

Seek the Gnarl

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| | |
|----------------------------|----|
| Introduction..... | 2 |
| Gnarl | 2 |
| Literature..... | 5 |
| Transrealism..... | 10 |
| Plot | 16 |
| Thought Experiments..... | 18 |
| Satire | 20 |
| Gnarl Theory?..... | 22 |
| Books by Rudy Rucker | 23 |

Introduction

Somewhere in the 1990s, I adopted “seek the gnarl” as a personal motto. Indeed, I published an essay collection under the title *Seek!* and a story collection under the title *Gnarl!* To be rigorously logical, I might then have collected my poems as *the*, but that wouldn’t be poetic; in any case I’d already printed my early poems as a chapbook taking its name from the instructions on firecracker packages: *Light Fuse And Get Away*.

As a reader, I’ve always sought the gnarl, that is, I like to find odd, interesting, unpredictable kinds of books, possibly with outré or transgressive themes. My favorites would include Jack Kerouac and William Burroughs, Robert Sheckley and Phil Dick, Jorge-Luis Borges and Thomas Pynchon.

I try to write the kinds of books that I like to read — so as a writer, I’m also seeking the gnarl.

In this essay I’ll discuss what I mean by gnarl, and some of the specific ways in which literature can be gnarly.

Gnarl

I use *gnarl* in an idiosyncratic and somewhat technical sense; I use it to mean a level of complexity that lies in the zone between predictability and randomness.

The original meaning of “gnarl” was simply “a knot in the wood of a tree.” In California surfer slang, “gnarly” came to be used to describe complicated, rapidly changing surf conditions. And then, by extension, something gnarly came to be anything with surprisingly intricate detail. As a late-arriving and perhaps over-assimilated Californian, I get a kick out of the word.

Do note that “gnarly” can also mean “disgusting.” Soon after I moved to California in 1986, I was at an art festival where a caterer was roasting a huge whole pig on a spit above a gas-fired grill the size of a car. Two teen-age boys walked by and looked silently at the pig. Finally one of them observed, “Gnarly, dude.” In the same vein, my son has been heard to say, “Never ever eat anything gnarly.” And having your body become old and gnarled isn’t necessarily a pleasant thing. But here I only want to talk about gnarl in a good kind of way.

Clouds, fire, and water are gnarly in the sense of being beautifully intricate, with purposeful-looking but not quite comprehensible patterns. And of course all living things are gnarly, in that they inevitably do things that are much more complex than one might have expected. The shapes of tree branches are the standard example of gnarl. The life cycle of a jellyfish is way gnarly. The wild three-dimensional paths that a humming-bird sweeps out are kind of gnarly too, and, if the truth be told, your ears are gnarly as well.

I’m a writer first and foremost, but for most of my life I had a day-job as a professor, first in mathematics and then in computer science. I’ve spent the last twenty years in the dark Satanic mills of Silicon Valley. Originally I thought I was going there as a kind of literary lark — like an overbold William Blake manning a loom in Manchester. But eventually I went native on the story. It changed the way I think. I drank the Kool-Aid.

I derived the technical notion of gnarl from the work of Stephen Wolfram, best-known for his ground-breaking book, *A New Kind of Science*. I first met Wolfram in 1984, when researching a popular-science article for *Isaac Asimov’s Science Fiction*

Magazine. He made a big impression on me, in fact it's thanks to him I sought work as a computer science.

Simplifying a bit, we can say that Wolfram distinguishes among three kinds of processes:

- *Too cold*. Processes that are utterly predictable. This may be because they die out and become constant, or because they're repetitive in some way.
- *Too hot*. Processes that are completely random-looking.
- *Just right*. Processes that are structured in interesting ways but nonetheless unpredictable.

This third zone is what I call *gnarly*. Gnarl isn't a word that other computer scientists use at this time, but I'm expecting my usage to become more popular with the publication of my nonfiction book *The Lifebox, the Seashell, and the Soul: What Gnarly Computation Taught Me About Ultimate Reality, the Meaning of Life, and How To Be Happy*.

Gnarliness lies between predictability and randomness. It's an interface phenomenon like organic life, poised between crystalline order and messy deliquescence.

Although gnarly is a transitional zone, it's not necessarily narrow. I'm going to find it useful to distinguish between *low gnarl* and *high gnarl*. Low gnarl is close to being periodic and predictable, while high gnarl is closer to being fully random.

Literature

So what does gnarl have to do with literature in general, and science fiction in particular?

I'll begin by presenting four tables that summarize how gnarliness makes its way into literature in four areas: subject matter, plot, genre tropes, and social commentary. For me, tables are a tool for thinking. I figure out some column headers and row topics, and then, *wham*, I've got all these nice cells to fill. Let me warn you that you need to take my tables with a grain of salt. They're Procrustean beds. In Greek myth, Procrustes was a bandit masquerading as an inn-keeper. He said he had a wonderful bed that would fit you perfectly, no matter what your size. The catch was, if you were too short for the bed, Procrustes would stretch you on the rack, and if you were too tall, he'd lop off your head or your feet. Filling the cells of a table always involves a certain amount of Procrustean fine-tuning.

(a) *Subject matter and transrealism.* Regarding the kinds of characters and situations that you can write about, my sense is that we have a four-fold spectrum of possible modes: simple genre writing with stock characters, mimetic realism, the heightened kind of realism that I call transrealism, and full-on fabulation. Both realism and transrealism lie in the gnarly zone. Speaking specifically in terms of subject matter, I'd be inclined to say that transrealism is gnarlier, as it allows for more possibilities.

| | | | |
|-------------------|-----------------|-----------------|-------------------|
| <i>Complexity</i> | <i>Literary</i> | <i>Examples</i> | <i>Techniques</i> |
|-------------------|-----------------|-----------------|-------------------|

| | | | |
|---|--------------|---|-----------------------------|
| <i>Level</i> | <i>Style</i> | | |
| <i>Predictable</i> <i>(Too cold)</i> | Genre | Standard fantasy, SF, romance. Most TV and Film. Second-hand experience. | Modeled on books and films. |
| <i>Low gnarl</i> | Realism | John Updike, Anne Tyler, memoirs | Modeled on observed world. |
| <i>High gnarl</i> | Transrealism | <i>Ulysses</i> , New Journalism, Beat lit, Sheckley, Dick, Rucker | Realism + transcendence |
| <i>Random</i> <i>(Too hot)</i> | Fabulation | Magic realism, Hard SF, Lewis Carroll | Transcendence |

(b) *Plot and emergence.* With respect to plot structures, I see a similar four-fold division. At the low end of complexity, we have standardized plots, at the high end, we have no large-scale plot at all, and in between we have the gnarly somewhat unpredictable plots. These can be found in two kinds of ways, either my mimicking reality precisely, or by fitting reality into a classic monomythic kind of plot structure. It's debatable whether the brute oddity of real events is or is not gnarlier than the events that occur in novels. Is truth stranger than fiction? My sense is that in fact transreal fiction is at least more computationally complex due to the interaction between reality, fantasy, and the trellis of a classic plot structure such as the monomyth.

| | | | |
|-------------------|-----------------|------------------------|-------------------|
| <i>Complexity</i> | <i>Literary</i> | <i>Characteristics</i> | <i>Techniques</i> |
|-------------------|-----------------|------------------------|-------------------|

| <i>Level</i> | <i>Style</i> | | |
|---|----------------|--|--|
| <i>Predictable</i> <i>(Too cold)</i> | Cookie-cutter | A plot very obviously modeled to a traditional pattern. | Monomyth |
| <i>Low gnarl</i> | Roman à clef | A plot modeled directly on reality, with the odd and somewhat senseless twists that actually occur in the real world. | Realism |
| <i>High gnarl</i> | Emergent plot. | A plot modeled on reality as grafted onto traditional story patterns. The reality acts on the story pattern to create unpredictable situations that the author tweaks so as to express subtext and subtle mental states. | Realism + monomyth |
| <i>Random</i> <i>(Too hot)</i> | Surrealism | Completely arbitrary events occur. (This is actually hard to do, as the subconscious, for instance, isn't all that random.) | Dreams, subconscious or, an external randomizer. |

(c) *Genre tropes and thought experiments.* Turning to the scientific ideas that go into science fiction or the magical accoutrements that make their way into fantasy, I can distinguish four ways of incorporating these kinds of ideas.

| <i>Complexity Level</i> | <i>Style of Scientific Speculation</i> | <i>Characteristics</i> | <i>Techniques</i> |
|-------------------------------|---|--|---|
| <i>Predictable (Too cold)</i> | Rote | Received ideas of science and magic, used with no deep understanding on the part of the author. | Cut and paste. |
| <i>Low gnarl</i> | Tendentious | Exact but pedagogic science, niggling and overly detailed magic. Emphasis on limits rather than possibilities. | Modeled on known science or received ideas about magic, treated in a <i>limitative</i> fashion. |
| <i>High gnarl</i> | Surprising and creative thought experiments | Science and magic that makes you go <i>aha</i> . Rigorously working out the consequences of crazy ideas. | Thought experiments leading to new science. |
| <i>Random (Too hot)</i> | Irrational | Anything goes. | Abandoning logic. |

(d) *Social commentary*. When we look at how a novel treats of existing social trends we can again distinguish four levels.

| <i>Complexity Level</i> | <i>Style of Commentary</i> | <i>Characteristics</i> | <i>Examples</i> |
|-------------------------------|--|--|--|
| <i>Predictable (Too cold)</i> | Humorless propaganda for the status quo. | Parroting and advocating existing power structures with a complete lack of awareness. Sleep-walking. | <i>Star Trek.</i> |
| <i>Low gnarl</i> | Comedy | Noticing that existing social trends lead to contradictions and absurdities. | Pohl and Kornbluth's <i>The Space Merchants.</i> |
| <i>High gnarl</i> | Satire | Force-growing social trends into completely mad yet rigorously logical environments. | The work of Robert Sheckley and Philip K. Dick. |
| <i>Random (Too hot)</i> | Jape, parody, sophomoric humor | Everything's a joke, general silliness. | Douglas Adams, Ron Goulart. |

This all bears further discussion. In the following four sections, I'll discuss the gnarly notions of transrealism, emergent plot, thought experiments, and satire that I've introduced via my four tables. But, in the interest of brevity, I'm not going to go into a line-by-line discussion of the tables. At the very fine level you might best think of the

tables as springboards for further discussion and thought.

Transrealism

Early in my writing career, my friend Gregory Gibson said something like, “It would be great to write science fiction and have it be about your everyday life.” I took that to heart. Also Philip K. Dick was an inspiration here. I seem to recall that the flap copy of a British edition of *A Scanner Darkly* that I read at Brighton Seacon in 1979 referred to the book as “transcendental autobiography.”

In 1983 I published an essay, “A Transrealist Manifesto,” in the *SFWA Bulletin* [reprinted in my anthology *Seek!*, also available on my web site]. I don’t remember exactly why I wrote this article. Perhaps I was inspired by the inflammatory style of Bruce Sterling’s zine *Cheap Truth*. And certainly I had a beef: although I was starting to get some novels published, I was having a lot of trouble selling my short stories. (It’s my impression that science fiction magazine editors are a *lot* more conservative than science fiction book publishers.) Like any young artist’s manifesto, mine was designed to announce that my style of doing things was the One True Way — or at least a legitimate way of creating art.

Quite simply, transrealism is *trans* plus *realism*, a synthesis between fantastic fabulation (trans) and closely observed character-driven fiction (realism):

- *Trans*. Use the SF and fantasy tropes to express deep psychic archetypes. Put in science-fictional events or technologies which reflect deeper aspects of people and society. Manipulate subtext.

- *Realism*. Possibly include a main character similar to yourself and, in any case, base your characters on real people you know, or on combinations of them. To this end, have your characters be realistically neurotic — after all, there really *aren't* any “normal well-adjusted” people. Don't glorify the main character by making him or her unrealistically powerful, wise, or balanced. And the flip-side of that is to humanize the villains .

Here, for handy reference, is a list of my most fully transreal works, which are those featuring a character modeled in some way on me.

| | Transreal Series | “My” name | Period of my life: |
|---|--------------------------------|------------------|---------------------------|
| 1 | <i>The Secret of Life</i> | “Conrad Bunger” | 62 - 67 |
| 2 | <i>Spacetime Donuts</i> | “Vernor Maxwell” | 67 - 72 |
| 3 | <i>White Light</i> | “Felix Rayman” | 72 - 78 |
| 4 | <i>The Sex Sphere</i> | “Alwin Bitter” | 78 - 80 |
| | “Killeville” short stories | Various | 80 - 86 |
| 5 | <i>The Hacker and the Ants</i> | “Jerzy Rugby” | 86 - 92 |
| 6 | <i>Saucer Wisdom</i> | “Rudy Rucker” | 92 - 97 |

By the way, in hopes of selling to a larger market, and with my blessing, Tor Books marketed *Saucer Wisdom* as a non-fiction book of futurology. But I think it's more accurate to call the book a novel — in somewhat the same sense that Vladimir Nabokov's *Pale Fire* is a novel and not a long poem with annotations.

Being the great-great-great-grandson of the philosopher Georg Hegel, I have a genetic predisposition for programmatic dialectic thinking. As I discussed in my 1986 essay, “What is Cyberpunk?” (reprinted in *Seek!*) we can also parse cyberpunk as a synthesizing form.

- *Cyber*. Discuss the ongoing global merger between humans and machines.
- *Punk*. Have the people be quite non-robotic; have them be interested in sex, drugs, and rock’n’roll. While you’re at it make the robots funky as well! Get in there and spray graffiti all over the corporate future.

One shared feature of cyberpunk and my transrealist novels is that here we commonly find populist anti-authoritarian politics.

Would it be abstractly possible to create right-wing, militaristic cyberpunk or transrealism?

I’m not sure one really could write a right-wing transreal novel. To achieve true realism and to then transform it, one needs to be sensitive enough to the way things *are* (as opposed to how they “*should*” be). To see other people in a fully realistic way entails having a lively sympathy for other people, which would seem in turn to entail a liberal egalitarianism.

But maybe right-wing literature is possible in the cyberpunk genre — one has only to think of the more plodding and derivative science-fiction films. Indeed, the Terminator himself has come out as a Republican. The punks, after all, can be depicted

as common criminals instead of as revolutionary freedom fighters.

Although I remain a transrealist, my practice of transrealism has changed somewhat over the years.

I no longer think that I have to go whole hog with transrealism and cast my friends and family into my books. I think they got a little tired of it. For awhile there, I was like Ingmar Bergman, continually making movies with the same little troupe of actors/family/friends.

Over the years, I've gained enough writerly craft to start using characters who are assembled from bits and pieces of the real world — without being a particularly close match for any one person. These days I'm more likely to collage together a variety of observed traits to make my characters. Like a magpie gathering up bright scraps for a nest. One way to gather scraps for characters is to jot down gestures and remarks that you see or hear on the street. This is the method that Jack Kerouac called "sketching". And sometimes I even let myself make things up out of whole cloth.

Earlier in my career, it seemed important to put a character like me into my novels, and to immediately depict the people around me. This is due in part to a young writer's egotism — what could be more important than one's own personal experience!

As Robert Sheckley remarked in his preface to my story collection *Transreal!*: "A writer's first problem is how to write. His second is how to write a story. His third is how to write about himself." (p. xiv).

I no longer feel as strong an urge to directly depict myself in my fiction. But even without a specifically Rudoid character, my books can be transreal. My Ware novels are

full of refracted images of my life when I was writing them, as John Roche points out in “Beat Zen, Alien Zen: Varieties of Transreal Experience in Rudy Rucker’s Ware Novels.” Although there’s nothing of present-day California in *As Above, So Below*, my historical novel about Peter Bruegel, I came to identify so deeply with Bruegel that I put very much of myself into his character depiction. And the same thing happened when I represented Edgar Allan Poe in my alternate history *The Hollow Earth*.

Although my recent novel *Spaceland* was transreally based on life in Silicon Valley, I went ahead and made the main character Joe Cube quite unlike me — I made him a not-too-bright middle-manager. Since the action of the book involves having Joe explore higher dimensions, I thought that the reader might find it more congenial to have Joe be non-mathematical, so as better to mirror the puzzlement that the reader might feel.

My epic quest novel *Frek and the Elixir* would seem to be a complete fabrication: it’s set in the year 3003 and involves travel to utterly alien worlds. But Frek’s hometown is transreally modeled on the town of Lynchburg, Virginia, where I raised my children, and Frek himself includes elements of my own childhood memories as well as images of my son. Frek’s personal difficulties with his father mirror both my own relations with my father and my son’s relations with me. And the political subtext of the book is a direct expression of my feelings about Y2K America.

My work in progress *Mathematicians In Love* is set once again the contemporary Bay Area of California, and my main characters are young mathematicians incorporating many characteristics of people I’ve known. The main character shares much of my sensibility, but his life experiences are quite different from mine.

One practical reason for no longer putting my life into my books has to do with

something John Updike talks about: a writer's problem of bit-by-bit using up his or her past. And it may be that as I get older, the more recent parts of my life become less interesting to describe — or in any case less interesting to my youngish target audience.

In any case, the point is that you can write transreally without overtly using your own life or specific people that you know. Even without having any characters who are particularly like yourself, you can write closely observed works about your own life experiences. And if you're transmuting these experiences with the alchemy of science fiction, the result is transreal. So I might restate the principles of transrealism like this.

- *Trans.* The author raises the action to a higher level by infusing magic or weird science, choosing tropes so as best to intensify and augment some artistically chosen aspects of reality. Trans might variously stand for transfigurative, transformative, transcendental, transgressive, or transsexual.
- *Realism.* The author uses real-world ideas, emotions, perceptions that he or she has personally experienced or witnessed.

Even if we drop the autobiographical element, thanks to the *trans* component, transrealism remains something more than character-driven realistic SF or fantasy.

To this point, in his afterword to his greatest transreal novel, *A Scanner Darkly*, Philip K. Dick says something to the effect that, rather than being any of the characters in the novel, he, Phil, is the *novel itself*. "I myself, I am not a character in this novel; I am the novel." (p. 222).

Thinking of Philip K. Dick brings a caveat to mind. A transrealist author really

does need to model most of his characters upon observations of people *other* than himself or herself. For in Philip K. Dick's less successful novels, such as *A Crack In Space*, there is a tendency for quite a few of the male characters to of a similar type: gloomy, self-doubting, and easily cowed by authorities or by powerful women. One supposes that these might all be images of Phil himself. A book with too many examples of the same kind of character feels airless.

Plot

I used to maintain that it was better not to plot my novels in advance. But maybe I was just making a virtue of a vice. I denigrated plot outlines because I didn't like working on them, preferring to jump right into the writing.

One might defend the practice of not having a precise outline by speaking in terms of the gnarl. To wit, a characteristic feature of any complex process is that you can't look at what's going on today and immediately deduce what will be happening in a few weeks. It's necessary to have the world run step-by-step through the intervening ticks of time. Gnarly computations are unpredictable; they don't allow for short-cuts. In other words, the last chapter of a novel with a gnarly plot is, even in principle, unpredictable from the contents of the first chapter. You have to write the whole novel in order to discover what happens in the last chapter.

This said, I've also learned that if I start writing a novel with no plot outline at all, two things happen. First of all, the readers can tell. Some will be charmed by the spontaneity, but some will complain that the book feels improvised, like a shaggy-dog story. Second, if I'm working without a plot outline, I'm going to experience some really

painful and anxious days when everything seems broken, and I have no idea how to proceed. I've heard Sheckley refer to these periods in the compositional process as "black points." Writing an outline makes it easier on me. Perhaps it's a matter of mature craftsmanship versus youthful passion.

These days, even before I start writing a new book, I create an accompanying notes document in which I accumulate outlines, scene sketches and the like. These documents end up being very nearly as long as my books, and when the book comes out, I usually post the corresponding notes document online for perusal by those few who are very particularly interested in that book or in my working methods. (Links to these notes documents and some of my essays on writing can be found at www.rudyrucker.com/writing.)

Even with an outline, I can't be quite sure about the twists and turns my story will take. How precise, after all, is an outline? Or, as William Burroughs used to say: How closely can a map correspond to the territory?

Regarding the outline, I think of a novel's structure as breaking into four increasingly fine levels: parts, chapters, scenes, and actions. I start with a story arc, describing how the parts fit together. I break the parts into chapters and outline the chapters one by one. As I work on a chapter's outline, I break it into scenes, trying to outline the individual scenes themselves. But as for the actions that make up a scene, more often than not I simply visualize these and describe what I "see."

The outline changes as I work. Sh*t happens. After writing each scene in a given chapter, I find that I have to go back and revise the outlines of the remaining scenes of the chapter. And after finishing a chapter, I have to go back and revise the outlines of the

chapters to come. In the end, only the novel itself is the perfect outline of the novel.

Only the territory itself can be the perfect map. In this connection, I think of Jorge Luis Borges's one-paragraph fiction, "On Exactitude in Science," that contains this sentence: "In time, those Unconscionable Maps no longer satisfied, and the Cartographers Guilds struck a Map of the Empire whose size was that of the Empire, and which coincided point for point with it." (*Collected Fictions*, p. 225).

My point is that, whether or not you write an outline, in practice, the only way to discover the ending of a truly living book is to set yourself in motion and think constantly about the novel for months or years, writing all the while. The characters and tropes and social situations bounce off each other like eddies in a turbulent wakes, like gliders in a cellular automaton simulation, like vines twisting around each other in a jungle. And only time will tell just how the story ends. Gnarly plotting means there are no perfectly predictive short-cuts.

This said, I really have come to feel that it's not a bad idea to select in advance an armature of plot structure. The detailed eddies will indeed have to work themselves out during the writing, but there's no harm in having some sluices and gutters to guide the flow of the story along a harmonious and satisfying course.

Thought Experiments

There's a core of classic SF and fantasy ideas that I think of as "power chords" — the equivalent of heavy musical riffs that people instantly respond to. A more formal word for these is, of course, tropes.

Fiction in general has its own tropes, such as the unwed mother, the cruel father,

the buried treasure, and the midnight phone call. Some examples of specifically SFictional power chords are: Blaster guns, spaceships, time machines, aliens, telepathy, flying saucers, warped space, faster-than-light travel, holograms, immersive virtual reality, robots, teleportation, endless shrinking, levitation, antigravity, generation starships, ecodisaster, blowing up Earth, pleasure-center zappers, mind viruses, the attack of the giant ants, and the fourth dimension. (I analyze these at some length in my 1985 essay, "What SF Writers Want," reprinted in *Seek!*).

And one could readily work out a set of fantasy power chords as well.

I call it a science-fictional "thought experiment" when an author either makes up a brand-new power chord or extensively works out some of the consequences of an older power chord. I got the expression from the writings of Albert Einstein, where he sometimes talks about science-fictional "*Gedankenexperimenten*." Not that SF writing needs any justification, but it's nice to be able to use this expression when discussing our field with more sober-sided types.

It's interesting to analyze why fictional thought experiments are so powerful. The reason is that, in practice, it's intractably difficult to visualize the side effects of new technological developments. Only if you place the new tech into a fleshed-out fictional world and simulate the effects on reality can you get a clear image of what might happen.

This relates to, once again, the notion of unpredictability. As I discuss in *The Lifebox, the Seashell, and the Soul*, we can't predict in advance the outcomes of complex gnarly systems, although we can simulate (with great effort) their evolution step by step.

When it comes to futurology, only the most trivial changes to reality have easily predictable consequences. If I want to imagine what our world will be like one year after

the arrival of, say, soft plastic robots, the only way to get a realistic vision is to fictionally simulate society's reactions during the intervening year.

Science fictional simulation is the correct way to do futurology. The consultants of The Global Business Network, for instance, garner consulting fees from big businesses for helping them to try and create little SF-like scenarios.

Where to find material for thought experiments? Certainly you don't have to be a scientist. As Kurt Vonnegut used to remark, most science fiction writers don't know much about science. But SF writers have an ability to pick out some odd new notion and "set up the thought experiment." New material is everywhere around us, but only SF writers know how to use it. Quoting Sheckley's introduction to *Transreal!* once again, "At the heart of it all is a rage to extrapolate. Excuse me, shall I extrapolate that for you? Won't take a jiffy ..." p. xvi.

The most entertaining fantasy and SF writers have a rage to extrapolate; a zest for seeking the gnarl.

Satire

Finally I want to make some remarks about humor. Just the other day I wrote these lines in my work in progress, *Mathematicians in Love*, which is narrated by a Rudy-like character.

"I tend to tell my life story as if everything were funny, even though it's not. But I'm not actually a cheerful person.

"Given: the world is absurd. Do we laugh or do we cry? My bent

is to laugh; it feels better. But sometimes laughter loses and brutality wins. Sometimes there's nothing left but tears."

I'm always uncomfortable when I'm described as a science-fiction humorist. I'm not trying to be funny in my work. It's just that things often happen to come out sounding funny when I tell them the way I see them.

One source of humor is when someone shows us notice an incongruity or inconsistency in our supposedly smooth-running society. We experience a release of tension when someone points out the glitch to us. Something was off-kilter, and now we can see what it was. The elephant in the living-room has been named. The evil spirit has been incanted.

The least aware kinds of literature take society entirely at face value, numbly acquiescing in the myths and mores laid down by the powerful. These forms are dead, too cold.

At the other extreme, we have the too hot forms of social commentary where everything under the sun becomes questionable and a subject for mockery. Although I admire the craftsmanship of Douglas Adams, I always found his work too silly to be engaging. If everything's a joke, then nothing matters.

In the gnarly zone, we have fiction that extrapolates social conventions to the point where the inherent contradictions become overt enough to provoke the shock of recognition and the concomitant release of laughter. At the low end of this gnarly zone we have observational commentary on the order of stand-up comedy. And at the higher end we get inspired lunacy.

Gnarl Theory?

During my brief foray into academic literary criticism, I learned that it's common for papers to center around some underlying theory, and to view the works as illustrations of the theory. I'd like to propose putting into service the new theory of universal automatism and computational complexity, as explained in Wolfram's *A New Kind of Science* and in my *The Lifebox, the Seashell, and the Soul*. Call it gnarl theory. The exercise would then be to examine works in terms of their position on the order-to-disorder axis. This could be quite productive.

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Wetware, Avon Books, New York 1988, Avon Books, New York 1997.

Freeware, Avon Books, New York 1997.

Realware, Avon Books, New York 2000.

Other SF Novels

Master of Space and Time, Bluejay Books, New York 1984, Baen Books, New York 1985, Thunder's Mouth Press, New York 2005.

The Hollow Earth, William Morrow & Co., New York 1990, Avon Books, New York 1992.

Spaceland, Tor Books, New York 2002.

Frek and the Elixir, Tor Books, New York 2004.

Mathematicians in Love, in progress.

Historical Novel

As Above, So Below: A Novel of Peter Bruegel, Tor Books, New York 2002.

Collections

Light Fuse and Get Away, poems, Carp Press, Lynchburg VA, 1983.

The Fifty-Seventh Franz Kafka, stories, Ace Books, New York 1983.

Transreal!, collection of fiction and nonfiction, WCS Books, Englewood Colorado 1991.

Seek!, selected non-fiction, Four Walls Eight Windows, New York 1999.

Gnarl!, collected stories, Four Walls Eight Windows, New York 2000.

Memoir

All The Visions, Ocean View Books, Mountain View CA 1991.

Books Edited

Speculations on the Fourth Dimension: Selected Writings of Charles Howard

Hinton, Dover, New York 1983.

Mathenauts: Tales of Mathematical Wonder, Arbor House, New York 1987.

Semiotext(e) SF, Semiotext(e), New York 1989, (with Peter Wilson and Robert Anton Wilson).

MONDO 2000: A User's Guide to the New Edge, HarperCollins, New York 1992,
(with R.U.Sirius and Queen Mu).