnus*.

### ***Aliens in the Mirrors***

In Act I, largely for artistic reasons and a sense of what's cool and spooky, I'm having the aliens only be visible in mirrors, and only affecting the world by altering people's minds. In Act II, I want them firmly in the world, with e. g. the cone shell buried in the back yard of the Ziff's back yard, coming out to eat parrot head dad Gary Ziff, sloppy mother Sarah Ziff, and/or scary stoner/surfer/biker brother Pete Ziff.

I'd like to patch up some scientific story about why the aliens would first only appear in virtual mirrored form and then be able to come in bodily.

Let's say the mirror thing has to do with being in some sense ninety degrees out of quantum phase. I'm thinking of an orthogonal wave function. And we'll suppose that a mirror reflection rotates a quantum wave's phase by ninety degrees, which is in fact true for a photon.

And the transition happens because when the boys hampajump to La Hampa they create a kind of bridge.

### ***Tweak Site***

Suppose that reality is hacked by dipping into spacetime. Then it would make sense for the dipping to be in the vicinity of some crucial scene. E.g. the crucifixion, the Kennedy assassination, or the twin towers on 9/11.

Would be good to do a Rashomon kind of thing, have one particular scene that they go back to and tweak twice. Maybe they even end up "being" the cone shell.

## La Hampa And The Many Earths

### *The Underworld*

I need a nice name and an image for the level or place where the reality hackers can tweak the Knobby Giraffe, Nintendo Palm, Porn Star, or Dancing Shiva and change the universe.

I think of it as an underworld. A clear word with interesting associations, especially since I have Orpheus and Eurydice in mind, also Persephone and Pluto, also Rumpelstiltskin.

I think of the underworld as the region beneath the manhole that was at the end of *White Light*. The projection room in *Frek and the Elixir*. Behind the scenes. The cosmic “zeptocode” — cf. the microcode level on computer chips.

I also think of the subfab at Intel, the amazing clean basement of monster machines powering the fab space upstairs.

What if I call it Hell? More colorful, although I’m not sure I want the baggage of devils and damned souls. Always nice to do the Bosch and Bruegel thing, although I have done this already in *Sex Sphere* and in *Frek*. Originally, I had in mind something more like the mythical Hades. Would give it a more neutral name initially. Even if this place is in some ways like traditional Hell, I’d like this fact to be a revelation that occurs later in the book, so I wouldn’t want to telegraph the punch.

The damned souls might be reality hackers who screwed up, got eliminated from their spacetime and can’t go back. I don’t think dead people would go here, though maybe they would. Maybe the cosmos is like a bag-lady who won’t throw anything away, and any person’s memories are information that’s possibly of value. Any dog’s memories, too, any flower’s memories. You can only leave the underEarth if there’s a world you can fit into.

And the devils? That creature Zed in the Exaplex in *Frek* was a devil, though I didn’t exactly think of it that way at the time. For that matter, the Dronners and Kluppers of *Spaceland* were like devils in the Bosch sense of weird beings in the underworld. There might be some such forces in the underworld. Something higher-order than the alien cockroach mathematicians from *Galaxy Z* who are, after all, just fellow reality hackers.

Now what about the name of the place. I’m having a hard time with this.

*The underEarth is*, I think, too long. *Hell* is nice but not a good idea, as discussed above. Maybe something heavenly? *Walhalla*. God’s office. *Godden*. *Eden*.

*Subdimension* is a classic SF word. *Subreality*, a nice play on surreal.

*Subdee*. *Submundo*, see below. *Subfab*. *Preterra*. *Pretera*.

*The Machine Level*. *Codeland*.

Or something fantasy-like. *Ylem* was Aristotle’s word for primordial matter. Bruegel painted a place called, variously, Schlaraffenland, Luilekkerland, or the Land of *Cockaigne*. That’s too much like the boring drug name. *Shambhala*, Shangri-La, too specifically religious.

*Dreamland* I like, but that sets up the expectation that this is a dream.

*Thoughtland* is nice, its a symbol of what I myself am doing with my personal obsession in going into another world, the world of my thoughts. Also *Flatland* includes a mention of a Thoughtland. Also Thoughtland has meaning in terms of what you do mentally over there affects what happens here. Also the name has

resonance if the cosmos is somehow accumulating the information patterns of living beings in this locale. But when I tried it on Sylvia, she said it sounded boring. “Readers don’t want to think! They want to be entertained.” More “land” names. *Caveland*. *Danceland*. *Tubeland* — I always wanted to use that name because in grad school, an English student named John Koch saw me reading *Flatland* and *Sphereland* and asked if my big goal in life was to write a sequel like — *Tubeland*. In the dreamy-kingdom mode, it could also be *Cloud Nine*, though that makes it seem jokey.

Generally I’d like to avoid names that require “the”. *The Cave*. The Metalevel.

I might shoot for an arbitrary nonsense word like the Cimön of White Light. *Slocum*. *Bridgeport*. *Taplop*.

*Terence*, for dear departed Terence McKenna, with his DMT elves from other dimensions. Would be fun to honor his memory, but not too obviously, as I don’t want to have to suffer the hail of brickbats and rotten cabbages. Throw in another letter from his name for the odd sound, and to put critics off the scent. *Terenceck*. That’s a nice sound, kind of Hungarian in fact, which often uses -ek for plural. Maybe I can have some hyperactive elves from *Terenceck*. And work in my Arfie the Half-Drunk Hacker vision from the Mondo house.

Math words. *Sheaf Space*. *Metabrane*. *Control Space*.

*Tube City*, the surfing phrase. Since Paul is a surfer, from Santa Barbara, maybe he goes for a Spanish surfing name. *Baja*. I like *Bajamundo*, which I just coined, though maybe that’s silly-sounding. I tried some translation software, “Lower world” produces “baje el mundo”. Another machine translation of “underworld” is “Mundo Terrenal,” which I could write *Mundoterrenal*, but I think the terrenal means more earthly, than subterranean. *Submundo* would probably be more accurate, and sounds pretty cool. “Hell” is “infierno.”

When fed to Spanish-to-English translation pages, “Underworld” also produces “*Hampa*,” which I believe means underworld like gangland. In Danish and Swedish, hampa actually means hemp, which is cool. Googling on hampa, I found a citation, “En el sórdido sub-mundo del hampa...” and then a lot of hits for “submundo del hampa,” like “Coba: Lenguaje secreto del hampa boliviana”. *Hampa* — I like *Hampa*. Although it sounds a bit like “Tampa” and the “Hamptons”, which aren’t such interesting places. “Tampax” is good, gnarly. And “hamper,” which can mean “to hinder” or “a basket of goodies.” Also we can get “amphetamine,” “amp up,” and “amplitude.” Not to mention “ham.” “This is funny-tasting ham, Pa.” “Well, it’s sham ham, Patty.”

I like *La Hampa* like La Playa, for the beach. I checked on Google, it is “la hampa” and not “el hampa.”

I think as of today (October 7, 2004) I’ll go with *Hampa*, though I may change that later.

### ***Doors To The Underworld***

How does one get to the underworld?

What I’m looking for is a passage that takes you into an underlayer of reality, a basement, as it were, and the passage can be found almost anywhere. Or maybe it can only be found amid hulking machinery. Maybe there’s a special cell phone with a laser light that comes out of it and paints a door on the floor or the ground, and then

the door is real. A trapdoor. A manhole. The manhole cover has a mandala on it. A round CA pattern.

I had a traditional Narnia-style magic door in *Frek*, a pantry door, not a wardrobe door.

There's an interesting web site I saw of photos of odd doors, the site is called "UK Entrances to Hell." Some low doors with graffiti on them in city walls. I think I'll start taking pictures of them around here. That web site suggests the kind of intriguing notion that if you poked around and found a weird enough door somewhere in town, you really could use it to get the underworld. That's nice and magical. Some of the doors are creepy. Buzzing behind them. Graffiti, metal, in a city. They're everywhere, once you learn to see them.

A door could even be a spot in a tree, like where two trunks bow out and then grow back together.

Could a door just be something you look at in a certain way? Or even a thought? A meditation. The inner door. What if, in your dreams, you go through the door? What if, while dreaming, you change reality so much that you can't come back? Creepy thought.

I need two doors into Hampa, and two door out. I'm not sure yet if the doors should look the same from either side. Probably somewhat the same.

(1) That much-photographed natural bridge in the ocean off Pfeiffer Beach in Big Sur. Suppose they go through it into the underworld, change reality, and then they want to go back again, but in the new world there's been an earthquake and the bridge is gone. Rubble in the surf. The boys get back, but not Alma. Seen from Hampa, the door is a cave mouth in a lake.

(2) There's a concert by Dancing Shiva at the Avalon Ballroom, and in the basement or a side room is a graffiti-marked metal door. From the Hampa side, this door looks, perhaps, like hole in the floor of a boxcar in a rushing train. And maybe Bela finds it because he's really stoned on that drug Paul helped invent.

Do note that when you jump back in, you might kick up a reality tsunami.

### *Spacetime and Hampaspacetime*

I need to clarify how it is that one gets out of spacetime, flies through a higher — call it the jumping dimension — and alights in the spacetime of Hampa, call it hampaspacetime.

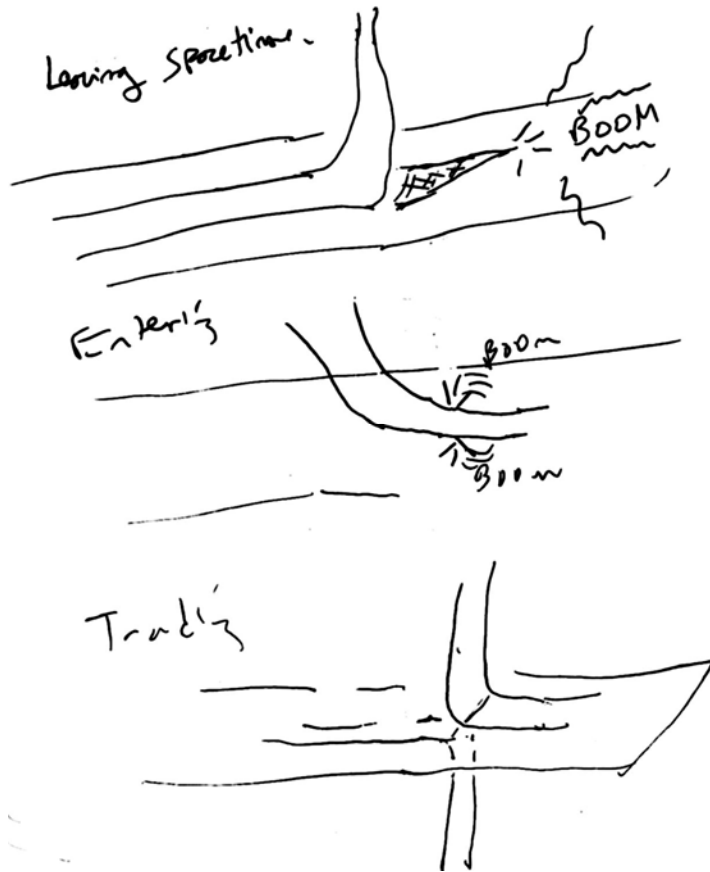
Is the jumping dimension a spatial dimension of Hampa? It might be cleaner to have the jumping dimension be a kind of gap between the two worlds.

Let's review what we know about hampaspacetime. The time of Hampa lies perpendicular to our stack of spacetimes, and the space of Hampa includes a direction that's the same direction as our time. I'd prefer to have hampaspacetime just be three dimensional, so we'd have two more space dimensions. Do the obvious: the three space dimensions of La Hampa are the up/down direction (might as well be able to walk around in La Hampa), one is be east/west, and one is north/south. We can suppose that our time happens to be parallel to the north/south direction of hampaspacetime.

Think of dancing Shiva. She has an umbilical cord that leads out, makes a turn, and disappears into the jumping dimension to connect somewherewhen to a spacetime sheet.

### Hampajumping

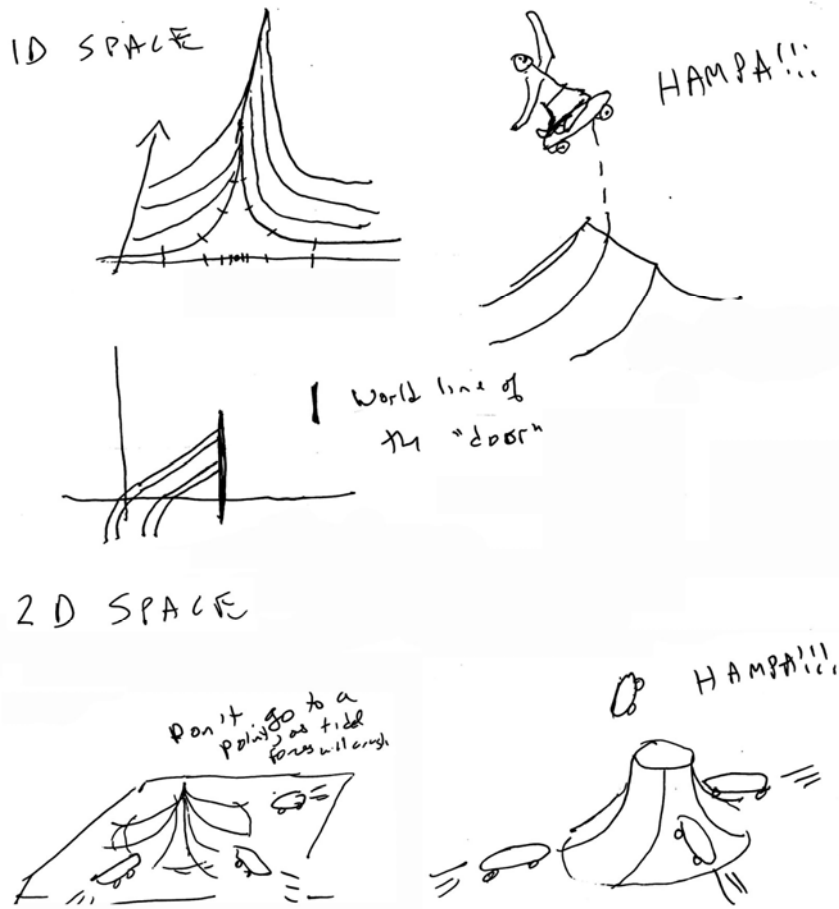
First of all, note that when you leave spacetime, you'll leave a hole, and they'll be a boom as it closes up around where you used to be. By the same token when you push your way in, you'll be pushing matter apart, and it'll make a boom. This would explain why the natural bridge collapses when they come back.



**Figure 4: Leaving and Entering Spacetime**

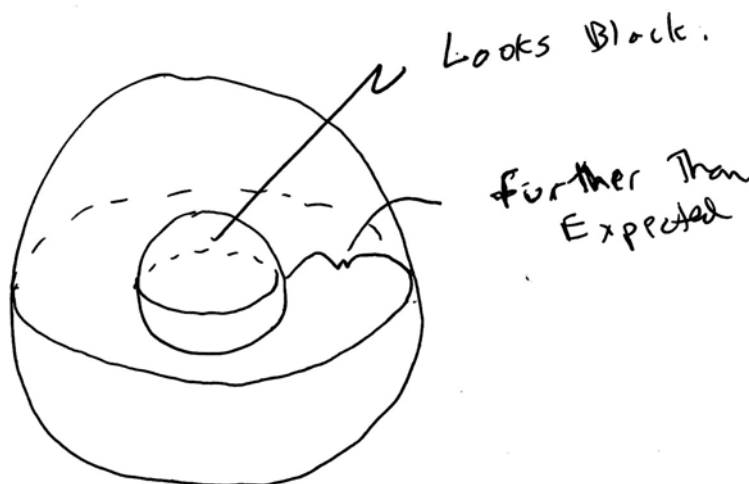
Now, what about the jump out of spacetime? The best way I can visualize it is in terms of a skateboard shooting off a quarter pipe, or a surfboard shooting off a wave.

I draw this for 1D and 2D in the next illo.



**Figure 5: Hampajumping**

When you go to 3D, the "ramp" will have the following appearance.



**Figure 6: Hampajump Ramp, (Einstein-Rosen Bridge)**

I was discussing the hampajump with Jeff Johannes in Geneseo, and he suggested I do something kind of obvious: emulate Heinlein's "And He Built a

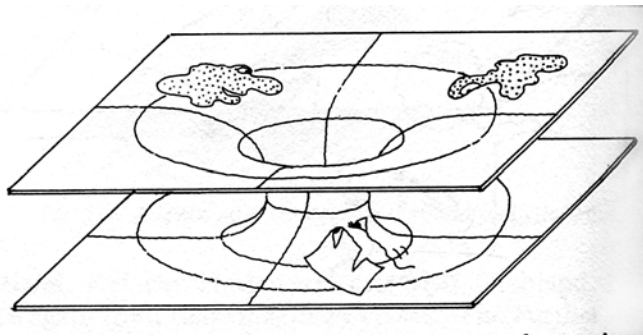


Crooked House,” in which an unfolded hypercube model “wants” to fold up via four dimensional space. Have my guys be on, like, surfboards that are modeled on roadkill Klein bottles: shapes that “want” to be four-dimensional.

### ***Surfing an Einstein-Rosen Bridge***

In [i]Mathematicians in Love[/i] I’m working on a scene where my characters surf through a tunnel to a parallel sheet of space.

I first thought about how to do this in Chapter Eight of my 1984 book, *The Fourth Dimension*. The traditional way for connecting two parallel sheets of space is to imagine a hump that bulges out from one space and merges into the other space as shown in the figure below, which was drawn from one of my sketches by David Povilaitis. This kind of connection is traditionally known as an Einstein-Rosen bridge or a wormhole.



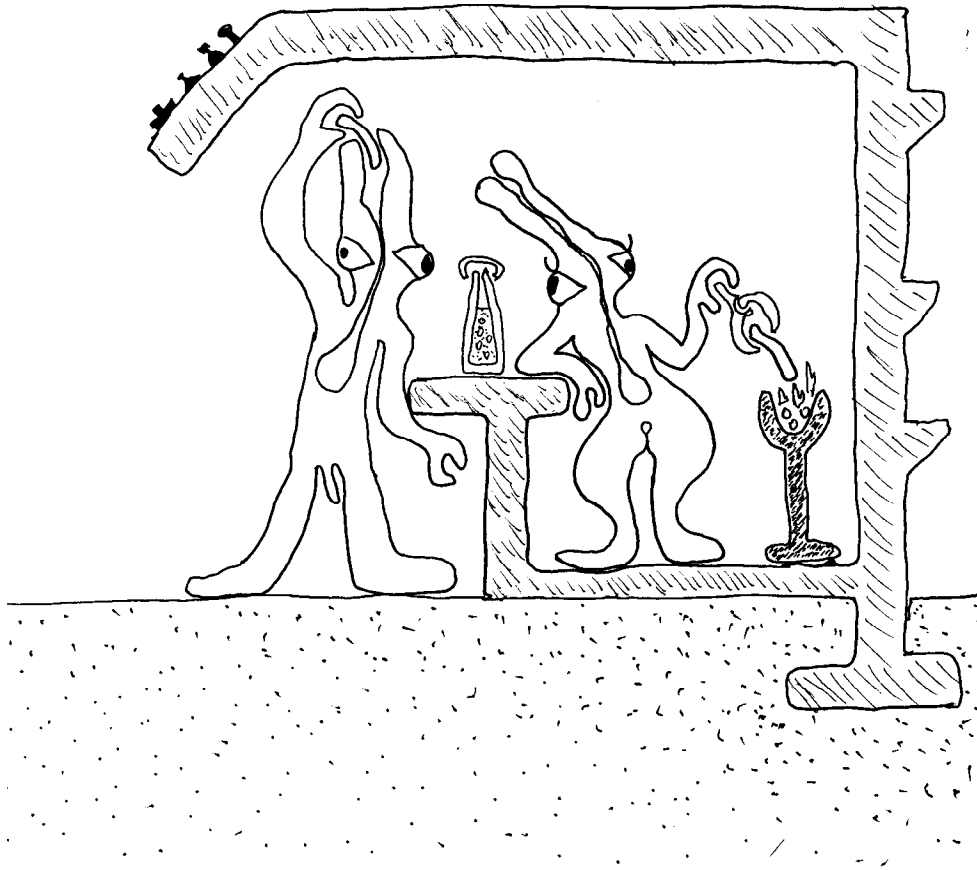
**Figure 7: Flatland E-R Bridge from *The Fourth Dimension***

In this scene, by the way, we see the traditional Edwin Abbott hero A Square about to sneak off into the parallel world of Globland with a married Flatlander woman Una, whom he hopes to seduce. Note that “A” is not an abbreviation, it’s his full first name.

Although we often think of Flatland as being a two-dimensional world like a table-top, we can also imagine, with Charles Howard Hinton and Kee Dewdney, a 2D world that’s turned upon its edge --- like a cross-sectional slice of our planet.

(By the way, I once edited a collection of Hinton’s writings called *Speculations on the Fourth Dimension* which is now out of print, but available used or (in part) online at <http://www.ibiblio.org/eldritch/chh/hinton.html>.)

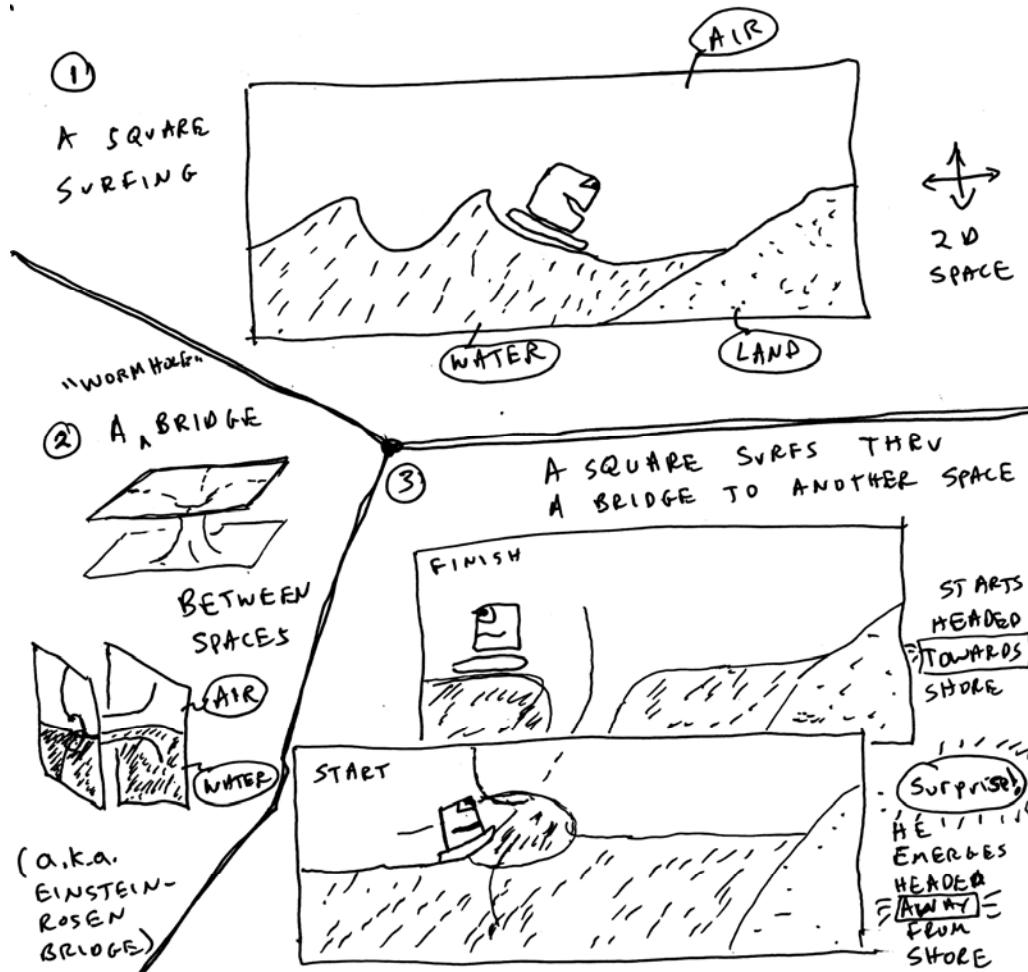
In the Hinton/Dewdney-style 2D world we have a notion of up/down matching the familiar one. In my 2002 novel *Spaceland* I used this kind of image.



**Figure 8: Dewdney-Hinton-Style Flatlanders**

In this picture we see a couple of Flatlanders at a hot-dog stand. They're drawn with some internal detail instead of just as, like, lines and squares with eyes. Those bumps on the roof are Flatland writing.

Now we get to the new image for today.



**Figure 9: Surfing a Hampajump**

This is a three-in-one picture:

- (1) A Square on a surfboard in a 2D world, riding a wave towards the shore.
- (2) A couple of sketches of an Einstein-Rosen bridge between two parallel universes, and in one of them I've drawn in water and air for the two worlds. The water sloshes right through the tunnel.
- (3) A Square surfs into one end of an Einstein-Rosen bridge and comes out the other end --- now facing away from the shore.

Before drawing this picture I hadn't realized that the passage through the hypertunnel would turn my surfers away from the shore. That's why I love math and logic. You set up the system, turn the crank, and, if you're lucky, you learn something new. It's like logic is a complicated feeler that we use to reach out and touch invisible part of the mental world. As Kurt Gödel once told me, "The a priori is very powerful."

### ***Time Dilation in the Hypertunnel***

Time will go faster, the closer you are to the tunnel. Because the tunnel is bending time through a right angle. So if you are near the tunnel the things further than you seem to be running slow (you're faster than them), while the things closer to it than you seem to be running fast.

It will resemble an Einstein-Rosen bridge, or a wormhole, as I've often described, in e. g. *The Fourth Dimension* or in *Realware* most recently. A sphere with another Earth inside it, the other world at the center of the sphere.

I never thought of mentioning the time dilation factor before.

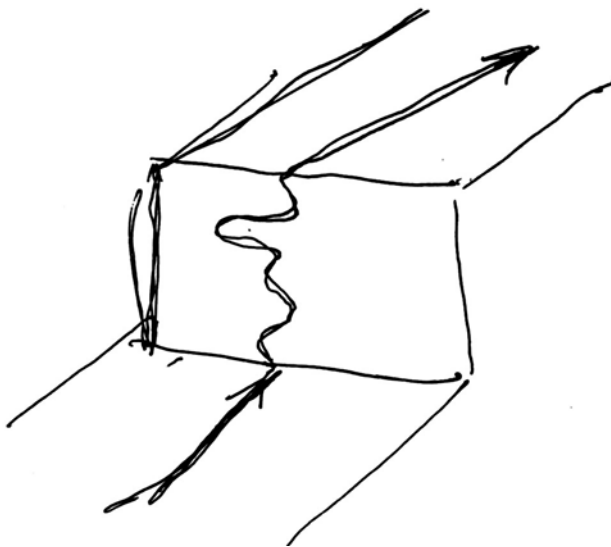
### ***Traveling Across Spacetime***

All over the universe, in every space and time, enlightened mathemagicians, a.k.a. reality hackers, are slipping down to Hampa and altering reality. And we don't notice the changes — as these changes affect different sheets of spacetime than ours. Of course if you yourself make the change and then emerge in a different spacetime, you'll notice the change.

Our lives are much different than we think, as reality is changing as hampatime elapses? [Recall that since I call the underworld Hampa, I use "hampatime" for its inherent time axis, which happens to be orthogonal to each axis of our spacetime.] Well, yes and no. My life is fixed in the spacetime I live in, so it's *not* changing. Yet "I" also exist in the other potato chips of spacetime. And in these I'm different.

Visualize a reality hacker's switch to a different spacetime via an excursion into Hampa as — a pattern on a stair step. On the bottom step's top surface is a spacetime, with the space running across the stair tread A, and the time axis running forward into the riser. The riser leads up in hampatime. Our hacker's worldline runs across the stair step, hits the riser (where the hacker enters a portal to Hampa) and wiggles up along the riser (having adventures in Hampa). And then the next step is encountered (the hacker exits the portal to Hampa) and his or her worldline runs across a flat tread B again, doing ordinary time.

In the picture below, space is the horizontal x axis, the z axis running into the page is the time axis, and the vertical y axis is the hampatime.



### **Figure 10: Time and Hampatime**

The easiest way to describe this is to be quite literal. The hacker disappears from his original spacetime and appears in a later spacetime. On step A, say, John Q. Hacker hits the riser and — leaves his spacetime forever and he never comes back and on step B, the universe A version of John Q. Hacker appears *ex nihilo*.

One odd thing about this way of depicting Hampa's relation to the stack of spacetimes is that we have the space of Hampa overlapping with the spaces of the successive spacetime sheets. Although I drew only two spacetime sheets in the stair step picture, I can imagine that there's a continuous or at least fairly dense stack of them between the two steps indicated. So in this case the riser of Hampa is more like a cutaway view.

If this were to be my definitive model, Hampa would be like a frozen frame of our spacetime in which the shapes of things alter as hampatime elapses. As hampatime elapses you are moving through the parallel worlds. It's a cool notion, but I think it's perhaps too difficult to use in a novel. I think I'll instead place hampaspace outside of our space, as illustrated in the following section.

#### ***One-Way Hampatime***

Let's suppose that you can't go back in hampatime. And that for each instant of hampatime there is a different cosmos with its spacetime. So you can't return to the spacetime you left from.

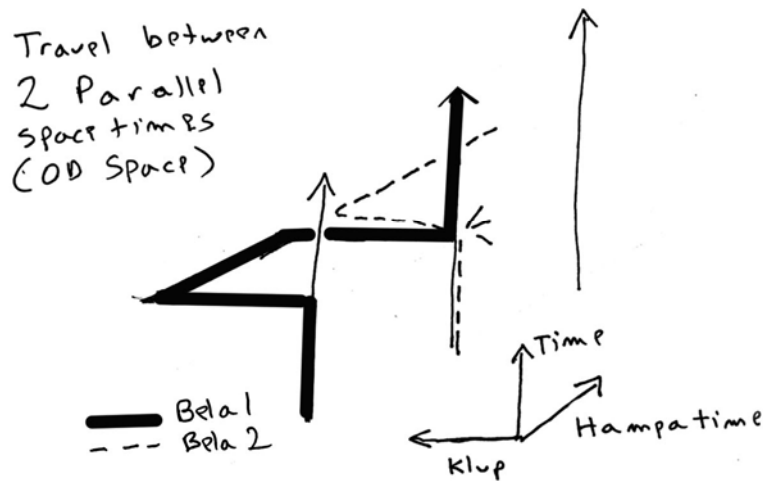
This is necessary, for we do allow you to move forward or backward relative to the cosmos's time in La Hampa. So that if you were able to return to your starting spacetime, you'd be able to travel into your own past, leading to paradoxes.

#### ***Spacetime Bumping***

In order to draw Hampa wholly outside of our spacetime stack, I'll shrink our space to 0 dimensions, that is, to a point, so that a spacetime is simply a line.

The direction you travel along so as to move from spacetime into Hampa is a spacelike dimension perpendicular to the ordinary ones, that is, it's like a spatial fourth dimension. Taking a page out of *Spaceland*, I refer to this dimension as the vinn/vout axis, although I could also call it klup/dron or ana/kata — in the drawing I happened to label it klup, but I should call it vinn, which is more evocative. "We surfed vout to Hampa, and later we surfed vinn to this here spacetime."

In the figure below we see three parallel spacetimes, a worldline of Bela-1, and a worldline of a Bela-2 whom he "bumps," as in replaces, as in musical chairs.



**Figure 11: Bumping the Guy in the Next Spacetime**

The bumping arises as way to deal with the issue of having there be potentially two of you in a new spacetime that you travel to — you and the native. If you want all to go smoothly for you in the new world, you'd like to get the native out of the way. The kindest idea is to shove the native out into Hampa, and let him/her move on to yet another spacetime. You bump your other self. This is nicer and has better karma than killing your other self. After all, the very last person I'd want to kill is someone just like me!

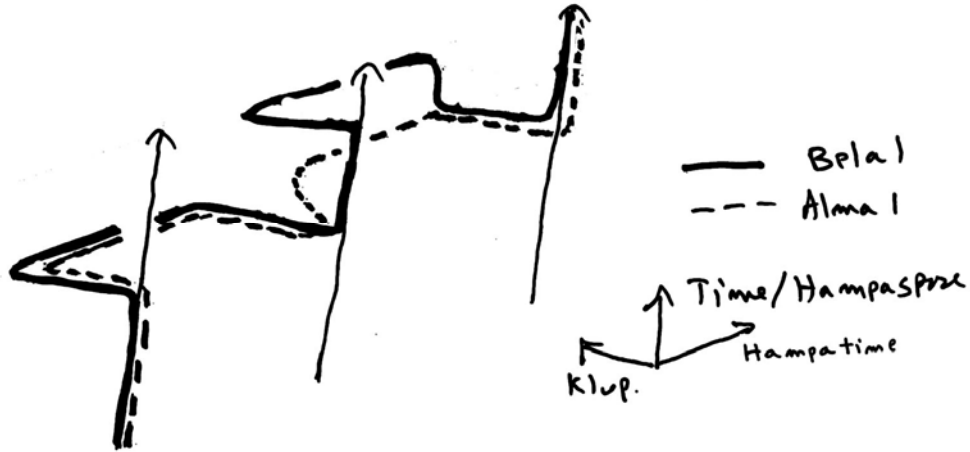
Could the other self come back and bump you back? Not if we have a unidirectional flow to hampatime — and this is a good reason so to do. If hampatime is irreversible, there's no danger of the hacker you shoved out coming back to replace you again — unless of course hampatime is a vast circle, an issue I'll take up in the "Cascades of Spacetime Bumping," section below.

### ***Meeting in Hampaspace***

I'm planning to have Alma-1 *not* bump Alma-2 from Earth-2. Alma-1 can somehow tell that Alma-2 is about to be killed, so that if she were to bump Alma-2, it would be Alma-1 who dies. So Alma-1 stays in Hampa, biding her hampatime until she sees a spacetime she wants to push into.

Or, better, Paul doesn't let Alma-1 in to Earth-2, as she'd have the wrong memories and still wouldn't love him. Also the tsunami splash of coming back kills Alma-2 who's waving from the beach.

Bela becomes aware that the dead body is Alma-2, so he goes back into Hampa to look for Alma-1; they meet and eventually go to a Earth-3 together.



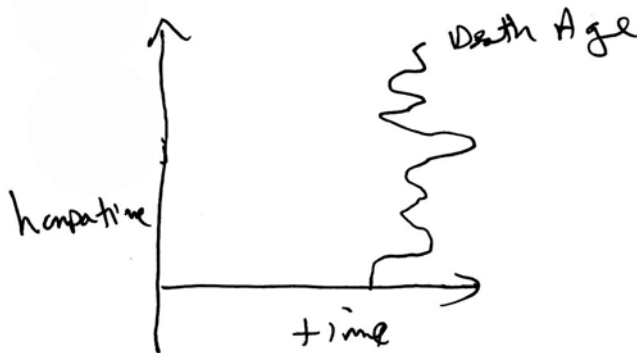
**Figure 12: Bela and Almas**

One subtlety here is that Bela re-enters Hampa at a time later than the time at which Alma entered Hampa. We suppose that our time direction is like a space direction in Hampa. Hampaspace. We could say, in other words, that our time is simply another direction in hampaspace. Bela's in a forest and there's, like, a Disney's-Alice-in-Wonderland arrow sign labeled *Last Week*.

Paul doesn't reenter La Hampa because he gets killed by the Ziffs in Earth-2.

**Variable Lifespans**

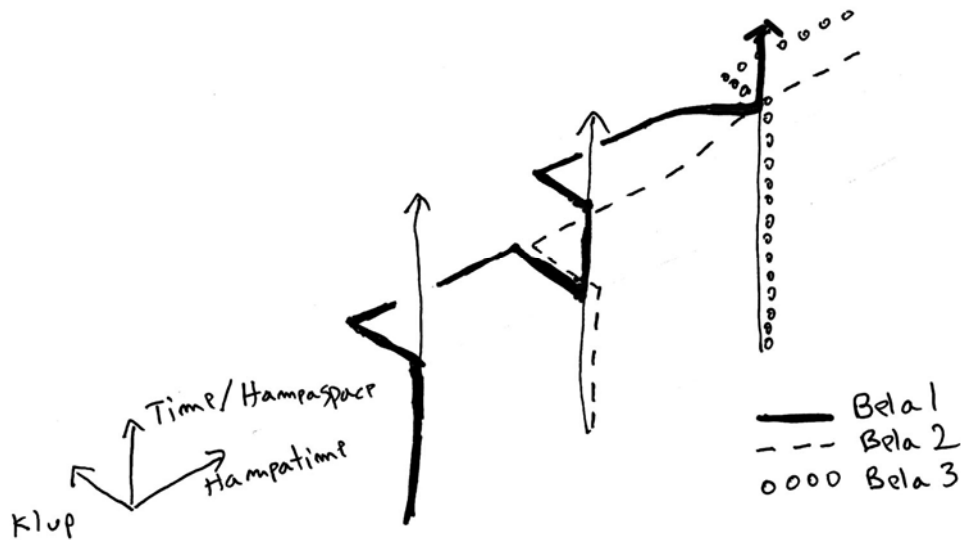
By the way, if Alma dies young in Earth-2, does that mean she has to die young in the hampa-time later worlds as well? I'll say no. A person's life span can fluctuate from world to world across hampatime. Like the edge of the surf foam on a flat beach.



**Figure 13: Variable Lifespans**

**Cascades of Spacetime Bumping**

Another wrinkle is that I'd like to have Bela-1 encounter the Bela-2 whom he bumped from Earth-2.



**Figure 14: Cascades of Spacetime Bumping**

They hang out in a friendly way and then have, perhaps, a bit of an argument over who gets to go into Earth-3, but Bela-1 manages to convince Bela-2 to let him go first, or perhaps he pushes ahead of him. (We'd lose dramatic tension if Bela-2 went first and then Bela-1 had to argue with Bela-3 as well.)

Another problem is that Paul-2 will also be in Hampa, and Bela-1 will have to deal with him. Possibly there's violence.

One unexpected consequence of the "bumping" is that there is now a potentially endless cascade of displaced Belas, with Bela-n hopping to world (n+1). The cascade in fact has to be endless, unless some bumped Bela decides to stay in Hampa and never return to spacetime. Or it could be that at some particular time (like the Earth blows up), it's no longer possible for a human to return to the world's spacetime, and some last Bela gets stranded in Hampa.

\*\*\*

On the very first jump, I think it would be a nice effect to have them see three figures surfing towards them, copies of themselves. Where do *those* three come from? Maybe those are from a universe further in the hampafuture? But that could lead to inconsistencies. It would be okay if they were from a different hyperverses, though. Possibly I'll just leave this one as a mystery.

### ***Circular Hampatime***

Suppose hampatime bends in a vast circle. Here the stack of spacetimes is bent around like a bagel, with the radial bagel chip slices being spacetimes. In this case, we might suppose that the original Bela-1 was bumped by Bela-N for some very large N. Bela-zillion.

This would be nice. We could have it be that when Bela first left space, he would feel as if someone shoved him, and he wonders about this, but dismisses it as an illusion. And then later on he realizes it was Bela-zillion bumping him. This closed causal loop is a classic pattern for time-travel stories: the time-machine



appears in the inventor's lab because the inventor made a copy of it and sent it into his own past.

If indeed Bela-1 was shoved out of spacetime by Bela-Zillion, then we could have another zinger. To wit, Bridge's Theorem was wrong all along! The only reason Paul and Bela and Alma could leave spacetime in the first place was because Paul-Zillion, Bela-Zillion, and Alma-Zillion pushed them. The theorem was never true, and the three were wholly mistaken about the mechanism of their transport.

But is Bela-2 being shoved out of Earth-2 by anyone? Yes, it could so be. Given that Bela shoves *both* Bela-2 and Bela-3 out of their spacetimes, he actually sets *two* Bela cascades into play. One cascade affects, if you will, the odd-numbered worlds: 3,5,7,...,2N+1,... And the other affects the even-numbered worlds: 2,4,6,...,2N,... So Bela could indeed be getting shoved out of Earth-1 and Earth-2 by, respectively, Bela-(2\*zillion+1) and Bela-(2\*zillion). Bela-1 ends up in 3, and Bela-2 ends up in, say 4. 3 goes to 5, 4 goes to 6, and so on.

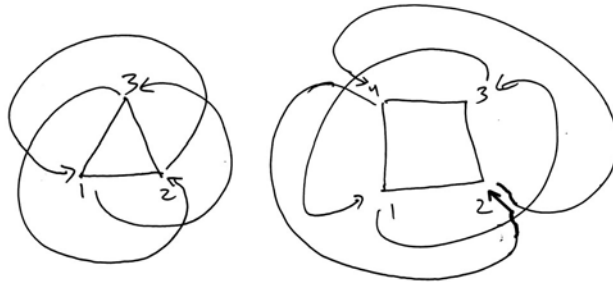
And we could, if we liked, bend both of these into circles.

One catch is that there might be a very large uninhabitable stretch along the great curve of circular hampatime.

But do keep in mind that we are looking at hampatime and *not* at time. So there don't have to be vastly different worlds, nor do we have to suppose that hampatime is vastly long.

Regarding the first point, it might be that there are in fact only some finite number of stable patterns that spacetime can be in, and that *mirabile dictu* humanity is in some sense a priori necessary.

Regarding the second point, it could be that hampatime spans no more than, say, a "year" of 365, or a "scale" of 7 or 12. Or there could turn out to be only 3 worlds! If the number of spacetimes is even, then the two Bela cascades are in two distinct cycles; if the number is odd, then it's in fact one cycle that goes around hampatime twice, which is better, as then there's a single chain of causation.

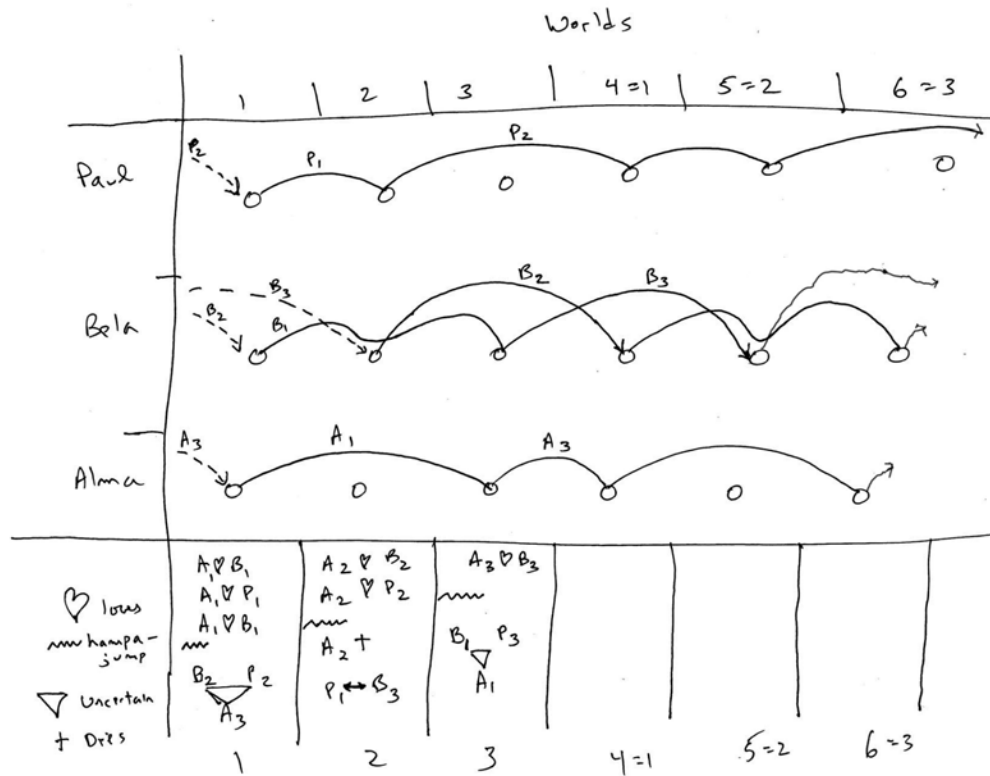


**Figure 15: A Cycle of Spacetime Bumpings**

How lovely and Keplerian it would be if there is only some finite number of possible worlds, and that each of them has us on our Earth.

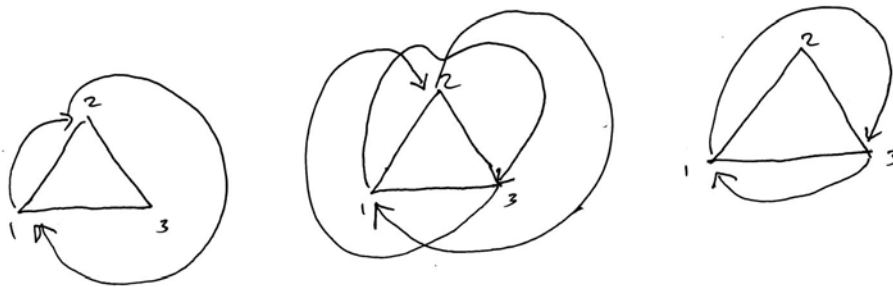
If we had only a few worlds, then Shiva wouldn't dance a world very often.

To be as simple as possible, let's suppose there really are just three worlds. Here's a picture of how that would play out.



**Figure 16: A Cycle of Three Possible Worlds**

Rolling the cycles up, we'd get the following three patterns for, respectively, Paul, Bela, and Alma



**Figure 17: The Three-World Cycle**

Note that  $P_1$  and  $P_2$  swap, that  $A_1$  and  $A_3$  swap, but that Bela does something more complicated, a three-cycle.  $A_1$  replaces  $A_3$ , who replaces  $A_2$ , who replaces  $A_1$ . In effect,  $A_n$  goes to  $A_{(n+2)}$ , if we think of  $\{1,2,3\}$  as a system with a  $+$  operation.

It's significant that Bela ends up with the same Alma, but with a *new* Paul rival.

[I can't see anything fractal-like about this, so *The Sierpinski Love Triangle* would be a bit of a misnomer for the title even in a 3-world model. I guess the one Sierpinski angle is the fact that it's a pattern that repeats over and over. If we don't insist that world-4 is really the same a Earth-1, then we would have a kind of repetition, like wallpaper.]

Also if we contemplate that at a later time, there might be further hampajumps the situation could get more complex. I'm going to suppose that you can't initiate a hampajump from Earth-3. Maybe the cone shells *eat* Bela-3 to stop the cascade.

And, given that Paul and Bela initiated the first two hamapjumps, for the sake of symmetry one might expect that Alma is responsible for the third. But this would have to imply that any further hampajumps would originate from Alma-3, living in Earth-1, and I don't think this would be useful.

Another zinger is to have someone who dies in Earth-1, like Cammy Vendt (used to be Geena Grover) actually do a hampajump. Before P, B, and A leave Earth-1, Cammy herself disappears, but none of them make much of this. But in fact, Cammy-1 has jumped to Earth-3. Maybe in Earth-3, Cammy-3 committed suicide, so there's no Cammy-3 who needs to leave there and come back to Earth-1. So Cammy-1 simply moves from Earth-1 to Earth-3. Or maybe Cammy-3 is bumped.

I'll have Cammy-1 actually *arrive* in Earth-3 later than Bela-1 and Alma-1 do. And then she can settle down with Bela and also explain to him that there's only three worlds.

\*\*\*

Although the three-world model is cute, I don't think I'll use it. Because if there were only three worlds, then all the reality hacking would be kind of meaningless, it would always have to end up with one of the three possible worlds. And the cone shell and cockroach mathematicians wouldn't have much to do.

Also, no novel gets done in three drafts.

### ***Cross-Universal Memory Transfer***

Would be better to say that there is a Hacker-A and a Hacker-B, one in each world.

What, then, gets jumped from one world to the other? Let's suppose it's just memories. In order to have the jump experience, Hacker needs to move his memories. In other words, we have to copy the memories of Hacker-A onto the brain of Hacker-B.

At the A end, we could either cut or copy — cut in the sense of leaving a blank space behind. So either a version of Hacker stays or he disappears. If you cut the memory, then Hacker leaves behind a mindless vegetable or nothing at all. Nothing at all might be good. We don't initially notice how many people are taking the trip to Hampa, because those people and all memories and traces of them disappear. This puts me in mind of the "New Stuff" drug in *Gravity's Rainbow*, which makes the user forget how they scored, with the result that it's exceedingly hard to find any New Stuff. If passing through a Door to Hampa removes all traces of the traveler, it's not like we'll be able to use detective work to find that door ourselves. So I'd say *cut*.

At the B end we could paste or blend — paste in the sense of instantly replacing Bela-B's memories by Bela-A's memories, or blend in the sense of combining the memories perhaps over a period of time. Pasting maximizes the experience of alienation and strangeness for the Bela-A memory placed into the body of Bela-B. But a slow blend might make even more dramatic sense in that then we have the growing sensation of strangeness. So I'd say *blend*.

Instead of cut-and-blend we could do something quite different, we could *swap*. Bela-A meets Paul-A, not realizing that Paul-A now is wearing Paul-B memories, and thus seems to believe entirely counterfactual things. This is confusing,

but could be cool. What if lots of people started going through Hampa, with the result that lots of people would be taking these odd trips and developing counterfactual memories as a result — because their memories were swapped with the memories of a person in a parallel world.

I like this, but I think it gives away too much early in the book. So having people disappear might be better.

Note, by the way, that either cut-and-blend or swap satisfies a Conservation of Gnarl principle. In the cut-and-blend case, you lose gnarl in world A, but you gain gnarl in world B (blending will increase gnarl more than simple pasting would). We could debate if this really *conserves* gnarl or if there is some slight loss. In the swap case, of course, you exchange gnarl.

Thinking about it some more, I'm not sure it makes sense to speak of any kind of change happening to World-A when the Hacker leaves for Hampa. Any change to the spacetime makes it a different spacetime. So I think there won't be a cut or a swap. In world A it will, in fact, appear that the Hacker didn't go through the Door at all. "It's not working." "Smoke more."

What if you tweak the seed in such a way that there's no copy of you to vampire onto in World B? I think then when you try and exit the portal of Hampa you can't get out, you bounce off the door, *boink*. There is no Hacker-B to host your Hacker-A memory. You're stuck in Hampa until you can tweak a copy of yourself back into the world.

\*\*\*

Here's a question: if Paul or Bela can remember how reality was before they changed it, where is this memory located? One might think that the memory can't be in the matrix of reality, or it would be wiped out when reality changes.

One way out is to do an inverse calculation involving the to-be-applied Transform before Transform is applied. Suppose I create a Transform process to change reality. Now let my image of my current and soon-to-be-old world be called OldR.  $\text{NewR} = \text{Transform}(\text{OldR})$ , which suggests I'll lose OldR.

If I want to have a memory OldR of the old reality, what I need to do is to ingrain a memory of the form  $\text{Transform}^{-1}(\text{OldR})$  into my mind. And then when Transform takes effect, I'll have the correct  $\text{Transform}(\text{Transform}^{-1}(\text{OldR})) = \text{OldR}$  memory.

An alternate way out is to assume that you have a higher memory external to spacetime. A hypermemory, I suppose. As if A Square had a stack of brains.

I might have Paul propose using the inverse transform memory approach, and it works. And Bela tries to do it, but it's too hard. But he remembers the old universe too. So it must be that the Hilbert space soul is correct, thinks Bela. But Bridge's Memory Theorem shows that you get the memory for free without having to work on it, so Paul was right.

I need a funky objective correlative for this. A memory egg.

\*\*\*

Have a Bridge's Memory Theorem to explain how reality hackers can remember the hampatime-earlier universes without having their minds be higher dimensional? Perhaps the tweak can be arranged such that it automatically embeds the memory. Kind of a fixed point theorem. Information growth.

That is, if RH is the reality hacker who carries out the transform  $U^* = \text{Tweak}(U)$ , then the Tweak process will of necessity create a  $\text{Tweak}^{-1}(\text{Memory}U)$  in RH, so that  $\text{RH}^*$  includes MemoryU.

I formalize this idea among the “Unused Bridge’s Theorems” as *Bridge’s Memory Theorem*.

**Lost and Recovered Memory**

Could I have a scenario where Paul goes to the underworld and somehow removes Alma from the spacetime Bela is living in, and Bela doesn’t notice, as his reality has changed too. And then Paul turns up and tells him, hey, Alma’s gone and you have to help me get her back.

My model for this is the ending of the Robert Sheckley novel *Mindswap*, where the guy goes into Twisterman’s Twisted World and comes out on an Earth with three suns — and has no sense that anything is amiss.

Maybe Bela has forgotten about Alma, and Paul has something to restore his memory. This would make for a nice scene.

But note that, in my model, the spacetime where Alma is missing is *different* from the spacetime where Bela starts the narrative. So if it’s Bela’s voice talking, the only way Bela can experience the changes that Paul wreaks, is for Bela to travel with Paul — and for both of them to somehow bring their old memories with them. And in this case if they eliminate Alma, it would seem that Bela will know about it. It’s not as if, in other words, reality changes out from under Bela.

But we could still have the revelation scene if Bela has the memories, but they are *dormant*, and Paul brings them back into his consciousness.

Like Paul, Bela, and Alma go to Big Sur. They go to Hampa. Alma gets stuck there. When they come out, Bela loses his memories, or represses them, but Paul doesn’t. Bela, for a time, is under the sway of his new host body’s memories. Paul and Bela drive back from Sur together, and Bela doesn’t notice there’s no Alma. There’s no sign of her at his house. Only then Paul brings him to his senses. Unpacks his memory egg.

That works.

**Swap Model of Hampajumping**

Should I force a “swap” when someone jumps to a new world? I don’t actually think I will, but let’s work out the consequences if I did force a swap. That is, if Bela-1 jumps to Earth-2, then Bela-2 of Earth-2 is immediately swapped into Earth-1, and so on. I’d get this table, with a row for each world, a column for each person, and with † meaning that person is dead in the given world.

Earth	Bela	Paul	Alma	Cammy
E-1	B-2	P-2	A-3	†
E-2	B-3	†	†	C-2
E-3	B-1	P-3	A-1	C-3

Now, I’d been thinking all along of having Bela end up with Cammy. But now, looking at this table, I see that it really makes better sense, as a love story, for Bela to end up with Alma. B-1 with A-1, and not with C-3.

I’ve been perhaps a bit too eager to throw over Alma for Cammy. But I need to let her grow, expand, develop. And, yes, Bela goes away from her in Earth-2 where he has his big fling with Cammy. But it doesn’t actually work out that well

with Cammy. She doesn't do anything terrible to him, they just don't get along that well. The reason Bela leaves Earth-2 isn't necessarily so he can get Alma; it's also because Joe Doakes is about to have him killed.

And in Earth-3, Alma initially thinks she going to go with Henry Nunez, say. Or with Paul. But she ends up with Bela. Or it could be that they have such a hard time getting back into Earth-3 that they know as soon as they get there that they'll be together.

I don't actually expect to enforce the swap, however, because I want Bela-2 to be there in La Hampa making trouble for Bela-1, rather than assuming that he got pushed right into Earth-1. Indeed, come to think of it, if Bela-2 is in La Hampa with Alma-1 while Bela-2 is down in Earth-2, it may well be that Bela-2 has an affair with her, and she in fact wants to bring Bela-2 into Earth-3 instead of Bela-1!

### ***Collapsing the Multiverse to a Large Tegmark Universe***

Perhaps there could be some kind of collapsing and encryption so that any possible universe K is coded in our actual universe A. Of course an easy way to do this would to have A be infinitely large, as Max Tegmark suggests, and as I review in the new introduction to *Infinity and the Mind*.

I like this idea lot. That way you have the multiverse without the quantum horseshit.

\*\*\*

Multiverse as a Library of Babel. Every universe exists. Mindless process of exhaustion generates every possible universe. A hyperverses is a creative effort of picking out a bouquet of universes, starting with one and making it better.

In principle two hyperverses could converge on the same universe and then, for that matter, diverge again. All the possible novels get written, not just the one.

\*\*\*

Do the aliens come from the same universe as us? The same hyperverses? Hard to say. The answer is yes if we use the Max Tegmark notion that there is simply one infinite all-encompassing universe, and these notions about different (local) universes that we thread into hyperverses are simply bookkeeping index methods to point to different locations of the one huge world.

In the Tegmark universe, all the worlds do exist, but the nataraja is picking out a sequence of them. Perhaps in some sense, also, the nataraja makes those worlds exist in a *realer* sense. It plugs them in, lights them up. These scripts get made into films, as it were.

\*\*\*

Still thinking about the flat "Tegmark" model of the multiverse. It's just an infinite or very, very large universe in which essentially every possible solar system appears. And jumping to a "parallel" world really means jumping to a distant system very much like ours. Note that here you can even have "time travel." Jumping a hundred years into the past means jumping to a solar system that happens to be just like ours was a hundred years ago. No quantum bullshit needed. Just a buttload of worlds.

I'd probably want to assume, however, that I have a global time which matches hampatime, to make sure someone can't be jumped into their own past.

Note, by the way, that one reason I like the Tegmark model is kind of an illusion. I dislike the notion that the multiverse is every possible universe, as then nothing has a deeper reason. But if the Tegmark universe is big enough to

exhaustively have every possible planet-sized electron-proton combo, then in effect we're using the same monkeys-on-a-typewriter thing.

I'd like to say that somehow the jellyfish actually lights up or creates only certain of the worlds. I have this distaste for matter doing nothing much. But yet, think of the stones buried in the earth, the stones within the moon. Nothing doing there. Just brute — *stuff*. Nature doesn't mind that.

### ***Geometry of the Cosmoses vis a vis La Hampa***

In my initial figures I used the following dimensional space+time signature: 0+1 evolving spacetime modeled by 1+1 La Hampa. The evolution axis matched the time axis of La Hampa. I call this the EXTRA HAMPADIMENSION approach. It worked like this:

(0D space, 1D hampaspace) *Cosmoses*. Space is 0-dimensional point and time is a line, making a 1D spacetime. Point the time lines into the page and use the vertical direction for hampatime. Stack the spacetime lines to make a plane of successive realities with the vertical direction along this plane orthogonal to the timelines being hampatime, the direction of metacosmic evolution.

*Hampajump*. I use the left/right horizontal dimension (perpendicular to the plane of the cosmoses) as the direction of the hampajump.

*La Hampa*. I view La Hampa as a 1D space + 1D time plane parallel to the plane of the cosmoses. Both axes are parallel to the sheet of stacked 1D spacetimes. Hampatime is vertical. Hampa space matches our timelines.

But, if I pursue this approach I end up with La Hampa being four dimensional. For I started out by drawing La Hampa as having one more dimension than ours. We live in a 3+2 dimensional cosmos: 3 space dimensions, one normal time dimension, plus a second cosmic evolution time dimension. If La Hampans can move freely over our time axis, then they would seem to have a 4+1 dimensional space: three matching our space and an extra space dimension matching our time, plus the dimension of hampatime which matches the cosmic evolution time dimension.

But I don't want to burden the reader with a 4D space for La Hampa. So either I don't represent our time axis as a hampaspace direction. OR one of our space directions doesn't match a space direction of La Hampa. Call these, respectively, the MISSING TIME model or the MISSING SPACE model.

Here's how the MISSING SPACE approach plays out in various models.

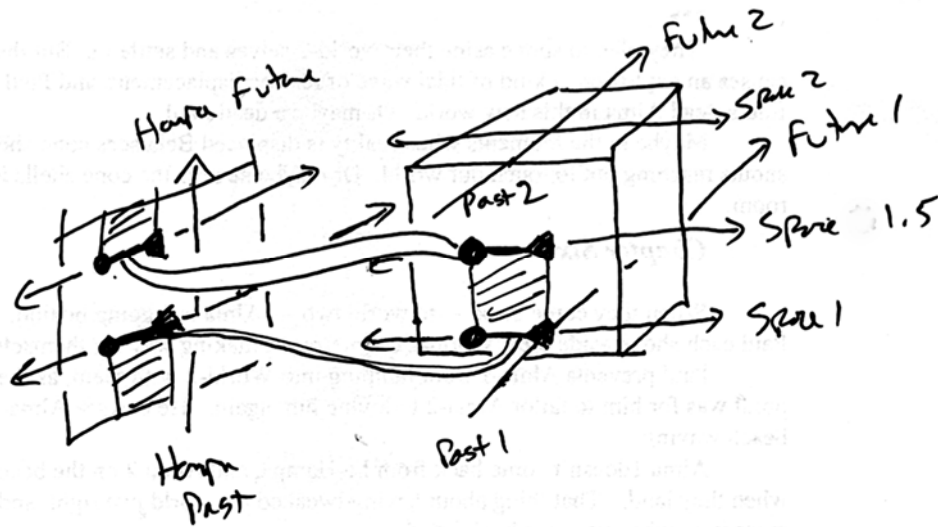
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(1D space, 1D Hampaspace) *Cosmoses*. Now visualize our space as a line. So we have a stack of spacetime planes, a stack of Minkowski diagrams. This fills up a 3D space. Again, we visualize time as going into the page, space as horizontal, and hampatime as vertical.

*Hampajump*. Since we already used up 3 dimensions with the cosmic stack, we have to use an invisible 4th dimension for the hampajump direction, which may as well also be, by the way, the direction in which the DinoBone function grows two representative space slices from a seed. I'll view this dimension as the invisible gap between two 3D figures. I put a picture of the stack of spacetimes on the right, and a picture of La Hampa spacetime on the left.

*La Hampa*. Hampatime points up the page. The direction into the page is the North/South of La Hampa, and it matches our time direction. The La Hampans don't move in our space direction. Does this mean they always pop out at the same spot? No, I can assume that the hampajump can reach out to any location at all. I'm seeing

an edge-on plane here, and the direction out of it can be the hampajump dimension, and a jump can go anywhere along the left-right axis that you like.



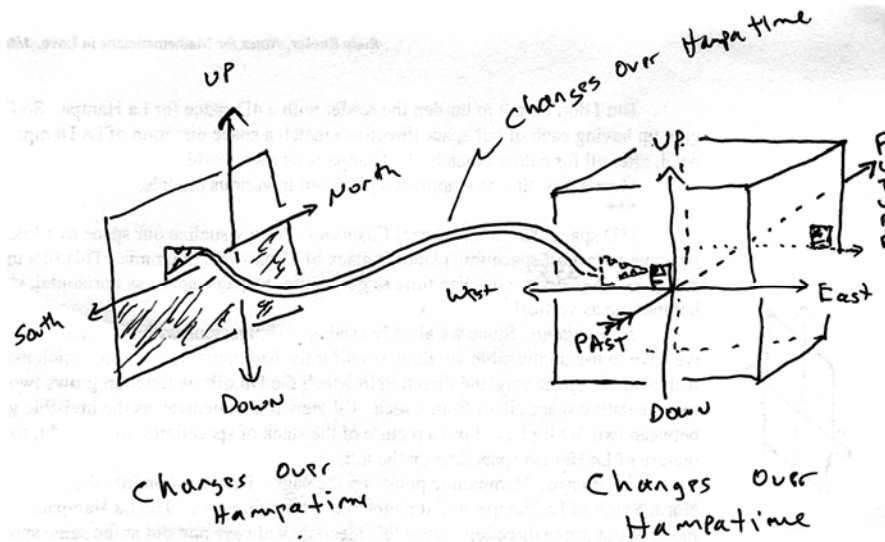
**Figure 18: (1D hampaspace+ 1D hampatime) and (1D space + time + hampatime).**

(2D space, 2D hampaspace) *Cosmoses*. If space is 2D, then spacetime is a 3D block. Visualize it with time going into the page. Imagine the stack as animated, changing, and this durational dimension is hampatime. Also so as to model the surface of the earth, think of the x-axis as the surface of the earth, as shown in Dewdney's *The Planiverse*, in Hinton's *An Adventure in Flatland*, or, for that matter, in my *Spaceland*. Call this direction East/West. So the up/down direction indeed matches what we on Earth would call "up."

*Hampajump*. Our cosmos figure has used 3 space dimensions (one of which represents time) and is animated in a time dimension representing cosmic evolution or hampatime. We need a fourth space dimension for the hampa jump. Again we visualize this simply by having a second drawing, La Hampa on the left, the evolving cosmic spacetime on the right.

*La Hampa*. Hampatime animates the La Hampa figure on the left in synch with the animation of the spacetime on the right. The animation dimension is hampatime, the time of La Hampa. In the La Hampa figure we have only two space dimensions, keeping a match between dimensionality of La Hampa and Earth. So we're looking at an animated plane. I'll orient it perpendicular to the page. Up can match our up, so the La Hampans can walk on a surface. The direction into the page matches our future time direction and is an ordinary space dimension for the La Hampans. The left/right direction is the direction of the hampajump. Once again, the La Hampans can hop to any East/West or for that matter up/down location in the right figure.





**Figure 19: (2D hampaspace) and (2D space + time).**

(3D Space, 3D hampaspace). *Cosmoses*. Now we see a 3D cosmos with up pointing up from the surface of the earth, east/west going left/right, north/south going into the page. We need two time directions. One animates the figure in cosmic time, the other animates the spacetime across hampatime. Think of two knobs outside an aquarium tank, if you will.

*Hampajump*. We've used 3 space dimensions and 2 time dimensions. Hampajump can be a 4th space dimension. Again represent this by a second figure — although by now I'm getting a little uneasy with this cheap trick.

*La Hampa*. So now I end up with, a 3D La Hampa animated in hampatime. The up direction is our up direction. The in/out or North/South direction can match our time. The left/right can match our East/West. Motion along our North/South can be handled by bending the direction of the hampajump.

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I think the MISSING SPACE approach is stupid, in the end. I think instead I will use a MISSING TIME approach. But I will get time back into the La Hampa model by using scale to represent it. I call this the TIME SCALE approach.

### ***The "Time Scale" Geography of La Hampa***

La Hampa resembles Micronesia, but some of the islands will float in the air. That is, you'll see the thousands of small muffin islands like you see off Palau, but some will be floating above sea level, up in the sky like clouds, and other islands are wholly submerged in the seemingly bottomless sea. I'd also like to have little suns of all sizes, so there's no determinate scale at all.

I'm thinking of having the scale dimension of La Hampa match the time dimension of our world. So if the cone shells only live at a certain size scale, then they only connect to, like, early summer of the particular year when my novel is set. One by one the connect to each spacetime sheet, but always that particular season.

This means that when Bela returns to La Hampa a few months later, he'll find a different indigenous population of aliens in La Hampa. And to get to the older

world where he left Alma, he'll have to shrink down and crawl inside a drop of water in a crack in a rock, and find an air bubble in there, like that.

And in the other direction, there will be some bad bigger aliens a bit higher up the scale, like in September. And the cone shells and roaches are worried about these big guys, they want to do something stupid like send down antilife. Flood the lower worlds or fuse them so they can have, oh, a Riverdance stage, oil refinery, Repulikkkan Party Platform, factory floor, like that. And it will be Bela's job to sneak up there, like Jack in "Jack and the Beanstalk," and he'll want to break those big meanies down. Image of the roach, cone, Bela peeking out from under a pebble.

I see these bad guys as evil giant robots. Mining machines that are "harvesting" natarajas. They tug one out and bring with it all of its higher-dimensionally-linked other bodies which exist at various other places and scales.

I like the "Farmer on the Wall" idea of diverse levels. The beings are the same through a few size levels, but not indefinitely. What is the conversion rate of time to scale? Oh, maybe 10x is one month. Note this is a non-QM reality, so there's no limit below or above. I like this, I especially like having suns, seas, islands of all sizes so there really is no singled-out level.

I see the bad things at the higher level being like giant Rockem Sockem robots. Like multinational corporations.

It makes for very nice objective correlative transreal symbolism to have *past* events be *small*. Seen wrong-way through a telescope.

\*\*\*

At first glance La Hampa resembled the pictures I'd seen of Micronesia — an archipelago of round green islands in an aquamarine sea beneath a sun-lit blue sky. But something here was radically different. There were many seas, many suns, many skies. The landscape was an endless fractal.

Imagine tossing a bucket of water into the air. The water breaks up into great jouncing globs. These are like the dancing seas of La Hampa. Next imagine that these water-balls have large air-bubbles within them — little skies — and suppose that there are smaller water globs within the air bubbles within the balls of water.

Moving up the scale, suppose that the air around your original flying bucketful of water globs is itself an air-bubble within a still larger water glob, one among many, and that these larger globs float within an air bubble within a still larger glob.

Fill in the scene with suns of every size — one domesticated little sun per sky, or air-bubble. And then add in islands as well — several friendly green dreamlands floating upon the surface of each water glob.

Perhaps there are some uppermost and lowermost limits, but so far as I was able to determine in talking to the La Hampans, nobody had ever encountered any boundaries. For all practical purposes La Hampa continued endlessly, both up and down the size scale.

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Note that to go up in scale, you always fly out through the water membrane that is the sky.

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Scale change is automatic, that is, space is negatively curved in such a way that a tiny air bubble feels like a big sky when you go into it. You shrink to fit. Likewise you grow to be a good size in the sky.

### ***Time and Hampascale Match***

La Hampan scale matches our time like this, with time running up the page, which is why he tunnels to Paradisio instead of to Nanonesia:

```
                /Sat June 12
Paradisio ----{
                \Sun June 6
                /Sat June 5
Nanonesia ----{
                \Sun May 30
```

Note that Nanonesia is kind of a “navel,” the spot where the jellyfish lives, the spot where Earth-1 time matched La Hampan time.

### ***Hyperverses and the La Hampan Natarajas***

So I have an essentially infinite La Hampa, with suns, islands, and seas of every size, as above so below, within and without. And in this case, it’s not reasonable to suppose that there would be only one hyperverse linked to this — where, once again, I’m using hyperverse to stand for a stack of spacetime universes arranged in evolutionary or novel-draft order along the dimension of hampatime.

I think we can well suppose that there are infinitely many linked hyperverses.

Now which commonly occurring object in La Hampa is the seed of a hyperverse?

I had been saying jellyfish lately, and I could do that, there could be lots of jellyfish lakes. But I don’t want to call it jellyfish. I could call it simply a dancing Shiva. Dancing Shiva is nice as I can imagine the sheet of spacetime trailing off Shiva’s moving arms. The metahistory of flexing spacetimes is a hyperverse.

I’d also considered having a sun be the seed.

I could of course use a literal fluttering leaf instead of a dancing Shiva jellyfish. Maybe it really *should* be just a leaf making a hyperverse: a fluttering leaf, each flutter is a universe, complete with its entire past and future. The leaf’s position is a seed to the DinoBone method that expands the pattern out to a space slice which in turn is Sherlocked out into the entire past and future of that universe. Nice that the leaf model as it’s fully Wolframite. But it’s more interesting to read about an organism. A Dancing Shiva.

What is an alternate name for “dancing Shiva”? Maybe another Spanish word. Saw a development called “Las Cumbres.” What is a cumbre? A cucumber minus the Q? No, it means summit. Sunfish, starfish, glowglob, keister, benjamin, drupe, shiva, sheeva, shivafish. The fates spinning history: the parcae.

Naw. To Google! Shiva is a “he,” I just learned. Dancing Shiva is sometimes called Natraj or Nataraja. A nataraja. Means Lord of the Dance. Raja=lord and nata=dance. dance-king. Nice name. Normally Shiva is dancing on top of a dwarf, by the way, a demon of ignorance, his name is Apasmarapurusha or just Purusha to his pals. Pete Ziff.

Why is the leaf or Shiva or jellyfish or nataraja or sun “bothering” to make the hyperverse? It is, let’s suppose, energizing for the creator. I create the hyperverse of my novel because it energizes me. Amuses me. Passes the time.

A barnacle feeding by waving its feathery “foot” in the water.

A sun could get the energy to glow from having the hyperverse. But it’s hard to imagine dancing with a sun, going into it. Maybe the jellyfish are almost like suns.

Maybe they begin to glow as their hyperverses get more beautiful. Maybe the jellyfish become suns. Now that would be nice. Part of the lifecycle of the nataraja.

Suns are usually in the air, jellyfish are in the water. How to transition?

As hampatime elapses, a nataraja jellyfish is beating its invisible spacetime veils, flexing them to make them lovelier. And as the veils get more beautiful, as their hyperverses evolve, the nataraja begins to glow. And at some point it begins to resemble a sun. If you look closely, a sun is in fact a nataraja, with still-discernible internal features. What I might call a glowing bloog (in the old Dr. Seuss sense of being like those floating air-jellies in Heinlein's juvenile novel, *Tunnel In The Sky*, and I also use bloog in *White Light*.)

Is the hyperverses even then continuing to evolve after it becomes a sun? How about instead saying that a final draft is reached. Like a novel. Time to mail it in. At some maximum optimality level the hyperverses comes to a halt.

The lesson that's a bit hard to wrap one's mind around is that, if there are infinitely many of these cosmos-spinning critters, then there are infinitely many hyperverses. Man is like grass, to the fourth degree. One, there are a lot of us on earth, two there are a lot of eras in human history, three there are a lot of other planets in space, four there is a whole sequence of alternate histories (spacetimes), five there are a lot of alternate sequences (hyperverses). (Max Tegmark makes the point that three through five are all in some sense the same if the space of our universe is infinite.)

But still this isn't like the formless static of a full Deutschland multiverse model. For each hyperverses is driven by a Puritan-work-ethic doctrine of perfectibility, going through better and better drafts of the reality.

That's why I like the idea that a draft someday is done and mailed off to the publisher. The natarajas finish their drafts and the turn into suns. "All happy now. All the same." Maybe our universe really *is* almost perfect as it is. Just needs a tiny bit more tweaking. And then our nataraja will become a sun. Happy ending.

That would be a cool end to the book. Assuming that World 3 is our actual world, this means that the universe is now fundamentally perfect. Dr. Pangloss: "This is the best of all possible worlds." Emphasis on the *possible*.

I'm thinking of Robert Sheckley's story, "The World of Heart's Desire" that I read when I spend a night in a jail cell in London, Ontario, around 1975, for shoplifting *Thirty Years of Foundational Studies* by Andrezj Mostowski from the university bookstore at the International Congress for Logic, Methodology, and Philosophy of Science.

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It occurred to me yesterday that, for all practical purposes, the nataraja that spins our hyperverses is a personal God. You can petition it to change things, and it can hear you. The change won't go into the revision you're in, but will appear in the patched new releases.

When a nataraja makes a sheet, a universe, it flexes its seed muscle and all the changes go out into all of spacetime at once. If you pray, it can hear you, it hears the prayers of all spacetime and adjusts its seed muscle for the maximum harmony. She sees the whole universe everywhen and everywhere and optimizes. Hears each plaint. Reduces the net *wheenk*.

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Could the hyperverses in any sense be the vlog of the nataraja?

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One question.

Suppose that hampascale is our time. So small things are our past, big things are our future. Why would Bela and Paul happen to come across into La Hampa at (a) the right location and (b) the right size and (c) the right hampatime so that they encounter the nataraja of our hyperverses?

Two possible answers.

*Chosen Ones.* The nataraja is linked to the hyperverses precisely at the location where the denizens of the universe first open up a hypertunnel to La Hampa. Too Belacentric, I think.

*Many Bodies.* The nataraja has many bodies visible in La Hampa. Like fingertips intersecting a water plane. The nataraja is higher-dimensional, the instances you see are like, his agents, his reps, his incarnations. The win with this approach is that there will be natarajas at larger size scales so that “our” nataraja can in some sense be menaced by the depredations of the evil giant purusha-robots.

I prefer the second answer.

\*\*\*

Multiverse as a Library of Babel. Every universe exists. Mindless process of exhaustion generates every possible universe. A hyperverses is a creative effort of picking out a bouquet of universes, starting with one and making it better.

In principle two hyperverses could converge on the same universe and then, for that matter, diverge again. All the possible novels get written, not just the one.

### ***The Ecology of La Hampa***

Suppose that most of the resident aliens are immigrants. The cone shells, cockroaches, lizards and nudibranchs. Do they come from the same universe as us? The same hyperverses? Hard to say. Do remember Max Tegmark’s notion that maybe there is simply one infinite all-encompassing cosmos, and these divisions into universe and hyperverses are simply bookkeeping index methods to point to different locations of the one huge world.

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One native La Hampan species are the natarajas. (Natarajae? Naw.)

The natarajas start as larvae in the earth. Telepathic worms that enjoy being eaten, they change their taste to conform with what you want. Like the world’s best *al dente* spaghetti. They eat the earth, they produce pure water, making droplets and ponds. They burrow into the water and become fish. And then they become jellyfish. As they get brighter they float closer to the surface and then float up to become suns. Also, a sun-like jellyfish-nataraja can boil away water, making a pocket of air around itself. Eventually a sun burns out and makes an island with spores in it, and these make worm larvae that become fish that become jellyfish that become suns that become islands.

Everything in La Hampa come from the natarajas.

And, next move, there is only one nataraja. They are all aspects of the same single nataraja. Each nataraja is dancing a part of the one Big universe. Each manifestation of the natarajas is a specific indexing system into the cosmos.

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The natarajas are instances of the one body of God. La Hampa is heaven.

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Lifecycle should include a winged stage as well. Think of Escher’s fish-birds.

I have this sequence: Egg, worm and water, minnow, parrot-fish, jellyfish, sun, island full of eggs. How do I fit in the birds? Is the parrot-fish both a bird and a fish? Can't quite see the transition from fish/bird to jellyfish.

Egg, worm, jellyfish, bird, parrot-fish, sun.

Could birds lay eggs which are islands, seas or suns at a smaller scale? Peel off the shell of an egg and you have a sea with a bubble in it.

What about the fruit bats? And the wild pigs? Spiders and mosquitoes? And the plants? Palms, orchids, thorns, mangoes, coconuts.

Maybe the nataraja lifecycle isn't a line, maybe it branches and perhaps flows back together. Like DNA — if we think of DNA as an organism then it branches.

You see life-forms spontaneously transform. Protean. A pig turns into a flock of parrots. A parrot dives into the water and becomes a parrot-fish.

A roast centipede becomes a chicken's drumstick. A strip of steak. A carrot. All is One.

\*\*\*

I decided to view all of La Hampa as filled with a colony-super-organism that I call the Nataraja. So I won't use that word to apply only to the jellyfish.

When Bela meets our universe's Nataraja jellyfish, it's a bit like the guy in Franz Kafka's story, "Before the Law." In that story a guy is scared off from going into the castle to learn the Law. And he sits there waiting his whole life and nobody else ever comes to the gate and then he's old and dying, and he asks the guard how some nobody else ever came, and the guard says, "No one else could ever be admitted here, since this gate was made only for you. I am now going to shut it."

## Physical Computation

### *Universal Dynamics*

The field my guys are working in universal dynamics.

Nature is digital, thanks to quantum loops, and everything is a digital computation. A computation can be modeled as network of transitions. This network is knotted in certain ways. Sheaf theory describes the knotting and its bifurcations.

We get predictability at certain scales, patterns recur.

Involve n-dimensional cellular automata?

"There used to be three road blocks to prediction: chaos, quantum mechanics, and computational irreducibility. But one by one, we're learning how to make the obstacles go away."

My idea is as follows. Bela's thesis adviser has proved that many dynamical systems are in fact identical. There are many fewer options than we'd believed. Specifically, he's managed to predict orchid blossom shapes by solving the Navier-Stokes equations for certain water splashes on a computer.

Bela and Paul's insight will be to eliminate the digital phase and use analog processes to model quite different analog processes. Here's a table of models and targets.

<b>Analog Model to Consult</b>	<b>Target Process to Predict</b>
water splashes	morphogenesis of a blossom
frost crystals	elections
organ music's standing	evolution of a city's

waves	neighborhoods
pendulum and magnets	fads
fluttering leaves	weather
flames	surf
ink spreading in water	success of a commercial product
guitar amplifier feedback	mood swings
sandpile	

How few dynamical patterns might there be? What if there were only seven of them. But then, how can there be billions of different people? If we say they have different initial conditions, then we're back to having things be unpredictable. Maybe — surprise — people really are more similar than we'd realized? But there'd have to be, I think at least a million kinds of people.

Suppose Bela does get his Ph. D., but Haut manages to blackball him from a good job.

### ***The Morphic Classification Theorem***

I want to have some cool Theorem that drives the mechanism of the plot. I unused alternate versions in the Peripheral Science Ideas section as well, where I refer to them as “Bridge’s Theorems” But actually in the book, I’m letting Bela prove them with Paul, and Haut gets to share credit and pushes his name closer to the front, so I have a Bridge-Haut-Kish Theorem, or BHK theorem.

*Morphic Classification Theorem.* Specifies all the dynamic processes that can occur. Allows for some predictions.

Perhaps a *Morphic Undecidability Theorem.*

*Seed Theorem* (i) A spacetime is fully determined by the topological properties of a finitely large seed pattern, [which can be thought of as two successive views of a three dimensional structure called a seed]. (ii) Any alteration of the seed instantaneously affects the structure of the entire spacetime. (iii) The seed is in a higher-dimensional location called hampaspace, positioned so as to be equidistant from every point of spacetime. (iv) The seed’s time axis is a second dimension of time called hampatime.

### ***Physical universal computation***

Bela makes a “computer” that’s a sensitive flame. It’s based on the Principle of Computational Equivalence (PCE), which says most complex physical processes are universally computing. It can be a candle by his bed.

It’s using vortex threads, knots.

Or in jail Bela uses a dripping faucet for a computer, à la Rob Shaw.

The interface is his brain. He stares at them and sees things.

The brain itself can emulate anything. Strictly speaking you don’t need to look at anything even. But this is kind of boring, it’s what we already do. With the brain there’s an issue of selecting both the rule and some initial conditions.

And later maybe he can sell a device like this. Emulate anything whatsoever with some simple device. A guitar? A fluttering leaf? Fiddling with breadboards and rubber bands? Music circuitry? An iPod-like device?

Consider a cell phone with a digital camera. You take three pictures of something and then the cell phone tells you what the thing will do next.

I'd also like to do the music thing.

### **Codec**

In reality, I think the unsolvability of the codec problem supports the Natural Unsolvability Hypothesis (NUH). So if I want to have a non-NUH world, I probably shouldn't be talking so much about codec.

Indeed, I'm wondering if I should bring in codec after all. From a philosophy-of-computer-science point of view, it's important, but in terms of appealing to someone reading a fantastic novel, codec is a bit overly erudite. And since, in practice, the codec problem really isn't solvable, I'm going to have to punt, and have Veeter get away with a cheating, hand-waving, wall-papering solution to it. So if I'm going to punt on it, why even bring it up. For that way nobody's satisfied.

I wrote what I consider a nice rap on codec in the passage where Bela's noodling alone on his guitar right after Alma leaves, and I kind of hate to cut it, which I'd have to do if I want to really de-emphasize codec.

I can only keep the rap in the case where I really am going to produce a generalized solution to codec problem, and the only solution I can see is to use quantum computation to do an exponential search in polynomial time, and I think this is maybe too heavy a trip to lay on the reader. Also I'm not sure that this answer actually fits the question — my reason for thinking so is as follows: suppose I did have a collection of sample input and output pairs. And suppose I had some way of exhaustively listing an exponential or superexponential collection of possible codecs. And then I could test each codec to see if, coupled to my computation, the codec transforms the sample inputs into the corresponding sample outputs.

What I think I'll do is keep Bela's codec rap, but have the cockroaches show him a solution to the generalized codec problem, and then Paul and Veeter implement the solution off-camera, and deflate Bela's concert with the problem, quickly saying that it's been solved by the kind of search collapse I suggested in the previous paragraph. A win with this approach is that, given the search possibility, you can effectively have the user interface to the codec be anything you like. And have the codec behind the scenes turning some human-friendly input format into computational input, letting the computation run, and then turning the output into a human-friendly form.

### **The Paracomputer**

This is a natural object viewed as a computer. For it to really be practically useful, you need a codec solution, a way of coding data in and decoding it out.

I think I'm calling this a paracomputer.

I was considering calling it a hypercomputer, then decided to find there's some name that better evokes the idea that it's a "wild," naturally occurring, native computer. I don't want to say analog computer, as that phrase is saddled with a crude meaning/reputation from the past. As it happens, "hypercomputer" also has a variety of technical meanings in the literature, see <http://en.wikipedia.org/wiki/Hypercomputer>. Generally it means a device able to compute non-computable functions, which isn't what I want.

Other candidate names: Orgocomputer, ciscomputer, subcomputer, found computer, ambient computer, naturocomputer, codec computer, Margolus computer, smart water, smart skin, atomic computer, comporter: it behaves or "comports itself." Compriser, composer, communer.



Then I was thinking of calling it a Comover, Comoover, Commover, or Commoover. It *mooves*. “Commmove” is a dictionary word that means “agitate, disturb.” I am inclined to double the letter O because otherwise people would tend to pronounce the word wrong, like come-over, and I want it to sound like co-mover. Problem is, this makes for a pretty silly-looking word no matter how you write it. Love a chance to cowishly say “moo,” but then nobody takes it seriously and this is, after all, philosophy of science I’m doing her.

Comgeter, replace the “put” with “get”. Comtaker. Comseer. All silly.

Metacomputer is nice, but it has an official meaning as a network of linked computers. This is in a way what a natural object is, so I could go with this, perhaps saying “natural metacomputer” now and then. But might I want to wave meta to use for La Hampa? But I think that bullshitting prick Stevenson already wrote about cyberspace as metaverse, so I wouldn’t want to call the aliens world that after all, so I could use it for my computer. Maybe.

Looking for other prefixes — Ultracomputer just means a fast supercomputer. Übercomputer, aerocomputer, hydrocomputer. Nah.

Well, hmm, para- isn’t taken, Google on paracomputer turns up no hits. “Para” suggests that it’s almost a computer, or similar to a computer, even though it isn’t *really* a computer. Slight concern that “para” has an association of being “less than,” and I want a “more than” association. But, wait, the “paranormal” association is really good. Mysto steam.

### ***Aliens Use Our World For Predictability Experiment***

As I discuss at length in my book *The Lifebox, the Seashell and the Soul*, the following is probably true: PCU (Principle of Computational Unpredictability): Most naturally occurring processes are unpredictable in the sense that they don’t allow for an exponential speed-up.

I think it might be fun to look at a world where PCU fails. A reality where we can rapidly could predict all kinds of things: weather, moods, stocks, health. I’m thinking maybe the Q-chip could do it, using, let’s say, the morphic classification theorem to map any old process into a problem for the chip, and then using the chip’s quantum computation to predict the outputs in linear time.

As a *practical* matter, worlds could vary between PCU and non-PCU according to whether a Q-chip-like technology has been developed. What might be more intriguing would be if worlds could *fundamentally* vary. As if the Q-chip simply wouldn’t work in some worlds. The easy worlds being, like places where the “ocean floor” is tame chunky gravel, and the hard worlds being places where the underlayment is murk.

What if the cockroaches and cone shells are working to transform our Earth into a non-PCU world simply so they can see how things would then work out. Suppose that this transformation is, for them, a decisive experiment intended to distinguish between their opposing philosophical positions.

Perhaps in a non-PCU world the distinction between Universal Automatism and, say, the Common Sense ontology becomes clear. In the latter case, some physical or mental processes would (not being computations) remain unpredictable. What if the thing that remained unpredictable in a non-PCU world were the affections of a woman! That would be cute.

And they analyzed Cammy’s brain to see if they could predict Cammy 2 or not.

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Maybe the aliens, call them Rowena the cone shell and Oskar the cockroach, maybe they happened upon a jellyfish just fanning out into a hyperverses and said to themselves "Let's run an experiment on this hyperverses."

Now if they force  $\sim$ PCU into this world, that must mean that  $\sim$ PCU is already true in their world, for how else could they make everything predictable for us if they didn't already know how to predict things in their world. Unless, of course, their world's computations are of a wholly different order.

If La Hampa is already  $\sim$ PCU, then why can't they just test  $T \neq C$  right there? Well, maybe they can't understand their own thought system T. But we're so much simpler that they can understand our T. And they give Bela the secret priestly logic so he can make our world be  $\sim$ PCU and he can predict any computer simulation C of Cammy, and see if Cammy acts like that.

Why do they have to actually give us the  $\sim$ PCU logic, why can't they just peek into our world and do the prediction themselves? Maybe it's an accident that Bela picks up the  $\sim$ PCU. The hierophantic logic. The Secret Teaching. Like what non-mathematicians think logic and math is.

### ***Solution To the Codec Problem.***

SF cheats change as time goes on; in historical order, some examples might be: mathematical genius, radio, radioactivity, telepathy, relativity, curved space, black holes, quantum mechanics, the multiverse, quarks, dark matter, string theory, and reverse causality. With all these gimmicks in the arsenal, surely my fictional characters can find a solution to the generalized codec problem!

I need to use a cheat to solve codec. Which one?

#### *Quantum computation.*

Suppose we regard finding the codec that makes a given paracomputer useful for a particular task is a kind of search problem. There are exponentially many possible codecs and you need to find the right one. But once you have the codec, your paracomputer can solve all kinds of problems in the particular domain that the codec is good for.

You could have a quantum computing "Q-chip" that acts like a cloud of a zillion parallel chips that compute each branch of a search problem at once, and come up with an optimal codec method in no time flat. In other words, use the Q-chip to search through all the possible ways of setting up, for instance, a market-to-water-to-market codec and quickly find the right one.

This isn't satisfying, though, as then we're using a computing cheat to solve another computing problem. If quantum computation is so great, why aren't we using it instead of the paracomputer? It muddies the water to throw in quantum computation when I already have the paracomputer and, in the offing, the oracle. And in any case, I'd rather have this be a fully digital non-quantum universe.

#### *Telepathy.*

In desperation I turn to telepathy? Maybe some kind of mental concentration can do the trick. Think of the fortune-tellers who see the future by staring at the gnarly curves within the crystal ball they use as a paracomputer. Maybe they're doing a codec with their minds. This would be good as then everyone could do it. But I plan to have everyone getting an oracle in Earth-2, so don't need this democracy.

#### *Reverse causality.*

Use the transactional interpretation of quantum mechanics. The question and the answer find each other. Why it works is a mystery. Just because we have a nice world. Throw in some dark matter here as well. Maybe some strings. Use Ishmael Reed's coinage, "spring theory."

*Mathematical genius.*

Let's suppose that one of the characters in our thought experiment is, oh, a genius who creates a really clever algorithm for finding codecs by using spring theory, which is a new offshoot of string theory. Or just say that Veeter is really smart and that he implemented a special purpose codec solver. He calls it devolution, it uses genetic algorithms and hash tables. People will believe this because they don't understand the barrier posed by exponential search. But it's bad to trade on their gullibility.

*Hierophantics.*

A higher logic learned from the La Hampan. Makes as big a change as using a language makes. This is more than genius, it's a new, alien way of thought. Hiero + phantics = mystery + showing.

### ***Haut's Paradox***

If prediction is possible, then what happens when you predict things involving the predictor. You're predicting the effects of your prediction, and you get into a regress, no? And let's suppose this sets off a cascade of higher order computations of every greater density. The *Singularity*, ta-da. This would seem to be so computation-intensive that it violates the Margolus-Levitin limit on computational density, but since the computation really is taking place, it must be that the computation has to reach out to a higher dimension, and reality bulges out making a tunnel to La Hampa.

Also on the prediction theme, I'm seeing Act II as showing How would it be? I don't know yet, and that's why I want to carry out this *Gedankenexperiment*.

And in Act III we'll get back to the "normal" world.

Haut figured out you don't need a program to run his paradox on a membrane like paracomputer, a Gobrane. Just need to zap the Gobrane in this certain golden-mean-type spot. I say this because I recall seeing the golden ratio pop up as an eigenvalue of a Markov series years ago when I was teaching Finite Math.

### ***Paracomputers and Oracles***

[Excerpted from my April 15, 2005, draft for an article, "Thought Experiments: Adventures In Gnarly Computation" for *Isaac Asimov's Science Fiction Magazine*.]

I believe that gnarly natural systems really are performing computations much more intense than any supercomputer. It's a simple matter of resources: a natural system is inherently parallel, with all its parts being updated at once. And a ordinary sized object is made up of something on the order of an octillion atoms ( $10^{27}$ ) <[http://education.jlab.org/qa/mathatom\\_04.html](http://education.jlab.org/qa/mathatom_04.html)>. If we could harness this system to act as a computer for us, we'd have what you might call a *paracomputer* that totally outstrips anything that our man-made beige buzzing desktop machines can do. I say "paracomputer" not "computer" to point out the fact that this is a *natural object* which behaves like computer, as opposed to being a high-tech totem that we clever monkeys made. Any gnarly natural process is a paracomputer. The fact that the naturally occurring paracomputers are much more powerful than our present-day supercomputers is borne in upon us by the fact that personal computer simulations of reality are, if you ignore the hype, quite crude.

Let me insert a deflationary side-remark on the Singularity that's supposed to occur when intelligent computers begin designing even more intelligent computers and so on. Perhaps the end result of this kind of process *won't* be a god. Perhaps it'll be something more like a wind-riffled pond, a campfire, or a fly buzzing around your backyard. Nature's paracomputers are, after all, already computing at the maximum possible flop.

A natural paracomputer would be powerful enough to be in striking range of predicting other natural systems in real time or perhaps even a bit faster than real time. The problem with our naturally-occurring paracomputers is that they're not set up for the kinds of tasks we like to use computers for --- like predicting the stock-market, rendering Homer Simpson, or simulating nuclear explosions.

To make practical use of paracomputers we need a solution to what you might call the *codec* or coding-decoding problem. If you want to learn something specific from a simulation, you have to know how to code your data into the simulation and how to decode it back out. Like suppose you're going to make predictions about the weather by reading tea-leaves. To get concrete answers, you *code* today's weather into a cup of tea, which you're using as a paracomputer. You swirl the cup around, drink the tea, look at the leaves, and *decode* the leaf pattern into tomorrow's weather. Codec.

This is a subtle point, so let me state it again. Suppose that you want to simulate the market price of a certain stock, and that you have all the data and equations to do it, but the simulation is so complicated that it requires much more time than the real-time period you want to simulate. And you'd like to turn this computation into, say, the motions of some wine when you pour it back and forth between two glasses. You know the computational power is there in the moving wine. But where's the codec? How do you feed the market trends into the wine? How do you get the prediction numbers out? Do you drink the paracomputer?

Finding the codec that makes a given paracomputer useful for a particular task is a hard problem, but once you have the codec, your paracomputer can solve things very fast. But how to find the codec? Well, let's use an SF cheat, let's suppose that one of the characters in our thought experiment is, oh, a genius who creates a really clever algorithm for finding codecs by using, say, string theory, which is a fictional offshoot of string theory.

So now suppose that we're able, for instance, to program the wind in the trees and use it as a paracomputer. Then what? I'm thinking about an interesting real-world limitative result that could come into play. This is the Margolus-Levitin theorem, which says that there's some maximum computational rate that any limited region of spacetime can perform at any given energy level. (See for instance Seth Lloyd's paper on the "Computational Capacity of the Universe," [http://arxiv.org/PS\\_cache/quant-ph/pdf/0110/0110141.pdf](http://arxiv.org/PS_cache/quant-ph/pdf/0110/0110141.pdf).) The limit is pretty high --- some ten-to-the-fiftieth bit-flips per second on a room-temperature laptop --- but SF writers love breaking limits.

Recently I've been visualizing a situation where a couple of crazy mathematicians (some things never change!) make a paracomputer from a vibrating membrane, use clever programming to find desired codecs, and set the paracomputer to predicting its *own* outputs. I expect the feedback process to produce an ever-increasing amount of computation within the little paracomputer. The result is that the device is on the point of violating the Margolus-Levitin limit, and the only way the universe can cope with this is by bulging out a big extra hump of spacetime in the vicinity of the paracomputer. And this hump acts as --- a tunnel to a higher universe inhabited by, of course, super-intelligent humanoid cockroaches and evil flying cone shell mollusks!

Now let's turn the hard-SF knob up to eleven. Even if we had natural paracomputers, we'd still be limited by the PCU. Most naturally occurring computations are unpredictable. Your paracomputers can speed things up by a linear factor because they're so massively parallel. Nevertheless, by the PCU, most problems would resist being absolutely crushed by clever shortcuts. The power of the paracomputer may indeed let you predict tomorrow's weather, but eventually the PCU catches up with you. You can't predict, say, next week's weather. Even with a paracomputer you might be able to approximately predict a person's activities for half an hour, but not to a huge degree of accuracy, and certainly not out to a time several months away. The PCU makes prediction impossible for extended periods of time.

Now, being a science-fiction writer, when I see a natural principle, I wonder if it could fail. Even if it's a principle such as the PCU that I think is true. (An inspiration here is a story by Robert Coates, "The Law," in which the law of averages fails. The story first appeared in the *New Yorker* of Nov 29, 1947, and can also be found in Clifton Fadiman's *The Mathematical Magpie*.)

So now let's suppose that, for their own nefarious purposes, the alien cockroaches and cone shells teach our mathematician heroes some amazing new technique that voids the PCU! This notion isn't utterly inconceivable. Consider, for instance, how drastically the use of language speeds up the human thought process. Or the way that using digital notation speeds up arithmetic. Maybe there's some thought tool we've never even dreamed of that can in fact crush any possible computation into a few quick chicken-scratches on the back of a business card. So our heroes learn this trick and they come back to spread the word.

And then we've got a world where the PCU fails. This is a reality where we can rapidly predict all kinds of things arbitrarily far into the future: weather, moods, stocks, health. A world where

people have oracles. SF is all about making things immediate and tactile, so let's suppose that an oracle is like a magic mirror. You look into it and ask it a question about the future, and it always gives you the right answer. Nice simple interface. What would it be like to live in a world with oracles?

I'm not sure yet. I'm still computing the outcome of this sequence of thought experiments --- the computation consists of writing an SF novel called *Mathematicians in Love*.

\*\*\*

Now that I rashly am going into print claiming I'll write about a ~PCU world, I'm wondering how to make that interesting. And, naturally, I rebel at having to do it. Maybe it was unwise to publish a description of a novel in progress. Oh well, I don't really have to honor precisely what I said I'd do. And it's not like many people would notice in any case whether or not I did. The Mathematician Godfather thing. *What* was that offer?

\*\*\*

Would it really make any difference if I could predict things? Wouldn't the ability to predict automatically undermine itself via Liar Paradoxes and Gödel Sentences? There'd be an arms-race of prediction. I could predict you until you got hold of an oracle, and then you'd be unpredictable. The Secret Knowledge of hierophantics. The boys were almost there with the Morphic Classification Theorem. Just another nudge and they have the new science of hierophantics.

I think I won't solve codec in Earth-1 as that steals the thunder. Wait and really solve it in Earth-2. Hierophantics is more about solving the codec, and the way it does it is by circumventing the PCU --- which is more honest, as I think any real codec solution is indeed NP-complete, so solving it really does bring in a ~PCU world.

\*\*\*

Suppose that in Earth-2 we have ubiquitous oracles. Paracomputers with self-solving codec and with additional hierophantic shortcuts. Say that they're as simple as looking into a dish of water. Then what social effects does this have?

*Weather.* Really what difference would it make if you predict the weather accurately? Surfers show up like to catch a train, big wave at 3:42 on the dot expected.

The stock market would have to go away, also *games of chance*. If everyone can predict, there's nothing to bet on. So what could people bet on instead? Only human behavior. On vlogs?

Also *sports events*, you'd know who's gonna win. But couldn't you work around that? Tell the right-fielder to pull in to, say, catch that line drive that otherwise drives in the winning run? Then the prediction changes, and the other guys alter their plan. Like that Mad Magazine cartoon years ago about a steady stream of pinch-hitters and pinch-batters for one particular at-bat.

*People's moods.* Would I just avoid seeing my partner when I know that s/he's in a bad mood? Would we get into Liar-Paradox-style unpredictability?

Can I work the vlog into this?

\*\*\*

It seems like Veeter already has the oracle:

Gobrane + BHK Theorem + Clever models + Data + Codec = Oracle.

Veeter finds the codec using a genetic algorithm "devolution" approach.

I'd had this idea that Bela might be bringing back some knowledge to make oracles more ubiquitous. Possibly hierophantics plays a role here. Is it interesting if everyone gets an oracle?

Another option is that knowing hierophantics makes Bela unpredictable via oracle. So he can evade the, like, ruthless Big Brother surveillance that Joe Doakes has put into play using Veeter's tech.

What has been predicted in Earth-1?

Haut: orchid blossom shapes, one election.

Veeter: tumbling dice, the chip futures market.

Paul: Veeter except it doesn't work.

In Earth-2, we can suppose that the Gobrane has started to work for predicting people and social movements. Without any alien intervention, just using Veeter's improvements on the BHK theorem. And suppose that Joe Doakes is ruthlessly using it to become a dictator for life.

And Bela can throw a monkey-wrench in it. The aliens don't care about this, by the way, it's just something Bela does.

\*\*\*

Consequences of oracles: gambling, sports, relationships. Planning construction, like, if I put in this concrete footing will it make the road drain into my garage? But it's just being used for politics.

### ***Computational Possibilities That Vary With Location***

*Zone A.* Includes Earth-1 and Earth-2.

*Earth-1.* Earth-1 should be a bit more deterministic, less PCU, more amenable to oracles. And you'd notice that in the clouds, the water, the fire.

*Earth-2.* Computationally very similar to Earth-1. It has an incipient fascist dictatorship based upon Gobrane-oracle technology.

*Zone B.* Includes Earth-3.

*Earth-3.* This world is the same as ours. Here we have, I think, no chance of BHK, no chance of Gobrane, no chance of hierophantics, free forever in the seething dark.

We have BHK and Gobrane prediction in Zone A and not in Zone B. How do I keep this consistent with my preferred Tegmarkian view of the "parallel" Earths as being different actual planets in a single very large universe? I suppose that the universe's background can have different underlying flavors, call them the turbulent vs. the smooth. Like a stream's rapids have a different-feeling ontology than does the calm part of the stream. Zone B is in the rapids, Zone A is in the calm.

The codec problems in Zone A happen to be solvable by Veeter's Mickey-Mouse devolution algorithm because the fitness landscapes of naturally occurring search problems in Zone A simply do happen to be quite smooth and readily hill-climbable.

This would be analogous to the output of, say Rule 110, in which some regions are simply a repetitive class-two background, while others have seething class-four glider action. Zone A happens to be a class-two region, while Zone B is full of class-three and class-four scuzz.

How does P and NP fit in? An NP problem is an exponential search problem with a polynomial target-recognition algorithm. If we could collapse all exponential searches then, a fortiori,  $P = NP$ . But collapsing all exponential searches seems like an inconsistent notion.

What is consistent, though, is the possibility that any exponential search that a human being happens to be interested in is in fact collapsible to a polynomial algorithm. And this could hold in Zone A, but not in Zone B.

How would Bela's hierophantic powers fit in? Perhaps he alone becomes non-collapsible. He is a droplet of Zone B behavior within Zone A.

## Unused Science Ideas

### *The speech of plants and animals*

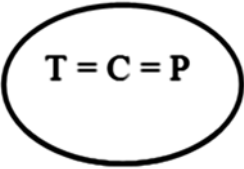
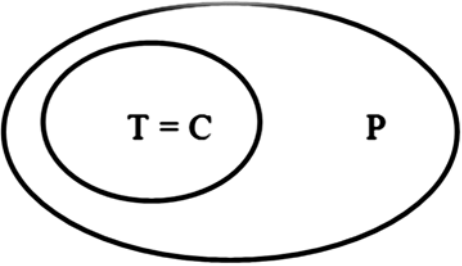
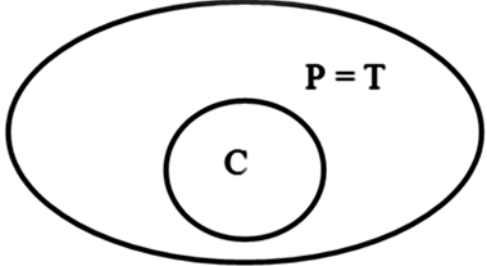
By the PCE, a plant or an animal is universally computing, so maybe you can learn to understand them.

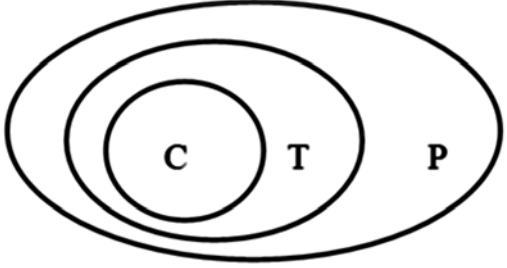
I'd like to use that beloved old fairy tale of the boy who's helping the wizard roast the heart of the magic raven. He's instructed not to taste it, but some hot fat springs onto the boy's thumb, and he licks it off, and thereby extracts the entire benefit of the raven heart. The boy can understand the speech of plants and animals. The jealous wizard pursues him.

Bela gets some knowledge of Paul's in this fashion. Perhaps Hampa gets all medieval on your ass.

### *Conflicting Worldviews of the Alien Mathematicians*

[Copied from *The Lifebox, the Seashell, and the Soul*]

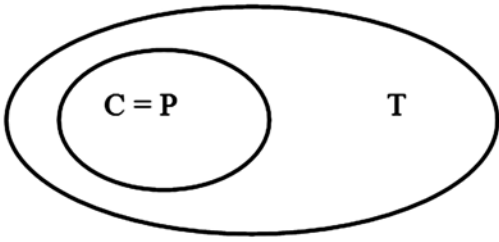
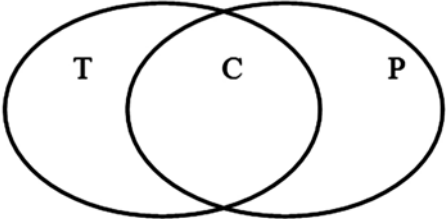
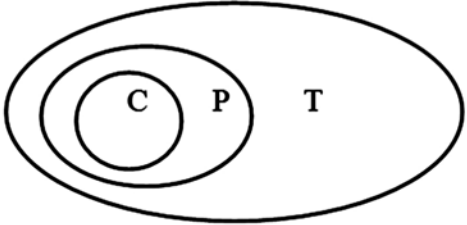
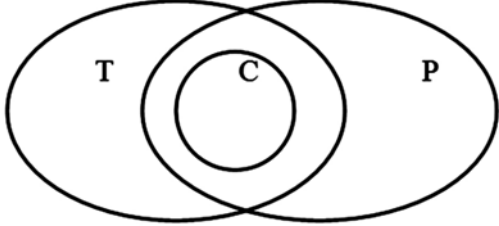
Description	0 or 1 for absence or presence of elements in the three "dot zones" $T \sim P,$ $(T \cap P) \sim C,$ $P \sim T$			Picture
1. Universal Automatism. Every object or thought is a computation. [Stephen Wolfram, Edward Fredkin, Alan Turing?]  CONE SHELLS	0	0	0	
2. Mechanism. We think like digital machines, and the rich continuous world of physics lies beyond us.	0	0	1	
3. Physical antimechanism. Thanks to being continuous physical beings, our behavior is richer than that of digital machines. [Roger Penrose, Nick Herbert.]	0	1	0	

<p>3. Common sense. Our minds can do more than machines, and some entities do more than our minds. That is, not every possible thought is a computation, and not every physical process is thinkable.</p>	0	1	1	
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**Figure 20: The “Natural” First Four Ontologies.**

In these four ontologies, there are no entities in  $T \sim P$ , that is, no thoughts which are not representable as physical processes.



Description	0 or 1 for absence or presence of elements in the three “dot zones” $T \sim P$ , $(T \cap P) \sim C$ , $P \sim T$			Picture
<p>5. <i>Supernaturalism</i>. Although physics is a digital computation, the mind has supernatural powers lying beyond physics. [New Agers.]</p> <p>COCKROACHES</p>	1	0	0	
<p>6. <i>Computationalism</i> Every thinkable physical process is a computation. But there are both non-thinkable things and non-physical thoughts.</p>	1	0	1	
<p>7. <i>Idealism</i> Some physical processes lie beyond computation, and the supernatural mind exceeds even physics. [Kurt Gödel.]</p>	1	1	0	
<p>8. <i>Plenitude</i> Every possible kind of object exists!</p> <p>BELA</p>	1	1	1	

**Figure 21: The “Supernatural” Second Four Ontologies**

In each of the latter four ontologies, we have objects in  $T \sim P$ , that is, thoughts which are not realizable as physical processes.

***Hyperspherical Hole Doors***

I am always tempted to reuse the hyperspherical hole concept that I introduced in *The Fourth Dimension*, and which I also used in *Realware*. A sphere that’s the mouth of a hypertunnel to another plane of reality.

I can think of a nice interface for a hole maker. You pick up a magic round control object, I think of it as a large California buckeye. You squeeze it once to set the center point. Still squeezing, you move your hand to drag a rubber-band sphere,

setting the radius. Release pressure and study the sphere. Squeeze the buckeye and move it and you can drag the highlighted sphere forward backward, up and down, left and right. Release and double squeeze and the sphere becomes a tunnel, a kind of hole in space that you can jump/fall through to land *\*whump\** in the underworld subfab.

Imagine doing this a whole lot of times, making a room into Swiss cheese. A great visual effect.

### ***The Inverse Problem***

There's a challenging "inverse problem." Given a reality, deduce the shape of a <Sherlock, DinoBone, Knobby Giraffe> triple that can create it. Even if Sherlock and DinoBone are assumed to default to the current values it's a hard problem. In fact its computationally unsolvable even in the simplest case where Sherlock and DinoBone are kept the same.

(Usually we'd expect Sherlock to be the same in any case, if we don't want to change our physics. And, so as not to overwhelm the reader, we might as well keep DinoBone constant as well, though, on the other hand, it might make sense to have DinoBone could depend upon the individual reality hacker. Styles of reality.)

The unsolvability of the inverse problem suggests that its impossible to undo a change in reality.

### ***Variants on Bridge's Theorems***

In the book, I speak of a BHK or Bridge-Haut-Kis theorem, rather than a Bridge's theorem, as I was planning when I originally listed these alternatives.

(a) *Bridge's Collapse Theorem*. You don't have the many worlds even if though you can alter reality. Now, the seed-to-universe transformation is instantaneous. And it's happening over and over, our one single spacetime keeps changing. Spacetime is flapping around like Pringle's potato chip, moving in the higher time dimension we call hampatime. But there's only the one spacetime.

(Think of spacetime as a minimal surface.)

Bridge's Collapse Theorem says that the hampatime that elapses while the flapping is happening can in fact be folded into spacetime. It involves a dual view of ordinary reality. Like nouns become verbs and verbs become nouns. "Budh" means to grow or to know.

(b) *Bridge's Ubiquity Theorem*. The Knobby Giraffe is everywhere. Suddenly Paul sees it all over the place. "I see His face in every flower."

(c) *Bridge's Surgery Theorem*. Akin to the classification of surfaces as sums of tori and crosscaps: any reality can be obtained from any other by flipping (or mirror-reversing, or maybe changing linkedness) of a unit cube at some location in the spacetime. Or by doing something else rather than flipping. Let's say a topological alteration. The knottedness of the spacetime foam.

(d) *Bridge's Cascade Theorem* (i) All of spacetime is determined by the full topological properties of any arbitrarily small region, and (ii) any *topological* alteration of a spacetime region instantaneously affects the structure of the entire spacetime. [The instantaneous nature of the transformation is due to what we commonly call quantum entanglement.]

(e) *Bridge's Stability Theorem*. Under no circumstances is Transform(S) the empty universe. What can happen is that if Transform is a destructive transformation

of any kind, then if A is the agent that applies Transform, then  $\text{Transform}(S) = S \sim A$ , that is, if A tries to execute a reality alteration that destroys the universe, then A disappears and the universe seals up the flaw where A used to be.

(f) *Bridge's Memory Theorem*. Suppose that Transform is a topological alteration of some local region that changes all of a spacetime S. Also suppose that Transform is executed by a coherent system A. Write  $S^*$  for  $\text{Transform}(S)$ , and  $A^*$  for  $\text{Transform}(A)$ .  $A^*$  will include a memory trace of S. [This result is somewhat counterintuitive. For A, being a subsystem of S will include a memory trace of S, so we would expect  $A^*$  to include a memory trace of  $S^*$ , but not of S. The proof hinges upon showing that A's role as agent brings into being a memory trace of the form  $\text{Transform}^{-1}(S)$  which is in turn transformed into a memory trace of S.]

### ***Transfinite Regress***

For this discussion, I'll speak of hypertime rather than hamptime.

Once I make the move of adding hypertime to time, I have the possibility of adding a hyperhypertime, and so on.

Although conceptually interesting, I don't think this works in a mass market novel, particularly in a novel that's meant to be somewhat slipstream and thus aimed at a wider audience than gonzo techies. At most I could have a brief psychedelic vision of the infinite regress.

But let's work out the regress details for kicks.

Suppose Meta Universe = Meta History(EdenApple), where EdenApple is some four dimensional seed and Meta History grows this seed into a stack of spacetime slices some way or another — possibly by using something like a HyperSherlock(HyperDinoBone(EdenApple)) approach, possibly using something simpler.

Here we can suppose that a Meta reality hacker jumps up yet another dimension and changes EdenApple to EdenApple\* and we get a Meta Universe\* = Meta History(EdenApple\*). And the same process ensues, regressing as long as we like, to have

... stacks of stacks of stacks of spacetimes.

It's an  $\omega^*$  sequence of "stacks of" there at the start, with the order type of the negative integers.

Now someone else might say, look, you've got infinitely many spacetimes there, and you've imagined a certain way of stacking them, you've imagined, in other words, a certain infinite dimensional basis for a Hilbert space of all existing spacetimes, which is a subset of all possible spacetimes.

But perhaps the stacking is just one way of looking at things, and in reality you simply have infinitely many universes in superspace. So that, in other words, you're looking at a multiverse.

"Fuck that defeatist bullshit," said Paul Bridge. "The Koinos Kosmos [Phil Dick's crackpot phase phrase] has a *point*. We know that our spacetime is one in a sequence of better and better spacetimes arranged along the hypertime axis to make a metahistory. And it's possible that this metahistory is one in a sequence of better and better metahistories arranged along a hyperhypertime axis to make a metametahistory — I think there's a subsubfab or a HyperHampa for metahacking it. An underunderworld. And — give a mathematician an inch and he takes an infinity — this metametahistory is one in a sequence of better and better metametahistories arranged along a hyperhyperhypertime axis to make a metametametahistory. Each N-

history is one in a sequence of better and better N-histories arranged along an (N+1)-time axis to make an (N+1) history.”

“You say there’s a point? What’s the point of that stacking bullshit?” I answered. “You might as well just admit that we’re in a multiverse. There’s lots of universes. Time branches.” I spread my fingers and wiggled them.

“I despise that lame-ass branching universes shit,” said Paul Bridge. “We don’t make a frigging new universe just because some cowboy in a Wyoming bar is rolling dice for a free drink. Or because an ant touches or doesn’t touch a grain of sugar. Or because a so-called electron hits or doesn’t hit a so-called nucleus. The universe doesn’t not branch for no particular reason no how contrary wise. It’s going somewhere. Catch the A train. The Mind in History. The very most I might grant you is that the subsuperspace of the real universes is a fractal in the full superspace of all the possible universes. A gnarly branch.”

“Is the branch moving?”

Pause. “Well, yes, I suppose it is. It’s moving in  $\omega$ -time. So, yeah, we end up with a transfinite hierarchy of universes. But *not every possible universe exists.*”

### ***Manichean Cosmos and the Axiom of Determinacy***

Could be there is an evil God, a Satan, working against our jellyfish, to keep making things worse. He looks like a flying manta ray. He controls Veeter, Joe Doakes, and the NSA agents.

Think of the Axiom of Determinacy in set theory where “players” pick successive digits of a real number and are competing as to whether the eventual number is in a targeted set or not. So they’re continually tweaking the universe, with an eye to having the hyperverses limit end up one way or another.

### ***A Day in La Hampa Is A Year on Earth***

Maybe one day in La Hampa is a year on Earth, and Paul realizes this, due to some heavy-duty mathematical-physics rap, and that’s why he wants to rush back in the night, so as not to lose so much time on Earth as to be wholly out of the loop.

They arrived in La Hampa at just past noon on Thursday May 31, 2012, and suppose they return to Earth just past midnight, which is effectively  $\frac{1}{2}$  year later, that is, Saturday, December 1, 2005. The elections are over, they were on Tuesday, November 6, 2005.

It wouldn’t be all that likely they’re on the beach then. But the tunnel back could of course end up anywhere. They could surf into a conference room or onto a Washer Drop stage.

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Paul drank some water too, then shook his head.

“I feel too pukeful to sleep,” he said. “And too excited. There’s something about the time-flows that I ought to analyze before — ” He groped around in the air. “Can I have paper and something to write with, Nataraja?”

A lined pad and a number two pencil appeared on our table. Paul propped himself up with his pillows and began inscribing precise lines of symbols — for all the world as if we were back in our apartment in Humelocke. It was a comforting sight.

[Paul deduces the variant time-flows from the angle of the gnarled jellyfish-cable that led through the hypertunnel, the angle at which it descends into the ocean.]

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But, *naw*, stick with the carefully thought out perpendicular time stuff you thought out earlier, Ru. And then we can do the zoom down in size-scale thing to find Alma-1 upon the return to La Hampa. Later on Earth means bigger in La Hampa. If you stay at the same size-level in La Hampa, then you jump back to the same time when you left. And stick with the surfboard bumping come-back scene and the earthquake collapse of the natural bridge, that's good stuff.

### ***Jellyfish Multiple Bodies***

There is an Earthly jellyfish-god in a lake at the Paradisio level, and she's the *same* one as the one at the level below, Nanonesia. She's transhampascalar, exists at every La Hampan size level, and thus at every time of Earth.

[Although this *should* be true, I think it would overburden the reader. Better to go back to the familiar Nanonesia lake to meet the jellyfish.]

## ***Unused Material***

### **Unused Phrases and Ideas**

#### ***Paul's Loneliness***

In Earth-2: Paul stared past me, his eyes wistfully following the fecund haunches of young mother pushing a stroller of twins. "I could have had a family," he said. "You stole it."

#### ***Vlog Product***

Lots of retired people were using Rumpelstiltskin cell-phone-sized Lifebox product to dictate memoirs for their grandchildren. Vlogging.

#### ***Random Bits***

The Apex Technical School, Sixth Ave. and 19<sup>th</sup> St.

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*Lolita*. Humbert's awkwardness talking to Lolita's husband, who is in fact literally deaf. The fierce time-wind blowing from the younger generation to the older, ripping the oldsters' words from their mouths unheard.

\*\*\*

Mr. Bones, the minstrel show character, who knocked two bones together for music. Minstrel shows were weird, white men putting on black face and denigrating black people. You could say that a white rap act is in some sense a minstrel-show, allowing white people to enjoy black music without have to endure the discomfoting presence of black performers. Aside from all that, I do like the idea of a skeleton named Mr. Bones.

#### ***Weird surfboard art.***

Have my guys be on, like, surfboards that are modeled on roadkill Klein bottles: shapes that "want" to be four-dimensional. Maybe use these on their way

back. Or have these shapes as decorations. I'm thinking of the cross-sections of the 4D cubic Mandelbrot set in particular.

### ***San Jose Air***

Down in San Jose where I grew up, the air's not so good. Anywhere you go in San Ho, you can always hear the roar of a freeway. Why is it that cars have to be so loud? It's the downside of chaotic air turbulence. That ripping noise.

### ***Child***

Complication: Alma brings with her a small child by Paul, call him Paul, Jr.

### ***Bela as a boy***

As a boy, Bela tried to build an electron microscope at home, and the supplier showed up with a klystron tube, "Where's Dr. Kis?"

### ***Cammy as Porn Star***

The porn star who hooks up with Paul. Like Tera Patrick, Jenna Jameson and their less-famous fellow ecdysiasts Victoria Zdrok, Rachel Ryan or Chantz Fortune. Cammy's had a lot of work done. Boobs, chin, nose, lips. "The Pussy And Ass of Cammy Vendt" is on sale in every sex shop in North Beach or Eighth Avenue, a rubber dingus in a small cellophane-windowed box revealing a butthole as sanitary as the Pillsbury Dough Boy's — just like Jenna's and Tera's models. Cammy is proud that she put hers on the market as well. They cast it directly from her bod. Six pounds of piezoplastic.

Oh, don't do this, no way, you'd lose reader sympathy for her.

### ***Alma's Sexuality***

By the way, I had no doubts about Alma's straightness. That wasn't the kind of thing she'd have bothered to lie about.

### ***Mektoub***

I've always wanted to have an Islamic character say, "Mektoub," meaning "It is written." It would be nice to have an Islamic character. I learned the word from Burroughs.

### ***Hair-Metal***

I like the name of the music genre, hair-metal. Two ordinary words. Find something analogous. Skin-plastic.

### ***La Hampa Effects***

Have a bunch of mathematicians there. Sierpinski. Waclaw sounds like Vahkwahv.

\*\*\*

Possibly do digital time in ticks.

### ***Geena Grover Character with Twist***

Originally I was planning to have Bela's "true love" be a programmer, but then I decided it would be simpler and a cleaner design to use Cammy Vendt.

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Geena loves Bela, he meets her at Rumpelstiltskin, she's a programmer. She's a crazy mathematician, too, except she isn't a mathematician. In certain lights she's a computer geek, although in other lights, she attractive and almost normal. She talks about her father a lot. Has slightly rough skin. Big, healthy girl. Jogger. Wears dress-for-success polyester suits by default, though she gets them at second-hand stores. She gets Bela in the end of Act III.

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Final twist: Geena-1 shows up, she hampajumped to Earth-3 a week before Bela and Alma, she didn't really die in Earth-1.

She told Bela-3 and Alma-3 how to leave, to get younger. Bela now realizes he was able to switch reality because he was pushed, and that there is a single cascade of his selves wrapping twice around hampatime and that there are in fact only three worlds. The morphic classification theorem had nothing to do with it. But no further jumps are possible. There's only three worlds, and further jumps would violate the a priori fact that one can't have contradictions. He realizes now that Bela-2 got to go to Earth-1 and be 25 years old. Fuck. He's wasted his life. Mektoub. He settles down to enjoy his remaining years with Geena Grover.

### ***Timebaking***

Even more shocking, it turns out that they're all fifteen years older. Somehow they screwed up and jumped fifteen years into the future, and their bodies for some goddamn reason timebaked themselves to match. They're forty years old now.

\*\*\*

He doesn't burden Bela-2 and Paul-2 with knowledge of the timebake effect. He feels uneasy about the really old Bela-3 he saw the first time in La Hampa.

### ***Flame Simulation***

He wants advice on predicting spacetime singularities. Bela tells him that the prediction device for this should be a bed of flame. They set one up.

### ***Turn to Violence***

Maybe Thuggee pulls out a pistol and pops a cap in the face of another drunk asshole who tries to climb onstage? But that might throw me into too much a violent spiral.

### ***Veeter Abdicates***

Veeter says, "Fuck it, I can control reality with the lamp," and cuts a deal with Karen Barbara, she promises to sponsor the tax law change that he wants. Legal question: if a winning candidate doesn't take office, who replaces them?

### ***Paracomputer Fetches Its Own Web Data***

Paul has dispensed with the computer addendum to the magic lamp. You just talk right into it. It picks any necessary data out of the wireless web.

### ***The Tang Fat Hotel Explosion***

The shock of the tunnel creation knocks down the walls to the neighboring rooms. Like the soft Interzone walls in Burroughs's *Naked Lunch*. Brief glimpse of aliens in the mirrors of all the other rooms.

Blow up the Tang Fat Hotel in Chinatown with a paracomputer that violates the Margolus-Levitin computational density limit! Jabbering Chinese scattering like chickens from a cherry-bombed henhouse! Sleazy tenants popping through soft meat walls into each others beds.

### ***Bela Plans Paracomputation For the People***

I was angry at Veeter and very glad I'd stashed Paul and the magic teapot at Tang Fat. I'd show these bastards I could play hardball too. Fueled by anger, I got on my computer and began composing a description of the Gobrane, of Veeter's devolution solution to the codec problem, and how this made the Gobrane into a usable paracomputer, given sufficient supercomputer preprocessing power for finding codecs. My plan was to put the info out there before the feds could classify it.

\*\*\*

As the band left, I got the biggest flash of all: Most gnarly natural systems were indeed models of my axioms. This followed *a fortiori* from our construction of the universal emulator in the proof of the Morphonic Classification Theorem. With a bit of ingenuity, you could make a paracomputer from a bowl of water or a candle flame. Code data into the bowl of water by blowing air across it, and decode the outputs from the jiggling waves. Code a question into a candle flame by vibrating the wick, and decode the answer from the shadows on the wall. And I even had a glimmer of how to get around the chicken-and-the-egg problem and design paracomputers that would devolve their own codecs on the fly.

One catch about using Pollinator was that, for his own complex ethical reasons, Onar had designed the system so that any personal identifying information was stripped from the posts. If you Pollinated some information, you were, in effect, giving it away for free.

### ***How Cone Shells Fly***

It's interesting how they can hover like that. We ran some numbers to see if hydrogen in their shells would be enough to make them weightless. Like balloons. But the numbers don't fit. Something else is keeping them aloft.

### ***The Evil Republicans Mining La Hampa***

[I think I'm dropping this angle, which I had at the end of Chapter Five, it seems too grandiose, and it might be better to simply be weaving together the strands already in play in the last third of the book.]

\*\*\*

"There's some dodgy things happening at a higher size level," said Vulma. "Up beyond this sky. And we thought that interacting you might help damp it down. It seems there's some — vandals? Some vandals from one of the many universes have found their way into La Hampa and have been removing the suns. They say they're harvesting them; they tow the little suns back to their system through



hypertunnels, and rather soon the cut-off suns die. But the suns are a stage in the life-cycle of the Nataraja jellyfish that create the universes, you see. And when a sun leaves La Hampa, its jellyfish stage disappears as well. So the vandals are destroying a considerable number of universes. Eventually they may remove one of ours. We're hoping that you can minimize these vandals' detrimental activities."

"Why us?" I asked.

"The vandals are from a future Earth."

"That's so typical!" exclaimed Paul. "Maybe God invented humans as spoilers."

"Ask your Nataraja jellyfish," said Oskar. "She would know. But mainly see what she can do about those vandals."

\*\*\*

The jellyfish also mentions the evil greedy mining activities at a higher scale that the aliens were talking about. Humans systematically "harvesting" the nataraja-suns to use as energy sources. They in fact come from the world Bela is about to go back into. The only way Bela can stop them is to get the Republican party out of power.

This destruction is important at our smaller scale in two ways. Firstly our nataraja might be inside one of the larger natarajas, as everything in La Hampa is nested up and down the scale. And secondly one of the larger natarajas may in fact be a different lower-dimensional manifestation of one and the same higher-dimensional nataraja. The boys see groups of natarajas in the Jellyfish Lake winking out of existence. The biggest threat ever! It's odd as, in effect, the veil of one particular nataraja is destroying other natarajas.

\*\*\*

Imagine if they were harvesting the suns to use as power plants in super SUVs. SSUVs. Note the "SS" in there. Schwarzenegger and his umpteen Hummers.

\*\*\*

In terms of the hyperverses, it could be that the future of Earth-1 already has the sun-thieves, and it gets worse in succeeding worlds I.1, 1.2, 1.3, etc., and Bela's intervention into Earth-2 is to stop it.

### ***Sandoval Conspiracy***

Maybe Sandoval was some kind of Nationalist agent?

If Sandoval were an agent, then his story at the start of Chapter Four is untrue, so it would have to be introduced with qualifiers. What if one of the politicians gave Sandoval a ride from his house to Paul's neighborhood instead of Sandoval driving sis's car and finding the way from Cammy's vlog.

If Cammy isn't killed, then Veeter gets more help from Paul and Bela, and the oracles do better, so Doakes is better off.

So it wouldn't be Doakes who wanted to kill Cammy? A member of Doakes's inner council, let's say it was his veep named, uh, Chet Dickney, Dicky Neche, Will Chaffee, Johnson Trask, Chick Needy, Fred Ramirez. I'll go with Ramirez. To me that's a evil name, as there was a mass-murderer of that name shortly after we moved to California in 1986, and I was scared of him.

I tried to balance for having two bad Latinos, Ramirez and Sandoval, by changing a fairly good character from being a Danny Nguyen to being a Danny Nunez.

And why would Ramirez order a hit on Cammy? To make Veeter look bad, knowing that Cammy was having sex in the driveway just then. It was an opportunistic hit.

Or is it better just to have Sandoval be an asshole loner, demonstrating the danger of the vlog?

I can see the power of a scene where Bela meets Sandoval's sister, and she doesn't have a car at all, never has, and he presses her, and she says that a limo picked up Sandoval on that fateful day. Gyula tracks down the limo for Bela, finds that it was a guy being paid by Fred Ramirez, who doesn't set much store by this high-tech stuff, wanted to shake Veeter off, as Veeter was asking for veep spot in November.

### ***Paradoxes***

Have Paul and Bela discuss the paradoxes: grandfather and relativity of simultaneity, vis a vis reality hacking.

### ***Drug Deal***

Today my cell phone rings, I pick it up, just grunts and noises, I hang up. It rings again, a young male voice, "Rusty, the shit came." I'm like, "Huh?" And he says, "The product." I told him he had a wrong number. "Oh."

### ***Name for Bela's Vlog Show***

The Crazy Mathematician.

### ***The Truth About Van Veeter.***

Part or all of the vlog ring was undoubtedly made by Van Veeter's company Rumpelstiltskin. And it seemed reasonable to suppose that Van Veeter would want to back a wireless-intensive operation like *Buzz*, as a way of leading people to new markets. But I was sure that he had a better reason for funding Leni Pex — she'd been the one to set the fire at the polling place.

### ***Tabla***

A pair of drums, the little *dayan* for the right hand and the big *bayan* for the left hand. Each has a black spot on the drum skin, weighted with wax and iron filings.

### ***Turning Points***

What are the specific acts that split Earth-1 and Earth-2 and which split Earth-2 and Earth-3?

The overt goal in going from I to II is to save Cammy. So it would be enough if Bela no longer encourages to Cammy to fuck Paul. But Bela would more naturally wish had fucked Cammy the night before, kept her close to him. If Alma can fuck Paul right in front of Bela, after all, why shouldn't Bela sleep with Cammy. So Change-I-a is that Bela sleeps with Cammy, Change-I-b is that Bela no longer encourages Cammy to sleep with Alma. Paul agrees with these, and slips in Change-I-c that he no longer takes meth in Palo Alto. Alma gets in on it and changes something she said to Henry Nunez so she has him as her boyfriend in II.

Now the change from II to III isn't necessarily that Bela talks to the nataraja. It could simply be that he brings back Alma. But we can suppose there is something about Earth-2 that he doesn't like. Suppose he doesn't like the ubiquitous oracles and gets rid of them, not realizing that in the process he'll be falsifying the Morphic Classification Theorem.

### ***Bela's First Fuck With Cammy***

Nominally Cammy was going to sleep in Margit's room. But, wired and fired up as we were, Cammy spent the night with me, leaving the vlog ring alone in the dark of my sister's old room.

The sex was fantastic. How can I put it — Cammy tasted good: her mouth, her skin, her body — her pheromones were like keys fitting into rusty doors I hadn't known were locked.

Between our bouts of lovemaking, we talked. It was nearly dawn by the time I went to sleep, with Cammy's taste and smell in every cranny of my tongue and nose. Maybe I was in love with her.

### ***Haut is Bi***

Maybe Haut is bi, and Paul mentions that he's done it with him, fair-haired boy.

### ***World-to-World Character Matches***

Perhaps I could match the mathematician aliens to Bela's Berkeley math friends. Like the people who were at Danny Nguyen's party. Rowena & sister = Eugenia Frazee; Danny Nguyen = Oskar; Melvane = Craig Wronski.

I recall that in 2004 I advised an MFA writing student, Valerie Frankel, and she'd written a novel, *The White Crystal of Calithwain*, about a girl who went to a fantasy world, and the people in the fantasy world matched her real-world acquaintances. That's kind of cute device. It kind of suggests, however, that the other Earth is a dream.

I didn't characterize the math friends in Berkeley very extensively, so if I want to do this number, could work backwards to change. I don't presently have twin sisters among the math students, e.g.

### ***Facts About Cone Shells***

Phylum: Mollusk.

Class: Gastropoda.

Subclass: Prosobranchia.

Family: Conidae.

Fertilization of the egg occurs in seawater. Some gastropods are hermaphrodites (having both sexes in the same individual) and some are protandric hermaphrodites, that is, they are male first and become female as they age. Turn into a woman as you grow up! I think I'll use this. The little cone shells can be boys. These li'l gaaahs are a bunch of motherfuckers — in the most literal sense!

### ***Hilbert on Cantor's Paradise***

Would be nice to work in this line by David Hilbert, "Nobody will be able to drive us from the paradise that [Georg] Cantor has created." Or, "No one shall expel us from the paradise that Cantor has created for us."

### ***More about Shiva the Jellyfish***

Made sense to call her/him Shiva. And as well as making our universe, the nataraja jellyfish was making all the possible alternate worlds that humans might conceivably inhabit.

### ***Don't Think of an Elephant in La Hampa***

In the dark they come across a wild pig that turned into a flock of bats.

"Don't think of an elephant," said Paul, half-joking. A wildly trumpeting elephant stampeded past, fell off the island's edge into the luminous ocean and turned into a school of sharks.

### ***The Book of Revelations***

I had this faint memory of how god appears in the Book of Revelations, something about a throne, and throwing down crowns around a glassy sea. So I looked up the Good Book on the web and found a summary of what John said.

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The Almighty looked like a diamond and a ruby. There was a rainbow encircling the throne — a rainbow that looked like an emerald

All around the throne in a circle were 24 thrones, and on them John saw twenty-four elders sitting. They were dressed in white robes with golden crowns on their heads.

Flashes of lightning were coming from God's throne, and the sound of crashing thunder reverberated all around him.

In front of the throne there were seven flaming lamps burning, the seven Spirits of God. Between the throne and John was a sea that seemed to be made of glass, like crystal.

In the center, grouped round the throne itself, were four animals with many eyes, in front and behind. The first animal was like a lion, the second like a bull, the third animal had a human face and the fourth animal was like a flying eagle.

Each of the four animals had six wings and had eyes all the way round as well as inside; and day and night they never stopped singing this song: "Ou we ni means getting gooder by the minute." And by this, they meant, "Holy, Holy, Holy is the Lord God, the Almighty; he was, he is and he is to come."

Every time the animals glorified and honored and gave thanks to the One sitting on the throne, the twenty-four elders prostrated themselves before him to worship the One who lives forever and ever. They threw down their crowns in front of the throne, saying, "Oh-naw-naw," which we may take to mean, "You are our Lord and our God, you are worthy of glory and honor and power, because you made all the universe and it was only by your will that everything was made and exists."

I saw that in the right hand of the One sitting on the throne there was a scroll that had writing on back and front and was sealed with seven seals. Then I saw a powerful angel who called with a loud voice, "Is there anyone worthy to open the

scroll and break the seals of it?" But there was no one, in heaven or on the earth or under the earth, who was able to open the scroll and read it.

Then I saw, standing between the throne with its four animals and the circle of the elders, a Lamb that seemed to have been sacrificed; it had seven horns and it had seven eyes, which are the seven Spirits God has sent out all over the world.

The Lamb came forward to take the scroll from the right hand of the One sitting on the throne, and when he took it, the four animals prostrated themselves before him and with them the twenty-four elders; each one of them was holding a harp and had a golden bowl full of incense made of the prayers of the saints. They sang a new hymn: "Fa-fa-fa-fa-fa-fa-fa-fa," which is Aramaic for, "You are worthy to take the scroll and break the seals of it, because you were sacrificed, and with your blood you bought men for God of every race, language, people and nation and made them a line of kings and priests, to serve our God and to rule the world."

[The lamb starts breaking the seals one by one.]

1. Jesus rides a white horse and brings a sword to cut a path of righteousness.
2. A rider on a red horse takes away peace and starts war all over Earth.
3. Commerce rides a black horse and brings toil, labor and greed.
4. The deathly pale horse appears: plague.
5. John sees people's dead souls.
6. When the sixth seal is broken, there will be a violent earthquake and the sun will go as black as sackcloth; the moon turn red as blood, and the stars of the sky will fall onto the earth like figs dropping from a tree in a high wind. The sky itself will disappear like a scroll being rolled up and all the mountains and islands will be shaken from their places. *Whoah*, that's cool.
7. Silence in heaven, but the Beast rampages across Earth. Fire rains upon Earth. And then the angels start up with seven motherfucking trumpets, and even more bad shit comes down. And if that's not enough, here come seven cocksucking bowls of plague.

And then there's a huge red dragon, war in heaven, a beast from the sea, the anti-Christ, the grapes of wrath, the prostitute and the scarlet beast, the fall of Babylon, the first battle of the end, the reign of a thousand years, the second battle of the end, the Last Judgment, and the damned are thrown into the burning lake.

### ***Borges on Paradise***

"We are not in paradise," the young man stubbornly replied. "Here, in the sublunary world, all things are mortal."

Paracelsus had risen to his feet.

"Where are we, then, if not in paradise?" he asked. "Do you believe that the deity is able to create a place that is not paradise? Do you believe that the Fall is something other than not realizing that we are in paradise?"

— from Jorge-Luis Borges, "The Rose of Paracelsus," in *Collected Fictions*, Viking Penguin 1998, pp. 505-506.

### ***Micronesian descriptors***

[Taken from my journal entries about my Micronesia trip in February, 2005.]

A carpet-like sea anemone with a father clown fish guarding baby clown fish like tiny specks.

Gemlike blue and aqua fish in tiny staghorn coral heads.

A wall like a china-shop of coral, plates with Zhabotinsky scrolled edges, staghorns, a school of fish the size of pizza pans, big gray guys, and more brightly colored littler ones, striped, dotted. Brain coral patterned in Turing stripes.

Heartbreakingly beautiful tree crowns against the pale blue sky.

Sakau plants lined the path, they have knobby stalks and heart-shaped leaves.

Native huts. One sticks in my mind, painted two-tone, dark blue on the bottom half of the wall, light blue on the top, a roof of corrugated tin, with some patches of red-painted corrugated metal. A hill behind it covered with palms halfway up, and big leafy trees on top, maybe breadfruits. Above the trees a fat white cloud echoing the shape of the forested hill. The kayak quiet in the calm, silty water, mangroves on either side, quivering schools of tiny pale blue fish.

A flock of red parrots, the name is lory, was squawking at me from a papaya tree, I pushed into the undergrowth to see them better and spent a half hour surrounded by the cries of birds. There were four different kinds, all aware of my presence and making noise about it. Coo-coo-coo, squawk-whistle, gahr-gahr. One of them flew down to get a really good look at me, he was black and gray with a fanned-out tail.

The pale green and pale lavender disks with the fractally folded edges, the brilliant yellow guys, the little guys who are green or gray or blue depending on the light and all these shades so lovely and watery and gleaming,

The last nudibranch with black body and yellow edge and red chemical sensor antennae and red tree-like naked gill growing out of his back,

The manta rays were incredibly streamlined, all about curvature and torsion, a body roughly the shape of a sea turtle, but with meaty triangular wings going out on either side, a rudder-type fin near the rear, a long spike at the very back. They were ten or twelve feet across. Their eyes are in protruding knobs at either side of their heads, not that they really have a separate head, "anterior end" might be more appropriate. They have a slit mouth they can open to be fairly big and round so as to suck in water; they're filter-feeders. They have a pair of little appendages sticking out of the sides of their heads, fleshy and oar-like rather than fin-like. Sometimes one of these would be rolled up, but usually they were sticking out, gently adjusting themselves to the current, playing a role, I suppose, analogous to an airplane's horizontal stabilizer fin at the rear. They had five gill slits down either side of their chests; they opened up the slits like lipless mouths, and the cleaner wrasses were in and out of the slits, worrying the skin, also busy along the rear edges of the mantas body.

Eighteen man-sized sharks.

Little fish, often they're a pale turquoise like shallow water above sand, other times they're like a tint of the sky, and sometimes they seem to glow as if they're electric.

We went down a wall covered with hard and soft coral and drifted with the current. Out in the open sea were big sharks, considerably larger than me, some of them. Not all that far away. We were at about 70 feet. There was a swirling whirlpool of big-eyed trevalleys, each of them trying not to be out on the edge where the sharks were. Like a slow cyclone, making a shape like a nest, with every now and then a bright flash as one of the fish turned onto his side to wriggle deeper into the core. These were big fish. Clouds of little butterfly-looking fish, yellow and white like confetti. Up above a school of several hundred barracuda.

Soft corals like casts of a person's lung passages, like prickly pears, like bushes and bowls and brambles.

A sea cucumber segmented like a centipede, leopard-spotted in brown and white, with fan-shaped feeding tubules sticking from the front like legs.

And in the depths was a swirling whirlpool of big-eyed trevalleys, each of them trying not to be out on the edge where the sharks were. Like a slow cyclone, making a shape like a nest, with every now and then a bright flash as one of the fish turned onto his side to wriggle deeper into the core.

### ***Jellyfish Lake***

[Taken from my journal entries about my Micronesia trip in February, 2005.]

So how was it? It put me in mind of a certain kind of program I used to have my computer graphics students write. You define the geometry of some graphical object — we used to use polyhedra or tori — but in this case its a rounded bell with four dangling clappers, positioned like table legs, with lots of bumps along them. And you fill space with objects of this kind with randomly selected radii, or better than random, select the distribution according to a power law so you have, say, a certain number of large four inch diameter jellyfish, twice as many two inchers, four times as many one inchers, eight times as many half inchers, sixteen times as many quarter inchers. And maybe none smaller than that. You randomize their directions of motion, the jellyfish seem to have no inkling of up or down, although they are ever so slowly heading towards the light, this doesn't prevent them from pulsing down for twenty feet or so before getting turned around. You animate them by giving them a repetitive motion. In this case its pulsing.

Now I have a theory about jellyfish pulsation. There's a CA reaction taking place in the cells of the bell that leads to moving waves of excitation. The waves move radially out from the center. The waves travel at the same speed in the flesh of any jellyfish, large or small. When the wave hits the rim of the bell, you see the effect of the bell pulsing, or contracting, thus propelling the jellyfish in the direction of the bell's summit. My insight in the water today is that if a jellyfish is half as big as another, it will pulsate twice as fast. More precisely, if a jellyfish bell has radius  $R$ , then it will pulsate  $A/R$  times per second, where  $A$  is a constant having to do with the effective speed of the reaction wave fronts in jellyfish flesh.

So I'm looking down at them with a scientist's eyes. But also it's completely spacy, there's nothing in the visual field but the greenish yellow sunlight water and the endlessly many jellyfish. A couple of times I dove down to twenty feet, then floated up, with them all around me, no real standard of location or direction, just jellyfish everywhere endlessly.

How densely packed were they? At the thickest regions, there might have been twenty or fifty of them touching my body at any one time, four big guys, eight smaller, sixteen smaller, thirty-two tiny ones, like that. Maybe more. I'd feel something smooth touching me and think I was brushing against another person. Just a jelly.

They stung ever so slightly, and the longer I stayed in, the more I could feel the venom. Particularly when I was free diving down through them, I'd feel tingles on my lips when they touched them. Writing about this, my skin is crawling. Quick, rush to the emergency room. The closest one would be, um, Manila.

Let's hypothetically suppose that at one point I made sure nobody was close enough to see my actions through their dive masks, and then hiked up one leg of my trunks to ensure that my private parts had touched a jellyfish as well.

"Jellyfish rike that very hot for two three week, then --- wearing the Happy Cloak."

***The Jellyfish-God's Metabolism***

God eats the energy of the universes. In a good way. She eats dark matter and shits energy and regular matter. Think of yin/yang, the dark and the light.

***Plans for Apportioning Success in the Three Worlds***

At one time I had this idea of Alma, media fame, and math fame being apportioned between Bela and Paul different ways in the three worlds, like with a view to balancing things out. Before I really started the book, like in the fall of 2004, my plan looked like this, the idea being that Bela gets one kind of success in each world.

	<i>Alma Goes To</i>	<i>Media Fame Goes To</i>	<i>Math Fame Goes To</i>
<i>Earth-1.</i>	Bela	Paul	Paul
<i>Earth-2.</i>	Paul, then nobody	Bela	Paul
<i>Earth-3.</i>	Paul	Paul	Bela

Now in May, 2005, I think it's more like this.

	<i>Alma Goes To</i>	<i>Media Fame Goes To</i>	<i>Math Fame Goes To</i>
<i>Earth-1.</i>	Bela	Bela	Paul
<i>Earth-2.</i>	Paul, then nobody	Bela	Nobody
<i>Earth-3.</i>	Bela	Nobody	Paul

***The Wishes That Change Earth-1 into Earth-2***

(a) Bela visited Paul and Veeter, but didn't leave with Alma, he took Cammy home, and Veeter doesn't have the murder scandal, so he didn't fire Bela and Paul, and the Gobrane has been moving forward quite rapidly.

(b) Alma and Paul are still together because Paul wasn't using meth.

(c) *But*, Alma did have that date with Henry Nguyen, and she was about to break up with Paul for Henry.

(d) Maybe Paul didn't phone Haut, so Haut's not involved and they don't have Haut's Paradox yet on Earth-2, although of course Paul and Bela still know it. They could hypertunnel back to La Hampa right away, but they don't want to quite yet.

***Twin Almas and Belas on Earth-3***

Bela and Alma go back, they're on skateboards again, they slide down the quarter pipe at the BFD concert at the Avalon, and Bela isn't a star, he's just watching the show. Bela-3 is onstage playing. Alma-3 isn't around.



In this world, Alma-3 is still living with Paul-3 at Stanford, being the good faculty wife. Paul has a good post-doc at UC Berkeley thanks to Haut. Bela-3 is in Washer Drop, and has lost interest in math. He's living with Cammy.

Bela-1 gets a job as a mathematician teaching at San Jose State.

### ***Effects of Gobubbles***

On the Sunday noon Pick 3 lottery drawing, a hundred people win the prize and they're all arrested. Lotteries are cancelled. A very odd baseball game at Heritagist Park that afternoon. All the flies are caught. More extreme home run bursts. More base-stealing.

### ***Extra Chase Scene Before Leaving Earth-2***

Bela uses his Gobubble to elude the cops, it's like Phil Dick's "The Golden Man." In one scene, Bela uses verbal jiving, he's able to say something warped that sounds like in the unknown tongue and it gets him away from a cop. Some double-talk like that guy used the time I was in court in London, Ontario.

Bela is scared, he wants to go back to La Hampa. He's done here, he's toppled the Heritagists. He misses Alma. He uses morphonics to finally, in the back seat of the car, figure out how to get Haut's Paradox working on a Gobubble. It's all about the timing of the three-point stim. A bubble dzeents away, taking out a freeway overpass support, cutting off the cops.

Bela goes to Rubber Rick's Globo Club. Everyone there will have a vlog ring. He's in hiding, but he does a Scarlet Pimpernel number, and comes onstage singing a song (like Irma Thomas coming on singing "Dancing in the Street" at Slim's), he's singing "Yes and No," an Haut's paradox song. Cammy looks great.

Bela hampajumps to La Hampa from the stage. Sandoval is there to assassinate him. Great ticking-clock scene. Bela knows it's coming, he's just ahead of them, he skateboards up a quarter pipe, blows Sandoval's cover in some lasting, public, regime-toppling way — better than mere violence — and flies through his new hypertunnel to La Hampa.

### ***Discuss Sun Formation With the Nanonesia Math Crew***

Tanya and Rowena say a bit about how their jellyfish-gods went solar. They remark again that becoming a sun is a natural phase for the jellyfish; when some race in your hyperverses learns to tunnel, if you're their jellyfish god, you can just about cap things off and become a sun. Tanya says the jellyfish might want to have Bela and Alma in her when she "blows up," she heard that's what happened in their worlds.

### ***Jimbos on Earth-3***

He can see the Jimbos still, and so can Alma, but Ma can't see them.

## **Deleted Fragments**

### ***False Start on Chapter One, October 15, 2004***

[This was my first attempt at writing the opening. I don't like it because (a) it has the wrong tone for my character — I mean, is this a guy you want to listen to for

the next couple hundred pages? And (b) it confusingly telegraphs the plot. But I was happy to find a GIF of the back of that Otis Redding album online. I saw the album in Niles Schoening's room the time I visited him at Columbia in, like, my junior year of college.]

Thanks to that stoop-shouldered twerp Geney Grabow finding a hole in the Kis-Bridge Hampajump Theorem, it looks like I'm in this particular spacetime for good. Your reality; my Earth-3. Nothing's working out like I wanted it.

One of my issues is that, no sooner do I manage to attach my name to the hampajump theorem, then it's fucking not true any more. You'd think logic and math would be the same everywhere. But no. The hampajump theorem is true in some worlds and false in others. False in a sucky non-standard world like yours, and true in the Earth-1 was born in.

Your Paul Bridge — I'd call him Bridge-3 — thinks the hole in our theorem is “an interesting opportunity.” Hell, he's happy about everything. He's got Alma. He's cooking up a second-order Bridge's Hampajump Modality Theorem. Doesn't want to let me in on the credit, even though he doesn't know what he's talking about. He's not a hampajumper like me. Thinks he knows it all, him and his spindly runt student Geney Grabow. Fuck them. Fuck all of you.

\*\*\*

Is this thing working? I'm, like, a tweaker cursing into air? Hello? I do still have my built-in lifebox, right? Testing Ms. Lifebox!

*Prompt:* Ou we ni.

*Response:* According to the glossary on the back album cover of Otis Redding's *Dictionary of Soul*, “Ou we ni” means “Getting gooder by the minute.”

Okay, it's working. I'm staring at the blank wall of my office, and I can see the text scroll by. Ou we ni. We're operational.

Dear reader. My name is Bela Kis. I'm here to tell you an astounding story with warm and wonderful takeaway lessons for the home.

Let's flash back to the early years of the Y2K era. My first semester at U. C. Berkeley.

**THE OTIS REDDING DICTIONARY OF SOUL COMPLETE & UNBELIEVABLE**

<b>Ou - yea</b> (ŭ' yā') adv.	to give in; a reply to get what one wants.	<b>SIDE 1</b> <b>1. FA-FA-FA-FA (SAD SONG)</b> <small>(By Redding &amp; Cropper; East Time Record, BMI; Time 2:37)</small>
<b>My - my - my</b> (mī) poss. adj.	no longer yours; goody three times.	
<b>Ou - ni</b> (ŭ' nī') adv.	to hurt so good.	<b>3. TENNESSEE WALTZ</b> <small>(By Conway &amp; Cole; Soul'Flow, BMI; Time 2:51)</small>
<b>Ni</b> (nī) adv.	to do very quickly.	<b>4. SWEET LORENE</b> <small>(By Redding, Porter &amp; Isaac; East Time Record, BMI; Time 2:25)</small>
<b>Leetle</b> (lēt' l) adj.	just enough to make one want more.	<b>5. TRY A LITTLE TENDERNESS</b> <small>(By Conway, Moore &amp; Cornish; Compton-Conroy &amp; Robbins, ASCAP; Time 2:43)</small>
<b>Ou</b> (ŭ) n.	ouchless excitement.	<b>6. DAY TRIPPER</b> <small>(By Lennon &amp; McCartney; MCA/Blue Music, BMI; Time 2:25)</small>
<b>Yea - ni</b> (yā' nī) adv.	an agreement to give in very quickly.	<b>SIDE 2</b> <b>1. MY LOVER'S PRAYER</b> <small>(By Redding; East Time Record, BMI; Time 3:00)</small>
<b>Oh - mi</b> (ō' mī) interj + adv (comp)	to get it very quickly.	<b>2. SHE PUT THE HURT ON ME</b> <small>(By Redding; East Time Record, BMI; Time 2:25)</small>
<b>Weel</b> (wēl) n., v., aux. v., v. L.	desire to give it or get it.	<b>3. TON OF JOY</b> <small>(By Redding; East Time Record, BMI; Time 2:50)</small>
<b>Gotta - Gotta</b> (gōt' tō) v.	not able to do without it.	<b>4. YOU'RE STILL MY BABY</b> <small>(By Mills, Beesline, BMI; Time 2:41)</small>
<b>Give it</b> (giv' ĩt) v + pron (comp)	absitively posilutely not.	<b>5. HAWG FOR YOU</b> <small>(By Redding; East Time Record, BMI; Time 2:25)</small>
<b>Oh - naw - naw</b> (ō nā') interj + adv (comp)	to let oneself go, under any circumstances.	<b>6. LOVE HAVE MERCY</b> <small>(By Porter &amp; Hayes; East Time Record, BMI; Time 2:20)</small>
<b>Fa - fa - fa - fa - fa</b> (fā) phrase	sad song.	<small>This is a high fidelity recording in stereo. For best results observe the R.I.A.A. high frequency roll-off characteristic with a 500 cycle crossover.</small>
<b>Ou we ni</b> (ŭ wē nī) phrase	getting gooder by the minute.	

Ou we ni, Otis Redding has done it again! He has just completed an UNBELIEVABLE OTIS REDDING DICTIONARY OF SOUL. It is abridged and can be easily interpreted by any person audacious enough to purchase a copy. This dictionary, created especially for you, is the undeviating vo-

cabulary of its author OTIS REDDING. Searching for something interesting to do and enjoy? Here... put this album on your turntable and listen to OTIS. If you should hear a word that you don't understand, get your OTIS REDDING DICTIONARY OF SOUL and look it up. 91707

**OTIS REDDING CAN ALSO BE HEARD ON THE FOLLOWING ALBUMS:**



**Figure 22: Otis Redding's Dictionary of Soul**

**Foreshadowing About Earth-2**

Nowadays I avoid politics as much as possible, by the way. I lost my taste for it after I shot the President on another of the worlds that I visited. Not that this means I'm a bad guy — Doakes-2 had it coming to him, as you'll see. But now let's get back to the special election pitting Heritagist Veeter against the Common Ground party-member Barbara in my original world.

**Barbarbara vs. Van van Veeter**

Originally I thought it would be funny to have the politicians' names be Barbarbara, with one too many "bar"s, and to have the guy's name be Van van Veeter with one too many "van"s, but the former seemed silly, and the latter got to a drag with the spell-checker always tripping over it.

**Explaining the Party Names**

(Let me remind you that the planet of my birth is somewhat different from the world in which I tell this tale. Our two main U. S. political parties happened to be known as the Heritagist and the Common Ground parties, a rough match for your Republicans and Democrats.)

### ***Alma as Latina***

She was intimidating in the lineup, with a loud mouth and usually some hard-looking homies at her side. Guys who wore shades in the water and preferred not to speak English. Come to think of it, I'd left that one beach party soon after I heard one of Alma's friends say he wanted to "kick the *pinche* hairfarmer's *culo*." An ugly little guy with a flattened nose.

\*\*\*

"I come from a really poor family," said Alma. "My mother's a maid in the Terrace Court Inn, my father's a gardener. I studied hard, I was on the debating team at Harbor High. The idea is that I go into politics, business or law, and rhetoric is good for all of those. I'm upwardly mobile."

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Alma Nguyen. From the Beach Flats area. Her father writes her name with all the accents: Núñez, but she doesn't. Think of the plastic-faced J-Lo I saw on TV in the lounge of the Day's Inn in Geneseo. Like — being in high-school forever, eternally living in the shadow of the plastic cheerleader girls. Ow. Thinking of Alma as J-Lo kills the Latina idea for me.

### ***Mood Conversation***

"The raindrop paths jump around like moods."

"Moody."

"Are you in the mood?"

"I'm stuck in traffic at big Moody curve on Route Seventeen."

"Play mood music."

"I'll use the Penfield mood organ."

### ***Sketch for Wedding Scene***

Bela goes to the wedding of Alma and Paul. Bela is the best man and Leni is matron of honor. Leni is webcasting it, using viz glasses, the webcast is part of "The Me Show" network.

The wedding is down by the San Francisco Bay in a park at Kirby Cove in the Marin Headlands. Bela has to remind Paul to take off his knapsack for the wedding. Paul has used his Morpheic Classification Theorem and a huge computation to set the time and date within a window of a week, so that there will be a sunny day. It works. But he had to use a supercomputer.

Bela demos his prediction abilities and finds a rainbow.

### ***Paul as Stoner***

Like one of those MIT drop-outs who'd hung with Tim Leary back at the dawn of time.

### ***Haut's Consulting Plans***

"So?" I admitted. "I'm right! Listen to me, Alma. Haut wants to start consulting for execs in jets, for politicians clip-clopping down hallways, and for TV anchors announcing their own names. Predicting stocks and mergers, terrorism and wars, cancer and strokes. Important, important, important, and forget the fact that even if you can emulate something, you can't necessarily emulate it any faster than it

happens in the real world. Those consulting gigs are a scam, and Haut is wrong to be marketing them, and I'm planning to tell everyone I know! We should air the truth on *Buzz*, Alma!"

### ***Bela's Music***

As I tuned my guitar it struck me that the morphic classification theorem indicated, for instance, that my guitar sounds had the same rake-cake-fish-dish-teapot structure as my romantic worries concerning Paul and Alma. The pattern was a spiral of rakes doubling as fish backbones, the fish schooling into a maelstrom inside a transparent glass teapot, with three mirror-bright dishes reflecting the scene into a kaleidoscopic hall-of-mirrors infinity.

### ***Against Prediction***

Mother Nature doesn't let power-tripping greedheads look up her skirts.

### ***Bela's Brag***

I knew how to codec anything at all. Just for starters, my smeared and tangled hypersheets of guitar sound were a perfect model of my thoughts. I knew how to code the weather into a teacup; decode a flapping flag into a medical diagnosis; model a legislature as a pile of rotting fruit.

### ***Morphic Undecidability***

I thought of the raindrops on the window at the cafe this afternoon, visualizing how to model their motions with our new system. Yes, it would work. So could I predict what a raindrop on a windowpane would do? Yes and — no. Today's second tidal wave of illumination struck me. The rainwater was already computing as fast as possible.

"Our theorem has no applications!" I told Paul. "Natural phenomena are quantum-calculating at the maximum speed. Natural computations don't allow for even a linear speedup! I think there's got to be a morphic undecidability theorem. Haut's splash-orchid and frost-vote demos — they're bogus. Remember: the splashes didn't look *exactly* like the actual orchids. And the vote simulation — hell, any social prediction is going to undermine itself if the society knows about it."

"Haut is going to freak if Veeter wins the election," said Paul. "But let's not go there. Let's stay here in Mathland. The way to actually *prove* a morphic undecidability theorem would be?"

We fell silent and stared at the ceiling for a full two minutes. And then it hit me. "A proof by contradiction!" I exclaimed. "Suppose we could always predict a system faster than it happens. So then our fish morphon could predict whether the rake handle ends up on his left or on his right when we assemble the Universal Emulator. And then he could position himself on the opposite side from the one predicted. Contradiction."

"You prick," said Paul, showing the gap between his front teeth. Not a smile.

"A liar paradox," I gloated. "This sentence is false. This fish is unpredictable. So now we've got a morphic undecidability theorem undermining the morphic classification theorem."

“I dunno. I’m not sure it works on real cases. That fish thing’s very artificial. And why try for that anyway? We want a useful theorem. We don’t want undecidability.”

“It’s not what we *want*, it’s what math gives us.”

“Maybe you just have it in for Haut. Let’s go back to the good stuff.”

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“The world’s not going to change,” I said, calm in my ignorance of what was to come. “Mamma Mathematica takes back with one hand what she gives with the other.”

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I needed to talk some more. “I saw Haut today, you know. He doesn’t want to believe my extra result about morphic undecidability. He says to drop morphic undecidability from our joint paper. He’s barely willing to let me leave it in my thesis. He keeps trying to add extra conditions to my theorem so it won’t apply to so many cases.”

“Duh?” said Paul.

“What are you guys talking about?” asked Alma.

“Morphic undecidability versus the BHK theorem gold rush,” said Paul in a slow, amused monotone, typing all the while. “Bela has this proof that we can’t make reliable predictions. But Haut and I think that we can get around it. Haut’s already marketing our technique. Get it while you can.”

“Predictions,” I spat. “For execs in jets, politicians clip-clopping down hallways, TV faces announcing their own names. Predicting stocks and mergers, terrorism and wars, cancer and strokes. Important, important, important, and forget the beautiful math. You know I’m right, Paul. Those consulting gigs are a scam. I have to tell everyone.”

### ***The Volga Boatmen in Russian***

She was singing a work song in some foreign language, her voice older and more worldly than I would have expected.

“Yo,” said Naz, noticing me behind them. “Doctor Bela. Heard you playing just now. Old school grime. Help us out, dog.”

I helped them push the machine up the steps, not bothering to ask why. K-Jen was, I slowly realized, singing “The Song of the Volga Boatmen” — in Russian. “*Volga Volga mat’ reka Shyroka e glooboka. Oy da da oy da oy da da oy da shyroka e glooboka.*” Her voice was dark and rough at the edges. I had a fleeting vision of her voice as a pattern of morphons: rakes and teapots.

### ***Cone Shell Arson***

“Yeah. So this, um, shell the size of a dog, not a big dog like a shepherd, more like a beagle, it’s flyin’ around in the mirror-world, sniffin’ something out, know what I mean, and I’m sittin’ real still, and then I see it go up near the window. But all the time I can only see it in the ball, know what I mean, it’s like hidden in the workadaddy world.”

“You saw it by the window of the YWCA?” I said.

“Where the voting is. Citizens in and outta there all day, but they’re not botherin’ me in the backyard, I might as well be a pile of garbage.” Leroy barked a bitter, coughing laugh. “Camouflaged. They don’t know that Leroy means The King.” He finished the wine, and put the empty bottle under the bench, then sighed

and rubbed his finger on the palmtop screen. “Look at me in there. King Leroy. Coulda been a star.”

“And the fire?”

“The shell fired an energy ray. I was the only one seen it, cause it happened inside the ball. But it was real. You ever use a magnifying glass to kill ants?” Leroy mimed moving a lens over his lap. “Whoooo. Death from the sky. Star wars. The cone shell sent a power-surge ray to light off the Y.”

### ***Precision***

“The morphic classification theorem lets us model things with analog natural processes that work at the maximum precision allowed by physics. So limited precision isn’t a problem anymore,” I said.

### ***Gooned Out***

“But my face itself is gooned-out,” said Leni. “I’ve got this software patch that makes me look like Casper the Friendly Ghost. So I can be more of an anonymous reporter? Like, the restaurant owners shouldn’t know what the local food-critic looks like.”

### ***“Bela’s Weenie” Lyrics***

“Bela’s weenie, on the net teevee, best you ever seen-ie. Oil it up with sesame, fry it in your wok, San Jose giggle-girls, sock the raga rock.”

### ***Dancing Cockroaches At the Rock Concert***

They looked just like human-sized cockroaches, and I wasn’t even seeing them in a mirror. The stage lights caught a pair of them, recognizably male and female, dancing together down front, plain as could be, no longer through a glass darkly. Her green-lipped mouth was bent in a smile, her lavender arms were pumping to the rhythm, her yellow-striped body was bending from side to side, and her long antenna were swaying like wheat in the wind. Her partner was turned away from me, the light glistening off the iridescent purplish material covering his back, and his head covered with wobbly tufts. Floating above the pair, tethered by cords to their hands, were a pair of jouncing — helium balloons? Or were those floating cone shells the size of dogs?

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Turning my attention back to the aliens I noticed that none of the people around them seemed to be reacting to them. Maybe the cockroach people were fans dressed up that way for a joke, and the cone shells really *were* just funny-shaped balloons. After all, thanks to the *Crazy Mathematician* show, everyone knew about my obsessions — these days I was always talking about flying cone shells and alien cockroaches, and indeed had worked them into a couple of the Washer Drop songs, such as “Conotoxins.” And Jen3 herself was quite the UFO nut, and we’d collaborated on “Sex Files.” Our true fans would have known all this in advance from my vlog.

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I asked the others about the cockroaches and cone shells I’d seen in the crowd.

“Sure I saw them,” said Jen3. “Freaks in weird outfits. Like a science-fiction convention. It was wild. I love that people are dressing up for our shows.”

“You really think it was just costumes?” I said, still a little uneasy. “Not actual aliens?”

### ***Cone Shells Luring Sandoval as Piñatas***

Sandoval was riding around town in a friend’s mini-pickup on Friday night, smoking pot laced with PCP. They noticed the wild-ass crowd at the outdoor Washer Drop concert. They wouldn’t have stopped, but when Sandoval glanced in the car’s rearview mirror he saw what looked like two cone-shaped piñatas over the crowd, which made him want to check it out. It was like the piñatas were calling him, drawing him in.

### ***Rockin’ Van***

When Cammy and Paul do it in the van, I could say, “Don’t come a-knockin’ if this van’s a-rockin.” But I resist putting in this corny old joke. I’ve learned that even if I think maybe other people haven’t heard a particular joke, in fact most of them have.

### ***“Adventures in Gnarly Computation” for IASFM***

On the science fiction front, I keep learning more about my cone shell mascots, who have very definitely made the casting call for my SF novel-in-progress, *Mathematicians in Love*. With mounting delight, I’ve learned that these critters harpoon their prey with detachable teeth that are loaded with hallucinogenic poisons called conotoxins; that they eat other mollusks and even small fish; that an anti-pain drug based on conotoxins has just been approved; and that an overdose of this drug can cause such powerful delusions that it takes electric shock treatment to bring the subject back down! (See <http://www.rudyrucker.com/blog/search.php?q=cone+shell> for information about these venomous mollusks.)

The actual Earth is wonderfully gnarly, and filled with beautiful information, all given to us for free.

### ***Introducing the “Commoover”***

“I discovered a remarkable, although stunningly obvious, method for turning a vibrating membrane into a universal commoover.” Haut, paused and gave me a sharp look, his eyes bright and mad. And then he jabbered on. “The boy is baffled, his callow face says: huh? Yes, Kis, I say ‘commoover’ not ‘computer’ because it *mooves*.”

### ***Qubit and Q-Chip***

[On April 15, 2005, I expunged quantum mechanics and quantum computation from my book, hooray. To do this I replaced the company name “Qubit Chips” by “Membrain Products.” Rather than making a quantum computing Q-chip, they make high-tech membranes. Below are some of the funky moves I had involving QM.]

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“He has some special hardware, the Q-chip. I’ve been up to my eyebrows in quantum information all week. We’ve made a paracomputer. Van’s awesome, Bela. He knows how to model the morphons. Day before yesterday, we had this big breakthrough over your little comic strip about the generalized codec technique.



Believe it or not, you drew a picture of the temporal evolution of a quantum-informational square-root-of-NOT gate.” He was talking very fast. “And the Q-chip is *made* of square-root-of-NOT gates,” continued Paul.

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“Hey, let’s see what the man can do,” said Veeter testily. “Listen up, Bela. The Q-chip is a slab of entangled quantum gates. Qubit figured out how to build it, but not how to program it, which is why MetaMeta was able to buy them out so easily. I was about to close the project down, but then I heard about the morphic classification theorem. And I figured out how to directly map your rakes, cakes, fish, dishes, and teapots into processes on the Q-chip.”

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“We’re talking two results here,” said Veeter intensely. “First, whenever I have a clear morphic diagram of a process I can get the Q-chip to emulate it. I figured that out by myself, thanks to your theorem. And second, in the last few days, Paul and I were able to figure out the missing fifth panel of your little comic strip. Entanglement! So now, on the Q-chip, codec’s a breeze. To make a long story short, the quantum computation carries out a super-exponential search in linear time and automatically finds the appropriate codec. And that’s *not* bullshit.”

### ***Gynecological Simile to the Cone Shell’s Mouth***

Opening her mouth that way, urging us to peer through to La Hampa, the cone shell reminded me of some evangelical Susie-Bright sex-worker in a nightclub on an examining table, encouraging one and all to use a speculum to see into the deepest crannies of her vagina.

### ***Dealing Conotoxins***

Pete shows up and the cone shell stings him too. And then in fact swallows him head first, his feet kicking outside her floppy mouth, like the tailfin of a fish Bela saw being eaten in the online cone shell video. Bela wouldn’t have stopped her. But Alma makes Rowena spit Pete back out.

Pete and Gary happily zonked.

“Good shit, man.”

“Conotoxins.”

“We gotta start dealing this shit. How can we score some *weight*?”

### ***Ghost Echo Surfers***

I had only a split second to glance back before the wave hit. There were three spectral surfers behind us; a trio exactly like me, Alma and Paul. Alma saw them too. But there was no time to think, no time to analyze. Alma and I knelt up on our boards, holding the gasping Paul from either side. And then the big wave hit.

We slid down it like kids sledding a hill of glass, steering ourselves towards the glowing mouth of the tunnel that filled the square hole in the rock. As we approached the hole, the booming of the surf faded, the waves off to the sides seemed to become sluggish mounds, and even the flying spray moved more slowly through the air. Telling myself I didn’t dare miss ramming the stone wall, I never looked back to see if those spooky doubles were still on our tail.

\*\*\*

[Later I tried this idea again, with a view to having Earth-3 skateboarding Alma-3 and Bela-3 swap in for Alma-1 and Bela-1 as they leave Earth-1. But then I decided that would violate my paradox-prevention principle that only one version of Earth is accessible at any given hampatime.]

All around us I saw multiple mirror images of Paul, Alma and myself — something to be expected in a region of radically warped space, yes, but one Alma-and-Bela pair were wearing street clothes and riding skateboards. Nothing was making sense. All I could do was ride this through.

\*\*\*

“I thought I saw copies of you and me coming back through the tunnel to Earth-1 on our way here.” I said. “As if there’s some kind of cosmic ring-around-the-Rosie happening.”

“I saw them too,” said Alma. “They had skateboards. The other Alma waved to me. She looked happy.”

### ***Slobbering Over Alma***

“Do you have to turn everything into a mind-breaking math trip, Bela?” interrupted Alma. “I want to go to the luau.” She dug in and paddled out ahead of us. Paul and I followed in her wake, admiring her naked bottom and the occasional glimpses of her dark furrow. She was my girlfriend and we were on our way to a luau with alien mathematicians. I felt very happy.

### ***Tegmark “Big Universe” Alternative to Parallel Worlds***

“Your jellyfish’s cable generates one after another of your parallel universes,” added Tanya. “And the series of universes is what we call a hyperverses. It’s like successive drafts of a novel.”

“She doesn’t *generate universes*,” objected Mulvane. “She *indexes regions of space*. The so-called parallel universes are simply different zones of one very, very, very large shared space. Occam’s Razor. There’s no need to multiply the realities, no need for mysto steam. One mammoth reality has room for all the monkeys on all the typewriters.”

“The word ‘indexing’ is misleadingly limp,” said Unger, eager to argue. “A divine jellyfish’s ever-evolving links to a series of worlds constitutes a creative *realization*. Like that of a human cinematographer who frames some ideally balanced sequence of images from the endless welter of visual input. Or like the output of a sculptor who finds successively lovelier images within a quarry’s stones: forms that approach the beauty of, ah, Alma.”

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I was beginning to understand the meaning of the gnarled connector cord I’d seen running through the hypertunnel from Earth to La Hampa. Some god-like jellyfish was in physical contact with our universe. As Tanya had it, the jellyfish was feeding in series of information-seeds that defined successive versions of our world. Or, in Mulvane’s view, the jellyfish was continually altering an index-code that singled out a series of locations in a pre-existing, exhaustively complete universe. In either case, the jellyfish was in some sense contacting an ever-changing series of Earths, each of them somewhat similar to ours, and each of them supposedly a bit better than the ones before. My mind felt very clear as I formed these ideas.

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“There’s a whole lot of Earths,” said Paul. “It doesn’t actually matter whether they’re in separate parallel universes or scattered across one big universe. The two models are in fact equivalent, but never mind. In any case, you can think of the Earths as drawings on a stack of papers, one Earth per sheet.”

### ***Why the Sequence of Earth’s is Discrete***

“I figure Mulvane was right; it’s a discrete sequence, and she makes a new version of Earth for every day that passes up here, otherwise there already would have been infinitely many copies of us tunneling over here.”

### ***Universality of Math***

Indeed, math is the best possible icebreaker topic if and when you meet an alien.

### ***Longer Raps About the Aliens’ Math Interests***

In their home world, the lizard forbearers of Malvane and Vulma lived underground. Their main concerns were tunnel branchings and family trees. They had very little appreciation for open space, for continuous-valued numbers, or for infinity. Left to their own devices, they preferred to study what they called graphic number theory, which was based on looking at integers as patterns of dots connected by lines. The field might sound trivial, but work on it for a few centuries, and you’d be surprised how complex it can get.

Given that Rowena and Jewelle’s ancestors were from a water planet, numbers and straight lines weren’t simple concepts for them. Instead they were experts on flow; they used transformations as their most basic geometrical building blocks, and only arrived at straight lines as the end result of a long chain of definitions and proofs. Focusing on dynamics, they’d developed a whole science of how curvature and torsion can vary with time. And they’d generalized the Navier-Stokes theory of fluid flow into higher-dimensional space to come up with an arcane field that they called hyperdynamics. And beyond that I couldn’t follow.

Before drifting off into his party with Alma, Unger told us that, being blind, he had little interest in space or number. For him the world was a system of electromagnetic fields, so he was perforce prone to viewing reality as an endless undivided whole. Logic for Unger was a tool for extending his perceptions, and he relished logic. But even more, Unger believed in his mind’s direct perceptions of impalpable form. According to Unger, infinite sets were as real as the objects that we non-nudibranchs saw with our crass eyes. What made Unger’s version of set theory fully alien was that he truly thought that everything in the natural world was a set — with a rock or an apple existing on exactly the same footing as such transfinite mathematical constructs as beth-four or alef-seventeen. Words, in particular, were potentially infinite sets of etymological links and conversational associations, which made rhetoric a kind of linguistic set-theory — and this was one of the topics that Unger took up with Alma after the two of them got high.

Oskar and Tanya’s ancestors were from a world near the core of their beloved Galaxy Z, a spot where solar systems were continually being torn apart by catastrophic close encounters. The roaches were forced to emigrate to new worlds every generation or so, which meant that, for them, most concepts were utterly relative. They had little respect for absolute truth, and focused instead upon the

relations between axiom systems and the theorems that might be logically deduced. Now, this wasn't so different from the formal mode of thought used by human mathematicians, but, since coming to La Hampa, Oskar and Tanya had added the mysterious hierophantic technique to their arsenal of logical inference methods. The usual flaw with formal logic is that, when faced with deciding if an arbitrary result is provable, you need to look through exponentially many possible proofs. But the roaches claimed that hierophantics could collapse even the largest exponential search into a few ultraefficient steps. In the grandiose style of mathematicians everywhere, they were overweeningly proud of their new technique. They said they were the best mathematicians in both La Hampa and in the entire multiverse — with the possible exceptions of Jewelle and Rowena.

### ***The Jellyfish God as the Stake in a Bet***

“What does the winner of your big bet get?” asked Paul.

“Winner own your jellyfish,” said Rowena. “For awhile.”

That stopped the conversation for a minute. Not to put too fine a point on it, as far as humanity was concerned, this particular jellyfish was God. These weird-ass aliens had a bet whose outcome determined the ownership of our God?

“Don't fret, Bela,” said Mulvane, noticing my bewildered frown. “Rowena acts like she's so important and profound. But nobody really owns anything, ever. Especially not a piece of the Nataraja.” He glared over at the cone shells. “Those two would be a bit more bearable if they'd speak properly.”

### ***Predictability of Cammy***

“Why'd you freaks start screwing with us in the first place?” Alma asked Oskar.

“Two reasons,” said the cockroach. “The second is my bet with Rowena about whether humans are predictable. We wanted to get a map of a human brain to see if we could predict the person's actions.”

“Cammy, Cammy, Cammy,” said Alma in a weary tone.

“That's right,” said Oscar perkily. Being both an alien *and* a mathematician, he wasn't big on picking up subtleties of human emotion. “Bela asks your jellyfish-god to bring Cammy back to life. And you guys hypertunnel on home to the new Earth. Meanwhile I use the Cammy axioms to make hierophantic predictions of what she does. If any of my predictions are wrong, I lose the bet. But that's not gonna happen.”

“Why not just test the question on yourselves?” asked Paul.

“Aw, then you get all that self-reference crud,” said Tanya. “You know, like that crazy Roland Haut's paradox. Nothing can successfully predict itself all the time. You can't even predict anything that's very much *like* yourself, because the target might be modeling you. But because we got hierophantics, we're higher-order than humans. So there's no problem, as long as we keep our predictions to ourself.”

“Should be easy to predict Cammy anyway,” said Alma with a bitter laugh. “She's always a slut.”

I drew in a deep breath and exhaled. It occurred to me that there was no reason I absolutely had to stay with Alma once we got back home. Life with Cammy might actually be better. But for now I needed to stay calm and patient. I owed Alma that much.

### ***Vandals, Visigoths and Republicans***

“It seems there’s some — do you always call those kinds of beings Republicans? No? Visigoths? Vandals? Some vandals from one of the many universes have found their way into La Hampa and have been killing off the suns. They say they’re ‘harvesting’ them.”

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It seems they’re quite oblivious to the possibility that they’ll eventually destroy their own reality.

### ***Future Humans Hypertunneling To La Hampa!***

“People from Earth’s entire future are coming to La Hampa?” marveled Paul. “And nobody minds?”

“We got infinite real estate here,” said Tanya. “La Hampa goes on forever up and down. Level after level. Fly up through the sky here, you’ll pop out of an ocean into a new sky with more floating water worlds, each of them with islands. The Paradisio level. There’s already some human types up there, like Oskar said. Two them went back down to your Earth, realized they shoulda stayed in La Hampa, and came back through your hypertunnel. They’re from the future of a hampatime-earlier Earth, if that makes any sense to you.”

“Don’t mix them up with time and hampatime tonight,” interrupted Oskar. “They’re tired. Let’s stick to levels. If you swim down through the ocean, you’ll find islands there, too. That’s the Subgum level. The Nataraja has room for everyone, but not that many people actually make it from any given world. You were the earliest people on any of the Earths to get a hypertunnel — earliest in your regular kind of time. June 2 and June 3 are the record. Congratulations to you for that. And, ahem, to us for helping you.”

### ***Hierophantics Analogy Made Explicit***

More concisely,

*Hierophantics : Mathematician :: Mathematics : Non-mathematician.*

### ***Hampascale is time***

Earth’s time is La Hampa’s scale or, more concisely, *Earth time is hampascale.*

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“How about time being hampascale?” I asked.

“Okay,” said Paul. “In La Hampa, scale is another dimension to explore, just like space. Call it hampascale. Now which of our dimensions might hampascale correspond to? Note that when Haut came over from the Tang Fat Hotel, he ended up in that bubble under the ocean. Subgum. That’s a smaller size level than Nanonesia. And Tanya said those people in the helicopter were actually from a future Earth. And they went up through the sky to a larger size level. Paradisio. Our past is small, our future is big. Earth’s time matches hampascale. And this leads to Lesson B. If we go back through the hypertunnel from this ocean here, we’ll be going right back to noon on — what day was it?”

### ***Calling a Spade a Spade with the Jellyfish***

[I wanted to write this line, enjoying the contrast between the ready obscenity and the sacredness of the scene (Bela is talking to God.)]

“I wish I’d fucked Cammy at my mother’s house after the Washer Drop concert in San Jose,” I said.

[But when I blogged this excerpt along with a photo of my *Bela and the Jellyfish* painting, I realized that the average person is going to be offended by the curse, it’s too Bruegelian, too Ruckerian. So I think I’ll, sigh, water it down to this: “I wish I’d made love with Cammy at my mother’s house after the Washer Drop concert in San Jose,” I said.]

### ***Corny Sex Joke about Cammy’s Infidelity***

“Sex isn’t that big a deal to me. It’s like brushing your teeth. I don’t see why everyone gets so bent out of shape.” But, damn, she’d sure looked like she was enjoying that Waclaw’s toothbrush.

### ***“Hundred Percent Nazi Scumbag”***

[I dropped this as, actually, they probably should use some other world than Nazi in the other Earths, a word like Kazi, but if I do that, then this passage would lose its force. So I did it differently.]

K-Jen wanted to call her song “Hundred-Percent Nazi Scumbag,” which got a laugh, but then I starting thinking how important it was to make a difference while there was time, and I said that maybe we’d have a change of reaching more people if we toned the song down and called it “Hundred-Percent Tyrant.” K-Jen said I was being as wimpy as Winston Merritt, and that these desperate times called for radical dreg-style confrontation. The insult of being compared to an impotent stuffed-shirt Common Grounder Senator flip-flopped my point of view, and I said what the hell, let’s make it “Hundred-Percent Evil Asshole,” and everyone liked that, “asshole” being, after all, a more universal and non-timebound notion than “Nazi,” which by now just meant “cool uniform” to a lot of people.

### ***Gobubble Haut’s Paradox***

“If it gets too bad, Paul, or if the Heritagists really come down on us, you think we can still use Haut’s paradox to get out?”

“Maybe,” said Paul. “I haven’t had time to think really hard about it. There’s difference between a Gobrane and a Gobubble, in that the Gobubble is a sphere and the Gobrane was a flat ellipse. So I’m not quite sure exactly how I’d want to zap a Gobubble to set up an Haut’s paradox. On a Gobrane, there are particular nodal points you can zap — but every point on a sphere is sort of the same. None of them jumps out at you.”

“What if you zapped it at three points? Use the first zap to make an origin, the second to make a unit on an x-axis. Assume the y-axis is perpendicular with the same unit. So then the third zap can be the Haut point. With the Golden Ratio.”

### ***Escaped Gobubbles***

After we stopped playing, most people had begun noticing that they could ask to see their own futures in the Gobubbles, and they took their Gobubbles home with

them. Yet a fair number of people had lost their bubbles to the wind, and quite a few of the iridescent spheres were drifting across the terraced stadium and its grounds. The wind off the bay picked up, blowing more and more of the bubbles through the public-friendly gratings in the stadium's right-field wall.

After we stopped playing, most people had begun noticing that they could ask to see their own futures in the Gobubbles, and they took their Gobubbles home with them. Yet a fair number of people had lost their bubbles to the wind. As I left the dressing room at the back of the stadium, the iridescent spheres were bouncing past on the sidewalk, each of them holding an image of some different person's future. It was, like, an objective correlative to human diversity. Homeless people were busy collecting the bubbles, stuffing futures into ragged sacks.

### ***More Weapons***

A ridged Ruger MP9 submachine gun.

A Special Forces MM-1 revolver grenade launcher capable of firing thirty little grenades a minute.

### ***Alternate Universe Autoeroticism***

"Should we blow each other?" Bela-2 asked me.

"Not with these sexual-tourist-type futurian women around," I said. "But we could if we were hard up. In a way, it'd be like jacking off."

"But not really," said Bela-2.

"Naw," I agreed. "Don't want to risk turning gay."

"Perish the thought, old thing."

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"I love you, Bela. I really do."

"Me too."

### ***Preface and Afterword***

[At one time I thought it would be funny to have a preface and afterword, but later I decided they just got in the way. Here's my draft for the Preface by Bela Kis.]

My story begins on an alternate Earth in the university town that we called Humelocke, a close match for your Berkeley. And the story ends with me here in your San Jose, California, writing up my adventures.

There's a whole sequence of Earths, you see, all designed by a giant jellyfish in La Hampa. A goddess. She was tweaking new revisions right up until she — died? Your Earth was her final draft; she claimed it was perfect. And then she put me here and turned into a ball of light.

In the course of my tale, I'm going to explain all this in precise detail, so don't automatically assume I'm a sketchy hairball. Although, yeah, maybe that's exactly what I am. I'm not quite sure anymore. You decide.

Next week, if all goes as planned, I'll begin teaching calculus and dynamical systems at San Jose State University. Not quite the glorious career I'd hoped for, but it's a job. And I'm engaged!

I want to get my adventures written up before my implanted memories of the other worlds disperse, so that's what I've been doing all summer. And I was able to make friends with the science-fiction writer Rudy Rucker, who used to teach in the

math department at SJSU. Rudy's been editing my story a little, and he says he can get it published as a novel. My life is science-fiction.

To make the story easier to read, I won't use each and every alternate place name we had. But I'll keep "Humelocke," in fond memory of that specific place and time where I first came to know wonder, madness and love.

— *Bela Kis, San Jose, California, August 15, 2004*

[I had also planned an Afterword by Rudy Rucker, but never brought it to so polished a state as the Preface.]

If you've read to the end of *Mathematicians in Love*, you'll realize that I didn't write this book. It was given to me by a young man named Bela Kis in the summer of 2004.

Bela was to begin teaching at SJSU in the fall. In the event, he taught one semester at SJSU. He and Alma got fascinated with SCUBA diving, were going out all the time. And then right after I sold our novel, he disappeared.

At first I wondered if he'd somehow tunneled off to another dimension. But then I got a postcard from him.

He's living on Palau in the South Pacific. He's working at the Palau Community College, and Alma is a dive guide.

Bela still says this is the best of all possible worlds.

## Cuts During Final Revisions

### *Washer Drop Play List*

Oil Pig, Bela's Weenie, Universal Automaton, Sex Files, Leaf Blower Man, Chainsaw Crying Clown, Where Are You, Conotoxins, Hipster Love Monkey, Evil Eye, Lug Bi War Bride, Hundred-Percent Asshole.

### *Music Descriptions*

I ran a few loops and ladders of feedback, and then we brought down the sound

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Naz had his drums and his machines synched together so that he sounded like three Mumbai madmen. K-Jen was in full-throated raving form, loud and soft, high and low, always rocking.

### *Three-Way Sex Scene: Bela, Paul and Alma*

I went back inside, pulling the door closed ever so gently so as not to wake Paul.

But Paul was gone from his spot. He was naked in bed with Alma.

"Oh come *on!*" I said.

Alma giggled, sitting up with the sheet across her breasts, looking perky and jazzed. "Maybe we should," she said. "Just this once. I've always wondered how it would be."

"Too gay," I said. "Paul's disgusting. He promised he'd leave us alone, dammit."

"It was too much for me," said Paul. His face was flushed and blotchy. "Hearing Alma with you. I wasn't really asleep. If it's okay with Alma, why not? Don't be stingy, Bela. And of course we'll wear rubbers." His expression was



earnest and pleading. Vulnerable and yearning. Deeply human. “Do I really disgust you?”

“Oh, you’re okay,” I muttered, getting into Alma’s bed on the opposite side from him. “Are you sure you want to do this, Alma?”

“I feel so desirable,” she said, reaching down to fondle me. Her other hand was on Paul. She kissed me and I responded. “Promise you won’t think I’m bad,” said Alma, looking into my eyes. “Because this is only going to happen once.” My hand was between her legs now, my fingers encountering Paul’s. This was kind of great. My pulse was pounding in my temples.

“Whatever you say, Alma,” I breathed. “Tell us what to do.”

We did a lot. Alma was a tiger. In the course of things I even touched Paul’s penis a couple of times. What had I been so scared of all these years? It was just a stiff dick, same as mine. And Alma — what a hottie. Woman enough for two men at the same time. What was so wrong? I was lucky she was moving back to Humelocke with me. As the sun rose, the three of us fell asleep, deliciously entangled.

### *How “Where Are You” Sounds*

My mournful, mystical love song was definitely a change of pace for Washer Drop, but the band humored me. We ended up arranging “Where Are You?” in a good way, with Cammy’s bass line solemn and profound, my guitar notes flowing across her chords like water over rocky falls, and with K-Jen singing angelic harmonies behind my lyrics.

### *Heritagist Stadium Concert*

Washer Drop played the first set, and we did most of our songs: “Oil Pig,” “Bela’s Weenie,” “Universal Automaton,” “Evil Eye,” “Sex Files,” “Lug Bi War Bride,” and “Where Are You?”

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All together we fired up “Crying Chainsaw Clown,” which was as madly wonderful a song as when we’d played it with Jutta at Rubber Rick’s Globo Club on Earth-1. And amplify that by the fact that in Heritagist Park on Earth-2 we had Waclaw, Stanislaw, Abdul and Cammy playing as well.

Waclaw wrung the last bit of intensity from the song, the applause died down, and thirty thousand faces gazed at us expectantly. I could see Gobubbles all across the stadium. Waclaw looked over at me, grinned and nodded. He had such an intense star quality that his smile was like the warmth of the sun.

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He’s a hundred-percent jerk — Never had to work.

He’s a hundred-percent dumb — Wants all our music numb.

He’s a hundred-percent greed — Robs the families in need.

He’s a hundred-percent rich — He use you for his bitch.

He’s a hundred-percent war — Our kids are dying for.

He’s a hundred-percent killer — Behind his mansion pillars.

He’s a hundred-percent hate — Stop, it’s getting late.

He’s a hundred-percent pig — Don’t let him be so big!

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So what, you might say, it's just a song, just some balls with images. But art gets inside people's heads. I'd be willing to argue that without Frank Zappa, the world never would have seen the fall of the Berlin Wall.

### ***Bela the Killer***

Moving faster than thought, I hit Sandoval in the chest with a burst of submachine-gun fire. *Hell*, yeah. He fell onto his back. This was the guy who'd slaughtered Cammy and Paul. I got out of the car and shot him in the head with my pistol just to be double sure that he was dead.

## ***Journal***

### ***March 27, 2003. The Idea!***

By the ocean, sun going down. On the rocky Esalen beach, alone, below the house where Terence McKenna and I led a seminar five or six years ago, maybe in 1997. I have an urge to write the *N. Y. Times Book Review* a letter defending Terence against a reviewer who, last week, said that, in Terence's last days, you couldn't tell if you were talking to him or to his brain tumor. Actually Terence was the same all the time. The tumor didn't make any difference. It sells short his true weirdness to think otherwise.

A seagull looks at me, its eyes disappear when seen directly head on. I sketch him in five or six positions: staring out to sea, cawing, looking at me, looking down at his feet, glancing at the shore. Sulfur smell from the stream raging into the sea. The sea here somehow wholly unlike in Santa Cruz. It's Big Sur sea, nay, *Esalen* sea. How lucky I am to be here. I say, "I love you," to the seagull. He bows. We do it again. Maybe the seagull is Terence.

Book idea: *Memoirs of a Crazy Mathematician*. Settling scores, taking credit. If I wrote a memoir, I wouldn't have to learn anything new, and I could talk about myself all the time. I'm old enough. Fifty-seven. That's really, really old. If the book did well, I could trundle out my collected journals. There might be new interest in the novels as well. Book as press-kit.

Patriotism is the last resort of a scoundrel. A memoir is the last resort of a writer.

### ***June 11, 2003. Discover Memoir Notes.***

I remembered that at Esalen I flashed on this book idea: *Memoirs of a Crazy Mathematician*. And then I stumbled onto the Memoir Notes document I'd made in April and forgotten once before. I only found it because while spell-checking I noticed I'd made a dictionary file called "memoir.dic" and I'm all, "Huh?" My mind is like a sieve, maybe the sooner I do memoirs the better. I'm gonna integrate the Memoirs notes into my diary.

*The Answers: Memoirs of a Crazy Mathematician*. That's very commercial. And everyone but me thinks I'm "crazy" anyway. So why not cry over the insult — all the way to the bank. But no way do I in fact want to call myself crazy. Just for a few bucks? No.

Shit, man, I owe the world a memoir. Seems like every week I see another memoir by a 25-year-old in the *N. Y. Times* Book sections. Saw another in City

Lights yesterday, something about a kid who met Feynman. You pick that up right away. The layperson is more comfortable with a memoir.

But why not just fob off my journals. Burroughs never wrote a memoir. Instead he wrote transreal novels, and published his journals. Maybe that's the way to go.

I think I should do a *novel* about a crazy mathematician, instead of calling myself crazy. My hero's "craziness" could involve some of the ideas in my memoir *The Answers*. But switching to this project wouldn't solve my current problem of how to write a commercial non-fiction book summarizing, in particular, what I learned in Silicon Valley over the last 17 years. [This became *The Lifebox, the Seashell and the Soul*, which occupied me from about 2003 to 2005.]

In any case, I would prefer to first do a non-fiction book and then the novel.

**January 13, 2004. Esalen. What is the Mind?**

S and I are spending two nights at Esalen, the kick-off to a six-day road trip to LA, planning to see a concert in the new Disney Hall down there, also stop off in Santa Barbara, doing the coast Rt. 1 all the way down.

I'm drinking blackberry sage tea (caffeinated), remembering my stay here with John Shirley. Kind of funny in retrospect. I have a real vivid memory of him crawling across the crew quarters ceiling, his hands and feet like suckers against the titanplast. Gollum! The roaring winds of deep space. I haven't seen John since, though if we met I think it would be cordially. Could be a good thing in a story, the two pals who have the falling out, then of course get back together.

For sure Sylvia's a better traveling partner! She went in the hot baths with me last night, first time she's dared try that, being modest, but it was dark and we had the big tub to ourselves on the cliff over the surf, the water hot and sulfured, the sky clear, and with the great milk-spill of the galaxy showing — first time we've seen it in a long time.

Down on the beach with S, remembering my idea in March, 2003, of writing a book called *Memoirs of a Crazy Mathematician*. And then I decided I was shy of that title, also didn't feel too stoked about writing memoirs, and got embroiled in the current project, the nonfiction book about computers and reality, *The Lifebox, the Seashell and the Soul*. *Lifebox* for short.

Coming back to *Memoirs of a Crazy Mathematician* for the moment, that actually does relate to the novel I want to do when I finish *Lifebox*. To do a book about crazy mathematicians. I *had* been thinking in terms of writing it from the point of view of a lesser guy, kind of like me writing about Wolfram or about Gödel. The competent journeyman describing his outré friend. A Boswell approach. And the regular guy has some life adventures, ordinary human stuff, Bruegelian romances.

*But* the alternate approach that just now occurs to me is that I could write it from the viewpoint of the crazy mathematician himself. And it could perhaps be a transreal autobiography, except what my life would have been like if I'd been a great mathematician. I'm leaning towards an SF twist, the guy discovers something that alters reality in some profound way. If I did the Boswell angle, then the crazy mathematician could conveniently disappear, taking his invention with him. If I did the transreal angle, then the crazy mathematician would be in some sense incapacitated by his discovery, to the point where he's in a nut house writing his memoir. In this case it would be nice to have an additional act, wherein the crazy mathematician gets out of the loony bin.

I think the Boswell is the way to go, then you've got two characters right away. Could call it *Memories of A Crazy Mathematician* instead of *Memoirs*. Simpler: just call it *A Crazy Mathematician*. I could in fact shuffle the chapters and do both the Boswell and the Transreal approach, like I did in *As Above, So Below*, but that kind of calls out for 3rd person, and I think I'd prefer to write this in 1st person. Could go arty and alternate 1st person chapters, but that sounds tiresome. The friend's name is Anatoly Pritkin, and the crazy Mathematician is Paul Bridge — I think of an Anglo name, remembering how much Norman Packard impressed me the first time I met him. Told this to Sylvia, and she's like "The friend should be *Hungarian!*" OK, he could be Zoltan Kis. Bela? Huba?

I'm writing this lying on my bed, we're back in our room, end of the second day. Tired out from doing nothing and eating a lot. I took a little hike up the canyon today, not much. S and I walked down to the stony beach, looked at the ocean and talked about consciousness, for as long as I could keep her on topic, anyway, she's more of a "why try and figure it out" stance. (I'll paste some of this plus some more notes about Mind into the Tome Notes document.) In Esalen I always feel like I ought to be able to "break through," like good old William J. Craddock talks about in *Be Not Content*. Craddock would try and do it with acid and still never break through. Nobody does break through, do they. Sylvia's more content with that than I am. My mind is a stream with ripples I call thoughts (or maybe it's something else) and (if it's like a stream) all I can do is throw pebbles into the water.

Before supper we were lying down resting, S asleep, me watching my mind, doing Esalen, right. The odd things that pop up. A goddess appears and lowers a crystal ball on a string into my mouth, e.g. A Tinkertoy construction shaped like a tire. Pynchon is marvelous at segueing through fantasies and dreams. He just unapologetically does it.

Meditating, lying there in bed, I notice that I get a little rush off each breath, an oxygen high, a rush up at the top of the nasal passages. Funny I never noticed that before. A free high several times a minute!

Later at bed time I'm tired, worn down by having sat by some hideously dull non-Esalenite denizens of Orange County who'd stayed at Esalen because it was "good deal," and talked only of the food, sixty-year-olds, I bet they were swingers. After getting away from them sat on the deck in back stoking a bonfire. Sylvia came to sit by me. Speaking of the dull dinner partners, I told her, "I saw them naked in the shower at the tubs," and the guy next to us like gets up and leaves, offended, according to Sylvia, by my Beavis-like crassness. Tired in bed, the thoughts aren't so fun, dull loops, Wolfram class 2.

Thinking of the mind the next morning, walking around. The miracle of all this being done by a carpet of cells that have grown themselves into a mat. How can it be? I see the footbridge, I have a model of it, walk onto it, look down at the ripples in the stream, the standing waves of foam, thinking these are like the mind, a woman walks past, her face twitches anxiously to see a silver-haired man in black jacket and sweatpants on the bridge, I think of Joseph Campbell, of myth, the troll under the bridge. All this coming out of the meat weave in my head. The associations somehow kept alive in the background, ready to pulse at my call, and always the new associations. Class 4.

I think it's very rare we have Class 3 thought patterns. A chaotic storm. Like maybe when I took acid it was like that? Not even. That was more like Class 4 very

dense and fast. Though maybe the White Light, or any milder type rush is class 3, with all the neurons firing there's no real content, simply a sense of stimulation.

**February 18, 2004. Email to Paul DiFi (First Plans for C. M.)**

I'm doing well, kind of overworked, teaching Advanced Computer Graphics and two sections of a graduate Computer Game Software Project course.

*The Lifebox, the Seashell and the Soul* is going rapidly, I have a lot of material accumulated about computers and reality. It's already almost half done, I think. Four Walls Eight Windows finally sent the first part of my advance yesterday (the deal was verbally made five months ago). Seeing a check is always invigorating. It's only thanks to you I ever found out about 4W8W as a publisher, come to think of it, so thanks once again. I probably already told you that they were the only ones willing to buy this new nonfiction project — my new "superagent" John Brockman had it turned down by about twenty higher-end houses. Maybe I screwed-up the proposal in that it was overstuffed and complicated, reasonably so, as my plan was/is to figure out what I'm doing while I do it, a standard principle of emergent computation, but not something smiled upon by your average editor who of course wants a concise high-concept statement of a single timely idea. Preferably "viewing with alarm" or "holding out a bright new future." Only Oakes was willing to trust me.

*Frek and the Elixir* is out start of April. I have no idea how it will do. May sink like a stone as usual. Why would this time out be any different? Most readers have already made up their minds about me. That weird annoying guy who just won't go away. I went to a *Locus* party a couple of weeks ago and C. Brown said they're reviewing it, didn't show me the review, but intimated it was good. On the strength of this I ponied up for a subscription to *Locus*, which I haven't gotten for many years.

I plan to cut my teaching down to 2 courses per semester starting next fall, something Deb encouraged me to do. Though I bitch about the drain of time it is, I do kind of enjoy going in to work, so don't want to quit entirely, also of course can't afford to. Good things about teaching are that (a) it gives me new things to think about all the time, and (b) my Asian students are as close as I'll ever come to hanging around with friendly saucerians. Actually even the white ones are like saucerians, being CS majors.

Congrats on *Spondulix* coming out, Andy's gonna give me a copy.

In the back of my mind I'm starting to think about what to write next. I was thinking of doing a transreal thing about mathematicians, called *Craxy Mathematicians* I mean *Crazy*, but really *Craxy* is even craxier... Popular theme right? And I know it inside out.

I had planned to set it in my real past, maybe a multi-decade thing about a Sancho Panza (narrator) and Don Quixote pair who meet in grad school, go on through life, with the smarter guy getting more and more far out, maybe there's some romance issue, they fight over the same woman, about two-thirds through you realize the narrator is even crazier than his brilliant friend. There's a new translation of Quixote supposed to be good, come to think of it, I never read the book yet, first time I tried I just got too annoyed at what a trouble-making fool the Don was, but maybe I'll try again. It never hurts to have an archetypal pattern to use!

Just now thinking about my alien students makes me consider more of a far future setting, with real aliens. I always loved that Delaney thing out on a rim of a galaxy, I think called "The Stars Like Grains of Sand." There'll be crazy mathematicians even there, and I could have SF fun...

Though recreating 1970s New Jersey and so on is certainly a temptation. I could even go the non-SF route, but, come on, Rudy, "Shoemaker stick to thy last," and forget not the non-SF Philip K. Dick novels where the reader is really wishing Phil would just go ahead and unlimber an alternate reality or two. Why hold back?

Yeah, it would probably be better to joots (Hofstadter's word for "jump out of the system" it all) it into Y3K or even Y4K.

I could even make it a Frek novel...Frek goes to college...have Cobb Anderson show up in a saucer...but that's too many constraints I think. A couple of years ago, I remember telling you that what eventually became Frek was going to be an *On the Road* novel called *Galactic Kicks*. Thanks, by the way, for the announcement of the Lovecraft/Kerouac novel. I wonder if they guy pulls it off. It's easy to slide over into *gaucherie* when tackling a pastiche, pushing the obvious buttons like a watchman punching the clocks on his rounds. (Note my writerly generosity of spirit regarding my fellows' work!)

Last month I saw the movie *Big Fish* with Rudy, Jr., and I was all but sobbing at the tale-telling father's funeral, where all his transreal character models show up and his son is amazed. Nice final image of the father as a big fish leaping out of the muddy river, shaking himself, swimming on. Sigh. The images of the father in the hospital bed looked so much like my own father, who I so often saw in hospital beds during the final decades of his life. Me thinking, "I'll be there before I know it." There's no way out.

Last night I woke up at 3 AM and had a cigarette. It was raining, a California storm, lovely on the back porch, a view of all the things I love: clouds, dripping water, plants. Sweet Gaia.

A funny thing when you meet a fellow crazy mathematician or for that matter a computer scientist which is really the same thing, there's a tendency to instantly overlook all the superficial aspects of the person (sex, race, hipness) and instantly go into the ozone. So Mathematics and Computer Science, maths, could be a commonality we have with aliens. Though of course maybe what we think interesting is mostly relative to our system. Wolfram thinks the system of classical mathematics is quite arbitrary, and aliens would be using a very different formal system. But each can simulate the other. Bogonian Tube-Gas Flutter Spectrum Harmonics is, e.g., the objective correlative of Number Theory. Computer Graphics is Holonomic Coordinate-Free Space Integration, which is to say Slime Taste Synthesis.

Well that's still a way's off.

### **February 25, 2004. Zhabotinsky Scrolls.**

I'm pretty much iced-in, haven't really done jack on the actual writing of yon tome (i.e. *The Lifebox, the Seashell, and the Soul*.) I've been in mega-hacker mode, revising my Pop computer game framework for CS 240: Graduate Software Project and writing some demos of lighting and textures for my CS 116B: Computer Graphics II. Papers to grade as well, but mainly its the hacking that sucks up all my time. Once my colleague Michael Beeson said, "Hacking is like drug-addiction. It uses up so much of your time that you never get around to doing the normal maintenance things like eating, washing, answering your mail." The other day Sylvia came home at 6 PM and I was still in my PJs, hadn't eaten all day. Debugging the Pop framework. Told my students about it, and they seemed to appreciate it. The kind of thing they'd do too.

I wonder if I can talk about what hacking is like in *The Lifebox, The Seashell and the Soul*. And I'd like to get into how teaching OpenGL lighting has enhanced my appreciation of the specular highlights on things (staring and staring at Sylvia's dully opalescent toroidal silver brooch in church on Sunday), the diffuse and ambient lighting, the emissivity, the radiosity. Not sure if I can work any of this in. Actually today, I really was kind of having fun with the hacking, though at some point there's always a bug that takes way too long to fix, and your butt begins to get numb on the chair. Nobody can ever really know how much fun I do have. When I'm just doing stuff and not writing in my journal or anything, my life has this pure, unobserved quality. Hacking and light.

Maybe both could fit in an extra chapter seven for *Lifebox*, call it "*Waking Up*". An example of not being awake could be the blood-lust hacking frenzy, an example of beginning to wake up is noticing lights in a new way, and the best is to go outside on the rain-washed hills like I did today. There's one spot on the path near the former nunnery at St. Joseph's hill, it's so bosky and closed in, the oaks so tumble-down and gnarly, a real little Eden, I'm always so thrilled to be there, and at the same time filled with a kind of anguish that I'm not there all the time.

The last few days I've been cranking to get good Zhabotinsky scroll images. Partly for the book, particularly the sections on morphogenesis and ecology, but also because Wolfram is planning, with much fanfare, to phone me on Tuesday and try and do some experiments together over the phone. By way of getting me ready, he's mailing me a new copy of *Mathematica*, and having one of his techs phone me to give me a half-hour primer on how to use WebEx, which seems to be some kind of enhanced internet communication method. I get daily messages from his secretary concerning my current state of preparation for mind-meld with the great man. So that drove me into orgies of Zhabotinsky cellular automata hacking, as that's to be, I think, the main theme of our talk.

The process is kind of science-fictional, fits in nicely with my background preparations for *Memoirs of a Crazy Mathematician*, which is what I'm leaning towards calling the novel I plan to start when *The Lifebox, the Seashell, and the Soul* is done. Or call it *Crazy Mathematicians* or possibly *Craxy Mathematicians*.

I had a flash of a three-act structure for the novel the other day. Act 1: Rutgers in New Jersey, 1972. Narrated by a guy like part of me but dumber. He has a weird friend, who's like another part of me, but smarter. The weird friend meets Gödel and learns something. I could even use my dream of Gödel's death. Act 2: The weird friend gets in a spacetime warp and pulls in the narrator. They land at the rim of Galaxy Z in the year 79982. It's the extra '2' that really bothers me. They hang out with giant-cockroach and slime-mold aliens who are also mathematicians of a kind. And eventually they get themselves transmitted back to Earth. Act 3: They're computer hackers in Silicon Valley, or no, better and more transreal, Huba Kis the narrator is a CS professor at SJSU and Paul Bridge his smart friend is running a software company.

***April 21, 2004. A Month of Disease.***

[I was sick with a viral flu for a month and started going crazy. Here's a quote from an entry about it in my regular journal.]

I'm not touching *Lifebox* for a month. Instead maybe I'll go ahead and start my novel, *Memoirs of a Crazy Mathematician*.

[In my regular journal, this passage then goes into demented feverish ranting about hanging myself and about shooting my neighbors for running a leaf-blower, all interspersed with “<grin>” tags to show that I’m “just kidding.”]

I think this last week has put me in just the right frame of mind to write it.  
<grin>

**July 26, 2004. Rereading Lolita.**

I’m on an eight hour plane ride from Paris to NYC. Reading a 1959 Crest paperback edition of *Lolita* that I found at Sylvia’s house in Geneva — I may have read this very copy thirty or forty years ago.

I’m noticing some nice things about the book, in terms of being a role model for *Crazy Mathematicians*. First of all its in the confessional mode, written by a guy who is in jail for some crime not initially explained, a crime which we’ll wait the whole book to hear the details of. So we know the story is going to end in violence, and we aren’t sure how. The jailhouse memoir by a half-mad criminal is a great format, quintessentially Nabokovian. Can be nuttier than transreal.

I like the name Zoltan Kis for the narrator, and his genius friend I still like Paul Bridge. Paul like the apostle who was converted by seeing God as a light. Bridge is obviously the bridge to higher Reality. Kis is small in Hungarian, and Zoltan just sounds cool, also has this lightning-bolt feel to it. The zaggy Z and the “olt.” Actually it’s spelled Zsolt, not Zolt.

I like Bela, too. Bellow. Bay. Bela Lugosi — quintessential Hungarian — portrayer of Dracula. When I was courting Sylvia, once I came to her cousin Judy Gajary’s house and a Hungarian man my age named Bela had been flirting with S all day. A rival! Sinister rival, yes.

Something else I like about *Lolita* is how elaborately the initial chapters set up the situation for Humbert Humbert the humble hunchback to end up as the ward of the divine Lo. A real stroke-fantasy of a plot, the machinery cranking along, things popping up.

I’d like to have a busy clockwork plot like that for *Crazy Mathematicians*. Those pricks my critics perennially fault me for plot. Would be nice to really line up something snappy this time around.

I’m seeing romance problems, as usual. But instead of having my Narrator get his woman taking by another guy (as in *Spaceland* and in *As Above, So Below*), this time I’ll have him be the guy who steals the girl.

Initially I’d been wanting to start the book out at Rutgers in 1972, but I think it would be more sfictional to start them out in grad school in some unspecified near future time. I hardly know Rutgers anymore, but I guess I could fake it. Or set it at Berkeley, Stanford, or even San Jose State. I’m a little hesitant, to set it in California again, it might then feel a little too much like *Spaceland*. And could be people are sick of reading about Silicon Valley. But that’s what I know.

I see them as having gone to Berkeley together. Mixed math and CS.

Well, anyway, my story line thus far is this.

(1) Paul Bridge has this great woman friend Annie Bloom living with him. Maybe they’re even married. And Paul and Zoltan are taking set theory classes together. Or maybe some other kind of math.

(2) Zoltan has a girlfriend at first, and the two couples hang out, but then Zoltan loses his girlfriend to a painter.



(3) Zoltan is coming around and having dinner at Paul and Annie's pad a lot, and he falls in love with Annie. Annie becomes attracted to him as well.

(4) Annie leaves Paul for Zoltan, there's this very clear moment of decision.

(5) Paul forms a plan to flip himself over to a parallel Earth in which he got Annie.

(6) The plan misfires and kills Annie, no, worse, it removes her from our universe, every trace of her. So Paul of course escapes any legal problems.

(7) Zoltan goes crazy, or thinks he's crazy, he's hearing the cockroach mathematicians of Galaxy Z. He resolves to kill Paul.

**September 19, 2004. The deck is clear.**

I finished *Lifebox* day before yesterday. 150,000 words and about 150 illos. Posted it as a 17 Meg PDF file on a password-protected site for a few peers, and my editors. Don't plan to touch it until, say, November 1, let the comments come in and handle them all at once.

So now I'm instantly casting around for something to write, which brings me to *Crazy Mathematicians*.

I had thought earlier that I might first work on a short story, but I really don't see the point anymore in writing stories — after my complete inability to sell my recent "The Men in the Back Room at the Country Club," and "Guadalupe and Hieronymus Bosch."

Though just possibly I'll do some work on "The Attack of the Giant Ants" while accumulating notes to use for a *Crazy Mathematicians*.

Today I was talking to Stephen Wolfram about *Lifebox* on the phone. I can never decide if he's crazier and/or smarter than I am or vice versa vice versa. At least he was sounding like he had better business ideas for my book promotion. But I'm somewhat more socialized than he.

That uncertainty over who's "really" crazy will be a theme in *Crazy Mathematicians*. Who is crazier, Bela or Paul?

I think I'll be able to use some of my *Lifebox* ideas.

**October 1, 2004. Howard Stern, Monadology, Benford**

Don't forget to use that Howard Stern show I listened to last year where a woman phones in and says she's driving topless, and listeners phone in to say they've spotted her, and finally we have the girl and one of the horn-dog listeners both on cell phones talking to Howard. That immediate monadic interplay.

I'm in a hotel in SF for a conference at SwissNex.

Lying here in bed at 7 AM, I just read the entire text of Gottfried Wilhem Leibniz's *The Monadology*, along with the annotations of philosopher Eric Steinhardt. I'd saved a copy onto my laptop from Steinhardt's web page yesterday. I think this is the first time I ever used my laptop to read something long that I didn't write myself.

Synchronistically enough, Steinhardt has a *cellular automaton* interpretation of the monadology, complete with a shrinking-towards-the-edges tessellation like I discussed in, e. g. *The Fourth Dimension*. It's like reading a great paper by one of my students.

The idea of the monadology seems to be that each entity in the world has a kind of soul called a monad. And each monad consists of a view of the world. There is, sez Leibniz, no objective world per se, just all those monads, each of which contains a subjective world, and the subjective worlds (thanks to God) match. The

monads don't communicate with each other; in Leibniz's famous phrase, "monads have no windows." Bi-fucking-zarre. They just *happen* to match. Each monad holds a whole model of the universe, although with one region enlarged and with lots of detail; this zoomed-in zone is the "body" associated with the monad.

I hear a door slamming in the hotel hall, a shower running downstairs. Other monads doing their thing. I can, with a slight effort, switch my point of view to theirs. The unlit white lampshade in the corner of my room is a monad, the gray-teal patch of San Francisco Bay I see out the window is a monad that experiences the world as rocks beneath its watery flow. The photons flying to my eyes from the computer screen are monads. My hungry empty stomach is a monad. Each monad is the whole universe as seen from one particular point of view.

A wildly extravagant and non-minimal worldview. I don't yet get why Leibniz is advocating it. First of all, he's dodecaduplicating the universe a zillion-fold. And then he has to assume that all the copies are in synch. Why not just have one universe and no synching to worry about?

But, for the fun of it, I'll try and think of everything as monads today.

I got into monadology, by the way, because I have a feeling that it could be a useful screwball theory to use for my new novel *Crazy Mathematicians*. In there, I have this idea of a so-called Knobby Giraffe seed of the universe that's available at every spot in spacetime. So maybe the Knobby Giraffes are monads.

Time to put some granola-monad in the stomach-monad.

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After breakfast I went for a morning get-together at SwissNex and talked to Greg Benford — he pops up again, just as he did when I was in the planning stages of *Frek and the Elixir*, and he turned me on to spheromaks and magnetohydrodynamic rings capable of hopping from sun to sun. This time we had a good talk about two-dimensional time. He was thinking of it in terms of having people seem to appear and disappear as their time axis comes into parallelism or perpendicularity to yours.

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Coming back to monadology, I'm wondering if it could be related to duality as used in projective geometry for instance. Normally a geometry has points as fundamental elements, defines a line as a pair of points, and notes that a line includes infinitely many points. In the dual view, lines are fundamental, a point is a pair of lines, and a point lies on infinitely many lines.

Normally a cosmology has spacetime events as fundamental elements, with minds arising from certain sets of events that constellate to produce a mind. In a monadology, minds are fundamental elements, with events arising as matching data found in minds.

*The Monadology* also reminds me of *The Lazy Man's Guide to Enlightenment* — which is so small I can never find it around the house when I want it — as I recall, this slim volume begins by saying, something like, "There's only one kind of us around: when contracted we're matter, when expanded we're mind, when fully expanded we're energy."

#### **October 4, 2004. *The Other World.***

It's striking how often I write about an "other world," such as now Hampa, Cimön in *White Light*, Klupdom and the All in *Spaceland*, the Antland of Fnoor in *The Hacker and the Ants*, Om and Heaven in *Realware*, hyperspace and Hilbert space

in *The Sex Sphere*, Node G in *Frek and the Elixir*, the inside of the *Hollow Earth*, or the superspace of *Master of Space and Time*.

What does it mean to me, exactly? Escape. A symbol of the mental world where I spend so much of my time. Blondie: "I'm not livin' in the real world." The time I quoted that to my Calculus students at Randolph-Macon Woman's College, they were outraged, and one Add-A-Bead proto-Republikkan snipped, "Where do you think you *are* living?" Um, wow, I'm living in my head, man. The underworld. My magic door is a fluttering leaf, a shadow, a cloud, a flame. All I have to do is look and think, and I'm lost in the ozone again. High on life.

More specifically than the mental world, it's really *writing* that's my other world. Writing is what I like to do best. I'm in fact compulsive about my writing, preferring it to the uncertainties and disappointments of daily life. My heroes leave the ordinary world for adventures in fabulous other lands — and for the real me, those other lands are my books.

**October 11, 2004. *When will I really begin?***

I keep fiddling with this notes document, figuring out my plot, my science ideas, my social ideas, my characters. Frequently breaking for naps in my backyard hammock. I'm up to 20,000 words of notes now, and I'm getting anxious that I'll never actually start the book.

But, dammit, I'm not ready yet. I'm still figuring out significant details. But getting anxious. Sooner or later, the anxiety will build to the point where I go ahead and dive in. Or I'll get inspired or something. The Muse will, as I like to say, show up and sit on my face. Smother me now, O Muse! Blow me!

My theme is that a guy can jump over to a parallel spacetime, replacing his native self that was there and taking over his life. Sometimes my life feels as odd as that. As if I'd just showed up here from some other dimension, with all this stuff and all these seeming memories, a wife and children — and it all seems somehow odd and alien. The sensation of *jamais vu*. Sylvia on the porch last night. What a pleasant, good-looking woman. Seemingly I've lived with her for nearly forty years, but I don't know the first thing about her. She's a voice in the air, a shape in the fog.

Open with Bela Kis working on his thesis in the field of universal dynamics. All he has is gnarly drawings of mathematical diagrams. This will transreally match me beginning this novel on the basis of a bunch of drawings of spacetime diagrams.

**October 20, 2004. *Autobiography. Pale Fire.***

I just finished writing a 12,000 word autobiographical essay for *Contemporary Authors*. They're paying me \$1000. It was interesting to work on, gave me a little insight into what makes me tick. This could be helpful in characterizing Bela Kis. In the long run, I'm also thinking of the essay as the armature for my projected metaproject *Rudy's Lifebox*, not that I want to dig into that anytime soon.

On the flight back from Arpad's funeral in Geneva last month, I read Nabokov's *Pale Fire*, and now I'm reading an interesting critical book about it *Nabokov's Pale Fire*, by his biographer Boyd.

I could cast Paul Bridge as Shade, and Bela Kis as Kinbote. I could even do the full *Pale Fire* number and have Kis's narrative be in some sense a commentary on a philosophical but empirically testable essay by Bridge — I'm thinking of a paper that's a cross between Borges's "A New Refutation of Time," and Gödel's, "A

Remark About the Relationship Between Relativity Theory and Idealistic Philosophy.”

If I really want to use the *Pale Fire* model, the book's title has to match the title of the core document. I'd have a paper by Paul Bridge, embedded in between a very long introduction and long notes and commentary by Bela Kis.

The paper would have an explicit explanation of the Hampa, how to get there, how to tweak Shiva, and how to return. I could write it in high academic style. I could fold in some of the writings and drawings from this very notes document. Now if the paper and book title match, it's hard to call my book *Crazy Mathematicians*, for would Paul really use “Crazy Mathematicians” for his paper title? Would “Reality Surfing” be more accurate? And would this perhaps be a more commercial book title? “Reality Hackers.” “What is Reality?”

That seems maybe a little too baroque. I think having Bela just tell the story and giving it the kind of cute title *Crazy Mathematicians* is better. But I *could* perhaps put in a paper, “What Is Reality?” by Bela Kis and Paul Bridge as an appendix. I'm thinking co-authored as the universe where Bela tells the story, Earth-3 is, come to think of it, *our* universe, and I'm planning that he has ripped off Paul's ideas in this world.

Still thinking of *Pale Fire*, I'd like to work in lots of subtle synchronicities, as Nabokov does. I like the idea of working off the masterpiece *Pale Fire* much more than the idea of emulating cornball *Don Quixote* which I can't even read more than twenty pages of, it's just so lame and painfully unfunny, and Don Q is *such* a stupid and dangerous asshole, bashing innocent people's skulls in. I'm sorry, lecture me all you want about *Don Q* being a classic, but it's too *Three Stooges* for me.

The *Pale Fire* model raises the bar. Of late I've been worrying that *Crazy Mathematicians* as I presently conceive it is still just a mail-it-in project.

There's three kinds of book projects I distinguish. There's the long-ball, the no-brainer, and the mail-it-in.

Mail-it-in is the least desirable, this is make-work that I finish as rapidly as possible with not that much pleasure. Certainly my software engineering textbook was mail-it-in. *The Lifebox, the Seashell and the Soul* had elements of mail-it-in.

No-brainer is a book that's very easy for me to write. *Spaceland* would be a recent example. Simple clear characters, science that I know inside out, a setting that's close to home. I wouldn't call *Spaceland* mail-it-in because I took a lot of pleasure in writing it. But certainly it was easy to write. There's something to be said for the no-brainer. “Don't try and kill the ball. Just hit it.” Easy mastery like the work of, say, Elmore Leonard. But Leonard, too, has his ups and downs, and the better ones are when he's trying something new.

Long-ball refers to the books that are in some way more ambitious, more of a challenge. *Frek and the Elixir* and *As Above, So Below* were long-ball, especially the latter. *Frek* had no-brainer aspects to it, in that it's quite easy for me to write SF. *The Lifebox, the Seashell and the Soul* had long-ball aspects in that I had to dig quite deep to come up with the ideas. In these projects, I *am* trying to kill the ball, I'm hoping to hit the long ball, the homer.

I'm a little down on long-ball books just now. Working on my autobio note reminded me how disappointed I was at the commercial fizzle of my Bruegel novel, and I'm anxious that *Frek* is fizzling as well. Tor shovels the books out the door with no publicity, and even when the first printing sells out, they won't print more copies. Why knock myself out?

Well, remember that the reason I write is to express myself and to exercise my psyche. It's not about the money. It's about the art.

My concern with no-brainer books is that they might shade into being mail-it-in. The no-brainer default for *Crazy Mathematicians* is to be funny, a romp, gonzo, wacky. I mean that's what you'd expect from the title. I rebel at that. I want something that's artistically challenging; I don't want to write a yuk-fest, because if that's what I'm doing, it's worse than no-brainer, it's mail-it-in.

"Mathematicians is da kwaaaaaaaaaaaaaziest peoples!" Wearing clown makeup, squeezing a bulb horn. A black person wearing blackface. "Yowsah!"

I'd rather have my book reflect "the tears of things," like the Bruegel book did. Horror and madness. I should read that book, *A Perfect Mind*. Suppose that Bela is quite seriously demented and this is evident from the start.

As usual, I want to write a masterpiece. But a masterpiece can either be long-ball or no-brainer.

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I need to keep two issues separate for myself: (a) how I write the book and (b) how I market it. There's no real linkage. I *imagine* there is because I think that if I write a masterpiece, it'll be too good for Tor. But the *reality* is that even if I think it's a masterpiece, that doesn't change the market, and, as with *Bruegel* and *Frek*, probably nobody but Tor or Avalon would buy it anyway. Avalon is in play because John Oakes recently sold Four Walls Eight Windows to Avalon and is now working for Avalon himself. He bought and they just bought *The Lifebox, the Seashell and the Soul* for Avalon, also the reprint rights for *Master of Space and Time*. If I just live with selling it to Tor or Avalon, I could relax on the question of finding an SF agent: I could go back to Susan Protter, who could easily make a deal with either of them. John Oakes tends to quarrel with her, but so what. As I once told him, "It's not necessarily a bad thing if my agent annoys my publisher."

Another anti-(a)-to-(b)-linkage point to make: as I discuss in Chapter Five of my *Lifebox* tome, given the power law behavior of literary success, there's absolutely no predicting which book hits big. I shouldn't be tarding myself for the imagined tastes of clients. Just go ahead and fuck the muse. Or the nurse. Or whoever shows up.

The point is that I should focus on (a) and postpone any worry about (b).

I need to write a first few pages, so as to find Bela's voice. I made a first try today, but didn't like it. I'll try again tomorrow or later this week. Maybe I'll just fix the bathroom faucet tomorrow.

**October 22, 2004. New Title.**

That *Crazy Mathematicians* title was hanging me up. So, today, I'm using *The Sierpinski Love Triangle* instead. Not too commercial. I imagine that yet another title will emerge.

Also I'm making the narrator Bela be the cool guy, and have Paul be more of a geek, in kind of a Fletcher and Harry pair, as in *Master of Space and Time*. That's a standard Golden Age SF pattern.

I keep studying *Pale Fire*, and this critical book about it, and the idea of working in a whole lot of connections and hidden stuff seems tempting. Not that the reader needs to *get* the secret levels. But having them there thickens the texture. Like the more layers you paint onto a canvas, the more interesting the picture looks — provided it doesn't turn muddy on you.

**October 23, 2004. Book #27, Zappa, Timebake.**

I'm was originally planning three acts of three chapters each, breaking each chapter into three little groups of scenes. And then I was thinking it would be simpler for the reader just to have twenty-seven short chapters.

The short chapters can be easy, like eating peanuts. After I started thinking about 27 chapters, it struck me that this novel is going to be my twenty-seventh book. Synchronicity!

Like when I decided to base *Frek* on the seventeen stages of the monomyth, and only later realized I'd reached this conclusion while sitting in the Casa 17 roadhouse on Route 17.

But keep in mind, that I actually made *Frek* into 15 chapters as that worked better with the story. By the same token, I'm not going to get all hung-up on having exactly 27 chapters in this new one.

But I might go for, like, 25 short chapters. If I want, like, a length of 90,000 this would mean, like, 3,500 words per chapter.

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I need to dream bigger for my image of Paul. Think Newton, Einstein. Someone whose ideas permanently change how we see reality.

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I bought a Frank Zappa DVD called *Does Humor Belong In Music?* I was struck by the geekly appearance of his then-drummer, Chad Wackerman, a slight fellow amid his drum pads, and the expression of pleasure, excitement, and delight on Chad's face as he played. Would be nice to have Bela or Paul taking the same pleasure at some point in being the star of "One In A Million."

Another thing I dug about these videos was how together and serious Frank seemed, though also how playful and how utterly contemptuous of accepted values. Sober as a judge, wild as an anarchist, consummately skilled and professional. I like to think I'm a like that these days. What I'm doing right now is writing the sheet music and setting up the instruments, and pretty soon I'll get to perform, that is, to write the scenes.

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Could Paul or Bela also emulate the seasoned professional weirdness of Zappa or me? To do this, I would need to show them as becoming older.

What if each hampajump ages you by fifteen years? So the boys go from 25 to 40 to 55. In some ways that's how it recently felt to revisit my home of thirty years ago, Geneseo, NY. Not all that much had changed, it was like I'd only been gone a few weeks, but I and the others were all thirty years older.

That would be heavy. The boys, like, shrivel a bit when they come back. A timebake, as Laidlaw called rapid aging in *Dad's Nuke*. Do the timebake not when you go vout to Hampa, but when you come back vinn to a new spacetime.

This makes it all the more dramatic and difficult for Bela to decide to do the second hampajump. He's going to lose another fifteen years of his life! So we'd better make Earth-2 so screwed up that he definitely has to get out of there, he's running for his life, and losing fifteen years looks better than losing all of them.

**October 27, 2004. Started.**

I'm liking the idea of having Bela get 15 years older after each jump. That in fact dovetails with my original notion of having Act I be at Rutgers in 72, Act II be in

Galaxy Z, and Act III be in Silicon Valley around 2004. It's a good fit for my present day life.

I can't believe I retired. Me that polite gray-haired man in the picture of the little retirement party in the CS mail room? I'm feeling a little dizzy. What have I done! Has it really come to this? Is my life over?

What makes this time doubly empty for me is that I'm between books. There's some clean-up work to do on *Lifebox* — which I'm putting off — and the first few pages of this new novel to write. I've rejected the *Crazy Mathematicians* title and don't have a new title that I'm really sure about. *Three Times Love* is the latest, though I'm losing interest in selling it so hard as a love story.

Title or not, I have a pretty good plot outline and it's time to begin writing. I can't take the anxiety anymore. Anxiety over whether I'll ever start. These notes have now ballooned to 26,000 words and as of yesterday, I hadn't written word one of the novel, I don't even have a firm title.

Starting a novel is scary and hard. It's like you're picking the seed to grow a whole universe from. So much depends on every word. As chance would have it, seeding is a theme of the novel, as my characters will at two points be picking a seed to grow a new alternate universe to hampajump into.

Sitting in the Great Bear Coffee Roasting Shop, I managed to write the first 500 words yesterday, and I think they'll be okay, though I haven't reread them yet. I'm worried they're too funny. I have this reflexive tendency to be funny, and I worry that it undercuts the reader identification with my characters. I need less yoks, more whenk. I don't entirely mean this, as in fact I like for things to be both sad and funny.

Now for some defensive grumbling. In the essentially middlebrow genre of SF, it's only the humorless books that sell really well. Self-important. High seriousness. The future is no laughing matter. Poor me.

Writing yesterday felt really good. Time's been so heavy on my hands. When I'm writing, I'm in the zone, the ozone, mindless as in "the Zen doctrine of no mind," absorbed by my craft — and the minutes and hours melt away.

More and more I'm thinking of *aging* as the real theme of the book.

I was saying this is my 27<sup>th</sup> book, and now I do a little more fiddling, and see that it's my 16<sup>th</sup> novel, assuming, as one should, that *Saucer Wisdom* was a novel. That's tidy. The 3<sup>3</sup> book and the 2<sup>4</sup> novel.

You'd think that by now I'd know what the hell I'm doing.

Sitting in the Los Gatos Coffee Roasting right now. Nothing like writing in a coffee shop. Just went to yoga, it was great. I revised the start of the book, and I'm liking it. Got a 600 word scene done. Now for another. Always so hard to make those first brush marks on the blank canvas.

Also I'm thinking I'll just go back to *Crazy Mathematicians* for the title. First thought, best thought. Trust the muse. And these two birds *are* nuts.

### **November 1, 2004. *The Material Comes To Life.***

So now I've got 4,200 words done, in fact I may have finished the first chapter. The first couple of thousand words came really easily, I had all this great character background stuff that I cold slot right in. I read it to my math friend Pearce and he loved it.

And then I started worrying my characters were too unappealing to carry a novel, a review of *Spaceland* that I recently read said that about those characters. So

then I started making Bela and Paul marginally more likable, also realized they should genuinely like each other, otherwise we don't have a solid start, also they're going to have to invent something cool in math, and Bela can't just be a slacker and a loser.

And then this scene I had with my own thesis adviser Erik Ellentuck came up, where he scolded me to the point of my breaking into tears, and I had to put that in.

And then I had to start figuring out exactly what is this new field of universal dynamics, and I hit on the idea that it'll be about using analog processes to precisely simulate each other, so that digital computation can wither away, at least in the context of predicting things about gnarly chaotic processes.

And then, spurred by the fact that tomorrow is the day of the Bush/Kerry vote, I put in a closely disputed election, which is an exciting example of something someone might try to predict — which is going to be the big thing that universal dynamics is for.

So now my chapter-by-chapter outline is kind of busted and I'll revise it. I kind of hate to destroy the record of progress. I could even geek out and be using that three-initial software to save the diffs. What's it called, I think RCS for revision control system. It's great to be forgetting this kind of thing. Like Charles Howard Hinton's rap about visiting "The Unlearner." Saving it all is what used to hang up Ted Nelson from ever finishing anything; he had this notion that he needed to preserve every variant, every passing thought, every blind alley. Why? "For the scholars." As if. Oh, hell, why not save it anyway; I can save the whole chapter outline a few times, at least the increasingly small tail of it that keeps changing. The crazy person who saves bowel movements in pickle jars. "Sample the bouquet of this fine aught-four."

It makes me anxious for the material to take on life. It's gonna break my plot! An author needs to have graceful degradation of function while experiencing an increasing loss of control.

I'm happy and excited that it's going so well. Running and running and finally jumping into the air, flapping, and yes, once again I'm aloft.

***November 5, 2004. Ocean Beach. Starting Chap One Scene Three.***

So I did the scene of Bela and Paul in their apartment, then the scene of Bela and Alma at Evans Hall, and now I'm gonna to Bela and Alma at the beach and coming back to Rochdale. I still would like to try and do three scenes per chapter, if that's not too Procrustean.

Title thoughts again. How about *Mathematicians in Love*. I remember my writer friend Terry Bisson had suggested I call my Bruegel novel *Bruegel in Love*, which might have been a better idea than *As Above, So Below*. There was a Berger novel *Reinhart in Love* years ago. "Love" is more commercial than "Crazy." It's sweeter.

Daughter Isabel is visiting, and yesterday I went and walked with her on Ocean Beach and took some notes for the scene I want to do. I was also thinking of the Bruegel novel, talking with her about it, and thinking what a complex character Williblad Cheroo was. I should make Paul Bridge that complex. A friend yet an enemy. I could dig down and write this as richly as *Bruegel*.

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*Ocean Beach notes, November 4, 2004:*

Container ships chugging past toward the Golden Gate.



Little birds running like their legs are wheels, their bodies don't move, how nice it would be to cup one in your hand and feel its heartbeat.

The horizon line isn't straight, its wavy, scalloped, undulating. Giant waves out there, far outsiders.

The waves closer in were smooth and clean, like slow gray hills, with perfect lips and spray blowing back off them towards the sea.

It was a marbled cloudy sky, with shafts of afternoon light coming down through rents in the cloud cover, pillars of light like fingers of God.

Crossed the dunes and the beach grass. Tropical plants in the highway divider, cacti.

The coffee shop is called Java Beach, at the corner of Judah Street and La Playa. They have a checkered floor. Black leather couches. A character sitting there, older man in a flat hat and wearing a red carnation. Numerous young people doing homework on laptops, perhaps students from SF State.

**November 7, 2004. Rain on a window.**

I think I'm calling it *Mathematicians in Love*, although originally I was thinking of it as *Crazy Mathematicians*. I'm working on the third of four scenes making up Chapter One, a scene where my character Bela Kis has been walking on Ocean Beach with a girl Alma Ziff whom he's falling in love with.

I changed Alma from being Latina to being Jewish, I can relate to her better that way, Latina is a stretch for me, means trying too hard to be PC. I put her in the house where we bought the pumpkins in Cruz near the Third Street beach last year, like on Broadway off of Seabright (?) Road.

By way of research, the other day I took Isabel to Ocean Beach both for fun, but also to get some beach images in my head. And now I've written the beach part, and Bela and Alma are sitting in the Java Beach coffee shop looking at rain running down the window pane. So this morning to simulate rain, I set up the sprinkler in our back yard to hit the bedroom window and sat and looked at that for awhile.

The drops aren't all that round, their edges are scalloped and jagged.

Big and small drops accumulate on the glass, and then one drop starts moving, and makes its way down, zigzagging as it "eats" the drops it gets near.

It's a bit like what computer scientists call a self-organized critical process. The classic example is the sandpile model, where you simulate adding random grains of sand, and noticed where the slides take place. Here the sprinkler is adding water drops and some of the drops get lucky and set off a big trickle. In the critical processes, we expect to see power-laws, that is, the odds of a trickle of length  $L$  are  $1/L$ . Just a few really successful trickles. These guys are "riding the Tao."

It looks like a sliding drop is sniffing its way. It moves left and right, influenced by the presence of droplets, and perhaps also by dirt, oil, soap residue on the glass.

Note also that the trickle speeds up and slows down.

The trickles are objective correlatives for the lives of my characters.

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That's so California, that I have to set up a sprinkler to simulate rain. Good for my orange tree, too!

I still remember when I was in Torino a couple of years ago, and it was pouring rain, how excited I was to look out my room's window into the shabby

garden and see spreading raindrop circles in the puddles. I'll be in Milano next week, maybe it'll be raining there.

**November 15, 2004. Blogging, Wilco.**

The new novel title is definitely *Mathematicians in Love*. I got the first chapter done last week, modulo a few web-path maze-doors that I'll inevitably have to carpenter in later on. I hardly saw or talked to anyone last week, other than Sylvia. Somewhat claustrophobic, not having the job at SJSU anymore. I'm still coming to terms with being retired from being a professor. I have no life.

Having no life, I was blogging a lot, which meant I had all the more reason to stay \*ugh\* indoors. In one of his interviews, Bill Gibson remarks that he fears blogging drains off some divine essential energy that might otherwise go into writing. The analogy is that, e.g., it's probably better not to masturbate in the afternoon if you're planning a big night of love-making, or to eat candy right before a gourmet dinner. Takes the edge off.

But, on the other hand, could be as basically positive as warming up in my journal. A way to write even when you aren't quite ready to face the arena of the work in progress. In some sense, the more I write, the better. In principle, I can in fact write in my journal and paste the entries into the blog, in fact that's what I'm doing today.

But there's two things that make blogging different from writing in a journal. First of all it takes longer, both because you get into wrestling with the ever-refractory computer tech, and because bogging is seductively multimedia. Like I painted the dining-room pink this week, and now, saying that, I have to go and digitally photograph it and upload it, wah-la.

The second thing that makes blogging take more time than it should is that, compulsive character that I am, I build up this feeling that there's some deadline to meet, that I need to get a blog entry in today or if not today then tomorrow at the latest. So on a day when I would normally skip my journal and go straight for the novel or --- better --- for a bicycle ride, I'm blogging for an hour or so instead.

Another downside of blogging is that it doesn't fill the need for human companionship. You're talking to --- a darkened auditorium, possibly an empty one. Better maybe to phone up old friends and physically get together, rather than trying to create an illusion of a social life by maintaining a blog.

Still another downside of blogging is that in the back of my mind I'm then worrying about feedback or lack thereof from my potential viewers. And even get into revising the blog repeatedly, wasting still more time.

The worst possible blog? How about a guy photographs his bowel movement every morning and blogs that. I daresay such a blog actually exists somewhere in the smellier regions of the blogosphere.

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Saturday night we saw a great band, Wilco. I'd never heard them, just bought the ticket on the guess that they'd be good. Saw them in a nice venue, the Frank-Lloyd-Wright style Performing Arts Center in my dear San gets-no-respect Jose. Tix were sold out, but I tried Ticketron again in the afternoon and lo and behold, we got two seats in the middle of the ninth row. As usual, Sylvia and I were the oldest people at the concert.

These guys rocked in an interesting way. No hair, no costumes, no spit. The workmanlike musician thing, kind of like the Zappa bands. The drummer looked

great and ecstatic, his arms up in happy spider arcs. They'd play this simply catchy ballads and then wipe this great smear of sound across it, like an earthquake. Or pile up huge riffs and loops so that the big hall became an aural funhouse. Everyone was standing up after awhile, and then I was tired and I was sitting down, letting the music wash over me, my eyes closed, turning my head slowly, savoring how the sounds came in differently as I moved my ears. Each person there is hearing something slightly different. The soundscape is like a 3D cellular automaton filling the room, amazing how quickly it updates, amazing how it stays in synch (somewhat) with the twitches and twiddles of the musicians' picks and knobs.

I'd been kind of brooding over being lonely and isolated this week, also worrying about what goes into Chapter Two of *Mathematicians in Love*, but sitting there, letting the great sounds of "Spider" wash over me, I was able to open up and let go of my gerbil-wheel concerns. To imagine that God was speaking to me. If I used to be able to believe such a thing when high, why not now believe it sober? The chaos, the big aha, the noise in the sky, the synchronistic universe funneling me the exact impulses that I need to figure out the next chapter of my novel about guys who funnel impulses to alter the universe. The cosmos dancing with me.

Peering deep into the sounds, examining their ragged edges, gnarly as the borders of the Mandelbrot set. Dappled sound. And for the next few days, listening to any sound at all, I realize that I can do the same thing, notice the little patterns. Sounds are like ripples, standing waves in a stream, chaotic enough to be universally computing. The origin of the universe was that one big Om, it's said, though better are the interfering overlapping beat-sounds of the throat-singing monks. But, again, all that creative wealth is everywhere, even in the tapping of my keyboard, the ringing in my ears, the hum of my computer, well maybe not in the hum, I don't think 60 Hz sounds can have much soul, any more than a drum machine or a leaf-blower, it's gotta have that raggedness to it. Why oh why don't drum machines do slightly chaotic beats? It would take like two lines of code, or one extra feedback wire in the processor.

My character Bela can't get a job as a math prof, and I'd been thinking of doing the obvious and having him get work in \*ugh\* the computer industry. But coming outta Wilco, I'm thinking Bela might become a musician. A fun job like our man Tweedy has. Orpheus was said to play the lyre in such a way that animals would gather around, trees would lean over, and even the rocks would get softer. I'm imagining going a step past that. Bela's axe is an analog process capable of emulating the universe. He can predict any phenomenon by playing it. "Hum a few bars and I'll fake the rest of it."

Somewhat unrelated thought. I remember a, I think it was Bugs Bunny, comic years ago, where he gets a tuba-like Horn of Plenty, and all kind of food comes out of it. Carrots. And then Elmer Fudd jumps up and down on the magic tuba, and it comes apart, and Bugs puts it back together wrong, and when he sqwonks it again, things break and disappear, and he says, oh-oh, it's a Horn of Nothing.

**November 16, 2004. *Creatures in a Mirror.***

At the SF international air terminal, about to fly to Milano to give a talk, I'm waiting for them to print my ticket, staring absently at this clear space behind the ticket counter, assuming it's a mirror, and then I realize it's open air, and that I'm staring into the far distance, this terminal is huge.

And then I get the idea of looking into a real mirror and seeing beings in the distance that aren't there in your real world. The alien cockroach mathematicians.

**November 18, 2004. Blogging.**

I can see some of my characters becoming bigtime lifeboxers or lifebloggers. I have a feeling Nokia has trademarked "lifeblog" but I like the word a lot, maybe more than my coinage "lifebox." I guess the lifebox is the hardware, and the lifeblog is the content. The software is "Jenny," like in *Freeware*? Naw, I need a better word for that code, which is embedded in the lifebox. Blogware.

I see my character Bela as wearing a ring with a camera in it, and that's how he gets famous. The win with putting the camera in a *ring* (as opposed to a brooch) is that then the users can see the lifeblogger. Just have a fisheye lens in there, and trust the blogware to run some Eric-Gullichsen-style anamorphic algorithm to flatten out the image or, better yet, to let the user put their virtual eye at the ring and look all over the place. (The anacam blogware routine was originally developed by pornographers, natch, but that's beside the point.) Generally it's wise to wear the blogring on the opposite hand from the hand that you use for the more intimate duties. Uneasy rests the hand that wears the blog-ring.

And now strum a classic SF god-chord: Bela's lifeblog wakes up and starts *doing* things. And then the blogware finds a way to infect people to make them *become*, at least for a time, Bela.

Japanese hawkers selling up-to-the-nanosecond toys. This woman has radio-controlled dragonflies that do flips and are covered with flashing lights. She explains the robot dragonfly me in Italian, which I don't know. A cyberpunk moment. And then one of her cohorts held a ball of flashing lights up to my face and Bela's blogware entered my soul.

**November 26, 2004. Plot Problems.**

I feel stuck.

There's a conflict between my book outline and what's starting to happen.

I read an encouraging note by Alice Munro introducing her collection of stories, saying that she'd make an outline, write the story, find it went in a different direction, walk around with furrowed brow, figure out a better plot, rewrite, and then iterate the process a few more times.

What *is* the invention the boys discover? I don't want Bela to become a seer who knows the future, that's a suspense-killer.

I need for the morphic classification theorem to locate doors into Hampa. And it should be Paul who figures this out, although later Bela can use it too.

In Chapter One, I threw in the prediction of an election, but I don't want all sorts of things to become predictable, that's not where I want to go. Let's suppose that the prediction tech is, at least for now, klunky. Maybe in Earth-2 it works, and it might be interesting to see that. But maybe suppose that in Earth-1, you really do need a supercomputer for predicting. And in Earth-3 the theorem won't even be true at all.

But in this one instance where the aliens zap Bela in Earth-1, something becomes predictable, say the spacetime curvatures.

The aliens that Bela sees in the mirror are a clue to the existence of Hampa. The aliens know about Bela because he is eventually going into Hampa and they'll meet him there. They have their own way of reaching out to a past event in Earth to

view it and even influence it. For them, all life is a blog. They are objective correlative of blog readers. They are nudging Bela to make sure he comes. They give him an equation. Bela tells Paul about the aliens and the equation. This is how Paul deduces the existence of the quarter-pipe hampajump waves.

I want Bela to capitalize on his blog show by starting a band. The point of a blog is to sell something.

***December 9, 2004. Working on Lifebox. Laugh. The Third.***

I'm working on revising *Lifebox* now and with the Christmas break coming on, I probably won't get back to *Mathematicians* till January. And then I'll be going to Micronesia in February for three weeks.

Notes on two things the other day.

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A pretty girl, in her twenties, in front of me in line at the counter at Andalé Taqueria. She laughs in response to something the cute man behind the counter says. But it's not really a laugh, it's a gesture that stands for a laugh. She shows her teeth and makes a high wavering noise.

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Sylvia and I were reading T. S. Eliot's *The Waste Land* to each other day before yesterday, she was curious about it and dug it out, thought it had something to do with the Grail Legend she's studying in a Mythology course she's taking. And there's this great passage about the third person you see in your dreams. I want to have this personage show up when, say, two of my characters (I've forgotten their names!) are walking around in Hampa.

“Who is the third who walks always beside you?  
When I count, there are only you and I together  
But when I look ahead up the white road  
There is always another one walking beside you  
Gliding wrapt in a brown mantle, hooded  
I do not know whether a man or a woman  
— But who is that on the other side of you?”

In my humble opinion, sticking in that last line is a stylistic mistake, makes the passage a bit hysterical. Other than that, *yeah*, it's right on, I've often dreamed this.

***January 2, 2005. Done Revising Lifebox. Tidal Wave.***

I've been revising the *Lifebox* for about six weeks, but now I'm done, at least for now. So I can get back to the novel. Meanwhile I've been goofing on good SF shit in my blog, hope I'm not leaving the game in the locker room.

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[Tidal wave blog goof.]

I've been thinking about the tidal wave that hit Indonesia and Sri Lanka. And how after the first wave the ocean drew way back, and people could see all these fish flopping around on the bottom --- a few people making the classic mistake of walking out to collect the fish.

Imagine a science-fiction version. Due to some disruption, say a quantum supernova, *reality* is drawn away. Everything disappears in a certain zone, exposing the *creepers and scuttlers* that live "under" reality. Those flashes you see out of the corner of your eye, they're real. And now they're exposed, hanging there, flopping and twitching. They look like --- cone shells! You step forward into the reality-drained zone, filling your collecting-bag with the specimens, but then --- what's that rumble?

Reality disruption when the lovers return from La Hampa.

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[Cone shell blog goof.]

So I'm going on about cellular automata all the time and you're thinking, "Yes, but can CAs get me high?" I'll say! Stephen Wolfram's mascot is the textile cone shell, famous for having a one-dimensional CA wrapped around its shell.

Now as it happens, these little guys are fierce carnivore predators, prowling around in search of small fish to harpoon. See the [Cyber Diver News Network](#) for details.

The harpoon is a tiny barb laden with a venom called a conotoxin!

And today an article in the [Washington Post](#) [registration required to view] reports that a new conotoxin-derived pain-killing drug named Prialt has been approved. And we know all about "pain-killers," right? Prialt is said to be a thousand times as strong as morphine. It's so powerful that if its injected into your muscles or blood stream, it stops your heart --- the only way to take Prialt is to inject it into your spinal cord so that it goes straight to the brain. And, natch, a relatively common side-effect is [hallucinations](#).

*The world broke into cellular automata, at first in patches and then in chunks. A pair of gliders scuttled by, unwieldy as crabs on stilts. As I spoke, the sounds from my mouth became long strings of oscillators. And then a Zhabotinsky jellyfish engulfed me.*

**January 5, 2005. Revising the Plot.**

I'm working to get up enough momentum to dive back into the pool. Running around the edges. There's some plot points I'm uneasy about.

In Chapter One, I set up this thing about emulations. Haut has this program for using universal dynamics to set up predictions about all sorts of real-world things. In my first draft, the splash simulation emulates the orchid simulation. And the frost simulation emulates the real world voting behavior. For these to match, it might be better if the splash simulation were to emulate *actual* orchid blossoms.

I have a problem, which is that, in the light of the Principle of Computational Unpredictability (PCU), we know that naturally occurring computational processes are not predictable in the sense of allowing for exponential speedup. But, on the other hand, the Principle of Computational Equivalence (PCE) says that any complex computation can emulate any other. We *might* hope for a linear speedup of some natural process by running an emulation very quickly. Yet, as I claim in *Lifebox*, most natural computations don't even allow for linear speedup. They're at the maximum possible flop. So I think Haut's Program is wrong.

E.g. the orchid emulation via water splash is rather slow, and also doesn't accurately predict every detail of a real orchid. I can believe that the election can be sped up; but I don't believe that it could be accurate.

So let's suppose that the boys' thesis is to *disprove* Haut's hypothesis. To show, in effect, that the Dynamics Classification Theorem is at best qualitative, and that there can be no Metamorphomorphism.

*Yeah.* So now I'm going and making that change in Chapter One. Predictability is bullshit. And having the boys refute Haut's Program will make Haut hate Bela all the more. Van Veeter will *still* pay for it, though, because he's a stupid businessman, and Haut will *still* be marketing it — because he's a puffed-up con man who believes his own hype. (Think Stuart Kaufmann.)

**January 5, 2004. Hypnagogic Visions of Local Singularities**

Dropping off to sleep I had a vision. I was thinking about the "Singularity" as used in the contemporary sfictional sense of a vast speedup in computational power leading to a superhuman mind (of, variously, the robot, the cyborg or the hive variety). And I was trying to jibe this with my Wolframite sense that nature's computations are already happening at the maximum speed and complexity.

And then I threw quantum computation into the mix. And I had a vision of Paul Bridge in his Stanford lab making a red substance, some doughy stuff in a super-entangled quantum synch with itself, some Silly Putty that "computes" much faster than at the standard rate.

It's matter that "runs faster" than regular matter; it's, like, wattaflop matter as opposed to our normal petaflop matter. In my waking dream this goo was red, it's my vermilion Maguffin, a gift of the muse.

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At first I'm thinking that Paul uses the wattaflop matter to find the spot for the hampajump to the control world. But now thinking that instead of *predicting* a denormalized local singularity it would be more fun and sfictional to be *making* one. Show don't tell.

Paul uses denormalization to *create* the cusp they're going to hampajump upon with their surfboards. ("Denormalization" by the way, is a kind of pun on the "renormalization" method that physicist Kenneth Wilson used to understand phase transitions, work for which he was awarded a Nobel prize.)

The sword of the Singularity hammered into the plowshare of a local tool, yes indeed. It's good to mention the Singularity, it appeals to the SF hive-mind just now.

My physics inspiration here is Seth Lloyd's article about black hole computers in the *Scientific American* last month. Throw some input in the form of physical garbage into a little black hole and watch the radiation come out — here's your encrypted output, mofo. *Dzeent.* "Ack, a hard rain of cosmic rays!"

How to jibe this with my eidetic vision of hampajumping off a wave inside a Big Sur natural bridge? Why would you necessarily make a local singularity right there, out in fifteen feet of cold, rough water filled with sharp rocks? Perhaps the surrounding mass of the bridge stone is important for this, and the cooling water soaks up the gamma rays, and, hell, maybe crazy mathematicians Paul and Bela just think it seems cool, same as me.

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Possibly the trip takes place in a breath of a second, and they come down with the bridge collapsing.

I'm gonna lose that notion of aging fifteen years during each trip to La Hampa. Too depressing for the reader to see the characters getting time-baked, too much the bring-down intimation of mortality. It's cooler, I think, to have it take

seemingly no time at all in the regular world, and to not age you at all, in fact it could be that it feels like years in La Hampa, and no time in the regular world.

**January 13, 2005. Proposal.**

I wrote up a proposal and gave a first draft to Hartwell in NYC, who has to see it first in any case as Tor has an option on my next book. I'd meant to wait till I'd finished three chapters, but Dave asked for it, so I did a proposal that's a summary, my goals for the book, a picture of the plot, a chapter-by-chapter outline, and Chapter One.

*Lifebox* is in copy-editing, so it's time to move on.

Today I wrote up a better version of the proposal, emailed it to Hartwell, also I sent it to Russell Weinberger at the Brockman Agency in case they'll deign to handle it. And I think I'll show it to agent XX, got answering machine, left a message. Called the next day, got the answering machine again, didn't bother leaving a message. I realize now that, having left the walled city of insider writers, I'm approaching them through a public gate, and can expect just that cold shoulder I knew of yore. May need to write them snailmail or get contact info from Hartwell. Maybe wait and see what Brockman says first. He would, after all, be more likely to be able to break my book out into the mainstream market.

**January 16, 2005. Haut flips?**

Last night I had dinner with John Pearce at Michael Beeson's. John was reminiscing about his experiences as a math grad student at Berkeley. He said that there were three guys who had the same thesis adviser, call him V., and that they'd finished their theses and just needed for V. to sign off on them. So they go see V. in the nuthouse, and V. says he won't sign unless they help him escape! Would be cool if Roland Haut took this route.

This isn't what I'd planned for Chapter Two, but it might be worth putting in as it's a good "crazy mathematicians" story. I could even bulk it up and have Haut in the nuthouse do some work to advance the plot. He might (a) prefigure the cockroach math aliens and/or (b) use denormalization to levitate an item in his hospital room. *That* would be a nice scene.

Jon also told a story about a logic professor who flipped out and gave an invited lecture on "Heidegger and Logic," and the end of the lecture consisted of a reverent reading of Dr. Seuss's "One fish / two fish / red fish / blue fish." This actually is an influence I've kind of integrated into my rake-cake-fish-dish-teapot construct.

**January 17, 2005. Pocket notes.**

These are some recent notes from those folded-in-four sheets of paper I like to carry in my back pocket.

\*\*\*

The cockroaches from galaxy Z are using *us* as computers. That is, they interfere with Haut, Bela and Paul so as to compute something of interest to them. Perhaps a problem in number theory.

\*\*\*

Could only one sheet of reality exist after all? Oh, right, I'd have the problem with the relativity of simultaneity. But what if changes made from La Hampa



propagate instantly throughout all of spacetime? You'd have a possible problem only if users could tweak from two different spots in La Hampa. If there's one and only one tweak site, then it seems like it would be okay to just have one reality. Actually, given that the "past" (in the hampatime sense) realities are inaccessible, we could just as well say that its only the one reality being altered.

A problem with the one reality is that then you can't bump your stand-in.

\*\*\*

Music is an analog computation, I think again at the opera. Hard to program it. But maybe I should claim that there are only a few possible tracks. Grooves that computations fall into. Attractors.

\*\*\*

"So I became a lifeblogger." Vlogger?

The word vlogger vaguely reminds me of a slightly older boy, Phil Ardery at church camp in Kentucky, about 1962 when I was sixteen, he was a witty guy I looked up to, he was talking about some other camp experience, how he and a friend would tease a guy named Sampson whom they could hear beating off every night. They'd call out, "Flog it, Samps." Phil said his friend had a lisp, so it actually came out as "Fwog it, Samps." That was a fun time at camp, Churchill Davenport was in our cabin as well, and he carved his name on the wall and *misspelled* it as CHURCHHILL. He was such a cool guy, a real wild-ass, later he became an artist. Used to fuck all the girls, drive drunk, a rebel hero. As in, "He'll puke on you, he'll fuck your Mom, he'll smoke while huffing gas," words from the NOFX song about "the punkest motherfucker I ever did see."

"How does it feel to be so smart?" Churchill would ask me, as if he were really interested.

\*\*\*

What is the one thing that turns Alma against Paul? Meth use? Should be something he can undo by tweaking reality. you wouldn't have the relativity of simultaneity issue.

\*\*\*

The theorem should predict the bridge to La Hampa.

\*\*\*

Maybe instead of dancing with Shiva, you edit reality directly.'

\*\*\*

Bela sees a cone shell proboscis like a funnel/tunnel. I saw this alarming video clip online of a cone shell *engulfing* a tiny fish.

\*\*\*

In Chinatown SF: The Tang Fat Hotel next to the Mee Mee Bakery. I'm visualizing Bela lying low in the Tang Fat Hotel. On Sutter Street, I think. I wonder if I could actually check in there, or is it long-term occupancy only. "Your fat is so tangy, my dear."

\*\*\*

Hartwell's new assistant is Denis Wong. Hartwell mentioned a couple of possible agents in case I don't go back to Susan Protter.

**January 23, 2005. Worried About Plot.**

I have about half of Chapter Two done now. I ended up having Haut have this vision of an extradimensional cone shell. I'm worried it might be too much to have Bela see the cockroach aliens in this chapter.

I'd like Bela to get a vision of how to do codec. He's playing the guitar, turning his concerns into music, letting the feedback bounce around the room, and hearing the sounds, he's seeing the future. He's seeing how to get Alma back. Should he see the cockroach aliens at the same time? Maybe he realizes then that Haut had figured the codec out too, and that's why flipped out.

I'm having some doubts about La Hampa. Personally I would love to go off into La Hampa, get away from reality. But I have a feeling that makes the book less mainstream, less commercial. Especially going there *twice*.

There's also an issue with having Alma come along on the trip into La Hampa. On the plus side, this realizes the Eurydice stuck in Hell thing, so Bela needs to go back and save her. But as a practical matter, Paul wouldn't want to take Alma-1 into Earth-2, as the changes he made to Earth-2 will change how Alma-2 thinks, so it's really Alma-2 that he wants. He wouldn't want Alma-1 to bump Alma-2. Possibly Paul shoves Alma-1 back into La Hampa as they jump back down.

It would be easier for people to understand if they were just altering the reality they live in, a kind of simple thing. But then you have (a) the Grandfather Paradox, that is, what if you alter reality so that you aren't there to alter it, and (b) the relativity of simultaneity problem, that is, what if you and someone else alter reality at roughly the same time, then whose alterations "take". The problem is that there's no objective way to say which of you does it "first."

Another issue is that if the aliens are talking into our world, then they're doing it within our time flow, and not in the orthogonal hampatime flow.

Going back to (a) and (b), I suppose we could simply rule out (a) by having it be impossible to do such a thing, and we could avoid (b) by falling back on some universal standard of cosmic rest. The story is, after all, more important than the science.

The idea of bumping someone out of a world to replace them is a bit off, too. For when you bump them, you cause some alteration to the whole sheet of spacetime with unpredictable results. That might be OK. You jump into what looks like the perfect picture, but in the act of jumping in, you change the picture.

I also still have the problem of how the BHK theorem leads to hampajumping. I think it ought to be some quantum-computing goo you can spread around.

Remember that personally, what I really want is to go to La Hampa, and predictions don't much interest me.

The cockroaches are good, the cone shells are evil.

Discover that reality is fully deterministic.

Maybe Cammy loves Bela so much that she helps him shake Alma loose from Paul. Cammy goes and seduces Paul possibly? And vlogs it?

***January 24, 2005. The Phenomenology of Reality Hacking.***

Yesterday I was wondering whether to push ahead with my plot plans, or whether to just fudge it and do some things that are physically illogical.

Remember what Kurt Gödel told me: "The a priori is very powerful."

Stick with logic, Ru. "Ye shalt gain in kudzu," as I slogged *Mind Tools* in tiny print on the inside of the title page. Stick with the logical system and you'll gain all kinds of wonderfully gnarly plot.

I'm facing a problem because I want to have some La Hampa-based cone shells and cockroaches appear to my characters and I'm not clear how this fits in with the notion of reality hacking.

So alright, I need to work out the mechanics of how a being intervenes to change our spacetime sheet from La Hampa. I wrote up some ideas and added them into the Science Ideas section as “The Phenomenology of Reality Hacking.”

**January 26, 2005. *Girl Watching.***

I’m sitting in the Great Bear Coffee shop on Santa Cruz Ave in Los Gatos. Writing the freakout scene in Chapter Two of *Mathematicians In Love*. And right outside the window I see my character Alma!

Wavy brown hair, a little shorter than shoulder length. Pleased expression. Soft white skin, rounded cheeks. Wearing a blouse that’s a cascade of pale yellow organdy ruffles, sticking out from under her short black leather coat. Jeans of course. She gets into a beat old big white car with a cute boy her age at the wheel. Twenty-year-olds. They’re eager and pleasant. She’s huggable. They’re talking. The car drives off. It’s a Mercedes, I’d been expecting a Dodge.

\*\*\*

A day later I’m back in the Great Bear. This place is more happening than the Los Gatos Coffee Roaster. Cheaper tea, more comfortable chairs, younger crowd.

Four lovely teenage girls at the table next to me, on their way home from school. Laughing with each other over an instant message that one of them is seeing on her cell phone. Two more girls at the table next to them, two more at the table beyond that. I’m so invisible to them, such a humble old yearner. I keep switching between my all-near-vision computer glasses and my checking-out-the-room bifocal glasses. Is that too obvious? Better stick with the bifocals. I can, after all, see the computer screen with them (although less comfortably.) On my right is a guy nearly my age, gap-toothed, grinning, taking in the pulchritude as well, our eyes meet, mutual understanding. Now the four girls see something outside — their ride? Off they swirl, the little flock.

An older girl walks by and smiles at me, a perfect Goldie Hawn nice smile. I’m a tidy old man, after all, and evidently a writer, with my manuscript on the table beside my laptop. Yogically sitting cross-legged on my chair, as I tend to do for the sake of my eternally sore butt and lower back, a sage-looking pose. And I’m, oh yes, writing right now.

Back to the work. On with the computer glasses.

**February 11, 2005. *Demux.***

It’s coming along in that nice easy way, almost as relaxing a reading someone else’s book. I write a few hours a day to find out what comes next. I had a nice idea earlier this week for a new concept, I was trying to compress a video-with-sound that I’d made with my little digital camera. And when I compressed it, I’d lose the audio, and I found out that was because the track I have is “muxed” as in “multiplexed,” and the compression only handles the video part of the track and the audio track has to be extracted out and compressed on its own. And the process of extracting the audio from the muxed track is called, natch, demuxing, short for “demultiplexing.”

So now I’m thinking about the idea that humans are muxed. We’re multiplexed tracks of the physical and spiritual, perhaps. If you get demuxed, this thing like a six-foot-tall skinny golden carrot comes out of your body. It’s your so-called soul, which is perhaps an alien parasite like a tapeworm, or naw, it’s your soul. Has tiny little wings on it. A snake that flies. (Quetzacoatl.)

I was talking about demuxing at Sylvia's birthday dinner, but even Terry Bisson my fellow SF writer didn't quite get it. People are always a bit cold to a brand new idea. But if I dramatize it, it could be made to seem fairly natural. Actually in "the Andy Warhol Sand Candle," I had the main character's addiction be like a lumpy carrot that he pulled out of his head. He demuxed himself. And, come to think of it, Robert Sheckley's novel *Crompton Divided* is about a typically Sheckley-like hero who's demuxed into his four humors: sanguine, choleric, bilious, and black-bilious, and Crompton has to reassemble (mux) himself back together.

Could the cone shells be a demuxed aspect of the cockroach mathematicians? That would be kind of cool. On the other hand, it might be cool to have the two alien races instead of just one. Or maybe there's really only one race, and I'm a demuxed component of a cockroach/cone shell/human combine being.

Another reason I especially like the word "muxed" is that Kerouac uses it in *Visions of Cody*, a passage that I quote in that story I wrote with Paul DiFilippo, "Instability." Jack is writing about the Three Stooges, and refers to one of them, the dumb one (Joe?) as something like, "mopple-lipped, muxed and terminally flunk."

I'm in Yap now, by the way, and expect I'll pick up some inspiration here. I have hopes of actually seeing a cone shell *in situ*, on the hoof.

**February 20, 2005. Notes from Pocket Scraps in Micronesia.**

The cone shell kills Cammy to goad the goys into jumping the bridge to la Hampa. Veeter and/or Paul has already mentioned the bridge at the end of Chapter Three, in fact suggested a trip, and Bela said nix. Maybe Paul and Veeter demoed a small object being sent vout to La Hampa.

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Van Veeter is a Walkeresque computer genius. He just needed the little extra math from the boys. I'll have to work to jibe this with him being a politician.

\*\*\*

Veeter with Paul's help has found the rule of the quantum loops/spin networks that make what Wolfie calls "fundamental physics." Weave back a bit of a physics interest for Paul, perhaps he did undergrad work in physics. They've found the basic CA.

\*\*\*

Paul's lab in his kitchen. What does a quantum computer look like? Room temperature superconductor. Use a teapot to fit with Chapter One, do input through the lid, output out the spout, tweak by squeezing the handle. Aladdin's lamp.

A cone shell emerges from the little lamp like an evil genie in a cloud of mist.

**February 28, 2005. Cone Shell Info. Replot for Chap 4.**

The people diving with us on Pohnpei in Micronesia were fascinating, Scott and Jeanette Johnson, biologists turned computer workers for the US missile range at Kwajalein in the Marshall Islands east of here, also a part of the archipelago of Micronesia, although not part of the Federated States of Micronesia. They knew all about cone shells.

Yes, these guys do live in Micronesia, but I didn't see any because they spend most of the day buried under a shallow layer of sand and come out to hunt at night. You find them at night by following their slime trails.

There are three groups, one eats algae, one eats other shell-creatures such as cowries, snails and cone shells, and the baddest mofos of all eat fish. I think the

Johnsons said Wolfram's textile cones fall in the second category, but I'm not sure about the tent cones, who have simpler looking patterns. They said once they'd caught a tent cone and put it in a bucket and they irritated it so they could watch it lashing out and firing poison dart after poison dart. They said if you find an empty cowrie shell, that means a textile cone ate the poor cowrie. By the way, the guy, Scott Johnson, found a nice empty "map cowrie" shell for me. They're also big fans of giant clams, Jeanette said she has hundreds and hundreds of photos of their mantles. And she said that those glowing colored lips that I kept seeing embedded in the reefs of Palau are a kind of scallop rather than a clam. They said the Solomon Islands are good place to see cuttlefish and cone shells. So now I want to go there too.

I pushed them for still more cone shell info. The cone has a proboscis that sticks out from inside its mouth, and the stinger is in the proboscis. When eating a fellow mollusk, the cone slimes its mouth tube inside the victim's shell, engulfing it *in situ*. The proboscis is red. When a cone eats a fish, what you find the next day is a little pack of bones wrapped in mucus. They're such nasty little beasts.

What a great horrific image for my book. A cone shell is hiding under the dirt of Pete Ziff's back yard, and it creeps out at night and eats Pete, and then all you find is his bones wrapped in mucus.

\*\*\*

I finished Chapter 3 while on vacation in Micronesia. Now I need to set up the ideas for Chapter 4, and am faced with plot problems.

Although I liked the image of the cockroach aliens being at the first Washer Drop concert with cone shells hovering over them like balloons, I'm not sure this works logically. Really people *would* know they were aliens, you wouldn't mistake a real alien for someone in a costume.

I like the idea of a cone shell urging Sandoval into the concert, though. I could keep that and not have the aliens be there. Or maybe Bela could just see them in a mirror reflection off his guitar.

I think it would be best to have *all* the cone and roach appearances be in mirrors in Act I. And only in Act II will the door in some sense be wide open, so that the aliens appear in more solid form. Things get very fucked up in Act II and then Bela fixes things in Act III.

Back to the mirror thing, Sandoval or his friend can have seen the cone shell in the rear view mirror of their car. And I'd have to adjust the scene where Leroy saw the cone setting the fire at the polling place. Leroy could have been watching in a mirror-ball, in fact that can be a characteristic of him, that he carries a Christmas ornament around. My feeling is, however, that if the aliens are visible only in mirrors, then it's not kosher to have them directly change the world, e.g. by setting a fire. They can only affect people's minds. So I think the cones actually control Leroy into causing the short circuit, rather than doing it directly, as I'd originally written it.

\*\*\*

I need to figure out the *motives* of the roaches and the cones. It would be convenient for the plot if they were enemies with each other, and then Bela and his friends could join in a meta-cosmic battle between two alien races and turn the tide in favor of the good roaches.

[I *have* been toying with the idea of having the cones and roaches be multiplexed aspects of a single organism, springing this as a last act reveal, but then I have to work a bit to explain how the roaches and cones could have different goals

and beliefs if they're indeed parts of the same organism. It's not impossible to do this, beings can after all have inner conflicts.]

But I think to start with I need to definitely have the roaches and cones be rivals. But have it be a high-level rivalry, like a philosophical dispute, like Bishop Berkeley vs. Newton, or Brouwer vs. Gödel or Einstein vs. Bohr. On the whole I see the cones as the bad guys.

Again, what are their motives? Maybe both the roaches and the cones want Paul and Bela to break through to La Hampa so they can properly talk to them. Maybe the cones and roaches want some humans to decide which party is right, like the Judgment of Paris, when Aphrodite, Juno, and Athena ask the shepherd Paris to decide who's the most beautiful of the three. And eventually I should have a third kind of alien as well, let's say they're nudibranchs a.k.a. sea slugs, I just saw a number of these guys. I could even mux roach-cone-slug beings at the reveal, if I want. Will be a surprise to spring the slugs later in Act II, only hear about them for awhile.

I need three philosophical views relating to foundations of mathematics for the roach/cone/slug. I could reach back and talk about platonism/formalism/intuitionism, but that's very stale. Instead why not take three of the eight views outlined in Chapter Six of my *Lifebox* book. I pasted these options into the *Science Ideas* section. I'm seeing the cone shells as universal automatists believing  $C=P=T$ , which is fitting, as they're Wolfram's mascots. And it would be best if the chief rival of the cones, the cockroaches, have almost the same belief. We can differ minimally by having the roaches take the supernatural view  $C=P<T$ . They agree that reality is a deterministic computation, which is why they are hacking reality. But the cones believe that thought is strictly a deterministic part of reality, while the somewhat more spiritual cockroaches believe that thoughts extend beyond physics.

And the reader may want to see another view expressed, so perhaps I'll have the slugs could espouse the common sense belief  $C<T<P$ .

\*\*\*

So I'm supposing that the roaches and cones are trying to get the boys to La Hampa, and maybe something else. What they do so far is as follows. Looking at the list, I think I should be more novelistic about it, more manipulative, and have the cones and roaches making more clear-cut and concrete contributions to bringing about the state of affairs where Paul and Bela invent the quantum trampoline and bounce a hampajump. [By the way, over the course of the day, I keep revising this list to be crisper and at the same time revising the novel so that it matches what I need. Earlier on this forty-eight-hour day the list didn't look like this at all.]

1) Cone makes Leroy set a fire at polling place, making Veeter get elected.

2) (a) Roaches appear to Haut, and tell him Bela should work as a computer consultant instead of a professor. (b) Later a cone gets Haut started on solving the codec problem for paracomputers, but he flips.

3) Roaches appear to Bela, (a) making him realize he needs to get famous and throw a girl Paul's way and, more importantly, (b) helping him solve the generalized codec problem.

4) Cone leads Sandoval to Washer Drop concert so Cammy is killed. Cone examines her severed neck, reaching in tendrils to feel out her nervous system.

5) Maybe roaches help Paul get the hampajump working. It upsets Veeter.

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**March 3, 2005. More Plot Plans.**

I feel a little creepy about killing off both Cammy and Alma, I'm afraid it makes me look misogynistic. But I'm thinking of killing off Paul as well, actually, having Pete Ziff kill him, so what the heck. Kill everyone in sight, it's Shakespearian. Anyway, I'll be bringing them all back to life in Act III.

(If I didn't want to kill Alma, I could have her not go into La Hampa and have Paul 1 stay behind there and maybe Paul 2 die on the beach from the cataclysm of their return, but naah.)

\*\*\*

Roaches believe  $C=P<T$ . Supernaturalism.

Cones believe  $C=P=T$ . Universal Automatism.

Now suppose that Earth-2 is  $\sim$ PCU where every computation is predictable in linear time using the Q-chip and the morphic classification theorem. This could act as a test of the Roach/Cone dispute. For some thoughts will be unpredictable in Earth-2 iff  $P<T$ , that is, iff there are some thoughts which aren't computations or physical processes.

And the test thinker should be, of course, a woman. Cammy could be the one.

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What if the cone maps Cammy's brain while she's lying dead in the driveway. And the vlog reveals this activity as moving reflections in Cammy's sunglasses lying in the driveway next to her. So creepy.

\*\*\*

Perhaps in Act II, the cones and roaches are surprised to see the humans making it over to La Hampa. Suppose they didn't want that to happen. In that case, they would not have been telling Haut about the paradox, as it's the paradox that potentiates the jump.

That is, by using the lamp to predict the lamp you get into a loop such that the computational limits of the Margolus-Levitin theorem are exceeded so it must be that there is a bridge to another world.

\*\*\*

And now that the humans made the bridge, the aliens can come in. Maybe Alma staying behind has something to do with it. Which would be another reason for Bela to go get her.

In Earth-2, I want a cone to eat Mr. Ziff and leave his bones in the bed.

And have Bela oust the cones, save the world.

**March 10, 2005. Looking for an Agent. La Hampa = Micronesia.**

I want to get a deal pretty soon.

I talked to this agent XX about representing this novel for me, and she wasn't interested. I'd written her about it, and she didn't answer for four months, that's how long my humble letter sat in her slush-pile. And then it took quite a few days to raise her on the phone. Politely avoiding me. Finally we spoke, and she was like, "Tor is the only publisher open to diverse, idiosyncratic non-formula SF. What I'm about is working with beginning writers and helping them craft commercial proposals." She suggested I try YY, so I asked around about his contact info, and by the time I called him, he knew I was looking for him. SF publishing is indeed a small world.

I had to goad myself to call YY, I'm shy about these things. But I had a proposal and a novel frag (40,000 words) ready in PDF form. So I talked to YY and

explained that I'd like to try something different, the old hope of doing the Vonnegut or Phil Dick thing, although if it's business as usual I might as well stay with Susan who has my whole back-list, and he understood, and he said, "I'll look at it, and if I think it's just going to be a matter of selling it to Tor or John Oakes, then, yeah, you might as well stay with Susan. But I know some freakazoid editors at other houses who I might possibly approach. So I'll look over the proposal and let you know."

And now I'm looking at the novel and thinking maybe it could break out. So at least I'm giving it a try.

A good thing about this exercise is that in the process of working up the proposal, I redid the chapter outline and beefed it up somewhat.

And got the big insight about La Hampa. I'd been wondering what it was like there, I didn't have a mental image at all, and now suddenly I realized, *DUH*, La Hampa will look like Micronesia! Except maybe I'll remove the interface between sea and sky. The islands like clouds. Or keep the sea-sky interface and have islands like clouds, islands like islands and islands under the water. Rounded off rock islands. If the space of La Hampa were 4D, the islands would be tips or cross-sections of larger objects. Maybe it's best to really just have it be almost exactly like Micronesia. Easier for the reader, and, after all, just as wild and crazy to describe.

Jellyfish Lake; dancing Shiva lives down there. The manta rays are important! Just as I write this, brother Embry mailed me some great pictures of them! Of course! Dancing Shiva is a manta, perhaps.

Not the seventy islands, not the ten thousand islands, but the *googolplex* islands. On the sea, floating in the endless sky, on seas out in the endless sky, inside the seas. Seas like drops of water, with islands on them and inside them, and islands drifting between the seas. Lakes on the islands with islands on them and inside them. Air-bubbles inside the sunken islands, with floating droplet-seas inside them, and floating islands. Fractalization as per usual.

In Micronesia, I kept thinking that the islands looked like clouds that had alit upon the water and changed color. Especially the rock islands of Palau.

**March 16, 2005. Back to Susan Protter.**

So I waited five days to hear from YY, and tried to phone him and he kept not being there, and I was (paranoidly) sensing condescension from the secretary, feeling myself once again an outsider, a pest, a reject. So I wrote YY that if he didn't have any special plan to offer, I'd go back to Susan, and he wrote back, like, "I read the proposal but don't think it's likely I could break it out for you in a big way, so fine."

So then I called Susan Protter, and she was agreeable to agenting me again, although unable to get in some digs. "Return to the Spurned Wife." It's comfortable. She doesn't want to talk complex game-plan it's just, like, send it to Tor, they have an option on your next book from the last contract. She's right, but I'm always imagining there should be something more.

Well, at least she answers the phone when I call her. And she's honest, and she's on my side. And she nudges the editors as much or more than she nudges me, which is really a good thing.

But in my darker moments, I feel a bit like a boxer owned by the mob, or really just any boxer, hemmed in by the agents and promoters. Like Elvis with Colonel Parker.

Wondering if maybe I *could* have gotten YY to represent this book. I only waited five days, after all, before bringing this to a head. If I could have talked on



him on the phone it might have worked out different. But his secretary kept putting me off, and he ignored my requests to call him back. They don't like to say no in person, the agents. I was feeling rejected and impatient, still stinging from XX's drawn-out number on me. I wanted to bring it to a head. And even now, I still can't get YY on the phone. That oughtta tell me something, huh?

So, all right, Ru, that's the reality. Be your own right size. Deflation at depth, as they say. Just hope that Tor is actually willing to buy the book!

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So here I am in an airplane again flying to ICFA (International Conference for the Fantastic in the Arts) in Ft. Lauderdale, FLA. I'm GoH (Guest of Honor), and the theme of the conference is my own pet style: Transrealism.

I warmed up for this gig a couple of weekends ago, on Saturday, March 6, by chairing a panel on Transrealism at a little San Francisco SF con called Potlatch, had a lot of my local pals on it with me: John Shirley, Michael Blumlein, Richard Kadrey, and Terry Bisson the SF writers, also this arty character Loren Means who publishes a zine called *Ylem*, and an interesting transsexual guy Charlie Anders who publishes *Other* magazine and has a novel of his own coming out. My idea to hold this particular Potlatch panel so as to get in shape for the ICFA bout. It went okay, and Shirley did me the favor of reminding me to stress the *trans* part, that's why it's not just realism, duh. (I'd kind of forgotten this, or had internalized it to such an extent that I wasn't mentioning it.) Also a writer called Howard Hendrix unearthed a good line in the afterword of Phil Dick's *Scanner Darkly*, something like, "I'm not *in* this novel, I *am* the novel." That's kind of how I feel about *Mathematicians in Love*. Like I'm graduating to a less autobiographical form of transrealism.

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I saw David Hartwell at the ICFA con in Fort Lauderdale just now, he seemed so friendly and glad to see me. And happy to get my proposal. So it looks like I'm gonna do it the easy way. Why not, after all?

#### ***April 1, 2005. Back into Chapter Four.***

I got a couple of thousand words of chapter four done on the trip to Florida, like in the evenings when S was asleep, and on the planes. When I got home I had to spend a week doing the copy-editing of *Lifebox*.

Reading that, I had two ideas that might be useable, if not here, then in a short story. (1) A computer virus which is devoted to bringing about the Singularity. Breaking down barriers between the machines, bringing on the eschaton of the planetary hive-mind. (2) A device that speeds up the flow of time in certain local regions. Like having a Moore's Law for physics. I'd thought of speeding up my time before, but never contemplated the computational results. Prediction. Time to think.

In any case, now I can get back into my novel; it's nice to have the annoying and anxious-making copy-editing out of the way. I really should reread Chapters 1-3 and see where I am. Don't feel like it. Read them already. Well, maybe I'll read Chap 3 at least. I need to crystallize some things about the paracomputer and the oracles.

For now I've been solving codec for paracomputers with a Q-chip. What is a Q-chip? "A QCA," I mused. "A quantum cellular automaton."

**April 11, 2005. Taking My Own Advice, Outstanding Questions**

I'm working on a scene in chapter four where two National Security Agency (NSA) agents called Cal Kweskin and Maria Reyes are talking to Bela about alien cone shell videos.

To get ready for this, I'd gotten the *X Files* pilot show from the library and watched it, Fox Muldaur in his basement office with his "I Want To Believe" poster of the blurry UFO, and agent Dana Scully all white-skinned and red-headed. And at first when I was writing my scene, I was visualizing these two as my characters. And it was flat and dull. And I remembered the injunction that I've often given to beginning writers: "Model your characters and situations on life, not on movies and TV shows!" Duh! So then I thought of familiar human models for the agents, Michele G. for the woman agent, and my college friend Dick S. for the guy agent, and the agents got human and came alive.

There is a great picture of geography cone shell stinging a fish with a long curvy red tentacle on p. 89 of the April, 2005, Scientific American, part of an article in that issue: Gary Stix, "A Toxin Against Pain", pp. 88-93.

Going good now, hitting a thousand words a day most days.

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I have some outstanding questions I need to check.

(Q1) *Why*, once again, are the cone shells mapping Cammy's brain?

(A2) In Earth-2, the PCU will fail, and all computations will be predictable. If any person remains unpredictable, this means that thoughts are in fact not equivalent to computations. The cone shells plan to use the revived Cammy as a test-case; having mapped her brain in Earth-1, they will have a perfect simulation of her, and if she acts differently from their predictions, they'll know that  $T \neq C$ . By the way, the evil cones are of course betting on  $T = C$  and the nice cockroaches are betting on  $T \neq C$ .

(Q2) How does Haut's Paradox work? That is, how do you use a paracomputer to break the Margolus-Levitin limit on computational density? And why does this open a tunnel to another world?

(A2) An infinite regress of simulations. Make a paracomputer from a vibrating membrane, and set it to predicting its *own* outputs, and the feedback process produces an ever-increasing amount of computation within the little paracomputer. The result is that the device is on the point of violating the Margolus-Levitin limit, and the only way the universe can cope with this is by bulging out a big extra hump of spacetime in the vicinity of the paracomputer. And this hump acts as — a tunnel to a metauniverse. I don't quite believe this. If the paracomputer is an ordinary physical system like a vibrating membrane, why shouldn't it just hit the limit and stop? Presumably the codec and the morphon download are making it do something unnatural. It has self-reference. It keeps wanting to collapse into a pure state, and each collapse sets off a new decay into coherency. It's like, "No look, what I mean is, no look, what I mean is, no look, what I mean is..." It's on an acid-trip-style endless regress.

(Q3) Suppose that in Earth-2 we really do have ubiquitous oracles. Say that they're as simple as looking into a dish of water. Then what social effects does this have?

(A3) I'm drawing a bit of a blank. I mean, really what difference would it make if you predict the weather accurately? Yes, the stock market would have to go away, also games of chance. Also sports events, you'd know who's gonna win. But

couldn't you work around that? Tell the right-fielder to pull in to catch that Texas Leaguer after all? And people, would I just avoid seeing my partner when I know that s/he's in a bad mood? And wouldn't we very rapidly get into Liar-Paradox-style unpredictability after all?

**April 14, 2005. My Article for Asimov's. Paracomputers.**

I finished the Globo Club concert scene in Chapter Four, and now I have to write the scene in the Tang Fat Hotel, and I'm not quite ready. So I'm working on the notes.

After the success of my science talk on my *Lifebox* ideas at IAFA's International Conference on the Fantastic in the Arts last month, Sheila Williams of *IASF*M emailed Susan Protter that she'd like a science article from me. So I spent the last two days cobbling together a 4,000 word piece called "Adventures in Gnarly Computation." It quotes generously from both *Lifebox* and the article "Seek the Gnarl" that I wrote for my IAFA speech (as opposed to science presentation). "I've been honing my message," as George Bush likes to say.

Writing this essay was really good as it crystallized something I'd lost sight of. (I copied a relevant chunk of the essay into these notes under the Science Ideas section.)

The new insight is as follows.

Until the aliens give our boys some magic or a secret formula, they are still subject to the Principle of Computational Unpredictability (PCU). So their computer that Veeter builds is not a "prediction machine" as I'd initially been dubbing it. Prediction machines, or, as I now prefer to call them, oracles, won't come till Earth-2. That Q-chip/teapot/magic lamp device is just an exceedingly fast normal computer. Fast because it uses natural processes. It's what I'm calling paracomputer.

I ended up sending Shiela Williams three versions of my article in a row, two on the 14th, and one on the 15th. I hope this doesn't totally alienate her. I'm piling it up high and deep as I go along. "By rights, this should have been an important scientific paper ... not a thrilling wonder tale in some lurid, mass-produced edition," as the nut narrator of my story "Schrödinger's Cat" begins his tale.

**April 15, 2005. Paracomputers, Devolution, Skrenners, No QM.**

Although the notes now mention paracomputer throughout, I only started using this word today, and did a search-and-replace to put it in place of "prediction machine." At first I tried calling it a "commoover." What a stupid word, though. Fuck that. I'm calling it a "paracomputer." Today I also started using "oracle" instead of "prediction machine."

I want to expunge any mention of quantum computation, too. It's not good to have competing kinds of magic. And, really, I'd like to have a purely Wolframic digital universe, so QM isn't even true in this novel.

I think I'll need these gimmicks:

*Paracomputers*, that is, natural computers that run massively parallel and fast.

*Devolution*. Codec solved via a growing inverse hash-table hack in linear time, optimized by a genetic algorithm that runs evolution backwards. Ah yes. (Do note that this explanation of devolution is a more-or-less meaningless hand-waving string of buzzwords.) An exhaustive search would of course take exponential time, but the devolution turns out to get reasonably close, which is good enough, especially

as chaotic divergence and PCU problems swamp you before the codec inaccuracies really matter.

*Haut's Paradox.* Codec a paracomputer to simulate itself. An endless regress of computation results, fit to violate the Margolus-Levitin theorem. Space bulges out to make room for the computation, which produces a tunnel to La Hampa.

*Skrenners.* "A skrenner darkly." PCU violated by a higher-order not-exactly-thought method which involves, say, communion with the Absolute. Cosmic synchronicity. Each spacetime cell of the world can in fact access anywhere anywhen. Not just anyone can do this. But you can make it happen by using spring theory to make a macramé of Mobius strip branes. Looks like a mirror, the mirror that the evil Queen uses to see Snow White with. "Skrenner, skrenner on the wall — who's the gnarliest of them all?"

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I tore out some stuff about quantum mechanics and quantum computation that I'd let creep in. Expunging the cholera-bacillus of QM! It would have made all my other computational gimmicks seem weak.

"Work on what has been spoiled," as the I Ching puts it.

Doing the fixes, which were rather extensive, I was thinking of the guys who've been working this week on the carport under our deck. The side walls and some of the beams were rotted out; they ripped out the crumbling sections and put in solid new pressure-treated wood. That's what I was doing by removing the wifty mystery-mongering of QM. I'm so glad to have my scientific structure solid and rational now.

Yes. As I always say, when I talk about QM, I feel like a disenfranchised former land-owner singing he praises of Stalin, an atheist teaching Sunday school, a one-legged man at an ass-kicking contest, a grad student hopelessly asking mandarins for a teaching job. And now all that useless, rotten crap is in the driveway, waiting for a pickup to haul it to the dump where it belongs. Martin Gardner: "Quantum mechanics ruins everything."

"Methinks thou doth protest too much." Well, okay, one of these days I'll do a QM story, too, but I don't have to let it bully in and ruin all my other stories.

#### *April 17, 2005. Ideas for End of Chap Four*

Paul stopped at \$1M because the data was already getting too old.

Reveal that Veeter has been watching through his laptop that they borrowed, duh. He talks to them right before they test Haut's Paradox, saying this isn't a wise idea.

The paracomputer is swept off to La Hampa in the Tang Fat incident, so they'll need a new one for Pfeiffer Beach. The anomaly takes Roland Haut away, later he will turn up in La Hampa and make trouble there.

Also a cone shell flies in through the open tunnel before it snaps shut. (The cone shell will fly down to Santa Cruz, preceding Bela's car and eat Gary Ziff? In the daylight, they will notice the disturbed sand of the pumpkin patch and the siphon sticking up out of the sand. Pete pours gasoline on it and kills it?)

Gyula is waiting in his limo at the parking lot in North Beach. He's supposed to tell the boys they've been cut loose. That way they're not under time pressure at Alma's. Maybe he asks them not to publicize Haut's Paradox. Maybe says there could be some money coming to them. Bela buys Gyula's paracomputer from him. Gyula says he'll claim they roughed him up or, better, claim it was stolen, he doesn't

know how. Of course, they'll just take the paracomputer and not the laptop, so Veeter can't be tracking them.

Need to weave back that Gyula had a paracomputer all along, by the way he had it for predicting Bela — do this in the earlier scene where the limo and lawyers were waiting for Bela at Rochdale.

Slow down the time in the vicinity of the tunnel. I got this idea from listening to samples on the Web of the Houston rappers, DJ Screw, Bun B, and Pimp C. They get high on codeine cough syrup and play tapes back at half-speed.

***April 20-21, 2005. Past Halfway! Ideas for Chapter Five. Worries.***

I finished Chapter Four, and with eight chapters planned, I'm therefore halfway through the book, and I have written 55,000 words, so it looks as if the projected length is 110,000. Note also that I'm 155 days in since the start, so that means I got 155 days to go, which is five more months, so that brings it in at the end of September. And it's not like I've been working at all that Stakhanovite a pace, I've taken time off for this and that. So it seems quite likely that it'll be done by Thanksgiving in any case. No rush. Once I finish I just have to start a new one.

Possibly I'll do it in 7 instead of 8 chaps, making a 100K words, in which case I'm 55% done.

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Thoughts on Chap 5.

So Paul and Bela talk a bit on the way down to Cruz. Talking about the plan to use the hypertunnel to somehow go back in time.

In Cruz, Bela gets in bed with Alma in the garage, and Paul is whimpering, he's actually crying. Bela hears digging in the garden, goes out to check, can't see anything, back to bed, and Alma has let Paul in. It's a double fold-out couch, and the three of them have sex. "Just this once," says Alma. In the course of things Bela even touches Paul sexually a few times. It's okay. "What had I been so scared of all these years? It was just another man's stiff dick. Same as mine." Maybe Haut is bi, and Paul mentions that he's done it with him, fair-haired boy. They fall asleep, deliciously entangled.

Wake up and it's broad daylight, Gary Ziff is standing there glowering, sneering, gloating. He's wearing the same heavy gold chain dog-collar that Owen had, the one with the X-eyed Smiley Face medallion.

Gary says he found a pile of bones near the pumpkin patch and wants to know what the hell is going on. The chain was on top of it. He's threatening to call the cops, is vaguely trying to extort money from Bela, he's already lit, this early in the day, it's his day off, and he's also noticed the teapot in Bela's car and wants to know about that.

Bela notices the siphon of the cone shell sticking up from amidst the pumpkin patch. The snout. The proboscis snaking out of the snout, a long red tentacle heading Gary's way. It fastens upon him, injecting something. And sends a puff of white in the air. A sweet scent. Gary is raving stoned now. The cone shell emerges.

"Don't hurt him!" cries Alma, sturdily defending her Dad.

"Okay," says the cone shell in a woman's voice. Conversation with it. Alma misses most of this, she's dragged Dad into the house.

The cone shell wants to be Bela's helper. A female. She just killed Owen to save Bela. And she drugged Gary Ziff to get him off Bela's case. But she wants Bela to make it through the tunnel to La Hampa. She wasn't actually trying to eat Roland

Haut in his office way back when, she was just trying to show him the tunnel to La Hampa, she had a thread of it inside her digestive tract, you can see through her to the other world, in fact she shows Bela, like Susie Bright in a nightclub on an examining table, encouraging one and all to use a speculum to see all the way up her snatch. (Powerful temptation to stop censoring myself in this book.) “Come to our world, we can change the past.”

I would like to have someone chasing them to Pfeiffer Beach. Like in a movie: why just drive somewhere when it can be a car chase? Veeter is off their case for a day, but when he finds out from Gyula that his paracomputer is gone, he wants to go after the boys once again. The pursuit will be led by Henry Ngyuen from Watsonville who runs Membrain, which is handily on the way from Cruz to Sur. (Originally I was gonna call him Hernandez, but made him Nunez, so my bad guys are equally distributed across race: Sandoval, Veeter, Nunez.)

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The plot for the rest of the book looks kind of weak and unmotivated. It all seems kind of sad. And somewhat repetitive. I'd like to think it through a bit more.

Pretty much all of Chap 5 looks good already. It's Chap 6 that I'm worried about.

I'm also worried that maybe I'm not spending enough time in La Hampa. Maybe I need a crisis happening there. So the boys can save higher reality.

I'm rewriting the outline. And I may take a break and print out this whole notes document and re-orient myself for a book goal. But that seems boring.

I am kind of resentful of my Notes document for being longer than my Novel document. They are, respectively, 61,151 and 54,946 words long. And I feel like my Novel doc has to overtake the Notes doc or I'll never finish. So at one level I have this resistance to writing more notes. I'm planning a celebration at Crossover (when the Novel passes the Notes). Like when you sail over the Equator. Writing in the notes feels a bit like jacking off as opposed to fucking, which would correspond to writing in the novel. “I can dream, can't I?” The muse spread-eagled, all smiles, wide-open, her ass and my face.

What is this book about anyway? Looking at the plot outlined ahead, it seems kind of dull and depressing. Bela losing all these women and ending up teaching at a two-year college. Give the poor readers some hope, man. Maybe in Earth-3 it's a vision of a free revolutionary society instead. As if I'd never had to leave grad school and the early 1970s, now you're talking.

Originally I just had that back and forth love story idea. On the science front I went from reality modification to non-PCU. Earth-2 is highly predictable, and in rebound, Earth-3 is less predictable than our present one (the Morphic Classification Theorem isn't even true there). And now I'm also thinking it would be nice to spend more time in La Hampa maybe.

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I took a day off and went hiking in Castle Rock park near here. I got kind of lost, and the hike ended up having more phases than I'd expected. I went off course and had this wonderful adventure at the base of the Castle Rock Falls, a spot I wouldn't have dared try to hike to. But there I was.

This seemed to me to hold a kind of lesson for the novelist. Ultimately the landscape and its topography affect the course of your excursion as much as your advance plans.

**April 22, 2005. Notes in North Beach.**

I'm sitting at Caffé Trieste in North Beach working on the notes. I always thought if I lived here, I'd come to Trieste to work. Crawling with weirdoes, that's for sure.

The cone shell has a personality. Name ideas: Shelley, Snouter, Snoutress, Shellvia. I'll call her Rowena because Owen is inside her. I won't multiplex a cockroach into her yet.

Actually went by the Tang Fat Hotel today. There's about six places like it in the Stockton and Vallejo Street intersection, most of them call themselves hotels, but they're rooming houses. Old people coming in and out, some younger ones too, not prosperous at all. Clothes hanging in the windows on hangers: room-washed and drying? Locked glass door on the street, stairs leading up. I was scared to go up to the second floor of the Tang Fat, though three five-foot-tall old women went in while I was standing there. I tried to ask the women a question, they gave no sign of hearing me. Over on Columbus, I realize the structure of the Tang Fat is exactly like that of the gentrified Hotel Bohème, where I have indeed stayed.

If Jellyfish Lake holds the seeds of the universes, then one particular jellyfish is our dancing Shiva. As the jellyfish moves, our cosmic spacetime alters through its parallel sheets. So the other jellyfish are dancing other cosmoses, I guess.

How did Rowena and Oscar (the cockroach) happen to hit upon our world? The jellyfish is pregnant, coming to fruition. Entering a new part of its lifecycle.

**April 24, 2005. The Nature of La Hampa.**

I'm in that between-chapters zone, scared/intimidated of marking the blank canvas of the next chapter. I want to get it planned out. Although I have the first scene in Cruz worked out pretty well, I still feel the need to do more work on La Hampa before designing the scenes where Bela, Paul and Alma hampajump into there. Also I want to make the rest of the book seem interesting to me, so I'm stoked about getting there.

One thing I need to remember is to bring back the vlog in some transmuted form. I spent a lot of time setting it up in the early chapters, so it would be unsatisfying to the reader if I just drop it.

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Reading a story by Jorge Louis Borges called "Undr," I found this phrase: "a vaulted river that hung from the sky, and in its water swam fish and sailing ships."

Vision for La Hampa.

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So now I've been going over all the ideas again and these are my conclusions. La Hampa is infinite above and below. It's made of nested spheres/globs which are islands, air bubbles, suns, and seas.

The scale dimension of La Hampa matches our time dimension.

Our universe is but one sheet of many, which are stacked in a so-called hyperverses. The successive universes in the hyperverses are in some sense better and better, like successive drafts of a novel. There *is* a final draft, a finished version.

The dimension in which our universes evolve matches the time dimension of La Hampa, called hampatime.

There are many hyperverses.

Each hyperverses is coupled to a single La Hampan organism called a nataraja (Hindi for dancer + king, used as synonym for Dancing Shiva). The nataraja has four stages in its life-cycle: (1) a spore, (2) a worm-like larva which crawls through earth turning it into water, (3) a jellyfish in water which has a wing that's effectively a hyperverses and refining the water into air, (4) eventually it metamorphoses into a sun turning some of its air environment into earth and throwing out spores.

In the world of La Hampa, they have a higher form of reasoning so that they can in fact predict the outcome of any of our styles of computation in a linear amount of time. This is the Secret Teaching, also known as hierophantics. They do fall afoul of a kind of higher PCU when trying to predict their own computations. But processes in the human universe are fully predictable.

Oskar the cockroach and Rowena the cone shell were wondering if their thoughts are just computations and had the idea of doing an experiment on a lower form of life such as they might find in a section of a nataraja wing. So they wanted to get the software for Cammy and then try and predict her in a universe where she's been restored.

The boys talk to our nataraja, which is essentially like talking to God. The nataraja agrees to restore Cammy and Paul shouts out a request to get Alma back.

Bela brings back the La Hampan Secret teaching, hierophantics he becomes a hierophant. Cammy learns it from him, so she's not predictable anyway, the experiment is ruined.

The side effect of all the paracomputers and oracles is that there are a lot of tunnels to La Hampa. Which opens the thing up in a way that tells the nataraja that it's done. For one thing she doesn't want to deal with any more tweak requests.

Our nataraja turns into a sun. The final state our universe is present-day reality, more or less, but with hyperspace tunnels to La Hampa. Not necessarily the *best* possible world, but as good as it's gonna *get*, because God the nataraja has moved on. The final draft, the fair copy, the page proofs, the galleys, the first edition. Done.

***April 28, 2005. Into Chapter Five.***

So now I'm finally into chapter five. It's going fast. I spent about a week revising the outline, and have enough detail there that writing the actual chapter feels like doing a painting on top of a really good and thorough sketch. Filling in the colors of emotion and dialogue with all the forms in place.

I did the big attack-of-the-cone-shell scene, and, God willing, soon I'll do the surfing-to-La-Hampa scene.

Asimov's sent the contract for that article on gnarly computation which includes some claims about what I'm going to do in this novel. Already the claims don't seem quite accurate, but, oh well, let 'em stand. I also put some of my ideas about the natarajas on my blog today along with fresh pictures from Safia Chen of me in Jellyfish Lake. I have this faint superstition that it's not a good thing to talk about my novel plans, like it could be a jinx, but I'm doing it anyway. Like a sex offender unable to stop exposing himself. Speaking of which, the other night I dreamed I was wearing lipstick, and maybe I had artificial breasts like a she-male, and I was roller-skating naked around San Francisco with a growing sense of sexual excitement. Roller Girl! And then, in my dream, I got embarrassed and wanted to hide. Maybe this dream actually stood for blogging.



Although it can feel like outlining is a time-sink, in the end, I think the work goes faster this way. But now the notes have grown to 65,000 words and the novel is at 59,000. I really am looking forward to when the novel (hopefully) outstrips the notes in length. Could be another couple of weeks, though.

***April 29, 2005. Squinty Whale.***

I decided Bela's car should be one of those old station wagons with the squinty windows on the sides in the way back. I found a perfect picture of one, a 1972 Gran Torino Squire at <http://www.stationwagon.com/gallery/gallery.html>. It's a muscle car, with a small-block V-8 351 "Cleveland" engine no less, which makes it that much likelier that Bela, in his hurry to elude his pursuers, will slide that mofo right off a cliff by Bixby Bridge in Big Sur! Not to worry, the flying cone shell will sucker onto the rooftop and carry him to Pfeiffer Beach. (I blogged this plan, then wrote the scene, then blogged the scene. Roller-skating naked. "Look at me!").

COOP the hot-rodder teased me about this car, said it was kludgy as a mullet hair-do. He's into, like, chopped 30s rods. But I think for a twenty-year-old a GT could be cool. I still remember how excited daughter Isabel was to own a 70s Ford Falcon!

***May 7-9, 2005. Notes Near End of Chap 5***

[I made these notes on a scrap of paper while bicycling on the El Sereno mountain on the other side of Los Gatos. I was sitting in a meadow of flowers for a long time, all alone, it was lovely. Typing in and revising them over the next few days they got polished. Then it made sense to blend them into the outline where I continued polishing them, so I preserve this version frozen, a pencil sketch on a paper on the workroom floor.]

Should I use chapter titles?

Remember: Rowena isn't really a cone shell snail, she's an alien. Weave back a bit of an explanation of why they think about cone shells so much: NKS and "some other book about gnarly computation with a cone shell on the cover."

\*\*\*

The parrots morph into seagulls right when Bela expects to see a gull.

Maybe have the plants in La Hampa change as the aliens move around. They look like what the observer expects to see.

La Hampa is the body of God. La Hampa *is* in some rather literal sense God.

\*\*\*

Multiverse as a Library of Babel. Every universe exists. Mindless process of exhaustion generates every possible universe. A hyperverses is a creative effort of picking out a bouquet of universes, starting with one and making it better.

In principle two hyperverses could converge on the same universe and then, for that matter, diverge again. All the possible novels get written, not just the one.

\*\*\*

The aliens have houses. Like Micronesian huts. The aliens are scattered around on many of the islands. Unger uses brain wave fields.

Maybe the aliens mention having seen Roland Haut. Maybe Haut is down at the next size level, like in a bubble in the pond.

\*\*\*

The sun dims, they go to bed. Paul doesn't get to fuck Alma, that makes him the more eager to ditch her. Alma mentions again about wanting to wish she'd gone

on that date with Henry Nunez. Doesn't fuck Bela either. She's kind of snippy. Maybe she's drunk and mouthing off. She throws a tantrum about not wanting to bring Cammy back to life. Says she should get to wish that she'd gone out with Henry Nunez and had him propose to her.

Paul for sure doesn't want Alma in on the Jellyfish Lake wishing session, because he plans to use the wish to get Alma-2. Bela, too, figures it'll be easier not to let her in on it, but he hasn't thought it through very thoroughly. In the night Paul wakes up Bela and talks him into sneaking off with him to Jellyfish Lake without Alma.

Alma wakes up, comes after them. In the dark they come across a wild pig that turns into a flock of bats. They get to Jellyfish Lake, there's a luminous big jellyfish, the nataraja, they jump in. And that's the end of Chapter Five.

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Start Chapter Six with the wishing scene. What I think of as "The Court of the Dancer King."

The nataraja eats the energy of the universes. In a good way. They eat dark matter and shit energy and regular matter. Think of yin/yang, the dark and the light.

Shiva is like a transvestite? Like those pin-up trannies Sakia and Sulka? Or maybe is a man on the front and a woman on the back?

In speaking of the Court of the Dancer King, I think of Kafka's Parable of the Gate, there's this one gate into the Castle and it's only for you. It only wants Bela's wish.

Wishes for Earth-2:

(a) *Bela* wishes that he fucks Cammy after the concert. He still visits Paul and Veeter, but doesn't leave with Alma, he takes Cammy home. This means that Veeter doesn't have the murder scandal, so he doesn't fire Bela and Paul, and the Gobrane moves forward.

Paul somehow gets to make a wish, too. It's kind of like doing group sex with Alma all over again, the two of them sharing Shiva. Paul is closer than a brother.

Or maybe only Bela can wish, and he makes Paul's wish for him, wishes him to be free of his meth habit, not quite seeing that'll mean Paul keeps Alma.

(b) *Paul* wishes that he didn't do meth and that he didn't fuck Cammy (which won't actually come up, due to (a)). Because he doesn't do meth he doesn't phone up Haut, and he doesn't learn about Haut's Paradox.

And *Alma* doesn't get to make wish.

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The result is that in Earth-2, Paul-2, Alma-2, Bela-2 and Cammy-2 are on a double date to Pfeiffer Beach. It's evening, and they're by a campfire. The girls go to piss by the cliff. Bela-1 and Paul-1 send a tunnel down to the spot; it vacuums up Paul-2 and Bela-2 and Bela-2 and Paul-1 replace them. There's an earthquake from the reality disturbance. A rock falls on Alma-2's head and kills her. The boys will need to ask Cammy what's been happening, she'll need to fill them in. She realizes something is amiss, maybe this alienates her from Bela.

\*\*\*

Save the scale-change stuff for a later chapter, like when Bela goes back to La Hampa to rescue the abandoned Alma-1. Note: Scale change is automatic, that is, space is curved in such a way that a tiny air bubble feels like a big sky when you go into it. You shrink to fit. Likewise you grow to be a good size in the sky.

Or maybe let the reader off easy and don't do the weird-ass trip about La (Hampa scale) = (Earth time). Just use the one island in La Hampa and have the rest of it as window-dressing. In terms of science, focus on the oracles and their significance.

\*\*\*

The alien math specialties are as follows.

Lizards	Number	Number theory
Cone shells	Space	Topology, higher dimensions
Cockroaches	Logic	Axiomatics, mathematical logic
Nudibranch	Infinity	Set theory

**May 14-18, 2005. Done 5 of 7 Chaps. Rethinking My Endgame.**

I decided that I can drop the book to 7 chapters instead of 8, and get rid of the "war in heaven" thing. Focus instead on the love story. And then I'll be outta there in 7 chapters, and a length of under 100,000 words instead of 111,000. It's no vice to be concise. And in fact the publisher would prefer the shorter word length, as that's cheaper to print. And, now that I've done *Frek*, I have no need to prove I can hit the long ball. If I want to hit another long ball, then I can write *Frek 2*, that might be the book I write next.

But now the ending of *Mathematicians in Love* is up for grabs.

Every morning when I wake up, I wrestle with the book plans a bit, also when I wake up in the night. All day long, I keep forcing my attention back to it.

It's not like I can have one *aha* idea to fix things. It's a matter of finding a way to fit a mosaic of ideas into a whole. All day long I revise the notes, print them out, mark them up, type in more changes. It's like hitting an enormous pillow. Bit by bit some light dawns.

I go off down false paths, then realize I need to go back to what I planned before. Now that I'm so close to the end, it's a matter of simplifying, of finding the clearest path.

It's starting to seem likely that the length of the novel never will beat out the length of this notes document. Maybe some day they'll publish scholarly editions of my novels and notes bound together. The Norton Critical edition. Maybe some day I'll be safe in heaven dead.

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Here's my latest table of contents, which I sent to Hartwell at Tor along with a PDF of chapters 1 - 5, jogging him to make an offer:

*Chapter One: Bela, Paul and Alma*

*Chapter Two: Cone Shell Aliens*

*Chapter Three: Rocking With Washer Drop*

*Chapter Four: Hypertunnel at the Tang Fat Hotel*

*Chapter Five: Mathematicians from Galaxy Z*

*Chapter Six: The Oracles and the Hierophant*

*Chapter Seven: Love on Earth-3*

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Worrying about the ending, slowly things are congealing, it's something that emerges almost like a scroll coming out of a chemical reaction, the thought frags in my brain sticking together.

\*\*\*

I need more love and less SF gimmickry. Should really reread what I have and put in more wheenk and smooch and heartache. But every time I get ready to do the reread, I feel it's better to stare a bit longer into the aching void of my non-ending. Eyes seeking the patterns in the seething white of multiversal novelistic possibility. Just need to keep remembering that anything's possible. It's all up for grabs. Everything can be revised. (Including this writing-journal entry, which I've been compulsively revising for going on a week.)

On the other hand, it would be nice to do the reread so as to have fresh images of the characters when the boys go back to Earth. But first, dammit, I want to know the ending. So I can be dropping in the precog of it.

\*\*\*

Changes. I removed a former thing I had about Sandoval being lured by the cone-shells to the Washer Drop concert. I don't want to *blame* Rowena for the murder, I want to make it possible to like her. She just *utilizes* the existing-in-any-case murder as a chance to reach into Cammy's brain.

\*\*\*

Another high-level change I'm putting in has to do with the Earth-3 that Bela ends up in. I want to have Earth-3 be our actual world. And then Bela can mention this early in the book, adumbrating. And we have a logical reason why his "true" manuscript exists in our world. Maybe I, Rudy Rucker, got it from Bela, who is a new member of the Mathematics Department at SJSU. Should I do a *Hollow Earth*-style hoax preface or afterword? Seems repetitious, maybe, but the public likes repetition, maybe.

So in other words I'd be turning the progression on it's head, which is a nice game to play. You start in the weird world and end up in the normal world. And the reader doesn't notice/realize until quite a bit later that Earth-1 *was* weird.

*Earth-1* has different place names. And it has the possibility of the BHK theorem, which won't hold in Earth-3. Earth-1 should be a bit more deterministic, less PCU, more amenable to oracles. And you'd notice that in the clouds, the water, the fire.

*Earth-2* is a world with an incipient fascist dictatorship based upon Gobrane-oracle technology.

*Earth-3* is us, with no chance of BHK, no chance of Gobrane, no chance of hierophantics, free forever in the seething dark.

If BHK is true in Earth-1 and Earth-2 but false in Earth-3, then there is something really very different about our 3 zone as opposed to the zone with 1 and 2. This nudges us towards a parallel world multiversal model and away from a single-universe Tegmark view. But a Tegmarkian view would still be tenable if we accept that reality can have different underlying flavors, the turbulent vs. the smooth. Like a stream's rapids have a different-feeling ontology than does the calm part of the stream. Earth-3 is in the rapids. That should make us Earth-3-lings feel proud, to know we're in the gnarly zone.

\*\*\*

To make Earth-1 seem different in a butt-simple way, I'll use a few different place names. In Chapter One, Bela refers to Berkeley as Hume (Or as Locke? Oh, use

Humelocke) and says something like “In your world, which is the Earth-3 which I write this memoir, the town and university are known as Berkeley. But in the world where I started, they were known as Humelocke.” There’s a wonderful Jorge-Luis Borges essay, “A New Refutation of Time,” in which he talks about the idealism of Berkeley and Hume. This is actually very much to the point, in that, for an idealist like Hume, the various possible universes exist *only* while a Nataraja jellyfish “thinks” of them.

Maybe it’s too disruptive to break in about nomenclature right away in the first sentence of my book. Well, I’ll have the interruption come first as a tiny one paragraph section cordoned off by \*\*\*.

If I get into this, how many place names would I have to change? Californy instead of California? Naw. And I won’t touch San Jose, Santa Cruz, Big Sur, San Francisco — changing the names of the big cities makes it confusing and I don’t want to sacrifice basking in borrowed coolness of Santa Cruz and Big Sur. It’s painful enough to give up the magic of “Berkeley.” I think I *will* make the following name changes.

Berkeley. Evans Hall. Rochdale Apartments	Humelocke :Berkeley, Locke and Hume were the British Empiricists, (though really their <i>idealism</i> is more to the point); I combine the two non-Berkeley names to get a longer rhythm like the “Berkeley” sound. Pearce Hall is for my mathematician friend Jon Pearce, who went to Berkeley. Ratvale instead of Rochdale = roach + dale.
Bixby Bridge/Creek	Kerouac Bridge/Creek, as Jack Kerouac’s <i>Big Sur</i> is set there.
Pfeifer Beach	Miller Beach: Henry Miller lived near there.
Pacifica	Corona, like Pacifica, is a Mexican beer name; this wheeze was used in <i>House of Sand and Fog</i> .
Republican party	Heritagist party, like in my <i>Ware</i> novels. This is not an existing party name, and carries that certain tone of hysterical bad-faith patriotism-as-the-last-resort-of-a-scoundrel.
Democratic party	Common Ground party. This isn’t an existing party name, although the Green Party and others subscribe to a “Common Ground Statement.” Communist sounds like Communist, so we’ll have Common Grounders instead. I’d also considered Federalist, but way back in U. S. history, the Federalists were rivaled by an Anti-Federalist party that evolved into the Democratic party.

One more change in “names.” Have him say “Heritagists and Commonists” instead of “Republicans and Democrats”. No, I think I’ll make it the “Heritagist and the Common party.” Something like, “The political parties I call Heritagist and Common are roughly the same as, respectively, the Republicans and Democrats of this final Earth in which my journeys from world to world have ended.”

This would be a commercially sound move, as then when I make the Nationalists be complete fascists in Earth-2, it’s not so inflammatory as if I were calling this group Republicans. Of course it would be more satisfying for me and more ranting-punk bitter to leave “Republican and Democratic” instead of softening it to “Nationalist and Federalist.” But doing the switch makes it more abstract, makes

the action more clearly an instance of universal human folly. In twenty or fifty years, the Republican vs. Democrat thing could seem irrelevant. Also making the switch makes it more likely that Republican readers can enjoy my book — I do after all have a few Republican friends and relatives. They're not dumb or evil. Why not let Joe Republican enjoy my tale without me sticking my thumb in his eye? Whatever messages I have about media control will get through just the same. Forget not the example of Jonathan Swift.

\*\*\*

I should use the Washer Drop band for something in the ending, and should use the NSA agents for something too. Maybe Washer Drop publicizes a way to evade mind control. Maybe there are in fact evil aliens in touch with Joe Doakes; maybe the NSA pair are bad manta-ray aliens in disguise, and are Doakes's true controllers.

\*\*\*

I'd like to have a key issue on Earth-2 be a fascist take-over. Set up more foreboding in the earlier chapters. Emergency government. Sense of crisis. Mention more terrorist attacks. Make Doakes more fascist. Sense of the End Times.

Joe Doakes is trying to take over as dictator for life. And in Earth-2 he's succeeding. He's using Veeter's Gobrane technology to pull ahead in all the polls.

Think of the Bush-funded "Swift Boat Veterans for Truth" committee whose ads neutralized Kerry's war-hero status. Imagine an oracle-based ad campaign that swings the polls on every possible front.

The plan is that every senator and congressman, ever governor, every governorship, every member of every state assembly will be a committed member of the Nationalist party. The U. S. will vote itself into a perpetual dictatorship. Doakes is planning an amendment to remove term limits on elective offices. He'll also be planning to impeach all non-Nationalist-party-line judges.

Goal is a "hundred-percent" government! Bring about the hundred-percent system that our great people deserve and desire.

I get "hundred-percent" from something I heard on the radio after the dot-com crash. An interview with a brain-dead middle-manager lady at some Enron-like company describing on how their pension fund had invested a hundred-percent of the employees' monies in company stock, and even now after the stock had become worthless, this manageress's voice would lift up and lilt like Lenny's voice in the movie *Of Mice and Men* when he talks about "the fat of the land," a spitty slobber in the voice. "We wanted to be a hunnerd-percent invested!" Still punching that "hunnerd" with "sell it, Ed" emphasis. A hunnerd-percent Nationalist government for a new day in America!

\*\*\*

Don't worry too much about exactly why things are different in Earth-2, just put them in different. I will need to weave back some rather egregious differences in Earth-1 as well, though. Motto:

*It's just different.*

Later I can cobble together a piled-high-and-deep explanation of *why* they're different. Pick the differences artistically first.

The jellyfish wants to segue from Earth-1 to Earth-2 with as few bit-flips as possible. With a minimal Hamming distance between the seeds of the two worlds. This means that s/he may choose a world with some given effect E\* that happens to have lots of other changes not asked for. *Limiting* the changes to the transformation E

→ E\* might require many more seed changes. In other words, it may will be that the Hamming-closest seed that accomplishes  $E \rightarrow E^*$  has a buttload of un-sought-for side-effects.

Possibly the change to Earth-2 percolates back in time to make Doakes worse.  
\*\*\*

On the subject of nomenclature, up until today, I was always talking about World I, World II, and World III, and today I decided to globally change these to Earth-1, Earth-2 and Earth3, as I think these will be more reader-friendly names for these locales. By referring to them as if they were different “Earths” I sidestep the question of whether they’re best regarded as different planets in one vast Tegmark universe, or whether they’re really planets in different parallel universes in the multiverse.

In connection with this theme, I added the “Swap Model of Hampajumping” entry, and expanded the “Collapsing the Multiverse to a Large Tegmark Universe” entries. The swap entry includes this perspicacious and suggestive table:

Eart h	Bela	Paul	Alma	Cammy
E-1	B-2	P-2	A-3	†
E-2	B-3	†	†	C-2
E-3	B-1	P-3	A-1	C-3

*Ergo* Bela must end up with Alma. *Q. E. D.*  
\*\*\*

Bela can oppose Doakes because he has hierophantics and is unpredictable, a fish in water.

Maybe Joe Doakes is setting up a fake terrorist attack. With a fake Osama called Richard Q’adri as part of his public opinion manipulation.

Why is Doakes after Paul and Bela? Doakes has Bela killed, but frames Pete. Then he’s going to kill Bela.

Maybe Bela assassinates Joe Doakes.  
\*\*\*

Why doesn’t Paul’s person-prediction program work on Veeter? Not enough data is all. It was basically okay.

Veeter would have had Paul’s person-prediction program and a lot of vlogged Bela data so *could* predict Bela’s actions in Chapter 4.  
\*\*\*

When Bela first gets to Earth-2, he’s happy to use oracular media manipulation to hype Washer Drop. Takes a couple of days till he sees how it’s gonna change politics. It’ll be, like, Swift Boat Veterans for Truth getting out the Heritagist word everywhere, all the time.  
\*\*\*

Maybe the evil manta rays of La Hampa want to prevent humans from making hypertunnels, because they don’t want our jellyfish to successfully ripen into a sun, or maybe because they don’t want the nice mathematician aliens to have any new friends.

Come to think of it, we can’t hypertunnel from Earth-3 anyway, as the BHK theorem doesn’t work. In principle you could hypertunnel from a Zone B world, but

in practice you can't get the tech together. The evil rays revel in chaotic class-three and class-four zones.

\*\*\*

I was at yoga class with my great teacher Jan Hutchins. And at the end of class when I'm lying on my back in Savasana or "Corpse Pose" resting, Jan comes over and leans down and starts pushing on my breastbone in this very precise way, working his finger tips down towards my heart center, which was much in his mind as the day before he'd convinced himself he was having a heart attack.

And I think of a line in maybe *Freeware*, "Willy smiled to feel the hair-thin tendrils sink into his neck," after he puts an uvvy or a Happy Cloak onto his neck. And I think of the jellyfish-god sinking its tendrils into Bela and Alma's flesh in the lake on La Hampa.

\*\*\*

Possibly Paul is sexually in love with Bela. Maybe Paul is bi, and he already had an affair with Haut and perhaps even Veeter. Maybe Ramirez will set up a murder of Paul in Veeter's bed and try and frame Bela. Take away Veeter's political power by embroiling him in a gay sex-crime love triangle.

Bela could kill Oakes and/or Ramirez before leaving for Earth-3. But he doesn't want that karma. He just goes. "Be sure to vote."

\*\*\*

Haut will get wings — like an angel! Perfect, as La Hampa is heaven.

**May 18-19, 2005. Offer from Tor.**

(May 18, 2005). Susan Protter called today, and David Hartwell called, and she went through the labyrinthine *Spaceland* royalty statement with him and found where it says I've earned amount X off that book since it came out, so he's like, "How about an advance of X?"

And, sigh, he's saying they're taking a bath on *Frek and the Elixir*, which breaks my heart. But maybe he's just saying that to drive the advance down.

I recall the exact one moment when the success of *Frek* was somehow snatched away from me, the instant when I got shunted from a winner-world to a loser-world. I was in Dave's office at Tor in January, 2005, and he was all enthused, beaming at me, saying that *Frek* had just about sold out its hardcover first printing, had sold over 4,000 copies, and that was really amazingly good and then there's this, like — *\*pop\** in the continuity, this little glitch, like a scratch on a record — and Dave looks confusedly at the piece of paper he's holding and he's, like, "Oh...wait. It says you've only sold 2,000. That's, um, not bad. But how could I have misread the figures?" This really happened.

And right there, I would submit, is when the Nataraja jellyfish, a. k. a. God, reached in and said, "Let's have Rucker struggle a bit harder. I like it better that way." Like in the Book of Job. It makes me anxious that the same thing will happen with the movie of *Master of Space and Time* that Michel Gondry has been emailing me about lately. *\*Pop\**!

They paid me a larger advance on *Frek*, and if they don't expect to recoup that, so the best I can hope for, supposedly, is what they gave me for *Spaceland*, which was the less munificent amount X.

Susan's going to try and get him a bit higher.

Should I be upset that I'm with Susan at Tor again? I dunno. I have a feeling another agent couldn't do any better on it.



This kind of tepid publishing response always gives me a little stab of fear that eventually I won't be able to sell my books at all. I'd been specifically thinking of writing a sequel to *Frek*, and I wonder if Tor would be willing to go for it anymore. Susan thinks maybe not, but Dave often looks at things differently from her.

What is *wrong* with those stubborn, clannish SF fans, *Frek* is exactly the kind of book they want, for heaven's sake, it's just like *Lord of the Rings* or *Henry Potter* or *The Golden Compass*. But anything that's by Rudy Rucker makes the fen skittish and suspicious. Maybe they're anxious that anything by me will be too dirty or too hard. It would have helped if Tor had promoted it, of course. But, really, what difference does advertising make? It's all about the world of mouth.

If I didn't write *Frek 2* next, what *would* I write?

Maybe the *Ware* books were my best-selling novels. And that's exactly what I used to like to write. Sex, drugs, sniggering nihilism. Cyberpunk. At some point I started feeling embarrassed or ashamed to write this stuff, though. Ashamed of being a druggie, maybe. I cleaned up and began playing the avuncular sage or the innocent boy in my books. I guess I could still write about crazy druggies even though I'm clean. Pat Boone cutting a heavy metal record. Actually *Mathematicians in Love* is the closest I've come to cyberpunk of late.

What if I become unpublishable? I'd feel foolish continuing with my graphomania. My notes and journals are, after all, graphomania, not so different from Phil Dick's *Exegesis*. Dylan touring forever. Writing is like breathing for me.

Fear, fear, fear. At my Men's Group on Sunday night, and in yoga class today they were talking about letting go of fear. Fear is about the future, but here I am, today, and today everything is fine. I'm finishing a novel and someone's going to buy it and publish it. I'll always have some kind of activity to fill my time.

I could fully abandon writing for painting, if it came to that.

\*\*\*

(May 18, 2005). Susan called back, says Dave Hartwell went to Tom Doherty, owner of Tor, and begged for more money as if he needed a kidney transplant for his dying mother (as Susan put it) and Doherty was like, "Oh, all *right*, offer Rudy X+1." So we inched up. Imagine that. Woo hoo. But, hey, it's in the "low five figures"!

It's not as good as the advance for *Frek* or for *Lifebox*. But it's better than what I got for *As Above, So Below* or for *Spaceland*. A couple of months ago, I was looking through old contracts and I saw that I got more than for any of these for *Hacker and the Ants* ten years ago in 1994, which kind of bent me out of shape. Maybe my track record's gotten worse than it was in 1994. At this point is achingly clear that my novels are gonna sell maybe ten thousand copies in all editions combined.

Another possible explanation for the drop is something Susan is always saying, that advances have dropped across the board. Too many Clarion or MFA writing-program pipsqueaks glutting the market, maybe. Coolie labor.

Should I try someone other than Tor? If I tell Dave that I want to try John Oakes at Thunder's Mouth Press instead, there's a chance, though not a certainty, that this would damage my future relationship with Tor. And it is nice to have reasonable assurance of being printed by Tor, who are, after all, the largest SF publisher and, as XX said, the only ones willing to publish idiosyncratic non-formula SF. And we're busy trying to sell reprint rights for *The Hollow Earth* to Oakes anyway. And that other agent I talked to, YY, he didn't think *Mathematicians in Love* looked like a break-out mainstream book. And Susan Allison at Ace would just look at my

numbers and say the same thing as Tor, Susan Protter polled her back when I was agonizing over the sale of *Frek*. Maybe if I were a new dark horse Ace would overbid for me, but as things stand, no.

So, yeah, I'll take the offer. What with the foreign sales, the movie options, and the reprints, it's not like the advance is the only money I get off a book. I'm drilling a new oil-well, dog, hooking a new intake pipe to the money river! Ten grand ain't that bad.

So now go back and finish the book, Ru. Mail it in, just mail it the fuck in.

That's a resentment-flash there, as "mail it in" means "do a half-assed semblance of the real job". In point of fact I plan, as usual, to put my heart and soul into the book. In saying "just mail it in," I'm treating myself to a tear-stained thespian moment, as in, "If *that's* all they'll pay me, I won't even try, they can't tell the difference, they don't deserve my best." But in fact, it's only because I do try so hard that they pay me anything at all. Were I truly to start mailing it the fuck in, as I think some tired old blocked writers eventually do, my sales would stop altogether. This said, there's some enlightenment in the "mail it in" mantra, it tells me that I don't need to agonize all *that* much, it's just an SF novel that I'm writing, and this is something I know very well how to create, and the more easily and calmly I write it, the more enjoyable it's likely to be for the readers. No sweat, man. Write it and mail it in. But don't mail it *the fuck* in.

And then write another. Like — maybe a fifth *Ware* book? *Everyware*?

**May 23, 2005. *I See the End in Big Sur.***

Saturday morning I went alone to Pfeiffer Beach, thinking about the ending for *Mathematicians in Love*. I was happy. It was good to be there, good to know I had the Tor deal. Everyone I saw on Pfeiffer Beach was happy, not a *little* happy, but a *lot* happy. That's Sur.

I pretty much figured the whole book out; here's a table that I drew in the sand, it was fun to be using this transient format, also knowing I could photograph it and blog it.



The table translates into

(Name\Version)	Ver 1	Ver 2	Ver 3
Bela	Earth-3	La Hampa	Earth-1
Paul	Dies on Earth-2	La Hampa	Never leaves Earth-3
Alma	Earth-3	Dies on Earth-2	Earth-1

The three rows are the three characters, the three columns are the three versions of each character (there's three Earths), and the cells correspond to where that character-version ends up.

[In the end, I didn't swap Bela-3 and Alma-3 to Earth-1, I left them there, but embedded the minds of Bela-1 and Alma-1 inside them.]

I even saw what looked like Paul, Bela and Alma going out into the surf; In the usual nature of magical apparitions, they disappeared after two or three minutes -- they weren't there when I walked back. They were in La Hampa. I blogged their pictures at <http://www.rudyrucker.com/blog/index.php?m=05&y=05&d=23>.

I thought of a number of ways to simplify the plot; rather than listing them here, I'm gonna rework the outline now.

That hole in the rock is narrower than I remembered, actually only one surfer at a time could fit through, and they'd be nuts to try it. Two would be touching each other. I did see a nice notch on the left, a shelf. The geometry of the tunnel looked a little more complex than I'd imagined, like with a closet on the side off it.

Getting the offer from Tor really energized me. I had a passing thought of, "Aw, they don't want me to write a 120,000 words, they only want 100,000, what a deprivation." But then I was, like, an artist has to use the size canvas that he has. And, yeah, he could have painted more background, more goblins, and so on, but he fits in the best stuff he has. And makes it coherent. A muralist is a particularly apt simile. "This is the size of your wall." Or a composer: "This symphony has to last under half an hour," or "This has to fit on one disc." There's no deprivation in having a limit to work within. Indeed, it's a gift that someone cares.

And, yeah, I can leave a loose end — leave Bela-2 and Paul-2 up in La Hampa, and that's an opening for a possible sequel, not that a sequel is necessarily called for.

***May 26, 2005. Groping For The Ending. Hiatus for the Tome.***

I finished scene one of chapter 6. Seven scenes to go, and I can't decide on the ending. I'll list some of my issues.

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I've lost track of what I once thought of as a key story element, the predictability of certain kinds of worlds.

Perhaps it should be that it's the very computational richness of Earth-3 which causes our jellyfish to go solar when she creates us. That's why we're the final draft. The Principle of Computational Unpredictability is only true in our version, not in the other Earths, which are all polynomial-time solvable.

\*\*\*

If Alma-1 stays in La Hampa with Bela-2 and Paul-2 in Paradisio, why wouldn't she link up with them instead of waiting for Bela-1? Should Haut be allowed to take her captive at the Subgum level? Could Alma-1 somehow sense a difference in Bela-1? Or he's determined enough to get her to move?

What if there are scores of Belas, Pauls and Almas in Paradisio?

\*\*\*

And why, oh why, don't Bela and Alma just stay in Paradisio?

To have babies and a married life? But they could have babies and marry in La Hampa. Need a better reason. Perhaps something external, like a parity consideration, mandated by the jellyfish? No, something internal makes more sense, think transreally. Why did *I* settle down and become a yuppie instead of dragging Sylvia to the Haight and getting high all the time? Drive for success, wanted security, Sylvia wanted stability. Maybe Alma is the one who wants to go back to Earth. Maybe somehow "God made us do it, for God had a plan," not that I like talking that way.

\*\*\*

What about Bela-3 and Alma-3? Options:

(a) Bounce them to La Hampa. This is the easiest and least problematical, although it's a bit mean to them, as they're then permanently exiled, as post Earth-3-hamaptime La Hampa has no further access to Earth.

(b) Leave them in place on Earth-3 and end up with two pairs of A & B twins in Earth-3. As for relationships, I could have A-1 + B-1, A-3 + P-3, B-3 + C-3. All possible outcomes of the love knots being realized. That's kind of nice, although I have a bit of trouble seeing what their jobs are then. B-3 is in music, and B-1 falls back on math, working at SJSU? Wouldn't he be somewhat envious and resentful of B-3? And what about Alma? Maybe A-3 is content to be a faculty wife, but A-1 goes into politics. Maybe then A-3 joins her, and they come out as twins. There'd be trouble with their papers. But maybe they could work it out.

(c) Bounce them to Earth-1. This is the symmetric notion that I had on Pfeiffer beach. But the way I've set up the "hair logic" of my game, at any given hamaptime, you can jump to only the latest version of Earth. So you wouldn't be able to jump back in hamaptime to Earth-3 from Earth-1. The reason I set this up is to rule out time-travel paradoxes. So why put a hole in it right at the end.

(d) Have Bela-1 and Alma-1 be effectively vaporized as the jellyfish goes solar. And as her last act, God beams the memories of B-1 and A-1 into the minds of B-3 and A-3, not as a "paste" but as a "blend." A and B sitting in a rental house in San Jose, and A remembers, that is, the A-1 memories surface in A-3's mind. She looks over at Bela and reminds him. They're now what I might index as A-3(1) and B-3(1), with the (1) standing for the incorporated memories. Bela writes all this up and gives the story to his retired colleague and published author, Rudy Rucker. Rudy writes an afterword for the book in which we learn a bit more.

\*\*\*

Do I really want B to end up with A? Originally I wanted A to go with P on the final world, and then have B switch to C. If I use the (d) approach, I could do this in the Afterword, explaining why B isn't around anymore, he took off for Europe with C. It could be that the knowledge of their pasts tipped A-3 and B-3 away from each other.

\*\*\*

Did the jellyfish for the cone shell race go solar? The cockroach's jellyfish? That's why they're stranded?

\*\*\*

I have maybe too many people in Paradisio. Paul-2, Bela-2, Alma-1, Bela-1, Maria Reyes, Cal Kweskin. Maybe many more humans.

Reyes and Kveskin would have been the first to tunnel, actually. Because they were already in our world. So they must have started in an Earth-0 gone to La Hampa, come back to Earth-1 and decided, hey, I'd rather be in La Hampa.

Do I have to have Bela-2 and Paul-2 hanging around? If they're there, why would Alma even leave?

\*\*\*

I just got the page proofs of my tome, *The Lifebox, the Seashell and the Soul* in the mail. The designer completely fucked things up, the pictures are gray postage stamps with huge blocks of captions and odd white spaces, it's a sad disaster. I think they must have hired a freelancer who's never designed a book before. This comes on the heels of the absolute worst copy-editing job ever on *Lifebox*: robotic, tendentious, ignorant, fussy, overbearing, inflexible.

So now I gotta read through it. The I Ching throw: Work On What Has Been Spoiled.

Upside, maybe by the time I'm done I'll have the ending figured out for *Mathematicians in Love*.

### **June 7, 2005. "Bela and the Jellyfish" Painting**

Yesterday I was working on a painting based on a [photo of me](#) in Jellyfish Lake in Micronesia, but I'm thinking of it as my character Bela Kis meeting the Big Jellyfish which is G\*D in otherworldly La Hampa. I'm using acrylics, which I'm still getting the hang of, I'm more in the habit of using oils. You can't smear the colors around which is bad, but you can layer on colors pretty fast one after the other, which is good. The picture is called "Bela and the Jellyfish." I posted an [earlier version](#) as well. It's annoying when you're painting that there's no Ctrl-Z to undo a goof, no PhotoShop History dialog where you can roll back to an earlier state. Like life itself.

I finished "Bela and the Jellyfish" today. You can [click here](#) to see a bigger version.

Now I'll go back to writing *Mathematicians in Love*. Not so coincidentally, I'm at the scene where Bela and Alma meet the divine jellyfish and get to make some wishes about which version of Earth they'll return to.

### **June 7-14, 2005. Big Revision. Notes and Queries.**

Having taken a week off to work on the tome, I have enough distance on the novel now to be willing to go back and reread chapters 1 through 5 and my start on chap 6, correcting as I go, making it more consistent, and gearing up for the final dash to finish 6 and write 7.

I've decided to give the book a preface by Bela Kis and an afterword by Rudy Rucker. A hoax. This new guy Bela Kis was hired by the math dept. at SJSU and he looked me up, and he said he had these implanted memories of being born on another Earth, and traveling to a higher world, and then to a second Earth, then back to the higher world that he calls La Hampa, and then finally having his memories blasted into the brain of the Bela Kis that I was talking to. And he wants to write up his memories. And I help him.

This raises an issue about the date. If Bela gave me the book, it was either this summer, 2005, or maybe a bit likelier, last summer, 2004, and it took me a year to work the book up into a novel, also to look for him, as he's disappeared.

The book has a built-in a date constraint, in that I want there to be an incipient presidential election, with Veeter and Ramirez jockeying over the veep slot on the Joe

Doakes ticket. I'd initially thought to set the book in 2012 to give me a little future slack in terms of tech. But if Bela is here talking to me, then, really, the book has to be set in 2004. I don't, after all, have any especially unheard-of tech in the book, also any slight differences can be accounted for by the fact that Bela starts in another world. And then George Bush *is* Joe Doakes. Why not.

To set the dates, I peg it to the commencement at Berkeley, which was Friday, May 21, 2004, actually at Zellerbach Hall, rather than at the Greek Theatre as I wrote it. They had a *convocation* at the Greek on May 13, 2004. I'll stick with May 21, but possibly keep the Greek (alternate world), or just rewrite it to be Zellerbach. It's not like I *wrote* that much about the Greek anyway, I just dropped the name, and had the picture in my head.

As I go over this with "Humelocke" in place of "Berkeley," I'm realizing that I have to explain more about the landmarks I use. It's a mistake to do an in-group thing and assume that all my readers *know* the exact topography of Berkeley — a trap I might fall into in an attempt to seem cool to Berkelyites who are, after all, nor more than a few percent of my readers.

It was a mistake to use "San Jorge" for "San Jose," I'm gonna roll back that change.

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Here's some notes and queries that came up during the read-through:

- Make Bela frugal. And he had problems with his father, thus the authority issues.
- Do lots of alternate Earth bits in the first part. All food and clothes are different. Hair is kind of retro. Beehives. Say "mod" or "modern-style" instead of "punk," or, no, say dregger or dreg. (My roommate Dreg Gibson.)
- Paul pushes up his glasses, keep doing that. Paul is *so* weird at that first dinner, telling the "Flog it" story and the dirty joke about the rabbit. Keep that up. In later chapters I've had him speaking in a more goal-oriented and less digressive fashion. Need a bit more characterization later on.
- Why exactly *did* the cone shells help/encourage that homeless guy Leroy to set the fire? This meant that Veeter got in power, which meant he would end up working with Bela and Paul and producing the Gobrane and thus the hypertunnel.
- Keep Haut well-dressed.
- Have Bela mention music and sounds a lot.
- Bring back Ma in Chapter Seven. Bela-3(+1) and Alma-3(+1) are living with her while they look for a place of their own.
- Bring back Lulu and Danny? Lulu was so vivid.
- I should mention Alma's Happy Face necklace again. Or lose it in the ocean.

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I changed "punk" to "mod" and then to "dreg" and "dregger." "Bentley" (automobile) became "Hornswoggle." "Egyptian" Theater, not "Greek." "Samadhi," not "Nirvana." Fun to be altering all the brand-names. I've always kind of despised the contemporary writing gimmick of using lots of brand-names. Admittedly it's

drawn me in at times, but in a crummy, avid, wanting-to-be-cool kind of way that leaves me with a sick, exploited sucker feeling. The product-placement gimmick gives the articles a false, borrowed glory that evanesces really fast. Putting in fake names instead lets you see what's really there and what's missing.

\*\*\*

Revising, I'm getting a good feeling about the book. Good idea to have my character start on another world, look for the best of all possible Earths, and end up on ours: a high-concept gimmick that's is easy to get across.

\*\*\*

The revision is going a lot slower than I expected, I'd thought I could do a chapter a day, but it's more like two days per chapter. I'm fixing a lot of things. Something about the rhythm is incredibly slow and tiring. I read a few pages, marking them up and noting systematic changes that need to be made. I do this sitting down somewhere quiet — although it's very noisy at my house these days with some assholes endlessly digging a swimming-pool up the street. And then I get such a stack of changes in my mind that I go and type the changes into the novel document. The pervasive changes lead me all over the manuscript. I distract myself with email and blog. Eventually I'm done with that part, and then it's back to reading further in the manuscript. Somehow this is much harder than simply working on a given chapter or scene by iterating the cycle of: (a) read and revise the relevant portions of the outline, (b) type a bit of new novel material, (c) print recent novel pages, (d) hand correct the print-out, (d) type in the changes and jump to (a) or (b).

As I do the revisions, I'm in a lot of fear and doubt — worrying that the style isn't good, that the characters are cardboard, that the science is incomprehensible, that the plot is inconsistent, that the ending won't pan out. Worry is my middle name. And I *love* to complain about how hard it is to write.

\*\*\*

I think the reason I like writing on the growing edge more than revising is that, on the edge, I feel like the book is getting longer, I'm accomplishing something. Also I'm getting to explore new territory and discover fresh ideas. Revising is hard work without the obvious gain of enhanced word length. And I have to deal with the knotty issues that still aren't resolved. I get so anxious. But, fact is, I always find a fix of some kind.

This worry of mine reminds me of a scene in "Some Kind of Monster," the documentary on Metallica, and the guitarist — not the singer James but the other guy, the one with long curly hair, a soft spoken guy — he's trying to learn this new riff that James wrote so that he can "double it" (meaning, I think, play twice as many notes or play it twice as fast), and he can't quite get it, and is smiling, but in fact quite worried, and the drummer Lars is laughing, "You always worry, you always get it."

But if you weren't the type to worry *desperately*, then maybe you in fact *wouldn't* get it. Especially if you're working at a level where the "it" is something rather difficult and off the grid.

### **June 16-17, 2005. What About The "Men in Black"?**

Finally got all the changes in and now I'm back to having real fun. Went walking in Big Basin park yesterday, working on a paper copy of the outline of chapters 6 and 7.

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Maria Reyes and Cal Kweskin — who are they? I'm kind of thinking they're are from a hampatime-earlier Earth than ours, but some time later, Earth time. They come from, let us say, Earth-0. They discovered a hypertunnel method. How? Some other approach than the Margolus-Levitin method, perhaps.

On their world, Earth-0, Bela was killed by Ramirez the morning after he posted his stuff about the Gobrane. So it took longer for the tunnel to be found. Maybe years longer, naw, probably not all that much later, as it's something that the jellyfish-god is *eliciting* in the worlds she's making, as she's about ripe.

Let's suppose that Paul actually knows them, knows of their work, he knows them by face. Bela knows of them, too, but they're using alternate names. Their method for tunneling from Earth-0 to La Hampa was somewhat different; the real reason the tunnel methods work is that the jellyfish-god is ready to connect.

I suppose Maria and Cal got from La Hampa back to Earth-1 by praying to the jellyfish-god, as Bela and Paul will do to get from La Hampa to Earth-2. Note that they appeared on Earth-1 before Haut's jump on Tuesday.

Why would they have gone back to Earth? They'd dreamed of setting up a stable two-way tunnel, let's say, and only after they got to Earth-1 did they see how hard it was gonna be, only then did they grasp that every world would be different. They were on top of the research and realized it was likely that Bela and Paul would have a solution, and were glad to see that Bela wasn't dead on Earth-1 as he'd been on Earth-0.

And as soon as they come back to La Hampa, they want to go back up to their level, where they left, say, some friends, they're not particularly interested in Bela, Alma and Paul.

There's a bit of cachet in being the lowest-Hampa-level (that is, earliest in Earth time) people to make a tunnel.

\*\*\*

I think I better have the jellyfish update the world in ticks, like maybe once per La Hampan day. If there's an infinite continuum of worlds, then there could be an infinite number of people tunneling over from all the successive worlds.

Maybe a La Hampan day is as long as an Earth day. And there's one Earth per La Hampa level. Simple. Now, suppose that we don't adopt the reader-confusing belief that our jellyfish-god exists at every La Hampa scale level. Suppose we say that our jellyfish lives uniquely in the Jellyfish Lake of Nanonesia. Why does it just so "happen" that Bela and Paul tunnel over to the exact level where she lives? Put differently, why does the jellyfish happen to live on the scale level matching June 3, the date when the tunnel is first opens. Well, it's not a coincidence. The jellyfish-god always opens the tunnel to match the level where she is. Over hampatime she evolves her controlled worlds in such a way that finally a tunnel opens on that special day. The *omphalos*, the navel of the world.

\*\*\*

Back to Cal and Maria, why are they at a higher level? Well, say that the jellyfish allows for tunnels to come into La Hampa from higher levels. But she's only gonna bother making tunnels back at her level.

Why did Cal and Maria end up going back on June 1? I'm supposing Earth's jellyfish god lives *only* at the Nanonesia level, which is June 3. Maybe she just sent them back at that level so they could help Bela get away from the lawyers.



I think I'll suppose that Cal and Maria don't go inside the jellyfish, don't make wishes. They're in some sense not as central as are Bela and Alma to the jellyfish's plans.

\*\*\*

Alternate scheme would be to have Cal and Maria not even be human, just be, like manta rays in rubber human suits. Or to have them be humanoid from an Earthlike world, like Vulcans. Or robots.

\*\*\*

I'm a little concerned I might not be doing an extensive scale voyage as I'd planned. Well, I could if I put Cal and Maria several levels up, and have Alma up there, Bela goes there to be with her. And then when they get sucked down to the Nanonesian level, they can fall through a series of whirlpools, which might be fun.

Otherwise, maybe I can have some fun with scale in *Frek II*.

\*\*\*

I'm unclear about how many people will be at the higher levels. If, say, lots of people on Earth-1 find out about what the boys did, then there could be people jumping over at level after level into the future.

Or it could be that the jellyfish isn't interested in having a whole lot of people get across. Just allows one jump per each world's full timeline. So there'd be maybe one jump from an Earth on each of the days June 10: Cal and Maria from Earth-0, June 3: Haut earlier and later Bela, Paul, Alma from Earth-1, and then more on June 4 - 9, one group per day somehow all gathering... I don't know, this is so confusing with the two kinds of time, Earth and La Hampa. I'm sick of thinking about it.

\*\*\*

Maybe Cal and Maria were at Cammy's funeral as well? Yeah. And, oh, I've got it, have them be rival mathematicians from Stanford. Paul knows them by sight, but Bela's only heard of them. Professor Cal and his student Maria. They call themselves, natch, "Smith and Jones" when they're posing as the men-in-black NSA agents.

They have a grant from the NSA, so it's natural to pose as agents.

I have to deal with their helicopter pilot, I just realized. A third extra human who'll be over in La Hampa. Maybe he can be hunky, and Alma will have a crush on him, making it that much harder for Bela to win him back. Maybe make him a WASP. Or black, a real NSA-type, practically a cop. Really handsome, like that model Ty. Model him, like Williblad Cheroo, on memories of my one-time college roommate, Jack White. The mathematician's nemesis: the competent jock. Call him Dick Phillips to have some fun with *der Meister's* name.

I could bring them back into the action on Earth-2. Maybe they really *are* NSA agents as well as Stanford prof and grad student. And on Earth-2, they're on-board to help Veeter at first, though then they turn against him.

**June 18, 2005. Non-PCU Worlds. Bet About Cammy. Red Herrings.**

Today I got the galleys of that article I wrote for *Asimov's* where I claimed I'd be writing about a non-PCU world in *Mathematicians in Love*. Jeez.

At this point, wrapping up my book is more about simplifying and taking things out than it is about making it more complicated.

An easy way to make good on my promise would be to have it be that Earth-1 and Earth-2 already *were* non-PCU worlds. They just happen to be that way in the computational landscape. It's something that varies place to place in the multiverse,

the ambient computational weather. Like geology. I'll call non-PCU worlds "docile."

And having made good on my *Asimov's* brag by having Earth-1 and Earth-2 be non-PCU worlds, I get a punch line that our Earth, Earth-3 *is* a PCU world. That's why it's the best of all possible worlds. I guess La Hampa is PCU as well.

\*\*\*

This means, then that Cammy was in fact predictable in Earth-1. To simplify this subplot, I think I'll have the bet about Cammy's predictability already be solved when Bela first goes to La Hampa. Cammy was predictable, the aliens didn't need to wait for a new world to test this. Once they read her personality through her neck, they practiced predicting events in her past, as all the times of any current or former Earth are accessible to them. So Cammy will also be predictable in Earth-2, and perhaps Rowena gives Bela the prediction code right before he leaves, which will make Bela a bit fed up with Cammy pretty soon.

\*\*\*

I'm realizing that it's okay if certain seemingly important events turn out not to be such a big deal in terms of the real plot-line. I'm thinking of, for instance, the cone shell seemingly encouraging Leroy to set the polling place on fire, or the cone shells reaching into Cammy's neck, or the Men in Black, or the notion of hampascale as matching Earthly time.

These things are basically red herrings. They're things that seemed important when I thought of them, but really they aren't. I can leave them in the book, up to the point. Readers accept red herrings, as they add to the surface complexity of a book. The author does need some kind of explanation for the red herring event, but it can be rather small and perfunctory. The red herring event doesn't have to ramify out and be a big deal for the rest of the book. But if I have some red herrings maybe that turd of an SF-reviewer at the *Sunday Times* won't once again say I have an over-simple plot. I suspect that stupid people like him enjoy the sensation of being confused: it gives them the illusion of having ideas. (Oh, why do I always worry about him? He's hated every book I ever wrote, and he's not gonna change. My only hope is to outlive him. And the less I worry, the longer I'll live.)

I *do* have enough action lined up for the rest of the book. For the last few days I've been fretting over my red herrings. Some of the red herrings would "like" to bloom out and stink up the place, but I'm getting strict with them. What I've in fact been doing is pruning them back, de-emphasizing them. It's nice to be able to paste the excised but (to my eye) clever bits into this Notes document.

Remember that the main action is the love story with Alma. Keep your eye on the ball.

### **June 20, 2005. "Be Cool" in Polish**

I decided to have a guy called Waclaw Smorynski in the band AntiCrystal, along with Jutta Schreck, and then I was thinking I could have them be Polish from Warsaw, instead of German from Berlin.

And instead of Siggy, we have Stanislaw, maybe. Though Siggy is good.

And instead of "Leise" means 'be cool' in German," [lifted as homage from PKD], I'd have "???" means 'be cool' in Polish."

So what's the phrase? Hit Google and find "opanować się" in an online dictionary tool at <http://www.dict.pl/plen>, meaning "lighten up, cool off, simmer down." This tool is particularly good, as it lets you back up into Polish google

searches for the phrase to get some idea of context, and eventually I found a Polish idiom dictionary with the *opanować się* in it. “Opannawaxy, man.”

**June 22, 2005. Going Good. Section Divider.**

It’s going good this week, I’m into Chapter Six. I’ve been going back and smoothing things over, inserting premonitions, and so on. I had the Monogrub *One In A Million* game start in Chapter Five. I made Nunez a nice guy. I set up Lulu to become Paul’s girlfriend.

Sometimes when I put in a change it’s easier than I thought. It crossed my mind that a novel is really just stage-sets. You don’t have to, like, *build* the Pyramid of Cheops if you need it, you only have to sketch a picture of a corner of a pyramid and prop that up behind the characters. And even the characters have that aspect. You don’t have to fully understand someone’s entire life story. You just need to give them zingy, slightly startling things to say. It’s just words on paper.

I’m feeling less anxious now. I think it’s gonna be okay.

\*\*\*

I reorganized my scene breaks, and matched each scene break with a \*\*\* break symbol in the text. According to the present outline, I’ll have 37 scenes in 7 chapters, which would be nice, as both numbers are prime. One thing I was wondering is whether it might after all be a good idea to number the scenes. Like 1.1, 1.2, 1.3 ... 2.1, 2.2, ... and so on. That would give the book a mathy look. I don’t think I’d title the scenes, as then you’re faced with the Hobson’s choice of going cutsie-pie coy in the or of telegraphing every punch. Aw, I think just a divider is nice. I could make up a custom divider. Here we go:



The idea is do 1, 2, 3, 4, 5 ... ∞ ... ,5, 4, 3, 2, 1. Possibly have a bit more of a space between the pentagons and the circle?



**June 25, 2005. Hanging With My Characters**

Tonight there wasn’t much happening at home, and I went out to a coffee shop with my laptop and added some stuff to the scene in Chapter Six where Bela is rehearsing with his band the night before the stadium concert.

And I was thinking how much fun I was having with my characters, laughing at the crazy things they said, enjoying their antics. In a way it’s like having make-believe friends.

And tomorrow or Monday, when next I write, I get hang out with Paul Bridge again, another new pal I’ve found in my book. I’m almost at the point where I enjoy my characters more than the real people that I know.

\*\*\*

The ending is almost clear now, but not quite.

I have an issue about what do when Bela meets Bela-2 and Paul-2 on La Hampa, along with Alma, Maria Reyes, Cal Kweskin and the helicopter pilot who, I

now thing, might as well be a woman to balance out the sexes a little better. Call her Rikky Phillips instead of Dick Phillips. Maybe she could be black.

If Bela and Alma go to Earth-3, that leaves three men and two women. I could of course kill off Cal Kweskin to have a tidy pair of couples in La Hampa, a pair of Adams and Eves. I see Bela-2 with Rikky and Paul-2 with Maria.

It could also be that Bela-2 and Paul-2 are gone, disappeared to an Earth 2.5, but it would be missing a trick to duck Bela's meeting with his double.

\*\*\*

My novel's length is in striking distance of matching the notes' length now: Notes 94K, Novel 91.6K.

\*\*\*

Down at the Farmer's Market, I wrote out the lyrics for "Hundred-Percent Asshole," an anti-Heritagist song played by Washer Drop and AntiCrystal on Earth-2. The thing is, it's good to include lyrics for songs; adds texture to the book. I learned this when I was studying *Lord of the Rings* to write *Frek and the Elixir*. Not that Tolkein would have written a punk anthem, but it's the same idea.

He's a hundred-percent jerk — Never had to work.  
He's a hundred-percent dumb — Wants all our music numb.  
He's a hundred-percent rich — Use you for his bitch.  
He's a hundred-percent greed — Robs the families in need.  
He's a hundred-percent war — Our kids are dying for.  
He's a hundred-percent killer — Behind his White House pillars.  
He's a hundred-percent hate — Stop, it's getting late.  
He's a hundred-percent pig — Why'd we let him get so big?  
Hundred-percent asshole!  
Hundred-percent asshole!  
Hundred-percent asshole!  
Hundred-percent asshole!  
Hundred-percent asshole!

Let's suppose that this song really catches on, so that the Heritagists can't even say or write the phrase "hundred-percent" anymore without each and every listener or reader appending the word "asshole," whether or not they said it out loud.

**July 15 - 19, 2005. *Lost Half a Month. Revising Chaps 5 & 6.***

So now I lost about half a month. I finished Chapter Six, and hit the usual blank time between the chapters, working on the outline for a week, and then I went to NYC to visit Georgia and my new granddaughter Althea. Picked up a few ideas on the road. I didn't work on the novel at all on the road, instead all my energy went into blogging my trip. And of course into *doing* the trip and being with my family.

The aliens in La Hampa Paradisio can look like these great Jim Woodring-style mosaics I saw in the 28th St. subway station on the Broadway Local line in NYC.



Bright shapes of light, ellipsoids for waists, legs like belled-out cylinders with balls of light popping out the bottom. Glowing plasma beings. I'll call them Jimbos.

A city is a reef. Maybe the aliens have helped build up the city very fast.

I redid my outline last night. I have so much stuff to cram into the last chapter.

I've lost my momentum on the book by now, and I'm a bit cramped by knowing that in two weeks I'm taking a three-week trip to Switzerland and Hungary. I don't know that I could finish the chapter in these two weeks coming up. But if I can get it pulsing, breathing, birthed, then I can keep it going during the trip, like in Micronesia I had a chapter and my notes to work on — though I wasn't with my wife, which meant that I was writing a lot more. Could be I don't really get into Chapter Seven till end of August, so what. If I wait longer, then Budapest can be the Paradisio level of La Hampa.

\*\*\*

To get back my *schwung* (German for *momentum*), I'm going over chapters 5 and 6. Doing chap 5 took me all day yesterday and today. I can't believe how many revisions it needed — I already read through it once before. But then I'd already read 1-4 so maybe I was tired. I have to make special effort to revise the later chaps as many times as the earlier ones.

Somehow the revision feels like very hard and slow work. The weather's so hot, over ninety, with the sun like a hammer, I have to stay inside in the droning AC or fan. Maybe I'm a little jet-lagged, too.

\*\*\*

Re. Chapter 6, when I have more energy, I should go over the dinner scene with the aliens and the humans and make it more fun. At present it's mostly info dumps. I need some eyeball kicks, some physical comedy. Have the children playing games, singing, playing tricks, grab-assing (can a cone shell snail be said to "grab-ass"?).

Right now I just want to type in the rest of the changes I made with my pen and collapse on the couch.

\*\*\*

One thing about editing is that I can begin to question everything. The choice of words looks wrong, etc. And when I heavily correct a page I wonder, if I were to correct it again in a month, would I have just as many corrections? And that the process could go on forever? Or am I, as I hope, converging on an ideal fair copy?

\*\*\*

Finally I'm done with the revisions. I keep simplifying things; the ideas are right on the edge of being too complex to understand.

\*\*\*

I swear I'm not writing another fucking word in these notes until the novel outstrips the notes in word count. Right now I've got Novel = 96,365 and Notes = 97,815. Aw, but I *like* writing in the notes. Overwriter's Anonymous. Notes = 97,840.

**July 21-22, 2005. Crossover! A Hundred Thousand Words!**

Yes! Today I finished the first scene in Chapter Seven and got 98,967 words in the novel, finally ahead of today's 98,038 on the notes.

Break out the champagne and ice-cream, we're crossing the Equator!

\*\*\*

It's good to be writing again; when I go a couple of weeks without doing it, I always wonder if I can still write. Writing is, after all, impossibly hard.

\*\*\*

On July 22, 2005, I hit 100,864 words. Breaking a hundred kay! Wrote an ultraviolet Half-Life-style shoot-out scene today. Read it to Sylvia, she thought it was icky, over-the-top, shocking. But I think a lot of people might like it. It's what you see in movies.

**July 28, 2005. The End.**

I finished it today, 106,700 words. I compressed the ending a bit, eager to polish it off. Once I finished that peak scene at Veeter's house, time to wrap things up. I was able to finish it fast by just pasting in the outlined scenes and editing the outline. It's good.

I'm going to print off a copy and send it to David Hartwell, then do a revise at the end of August when I get back from this trip to Europe that we have planned.

I read the ending to Sylvia, it made me cry.

**October 14, 2005. Revisions.**

I got David Hartwell's revisions. Nothing too extensive. He noticed some places where the characters change too abruptly. He wants me to edit down the rather graphic three-way sex scene with Alma, Paul, and Bela — other writers can put in sex scenes, but when I do them, sigh, people always seem shocked, I somehow write about sex in the wrong way. Too frank and amused, I guess. David also wants me to, and this surprises me, to cut out the scene where Bela is shooting at the cops chasing them near the end of the book — I guess the idea is that in a commercial book you can't have the hero be a cop-killer, no matter how evil the "cops" are. I thought this was a nice action scene. And he has more changes along the lines of making Bela and Alma seem good and not nasty. It all seems doable, and won't really hurt the book and, after all, David has a clearer idea of what goes over in the commercial market than I do. And I can save the nasty deleted bits into this document.

I have a print-out of the book that I punched with three holes and put in a three-ring binder. I'll go through it and put in Dave's changes by hand, then put in John Walker's changes and Scott Aaronson's changes by hand — well, maybe not all the changes, I'll have to see what seems reasonable.

Then I'll reread the whole book from the start, fixing rough things I notice, also smoothing in around the changes, making all these marks by hand.

And then I'll go through it on the computer, keying in the changes.

Should take about a week, maybe two weeks.

I've been away from the book long enough now — three months — that I don't clearly remember its details, which is good, as then I can more readily tell if it's fully easy to follow, and correct where it's not.

***October 14 - November 7, 2005. Revisions.***

*Oct 14, 2005.* I got David Hartwell's revisions marked on the manuscript. Nothing too extensive. He noticed some places where the characters change too abruptly. He wants me to edit down the rather graphic three-way sex scene with Alma, Paul, and Bela — other writers can put in sex scenes, but when I do them, sigh, people always seem shocked, I somehow write about sex in the wrong way. Too frank and amused, I guess. David also wants me to, and this surprises me, to cut out the scene where Bela is shooting at the cops chasing them near the end of the book — I guess the idea is that in a commercial book you can't have the hero be a cop-killer, no matter how evil the "cops" are. I thought this was a nice action scene. And he has more changes along the lines of making Bela and Alma seem good and not nasty. It all seems doable, and won't really hurt the book and, after all, David has a clearer idea of what goes over in the commercial market than I do. And I can save the nasty deleted bits into this document.

I have a print-out of the book that I punched with three holes and put in a three-ring binder. I'll put that in storage.

I'll put in Dave's changes in the computer file, then put in John Walker's changes and Scott Aaronson's changes on the computer — well, maybe not all the changes, I'll have to see what seems reasonable. (I've had the Walker and Aaronson changes on ice for several months, waiting for Dave to weigh in — his opinion is the most important one, both because he's a pro and because he's the guy getting me paid.)

Then I'll print out the altered book and reread the whole book from the start, fixing rough things I notice, also smoothing in around the changes, making all these marks by hand. And then I'll keyboard in these changes.

Should take about a week, maybe two weeks. The slowest part will be rereading the book, it's hard to do more than a chapter a day, and there's seven of them.

I've been away from the book long enough now — three months — that I don't clearly remember its details, which is good, as then I can more readily tell if it's fully easy to follow, and correct where it's not.

\*\*\*

*Oct 15, 2005.* I emailed Dave: "You caught some spots where I need to motivate changes in characters' behavior, and some other spots where I need to make the characters more uniformly likeable --- good. Also, I'll pare down that three-way sex scene to a bare minimum as requested --- I can see now that it would turn off some people as written. The one change that surprises me is your suggestion to

remove the sequence where Bela is firing rockets and guns at pursuing evil helicopters on the freeway. I thought this seemed kind of cool and videogamey, but I don't usually write this kind of scene, so maybe I didn't do it right? Or is that it could turn off readers to have the hero be shooting guys who are, even though baddies, actual cops?"

\*\*\*

Oct 17, 2005. Talked to Dave on the phone.

He likes the book as much as *Frek*, which he thought was my best so far.

He feels in the second half it becomes less controlled and focused. The characters begin to drift.

He thought it didn't seem in character for Paul and Bela to go along with the three-way sex. Yes, Alma might do it, but not the boys. Suppose that Bela gets in bed between the two of them and then the don't have sex at all, just spend a very uncomfortable night. The father can discover them and be outraged as before.

Says there's a little too much of the rock and roll scenes. The band characters are good, but there's too much "and then, and then, and then," with detailed play lists and so on. Try and compress the rock scenes as they aren't really the focus of the book, and they start to seem like it.

Doesn't think it's realistic to have Bela shooting rockets at helicopters. That's a "cowboy" thing and Bela isn't a cowboy, so it's odd to have him suddenly become a cowboy and then afterwards go back to being a math guy. It would work better to have the helicopter shooting at them, and Gyula is saying to shoot back, and Bela is, like, we don't need to shoot, we're smart, just follow the Gobubble. And they "Golden Man" their way outta trouble with smart zigs and zags.

A final issue is the behavior of Roland Haut. At first he's unpleasant to Bela, and Bela sees him as an enemy but, after all, Haut is right, Bela isn't doing shit on his thesis. And then in La Hampa he becomes this evil psycho killer. We need for him to come onstage once more so we can motivate his changes in behavior. And possibly have him appear one more time near the end.

As for timeline, he said to get it in before Thanksgiving, but now I'm feeling kind of like getting to work on it, so I think I will drop "Postsingular" and "Hormiga Canyon" as of maybe tomorrow, Oct 18.

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Oct 19, 2005. I spent the day typing in, or at least taking into consideration, Hartwell's, Aaronson's, and Walker's suggestions and changes. A few are tricky enough that I need to fix them while rereading.

I'm printing it out and will start a read-through and final mark-up tomorrow.

One salient problem was posed by Scott Aaronson: "Why didn't Paul let Alma come back to Earth-2. He could have dated Alma-2 and leave Alma-1 for Bela?" Well, suppose that there's an exclusion principle, like a no-cloning kind of thing, only one copy of a given person per world. Fine. But now: "Why, seeing that Alma-1 probably was not coming through the tunnel into Earth-2, would Paul have helped herd Alma-2 into the tunnel so as to send her off to La Hampa?" I need to do some rewriting on this, fix it so Paul in fact tries to keep Alma-2 on Earth-2. And then Alma-2's death is a bit more Bela's fault.

A second problem is that Haut simply drops off the stage after he goes to La Hampa. I should do a scene where Bela talks to him, or at least have Paul admit talking too Haut and talk somewhat extensively about how he's changed.



Walker posed an issue that I don't think is a problem. This is that, the sooner people on some world learn to tunnel to La Hampa, the fewer are the revisions that their world gets. But so what. Being able to tunnel over is a sign that your world is almost "fully-baked".

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*October 23, 2005.* I'm moving along well. I've revised chapter 6 and 7, and I fixed the sex scene and the shooting-the-cops scene. Also I'm cutting down on the rock and roll. Also I fixed the plot-hole Aaronson found. Also I added an extra scene with Haut on Nanonesia. Also I added a riot during the Heritagist Stadium concert, though trimmed this whole scene down a bit.

I get a little anxious when I'm revising. Like, will there ever stop being things that I need to fix? Is there a danger of buffing/elaborating this bas-relief until the figures disappear entirely? Is this going to be the final fatal time when my final-draft plot problems and character inconsistencies will prove truly unfixable? This said, it feels *so good* when I do fix something.

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*October 24, 2005.* I finished revising the hard chapters, 5-7, and now I'm going back to read the first four. And I've changed 5-7 enough that I think I'll read through them again. It's in the nature of things that usually the earlier chapters of my books end up being more polished, as I reread them more often, so I "owe" the later chaps some extra attention.

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*November 5, 2005.* I printed fresh copies of chaps 5-7 and then went back through the whole book, reading chapters 1-7, revising. In other words, I'm doing a double revision on chaps 5-7, which is good.

I'm alternating between marking up pages and typing the changes in. It'll take another day or two. This whole job is taking longer than I expected. The revising goes slow when I need to think about how to fix things. Another thing that's slowed me down is that in the meantime I spent three days in Wyoming and three days in Boston, although I got a fair amount of revising done on the plane trips.

I put in a couple more small fixes, like I had Bela pay Gyula his money before leaving Earth-1. I took out the more self-aggrandizing remarks of Bela's about how good his rock band is. In general, I'm making it simpler. I did a search for every occurrence of "there was" or "there were" which is very often a boring way to start a sentence. I also, as usual, searched to make sure that I never use the word "cool" in a sincere way. I just have nerds use the word, or use it slightly ironically, for in the post-Bill-Gates world, cool's not cool.

Maybe I need to have Cammy say "bud" more often, at least on Earth-2.

Lulu and Leni should have had a falling-out on Earth-2.

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*November 7, 2005.* I finished typing in all the changes yesterday. And this morning I printed and revised the final section of the last few pages about five more times, trying to get them just right. I'm done now, though of course I'll polish it a bit more during the copy-edits and page proofs. I printed the whole thing in double-space and now I'm wrapping it up to mail to Tor.

Another masterpiece.

**May 4, 2006. Copy-edits. Making the Timelines Jibe.**

I've been going over the copy-edits for the last few days. The book still seems good. I laughed, I cried, I pondered, I wondered.

I'm doing some intense edits on the La Hampa scene in the last chapter. I'd left the interactions among futurians's timelines a little vague. And now I'm ironing it all out.

William Burroughs used to like quoting some (perhaps imaginary) judge, "If you can't be just, be arbitrary." And, I would add, be *consistent* in the application of your arbitrary principle.

Here are the principles I adopted.

(1a) *La Hampa To Earth Departure Time.* The Jellyfish always makes a new Earth on Friday of La Hampa. Anyone who wants to hampajump to that Earth can only do so on that Friday at the moment when the new Earth is created. That way all of the influences are taken into account at once.

(1b) *La Hampa To Earth Arrival Time.* The local Earth time at which you arrive from La Hampa is pegged to the precise size scale location in La Hampa. Roughly each level varies by a week, but within a level you can scrootch up and down and alter your Earth arrival time.

(2b) *Earth to La Hampa Departure Time.* You can hampajump to La Hampa any time you're able to. The time when you leave from will affect the La Hampa level at which you arrive.

(2b) *Earth to La Hampa Departure Time.* Anyone who hampajumps to La Hampa arrives on Thursday in La Hampa time, specifically on the Thursday after the Friday when their Earth was created.

**July 17, 2006. Page Proofs.**

I went through the page proofs and found a few more small tweaks.

I was sad to see the characters going away. I'll miss Bela and Paul.

At the end, I had a feeling the book was wrapping up too fast, but at that point it was all done, and time to bail. Practical considerations played a part in the quick end too, like how many words Tor would want to print, and how much longer I could take the tension of not being done with my book. Maybe the quick bail really was for the best.

I really like that dinner at Bela's apartment in the first chapter. Later on in the book, there's so much plot mechanism to maneuver around that they don't get to talk so casually. Maybe sometime I'll do a book with lots more casual conversations and less of a science plot.

But over all, reading *Mathematicians in Love* again, several times I had the feeling this could be my best novel.