XIV.

Negative Capability (1990)

I can talk to you (says the Toad.) I came to snatch you from the abyss. Those who call themselves your friends, smitten with consternation, stare at you whenever they meet your pale and stooping figure at the theatre, in public places, in churches, or squeezing between your two sinewy thighs that horse who only gallops by night, bearing his phantom master swathed in a long black cloak. Abandon those thoughts which make your heart empty as a desert ... .

— Lautréamont: *Les Chants de Maldoror*

I was limply poking about in the garbage saying probably, for at that age I must still have been capable of general ideas, This is life.

— Samuel Beckett: *Molloy*.

—404—

Epiphany (1989)

The Canyon Center is (or was — I won't go back to look) a large office complex at the corner of Ninth Street (N/S) and Canyon Boulevard (E/W) on the west end of downtown Boulder. It faced Ninth, and behind it lay a plaza, a parking lot, and a rabbit warren of townhouses and condominiums that disappeared from sight into the west. The Center proper consisted of three pieces: a smaller chunk which held a few small shops but mainly comprised a large open office space filled with cubicles inhabited, in the days when I knew the place, by a vipers' nest of penny stockbrokers; a larger chunk in which a variety of businesses hung their assorted shingles; and a detached low building in the plaza, which at the time was occupied by a restaurant.

I worked here for a season in the evenings, from six until nine or ten. I generally cleaned the first building by myself. There was another guy who worked with me, but he had a much more relaxed attitude toward the job, and tended to get there later than I did. As always when I worked as a janitor I arrived on time or if possible early, started immediately, and moved as fast as lightning until I was done, because I hated the work and wanted it to be over with as quickly as possible. — The devolution of tolerance for cigarettes had progressed far enough that I could no longer smoke while working, however, a serious drawback, and so I usually paused for a few minutes on the pedestrian bridge while crossing from one building to the other on the second story to get a quick fix before continuing. Sometimes I took a moment to read the *Wall Street Journal*, which I fished out of the trash in one office and perused rapidly before handing it over to a lawyer who worked late on the other side and was too cheap to buy it for himself. — These were still the Eighties, after all; I felt I should participate, if only vicariously, in the Decade of Greed.

The *Journal* was a curious mixture of useful information and unbalanced opinion. Thus I learned on one page that in a competitive experiment comparing the advice of an assortment of professional stock-pickers the control, darts thrown at a board, had won, and on another that Michael Milken deserved to make half a billion dollars a year because he got up to go to work at four every morning. Since I slept three hours between jobs, went to work again at two, and made six hundred a month, I felt there must be some flaw in this argument, but was too tired to discover it.

One evening as I stood smoking in an exhausted stupor on the bridge a young couple came in off the street and walked beneath me toward the restaurant, holding hands, animated, laughing gaily as they crossed the plaza toward their dinner date.

And here was the epiphany.

I didn't think quite so cinematically in those days, but nonetheless I could *feel* the crane shot that would reveal this tableaux, the camera rising up behind me to frame me in the foreground, leaning on my broom burnt out and desperate with a cigarette in my hand, gazing down — O bitter irony — on this happy couple below as they danced without a care into a dinner at this restaurant I could never afford. — Here suddenly I understood what I had always repressed before, that the life of the city went on without the slightest concern for me and the social class to which I now belonged. That there were two kinds of people, the people who went to the party and the people who cleaned up afterwards, the Eloi and the Morlocks, and that I had now become one of the lesser of the latter, the merest Wog. That it would never get better for me, that it would only get worse. That the bright lights, the parties, the drugs, the drink, the laughter, the romantic entanglements, were all for others, not for me. That the society I found myself among would never rest until it had clubbed me to death, because I was a cull, a reject, one who had been cast aside, and the end they desired was that I should die in the gutter.

And I shrugged, because I didn't have time to care what those assholes wanted. — I finished the cigarette, littered the pavement beneath me with the smoldering butt, and moved on to the next building. — *Was mich nicht umbringt, macht mich starker*. — I felt now I could crush rocks with my bare hands.

—405—

Negative capability

> I have not as yet been able to deduce from phenomena the reason for these properties of gravity, and I do not feign hypotheses. ... it is enough that gravity should really exist and should act according to the laws that we have set forth and should suffice for all the motions of the heavenly bodies and of our sea.
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> — Isaac Newton: *General Scholium* to the *Principia Mathematica*.
>
> It is the way of bound minds to prefer *any explanation* to none: in this they are easily satisfied. High culture demands that some things should be left unexplained: (inserts the Greek for 'I withhold judgment')."
>
> — Nietzsche: *Early Notebooks* 19 (107)

I don't recall many evenings I spent in Fleming House that could be characterized as pleasurable. I remember the best meal I ever had there, for instance — a total accident: I slept through dinner, woke just in time to get into the kitchen before it closed, after everyone else had eaten and left, and got an entire apple pie and a pot of coffee from the cooks. Even they couldn't fuck that up. I never ate so well.

I also remember another when I got very stoned, stumbled back to my room, and read "The Eve of St. Agnes" in an extremely receptive state. This was one of the most profound aesthetic experiences of my life;[1] right up there with seeing Jeff Beck live at the old Shrine Auditorium and the moment when I realized why the Schrödinger equation said that the Hamiltonian was the infinitesimal generator of time translations and scrawled the words of Faust in the margin of the book that presented this revelation, "Was he a god, who wrote these signs?"[2] — Subsequently I viewed Keats with a sort of reverential awe, and figured he and Yeats, among the modern poets whom I knew and understood, had the greatest power over the language. Had he lived, I thought, he might have rivaled Milton.

—ii—

Keats was also remarkable for having made, by way of careless aside, a rather deep contribution to the philosophy of science. I refer to the famous letter he sent his brothers (George and Thomas, 21 December 1817), in which he described a conversation with his friend Dilke in which, he said, "it struck me what quality went to form a Man of Achievement, especially in literature, and which Shakespeare possessed so enormously—I mean Negative Capability, that is, when a man is capable of being in uncertainties, mysteries, doubts, without any irritable reaching after fact and reason ... with a great poet the sense of Beauty overcomes every other consideration... ."[3] — This referred specifically to Coleridge, whom Keats thought had a pernicious tendency to overthink everything, but more generally is

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[1] You must bear in mind my usual custom when in this condition was to do something like read a three-foot stack of Marvel comics. How Keats supplanted *Nick Fury, Agent of SHIELD* on this occasion I have no idea.

[2] "War es ein Gott, der diese Zeichen schrieb." — Which signs disclose, furthermore, the hidden powers of Nature. — Exactly.

[3] Grant F. Scott (editor), *Selected Letters of John Keats*. Cambridge: Harvard University Press, 1958; pp. 60-61.

perhaps supposed to represent an appeal to intuition over reason.[4] — Which seems unlikely, because Keats had such a wonderfully clear head.

No, what Keats means is something different, as the reference to Shakespeare must indicate. — What Shakespeare could do, better than anyone before or since, was to invent characters completely true to life. And life, as we know it, is always unfinished, a snapshot captured in medias res; our state of knowledge is always incomplete; what Hamlet is doing is obviously true to Nature, but still mysterious, in that it doesn't make sense to us and *it doesn't have to*. Because in real life complete understanding always eludes us. — And the process of understanding is not *linear*: you often have to move forward and hope to resolve apparent paradoxes later. Not because explanation is impossible in principle, but because you must recognize that there are limits to your own knowledge and powers and the reasonable span of your attention, and whatever the real explanation is, for the moment you can't provide it. You must be willing to settle for partial solutions to your problems, because everything can't be finished at once. — So what is truly realistic in the description of character is the unanticipated, the inexplicable; the element of surprise. Because (if you want to put it that way) any human being is a black box with many hidden degrees of freedom. What makes Hamlet seem so real is his undetermined parameters. He presents more questions than answers.

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Again, because art is often better served by leaving something out — is even occasionally so defined, see Michelangelo on sculpture — the *lack* of an explanation is often more provocative: cf., e.g., the choice between the Lady and the Tiger, the contents of the briefcase in *Pulp*

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[4] I have no idea what the accepted theory is, though I have read several "explanations" of this passage which have absolutely nothing to do with what Keats intended.

Fiction,[5] the nature of its original, the Great Whatsit in *Kiss Me, Deadly*, who is is telling the truth in *Rashomon*, whether in *Point Blank* Lee Marvin is alive or dead,[6] what the Monolith was "really" doing in *2001: A Space Odyssey*;[7] and so on. Here you don't deny the possibility of a continuation, a resolution of the narrative; you simply recognize that that it is the *choice* that is interesting, not the selection.

—iv—

Wittgenstein notoriously expressed a similar principle as "Wovon man nicht sprechen kann, darüber muss man schweigen" but his picture of language and what could be expressed in it was static, Parmenidean. The point here is Heraclitean: if it isn't possible to say anything that makes sense — that *adds* anything — then the artistically satisfying choice is to say nothing at all. — But everything is flux, and another story may be told later.

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In Hitchcock — setting aside the famous explanation to Truffaut of the MacGuffin, which shows he understood the principle quite as well as Keats did — a perfect illustration is the central mystery of *The Birds*: why do they suddenly want to kill everybody? — In the innumerable scifi movies modeled on this (and upon which of course this was modeled), someone in a white lab coat makes an entrance at the

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[5] About this, incidentally, Ebert admitted he did ask Tarantino, who said — no great surprise — he didn't know himself, and it didn't matter. — Precisely.

[6] Steven Soderbergh, whose *The Limey* was a somewhat less ambiguous homage, interviewed John Boorman for the DVD edition of *Point Blank*, and of course Boorman said the same as Tarantino, i.e., Who cares? — One should note however that what could be called the Avenger/Revenge genre is deliberately ambiguous on this point: Edmond Dantes escapes the Chateau D'If only by being hurled into the sea in a burial shroud; Uma Thurman in *Kill Bill* is shot and effectively killed before she awakes miraculously from a coma; the protagonist of *The Crow* is literally an avenger returned from the grave; etc.

[7] Arthur Clarke, of course, less gifted with negative capability than Kubrick, wrote several unconvincing sequels to "explain" what it all meant.

appropriate expository moment, waves a magic wand — Radioactivity! — later: DNA! now trending toward: Quantum Entanglement! — and Explains It All, in a fashion so absurdly vacuous that cultists later claim it is some kind of deliberate joke; though in truth screenwriters facing deadlines and running low on drugs rarely have the luxury of self-conscious postmodernism.

Hitchcock, however, scoffs at such irritable reaching after fact and reason.[8] — The Birds are malevolent. There may be a reason, but it isn't one we could understand. It suffices (Gloucester) that

> As flies to wanton boys are we to the gods,
> They kill us for their sport.

—vi—

But the most striking examples don't come from literature or film but the history of science.

Consider Copernicus, for instance. The modern reading of history completely trivializes how radical his system was; how absurd his ideas seemed. He threw out the Ptolemaic system of crystalline celestial spheres, which made a certain sort of sense and was internally consistent, and replaced it with another such system which didn't and was not. He raised questions he had to ignore because he had no answers for them: if the Earth revolves around the Sun, why don't we feel the motion? Why when I jump into the air on a moving planet do I land in the same place? If the Earth rotates about its axis then why isn't there a thousand-mile-an-hour wind at the equator? Why (if the world is really round) should bodies fall toward the center of the Earth, if it isn't the center of the universe? Shouldn't everything be falling toward the Sun instead? (What is the meaning of "down"?)

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[8] Indeed makes deliberate fun of these speeches in *North By Northwest*, when the Professor's long-delayed explanation to Cary Grant of what has actually been going on is drowned out by engine noise as they cross the airfield.

It is all too easy to make fun of the way the analysts of the period between the wars would have treated these questions: to say that "the Earth moves" is a simple category mistake, it is meaningless, what Moore would have called a howler — as follows from the logical grammar of "move", this simply isn't how the word is used. For when I walk to the grocery and back, e.g., my house is in the same place that I left it, it hasn't moved 67,000 miles in the intervening hour. And the counterargument that everything moves in unison and only relative motions can be observed is prima facie absurd, easily eliminated by Occam's Razor. — Moreover (anticipating assertions Copernicus didn't have the nerve to make) the objects we observe in the heavens are not physical bodies, because the same predicates do not apply to them: a star has a position on the celestial sphere and therefore can be located by providing two angles, but it does not have a *distance* (the absence of observable parallax proves that);[9] let alone a weight, degrees of heat and cold, an odor, a back side (the question "what does Sirius look like from the other side?" was manifestly meaningless) (here insert the embarrassing fact that we always see the same face of the Moon), etc. (One might say "Doubt thou the stars are fire" before even "Doubt that the sun doth move", but technically this too is a mistake, because they *cannot be* hot to the touch — they cannot be touched at all.) — If you examine the arguments his opponents made against Galileo, they are quite like the arguments Wittgenstein's disciples made against the idea that a machine could think: you simply aren't allowed to talk like that.

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[9] The effect was not observed until the 19th century. The apparent movement of the nearest star from one end of the Earth's orbit to the other is less than a second of arc, 1/3600 of a degree. (In fact the arc-second defines the parsec, a bit more than three light-years. Proxima Centauri, the nearest star, is more than four light-years away.)

Which probably explains why the character of Simplicio in the *Dialogue Concerning the Two Chief World Systems* (1632) sounds so much like an ordinary language philosopher, though the really telling exchange occurs when Sagredo remarks to Galileo's mouthpiece Salviati his astonishment that the heliocentric system (he attributes it to the Pythagoreans) was passed over in favor of the Ptolemaic, and Salviati insists that he is amazed at just the opposite — "I repeat," he says, "there is no limit to my astonishment when I reflect that Aristarchus and Copernicus were able to make reason so conquer sense that, in defiance of the latter, the former became mistress of their belief."[10]

But what is he talking about here? — Negative capability.

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There is also an art of omission in scientific hypothesis, in other words. We advance in a state of partial knowledge, and must accept that we can't explain everything at once, that therefore there is an art to deciding what should be left out. And this represents an essentially *aesthetic* choice.

The Copernican hypothesis could only make sense after Galileo discovered inertia and Newton found the law of gravity. But Copernicus knew nothing of these, and had to make a blind leap into the unknown, following his intuition and his sense of taste.

—ix—

Two principles that are often said to govern the formation of hypotheses are those of Occam and Popper. Occam says that one ought not to multiply entities unnecessarily, and thus the least

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[10] Stillman Drake translation. — Feyerabend laid great stress on this passage in *Against Method*. Obviously.

hypothesis is best; Popper says that what distinguishes science from bullshit is falsifiability, the possibility that a statement can be proven wrong. Neither is incorrect.

But what history teaches us is that any radical step forward always involves introducing some preposterous hypothesis that seems to be at odds with everything we know; which thus is hardly minimal, and usually appears to contradict experimental evidence — which is already falsified.

With regard to Popper, the explanation is straightforward — experimental evidence is always more ambiguous than it seems, because it is presented not as bare summaries of measurements and facts, but interpretations of what those results mean; it depends on a process of pattern recognition — I look at the iron filings spread on the sheet of paper above the bar magnet and *see* that they are arranging themselves in lines of force — one assumes that all the relevant factors have been identified — the Moon would show its other side if it were not tidally locked by the gravitational attraction of the Earth — and so on, as usual you do not appreciate how complex all this is until you contemplate programming a machine to do it for you; and it is all, in a familiar sense, unstable under small perturbations.[11] Even a slight change in color or accent can turn the sketch of one thing into the sketch of another, the vase into a face, the top side of the cube into the bottom,

With regard to Occam, the point is a trifle subtler, but we might appeal to biological analogy: the genome is modified by point mutation, which is minimal and gradual, but also by replacing whole segments of one strand of DNA with corresponding segments from another. Similarly the domains of two different conceptual schemes may overlap in such a way that we can segue from one to another, exchanging parts in the process.

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[11] From the Bayesian viewpoint one might say that probabilities are sensitive to changes in the choice of priors. Of course this is just the reason the Bayesian viewpoint is so stupid.

The simplest examples are puns, or jokes ("A horse walks into a bar and the bartender asks, 'Why the long face?'"), or the counting arguments in mathematics where something is computed two different ways, the results are set equal, and a nontrivial result drops out; see for instance the proof of the group-theoretic Cauchy theorem from the class formula.

A more complex example might be the problem of which way is down: how can it possibly happen that everything doesn't fall to one distinguished center of the universe? But then you might abruptly remember that Nicholas of Cusa said the universe is a circle whose center is everywhere and its circumference nowhere, place the question in two different contexts simultaneously, and wonder, why can't *everywhere* be down?

Or you might simply be staring at the Moon and have an apple drop upon your head.[12] In any case parsimony doesn't enter into it.

—x—

Though Newton managed to rationalize Copernicus, there was a glaring omission in his System of the World: he had no explanation for gravity. He simply stated the law, and muttered the famous disclaimer "hypotheses non fingo." Leibniz gave him an enormous amount of well-deserved shit for this: action at a distance before Newton and after Einstein looked like the operation of occult forces. But Newton was fully conscious of what he was doing: he had entertained a vast number of ideas about the propagation of influences through some

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[12] According to Thomas Levenson (*Newton and the Counterfeiter*, Boston: Houghton Mifflin, 2009), whether the legend is true or not, the tree actually existed, and was preserved at Woolsthorpe after Newton's death until 1819, when it fell down in a storm. "A sliver of the tree ended up at the Royal Astronomical Society, and branches had already been grafted onto younger hosts, which in time bore fruit of their own." — And, presumably, supported no slight burden of metaphor..

kind of ether and knew none of them worked.[13] Knowing that he couldn't fully explain it, but seeing — this is the more important realization — that he had a valid partial explanation, he recognized the limitations — not of science, but of scientists — to make explanations. — In more ways than one this was the first modern man. Newton even more than Shakespeare was the master of negative capability.

—xi—

Newton *described* gravity; Leibniz objected he had not given a *reason* for it. Newton anticipated the objection, and recognized that there was no point in straining for reasons when they were still out of reach. — He pretended this represented a conservative unwillingness to go beyond induction, but he knew, obviously, this was preposterous: he had said every particle of matter in the universe attracted every other; from the standpoint of empirical evidence this was just a wild guess. But it was an elegant idea that explained everything that had been seen in astronomy, and predicted more, e.g. the return of Halley's comet. — Nonetheless there wasn't any *experimental* evidence to support the law

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[13] From Newton's third letter to Bentley: "It is inconceivable, that inanimate brute matter should, without the mediation of something else, which is not material, operate upon, and affect other matter without mutual contact; as it must do, if gravitation, in the sense of Epicurus, be essential and inherent in it. And this is one reason, why I desired you would not ascribe innate gravity to me. That gravity should be innate, inherent, and essential to matter, so that one body may act upon another, at a distance through a vacuum, without the mediation of anything else, by and through which their action and force may be conveyed from one to another, is to me so great an absurdity, that I believe no man who has in philosophical matters a competent faculty of thinking, can ever fall into it." — A pretty clear endorsement of local causality from the guy who managed to convince everyone else to renounce it. — In fact in his earliest notebooks (see Richard Westfall, *Never at Rest*; Cambridge: Cambridge University Press, 1980) Newton had assumed the existence of currents of "subtle invisible matter" as the cause of gravity, and even attempted to design perpetual motion machines that exploited them. — In writing the *Principia* he had originally intended to posit universal attraction as something arising from the nature of matter, even though this idea was inconsistent with the mechanical philosophy that one body could only influence another by direct contact. After preliminary criticism by Huygens he had second thoughts, and was evasive in his final draft about the existence of forces generally, and agnostic about causes.

of gravitation until Cavendish measured it in the laboratory at the end of the following century.[14]

And no *explanation*, of course, until Einstein formulated the general theory of relativity, and reduced gravity to the curvature of space. With the benefit of hindsight it is easy to see that several generations of mathematical progress were required, and the introduction by Faraday and Maxwell of the concept of the field, to make this idea — the most beautiful idea that anyone has ever had — possible. — The origins of gravitational attraction *had* to be a mystery to Newton and his contemporaries. They simply did not have the conceptual tools to resolve it.

Newton invented the calculus first, but Leibniz invented it better. Unfortunately in so doing he introduced absurd and self-contradictory intermediate propositions about the ratios of infinitesimals to derive correct answers. Regarding this tissue of fallacies D'Alembert[15] is supposed to have told a skeptical student, "Go on, and faith will come to you." And faith was necessary,[16] because secure foundations for mathematical analysis were not discovered until the nineteenth century.[17]

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[14] His experiments were performed in 1797-98. His results were stated in terms of the density of the Earth, and he referred to his experiments as "weighing the world" rather than determining the gravitational constant, as we now think of it.

[15] Incidentally if you (Richard) look up your own academic line of descent, you will find that Rescher was a student of Church who was, etc., and the chain originates with the Prime Mover D'Alembert, an autodidact in the age before the invention of the doctorate. So in a way this is your ancestor.

[16] Berkeley had great fun pointing this out in *The Analyst*.

[17] A similar situation holds in contemporary mathematical physics with regard to the use of the Feynman path integral, which presents formal and conceptual difficulties not unlike those encountered with infinitesimals. About it Feynman himself said "One feels as Cavalieri must have felt, calculating the volume of a pyramid before the invention of the calculus."

Darwin made a broadly convincing phenomenological argument for evolution, but had no explanation for the mechanism of variation because of his fundamental misunderstanding of genetics.[18] The theory was only completed by Mendelian atomism (particulate inheritance) and molecular biology. — Again, until the missing details were filled in, reason had to conquer sense.

To illustrate his theory of electromagnetism Maxwell presented various mechanical models of the ether to motivate the choice of his field equations. This created some confusion with regard to which model was supposed to be correct, since the theory appeared to rely upon it. Hertz resolved the difficulty by declaring Maxwell's *theory* to be Maxwell's *equations* — i.e., by invoking negative capability to ignore the question entirely.

Einstein's most radical idea was the photon hypothesis (1905); indeed this was an idea so radical he was reluctant to acknowledge it himself. Even his greatest admirers among his contemporaries thought he had taken leave of his senses;[19] Millikan, e.g., was so convinced Einstein's explanation of the photoelectric effect was wrong that he spent a decade trying to disprove it.[20] An experimentum crucis had settled between the wave and particle theories of light a century earlier, and the Maxwell theory of electromagnetism, which predicted light as a solution of the wave equation that could be derived from it, had confirmed it; indeed Einstein himself while coming up with the photon idea was simultaneously insisting, in the theory of relativity, that Maxwell's equations, from which Lorentz invariance and the invariance of the speed of light are deduced, were more fundamental than Newtonian mechanics. — Only with the observation and

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[18] I.e., he believed the blending theory of inheritance.

[19] See (19f) of Pais, *Subtle is the Lord*.

[20] Pais (18a) quotes him: "I spent ten years of my life testing that 1905 equation of Einstein's and contrary to all my expectations, I was compelled in 1915 to assert its unambiguous verification in spite of its unreasonableness, since it seemed to violate everything we knew about the interference of light."

explanation[21] of the Compton effect (1924) was there direct confirmation of the existence of photons; and the subsequent recognition of the wave/particle duality was less a resolution of the contradiction between the two theories than an admission of the necessity of living with uncertainties, mysteries, and doubts.

Bohr in proposing his model of the atom (1911) hypothesized that it was like a miniature solar system, with electrons orbiting the nucleus in the same way that planets circle the sun, but with the additional condition that only a discrete series of orbits were permitted, with angular momentum a multiple of Planck's quantum of action, and only quantum jumps from one orbit to another allowed, not the continuous mission of radiation predicted by the classical theory; this ansatz miraculously reproduced the spectrum of the hydrogen atom, but it was a source of bafflement that such contradictory ideas could reproduce an experimental result no one could understand otherwise.

About his own efforts to find a physics consistent with the quantum conditions, Einstein said:

> All my attempts ... failed completely. It was as if the ground had been pulled out from under one, with no firm foundation to be seen anywhere ... . That this insecure and contradictory foundation was sufficient to enable a man of Bohr's unique instinct and tact to discover the major laws of the spectral lines and of the electron shells of the atoms together with their significance for chemistry appeared to me like a miracle—and appears to me as a miracle even today. This is the highest form of musicality in the sphere of thought.[22]

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[21] Note that in this instance as so many others the "result of the experiment" is stated as a formula, which (a) contradicts the prediction of the wave theory but (b) can easily be derived from the assumption that photons bounce off electrons the same way that billiard balls bounce off one another.

[22] *Autobiographical Notes*, pp. 45-47 of *Albert Einstein, Philosopher-Scientist*, ed. Paul Arthur Schilpp. New York: Open Court, 1949.

— i.e., with a great poet the sense of Beauty overcomes every other consideration.

Heisenberg in his memoirs reproduces a conversation with Pauli in 1922 in which he refers to Bohr's model as "(a) peculiar mixture of incomprehensible mumbo-jumbo and empirical success" — which, he admits, "quite naturally exerted a great fascination on us... ." — Pauli, the great critical spirit, characterized electron orbits as "myth", but admitted Bohr was right in some sense, and asked (says Heisenberg) what it might be.

Heisenberg reconstructs his answer:

> Bohr must surely know that he starts from contradictory assumptions which cannot be correct in their present form. But he has an unerring instinct for using these very assumptions to construct fairly convincing models of atomic processes. Bohr uses classical mechanics or quantum theory just as a painter uses his brushes and colors. Brushes do not determine the picture, and color is never the full reality; but if he keeps the picture before his mind's eye, the artist can use his brush to convey, however inadequately, his own mental picture to others. ... It is not at all certain that Bohr himself believes that electrons revolve inside the atom. But he is convinced of the correctness of his picture. The fact that he cannot yet express it by adequate linguistic or mathematical techniques is no disaster. On the contrary, it is a great challenge.[23]

(Later Heisenberg meets the great man and discovers that Bohr himself doesn't believe in the literal truth of his model, and that his

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[23] Werner Heisenberg, *Physics and Beyond* (transl. Arnold J. Pomerans), New York: Harper & Row, 1971. This exchange appears on pp. 35-37. The caveat here is that this is an English translation of a conversation that took place forty years before Heisenberg attempted to reproduce it.

real starting-point is the stability of matter. But that of course is another story.)

When Heisenberg invented his matrix mechanics he thought it was a mistake that the quantities he associated with position and momentum did not obey the commutative law of multiplication. He went ahead anyway, assuming that his error could be corrected later. As it turned out he hadn't made a mistake, but instead had made a fundamental discovery. But that could only appear after he'd ignored the problem and pressed onward.

Gell-Mann when he invented quarks pointed out their contradictory properties, their fractional electric charges, e.g., which had never been seen, and refrained from stating explicitly whether he regarded them as physical particles or mathematical abstractions; if the former, then some mysterious conspiracy on the part of Nature would have to prevent their escape from the nucleon to be observed directly. (This is the problem of quark confinement, now regarded as a mathematical theorem awaiting rigorous proof.) — Zweig, on the other hand, confirms that he worked from the assumption that quarks were real from the outset,[24] though he thought the most serious problem (later resolved by the introduction of the color charge) was the apparent violation of the spin-statistics theorem. — In this case the equivalent of the Compton effect was the discovery, in another series of scattering experiments which measured only electromagnetic interactions, that the hadron had pointlike internal constituents with fractional charges.[25]

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[24] George Zweig, "Memories of Murray and the Quark Model." Talk presented at the Conference in Honor of Murray Gell-mann's 80th Birthday, Singapore, 24 February 2010; arXiv:1007.0494v1 (physics.hist-ph) 3 July 2010. Zweig details other technical objections made by Feynman which were eventually resolved.

[25] There was a brief intermediate fashion, promoted by Feynman, for a phenomenological "parton" theory which was agnostic about the identification of these constituents with quarks. Obviously that pissed Murray off no end.

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Another way of looking at it is provided by the Metropolis algorithm,[26] which exploits the (mathematical) metaphor of the energy[27] landscape: you are trying to find the lowest point; pick a direction at random, take a small step, and if you are somewhere lower, stay there; if you are somewhere higher, flip a weighted coin to decide whether you stay or go back. The weighting of the coin is determined by a parameter like a temperature, a sort of thermal jiggle which makes it more likely you'll take an occasional chance on jumping uphill. — Dialing the temperature up and down during the course of a search is called "simulated annealing", and all this provides one good way of avoiding the traps provided by local minima into which you might otherwise wander and, looking up in all directions around you, assume you had found the bottom of the topography rather than some kind of volcanic lake. — Similarly one might think of negative capability as a sort of strategy for avoiding consistency (which always runs downhill) and taking the occasional chance on an enticing mistake.

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Other variations on the theme:

— From a strictly logical standpoint, skepticism about evolution is justified: it is, after all, very difficult to understand how a bucket of chemicals can produce a living cell in a mere few hundred million years; it does seem preposterous. — *But it happened*. — Nature is smarter than we are (as Feynman always said), and she has fooled us again. — So the real problem is to figure out *how* this can be possible; not to construct superficially convincing refutations of what can be

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[26] N. Metropolis, A.W. Rosenbluth, M.N. Rosenbluth, A.H. Teller, E. Teller: *Journal of Chemical Physics*, **21**, 1087 (1952).

[27] "Energy" can be defined almost arbitrarily; it is easiest to think of it as an altitude on a topographical map. (Though of course the map can be more than two-dimensional.)

inferred from observable facts — entertaining though this merry sport may be.

— The reality of the mind-body duality; that it is not some contradiction that shows the unreality of one or the other, or the necessity of reduction of one to the other, but just another fact of nature we are still trying to understand. Here by and large "scientists" exhibit negative capability, "philosophers" do not.

— The traditional difference in attitude between physicists and mathematicians: the former are used to employing techniques lacking in logical rigor, sometimes to the extreme of apparent contradiction; the latter typically regarded this methodology as inherently unsound. The distinguishing characteristic is, again, negative capability.

—xv—

Every explanation is a gamble. You have to know when to quit, and remove your winnings from the table.

Any real novelty requires an existential commitment, a willingness to take the plunge. A suspension of disbelief at what may at first appear to be preposterous. — And may really be. There is an element of risk. It is not unlike diving off a cliff and hoping not to hit a rock.

James Franck, though a famous experimentalist, is supposed to have made the following beautiful remark: "The only way that I can tell

whether a new idea is important is by the feeling of terror that seizes me."[28] Nietzsche could not have put it better.

—406—

Nietzsche *Early Notebooks* 19(107): "It is the way of bound minds to prefer *any explanation* to none: in this they are easily satisfied. High culture demands that some things should be left unexplained: (inserts the Greek for 'I withhold judgment')."

"On set, Novak told Hitchcock there were bits she could make no sense of. 'I said: "I can't understand why you see Madeleine in the hotel window and then she disappears. How does she leave the hotel?" And he said: "Ah, my dear, everything doesn't have to make sense in a mystery."'"[29]

In re Franck: "Whatever is fitted in any sort to excite the ideas of pain, and danger, that is to say, whatever is in any sort terrible, or is conversant about terrible objects, or operates in a manner analogous to terror, is a source of the *sublime,"* says Burke. (*A Philosophical Enquiry into the Origin of our Ideas of the Sublime and Beautiful*.)

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[28] "The Goddess is a lovely, slender woman with a hooked nose, deathly pale face, lips red as rowan-berries, startling blue eyes and long fair hair; she will suddenly transform herself ..... Her names and titles are innumerable. ... The test of a poet's vision ... is the accuracy of his portrayal of the White Goddess and of the island over which she rules. The reason why the hairs stand on end, the eyes water, the throat is constricted, the skin crawls and a shudder runs down the spine when one writes or reads a true poem is that (it) is necessarily an invocation of the White Goddess, or Muse, the Mother of All Living, the ancient power of fright and lust—the female spider or the queen-bee whose embrace is death." (Robert Graves.)

[29] Interview with Kim Novak by Simon Hattenstone, *The Guardian*, 15 Feb. 2021.

—407—

Art and Commerce. (1991)

Sometime in the early Nineties a couple who were friends of mine, former hippies who had struck it rich, made the not-uncommon mistake of thinking they had made enough to run away and live like gypsies for the rest of their lives. They left for Europe on a bicycle tour which was supposed to last forever, but ended after a few months of continuous stress and exposure when they got sick, recalled the advantages of health insurance and a roof over their heads, and returned to the States to resume their professional careers.

Before they left, however, they gave me all their plants, and thus I acquired a small tree, some bamboo-like object, maybe three feet tall, in a large pot. I set it as close to the bedroom window as I could manage (my apartment then as always represented a continuously-evolving solution to a kind of sphere-packing problem)[30] and, though I watered it absently on my way to the bathroom as I meandered sleepwalking through an extended episode of night-shift wage slavery, basically forgot about it. One day I woke up long enough to actually look at it and realized it had grown another couple of feet, in two orthogonal spurts (forming an 'L'): first sideways to the window itself, since the pot didn't fit between the dresser and the bookshelf which had previously established their positions; then up again, once the large green leaves got to the source of solar radiation they were seeking. The effect was startling: it seemed to be thriving, but environmental constraints had completely distorted its development. It was as if it had responded to two forces whose vectors could not simply add, because they were completely incompatible.

At this of course I had to laugh, since I recognized myself.

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[30] The famously intractable mathematical conundrum which asks for a general solution to the question of how many (perfect, identical, spherical) grapefruit you can pack into a rectangular crate of given dimensions.

A typical morning at the warehouse of *The Rocky Mountain News*.

—408—

Arbeit macht frei

Before I knew anything about it, I thought of poverty as romantic; I fancied myself a starving artist in a garret, like a character in *La Boheme*. Only gradually did I come to realize that it isn't about purity of heart being enhanced by a restricted diet. It is more like being clubbed alongside the head with a two-by-four the first thing every morning, and after a while — here affect an Italian-stallion accent — *you start to talk like Rocky Balboa*….

—ii—

Eventually I had to abandon the janitorial profession. The jobs paid less and less, though they didn't get any harder they were more closely monitored by management, and it became much easier for prospective employers to hire illegals — who, of course, worked for less than an American living wage, didn't speak enough English to talk back, and even if they had would have been too afraid of getting busted by the immigration Nazis to ask embarrassing questions about labor law. Unkindest cut of all, the myth of the industrious Mexican turned out to be just another racist slur, perpetrated by employers who thought little brown people were too stupid to con them, and if I wanted to work with my foreign-born colleagues I would have to *pretend* to be busy as energetically as they did, the kind of Parkinsonian behavior that I found supremely infuriating. I had no problem with cleaning toilets, but to linger over the job to maintain appearances was unthinkable.

Still, the logic was impeccable: for the yuppie scum who now ran the world, there were obvious advantages to color-coding the servant class. It was the implication that there *was* a servant class that I found unbearably offensive; let alone being forced to admit I belonged to it.

Thus presently I became unemployable even in this field, and had to find a lower rung on the economic ladder to which I might descend. Since it wasn't obvious that there was one, this was an alarming prospect.

But then I discovered newspaper delivery. There I malingered for a decade and a half.

—iii—

No doubt you have the picture — I did myself — of the bicycle delivery boy, pulling papers smoothly from a shoulder bag and tossing them to one side and the other while riding down a suburban street in the sunny afternoon. In fact by the time I got around to it, long after competition from television had forced all the newspapers to early morning delivery and the Boy Scouts had retired from service (though many scoutmaster wannabes remained in management), the carrier was invariably an adult burntout in a beat-to-shit old car who, like all other members of the working class after Reagan's first term, needed more than one job to survive. (It was a particular favorite among schoolteachers, and in the Nineties, anyway, Walter White would have been introduced to us not moonlighting in a carwash, but throwing papers.) — And far from being able to toss everything out the window and keep driving, it turned out that everyone in Boulder, at least, lived in a sixplex attached to the back of an old Victorian house in an unlit neighborhood where no way existed to access the customer save getting out of the car, stumbling blindly in the dark down a narrow sidewalk covered in season with black ice swearing furiously hoping not to slip fall and fracture anything you might need later, and then heaving all six pounds of the Sunday Denver Post to the precise spot on the third-floor balcony where it wouldn't smash a flower pot, wake the customer from drunken slumber, and force you to expend your meager energies in a shouting match with yet another imbecilic poster child for entitlement; the kind of demanding discus throw that more than once resulted in pulled muscles.

Nonetheless I became a virtuoso; and took particular pleasure in exercising my throwing arm instead of my legs. It saved time and effort, and it was therapeutic. — I still recall fondly the aesthetic satisfaction I felt when I determined that the easiest way to deliver a paper to one garden-level apartment in the rear of a two-story slum dwelling in the student ghetto was just to throw it clear over the roof. I did that all one winter, and loved it every time. — Fuck you, Horatio Alger. I knew I was going nowhere, but I would get there in style.

—iv—

Losing the thread

And weren't those brave words. — But it is here, alas, that the memoir takes a different direction. Because though hitherto I was able at least to maintain my identity, to console myself that, no matter what ignominy the search for employment had led me to, I remained nonetheless the blue-collar scholar, a rude mechanical who entertained Deep Thoughts, now all that had come to an end. Before this I could still pretend that I had control of the narrative, that I had my fingers on the thread that led back out of the labyrinth. Now all that was lost. Before this I had worked strange hours at the worst times of the night and morning, but there was still, somehow, a window left open to the light of reason: I had come home one morning from an exhausting session cleaning restaurants, discovered my roommate moping in the kitchen with a copy of the written PhD examination he had just failed, and told him how to do all the problems in the space of a few minutes — guessing the theorems the results relied on, because this was real analysis, the one branch of mathematics I refused to learn anything about. — Still intuition carried the day. — Now all that was over. Working all night seven days a week was to accept personal annihilation. It was like having your blood drained by a vampire every night. I staggered around in a state of stunned incoherence, unable to focus on anything more complex than optimizing my route list. Every thought was beaten from my head.

—v—

And now also I discovered The Problem of the Fourth Check.

When the relationship between labor and capital had been more favorable, when the ratio between the minimum wage and the cost of living had been more equitable, this problem had not arisen. But once rent exceeded fifty percent of gross income, a kind of phase transition occurred. — Three checks *had* to be written in any given month: the rent, the utilities, the phone. But after that there were the incidental cash expenses essential to survival, food, gasoline, maintenance on the car (a constant drain when one drove for a living) — and the lesser expenses essential to maintaining my sanity, the occasional run to the used bookstore, movies on the cheap, now and then a pizza or a burger. — I pulled clothing and furniture from the dumpsters; jeans and sneakers I replaced once every six months when they disintegrated past punk. — I had no social life, never dined out, didn't go to the doctor or the dentist, took no trips — I went twenty-three years without a vacation — all that was put off until that day (I never doubted it was coming) when I would be able to afford it. — But then there was nothing left. The fourth check always bounced. — Indeed it was often difficult getting the first three to clear, and when one of them did not fines and penalties invariably resulted, and threw the delicate balance of the books awry. (This was never a *stable* equilibrium.)

Since the fourth check was usually designated for something like (mandatory) automobile insurance or the IRS, I began to appreciate another axiom of the impoverished life: that it was illegal. That if you could not afford to live, you would constantly be punished — and then *billed* — for it. That the fine print in the social contract had been put there to make it easier to get rid of you.

Screenplay

I never liked television per se, though when I lived in Los Angeles I kept it on all the time, because when your habit is to stay up all night it makes the perfect background noise. Even then, long before Turner, there were many channels that played nothing but old movies — interrupted at frequent intervals by commercials starring the used-car barons of that era, Ralph Williams, Cal Worthington, and their peers[31] — and I watched those exclusively.

Later when I lived in Berkeley there were Bogart triple features every night in hole-in-the-wall cinemas all up and down Telegraph Avenue, but after I returned to Boulder for a very long time it was a cultural wasteland: no used book stores, no art theaters — of course no girls who'd ever heard of Beckett; worst of all, no all-night television showing B-movie noir and Mamie Van Doren in *Voyage to the Planet of Prehistoric Women* at 4 a.m. So in this respect my education was interrupted, and for a long time I didn't see many movies. The invention of the VCR provided a way around this problem, but of course for several years after its introduction I couldn't afford one. Finally around 1990 I had a minor windfall as a consultant and bought a few toys. That was first on the list.

Once I could watch whatever I liked, film became like books: I could just go to the Video Station, until its demise in 2017 the epicenter of film culture in the city, and rent whatever I wanted. I began working

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[31] The big shots sold big cars, of course, this still being the golden age of the gas guzzler, but occasionally a Volkswagen dealer named (I think) Bill White would buy time during some deviant feature like *Jesse James Meets Frankenstein's Daughter* (William Beaudine, 1966) and parody the other guys; for obvious reasons I was particularly impressed with a rant that concluded "Talk about economy! Talk about convenience! Talk about the *Prolegomena to Any Future Metaphysics*! Come on down, we'll talk about *anything*... ."

my way through the history of film[32] and reading everything I could find about it in the university library; I still recall fondly browsing along the massive wall of shelves that held PN1995.9 for fresh microgenres, and did my considerable best to read everything in it; wrote out long lists of film titles I could never find; read one or two hundred screenplays, memoirs of the pioneers, analyses of editing, cinematography — even do-it-yourself guides to financing and guerrilla filmmaking, though these were not terribly edifying. ("What are 'credit cards'?" I asked myself, sounding the word out like a five-year-old.) There was an entirely new universe to explore, and in this period of cosmic inflation the bubble of my understanding expanded faster than the speed of light.

Once I could watch movies and pause and replay them as I chose — in computer-geek terms, once I had obtained random access — I began taking them apart to figure out what made them tick. I reverse-engineered movie into screenplays by breaking them down into scenes and transcribing the dialogue. (I even tried once to break a film down shot by shot, but that was too hard on the tape; it snapped after one freeze-frame too many.)

Then obviously — after analysis, synthesis — I had to try writing one myself. Since this was meant as an exercise and I wanted something simple, I decided on a college movie, because the characters could be drawn from my everyday life. This leant itself to comedy, of course,

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[32] An interesting observation: for a long time I had the feeling — as did even, according to Boswell, Dr. Johnson — that I'd read all the books I'd ever read sometime before my twentieth birthday. I had no idea whether this was true, whether you were that much quicker and smarter when you were young, or whether this was just some kind of illusion, an inverse Saul Steinberg effect created by the sense of an infinite world opening before you that came when you were seeing everything for the first time. But when I discovered film, I was able to confirm it was the latter, because I had the identical experience: I learned very rapidly, in six months or a year, who had done what and when, and even before gradually filling in the gaps (which I am still doing) had the experience of seeing something for the first time and recognizing it from prior description. (Sometimes at a glance. *Der Letzte Mann* and Eisenstein's *Que Viva Mexico*, for instance.) Thus it quickly came to seem that I had seen and learned everything right at the start.

not that the author or the subject could support anything else; in fact a comedy of manners, the whole thing seemed to flow from the image of the string of icons — bathroom facilities, access for the handicapped, etc. — displayed at the entrance to the university library. "Surely the one at the bottom should be a *book* icon," I thought.

Obviously this had to be a GenX environment with Boomer professors. So I didn't really want the protagonist to turn into me. Instead, in a peculiar fashion, I turned into him.

I set the romantic mechanism in motion by having him ghostwrite a paper on John Keats, to be read by an English instructor, whom I vaguely pictured as being something like Rosanna Arquette. — Perhaps not *that* vaguely, since I had her *Playboy* pictorial prominently displayed on my bulletin board as a source of inspiration. — Thus after entertaining a variety of other possibilities I fixed upon the title "Negative Capability".

Among the characteristics of the protagonist (I finally settled on Zooey Daedalus, Stephen being a bit too obvious) were the following: he drank a lot of tequila (not me at this time, but in previous incarnations, yes); he slept on the couch with the television on; he had two dogs who went with him everywhere (check); he made his living as an academic ghostwriter (no); perverse refusal to get a real job (yes, but perverse refusal went both ways, and they started it); thesis advisor stole his research and published it under his own name, causing a violent falling-out (no, but everyone who read it immediately asked whether this had happened to me).

Almost immediately I found myself sleeping on the couch with the television on. (Which is natural anyway if you have to get up in the middle of the night to go to work.) I have done so ever since.

The rest took longer.

(...)

sThe screenplay got close enough to being done that I passed it around among the usual suspects to solicit comments, but it never quite got finished: the consulting windfall came and went, and after the two months during which I plotted everything out at 151 scenes (admittedly this was overlong), and wrote 148 of them, I went back to working all night seven days a week. In three more months, I wrote another scene and a half, and finally gave up. It wasn't all that great, but it had moments, and it would have been nice to have been able to finish it. Certainly it wasn't bad for a first try.

(Our Hero, the ne'er-do-well theoretician cast out of graduate school into a life of academic crime, and his best friend, a computer scientist who has Sold Out to the corporate sector, are relaxing in the former's attic apartment watching a sci-fi feature on the University network, while simultaneously in her own apartment our female lead reads term papers submitted by her illiterate students:)

23. LABORATORY.

The usual movie laboratory set: bubbling retorts on lab benches; lots of glass and colored water. Racks of electronic gear; a couple of oscilloscopes. You know the drill.

Posed against this backdrop you discover two persons clad in lab smocks: DOC (aka PROFESSOR BROWN) and MARIA. The former is the movie image of the scientist: older, very sober, ponderous; the latter is his assistant, the sweet young thing in a pushup bra who inevitably ends up pursued by the monster.

The girl is saying earnestly:

MARIA
But surely there must be some answer,
Professor Brown. What good is our Science,
if we cannot repel this invasion by soulless
creatures from beyond the stars?

DOC
(gravely)
Science has never isolated the soul, Maria.
Except in Smokey Robinson.

Abruptly a longhaired but clean-jawed MALE PROTAGONIST flies backwards into the room, wielding the black Stratocaster slung over his shoulder like an automatic weapon, aiming it at some unseen menace out the door. Looking over his shoulder, he shouts frantically:

MALE PROTAGONIST
Doc! Maria! We've got to get out of here!
They're right behind me!

Sound without: OMINOUS DISCO MUSIC.

They freeze in postures of alarm.

PULL BACK TO REVEAL that this is a picture on a television screen. And that the screen is in the:

24. GARRET

— where ZOOEY and BOBBY are sitting on the couch, feet propped up, one at one end, one at the other, watching the movie. Their faces are lit by the light of the screen.

Windows are open behind them.

Zooey dressed as before. Bobby's taken his jacket off and loosened his tie.

They pass a bottle of Tequila back and forth as they talk, swigging straight from the bottle.

The dogs are on the floor before them, working on their bones.

Bobby is in the process of protesting:

BOBBY
What is this?

ZOOEY
Physics 211.

BOBBY
Yeah?

Zooey, looking at what's apparently a schedule, reads:

ZOOEY
Yeah. Professor Fritz Von Honk, lecturing on elementary kinematics and dynamics.
(pause)
Of course, Bong's the video jockey tonight, and he looked the other way when I swapped the tapes.

BOBBY
You'll hang him yet. What is this really?

ZOOEY
"Disco Bankers from Aldebaran."

Bobby laughs.

BOBBY
Uh-huh. — Listen, man. Has it ever occurred to you that you have to get a job?

ZOOEY
Fuck, Bobby. I'll admit this is at best a modest triumph, but do you have to spoil it by handing me this shit?

BOBBY
I'm serious. How long can you go on like this?

ZOOEY
(swigs; grins)
I made three hundred today.

Bobby is actually impressed:

BOBBY
Yeah?

Z. swigs and declaims the title grandly:

ZOOEY
"Negative Capability: Keats and the Artistic Imagination."

BOBBY
What? What do you know about the Romantic poets?

ZOOEY
I can read and write.

BOBBY
Yeah, right. So what if you get caught?

ZOOEY
What can they do? Throw me out of school again?

BOBBY
They'll think of something.

ZOOEY
Sure they will. Anyway what's the alternative? You want me to camp out among the cretins at the Fang Corporation, coding business mainframes for the benefit of the lower primates?

BOBBY
(smugly)
Sixty thousand this year. A shiny red Corvette. And the whole secretarial pool to splash around in.

ZOOEY
Yeah but tell me: these people who haven't the wit to patch their own accounting software — Do you find it politically expedient to correct their spelling?

BOBBY
(smiling)
Let's say that discretion is sometimes the better part of valor.

ZOOEY
Right. And tell me, while you're doing this, adding options to their menus, putting bar graphs in their quarterly reports: is this intellectually satisfying? Challenging? Jesus, Bobby, when you were in graduate school you made machines speak English. You used to be an artist.

BOBBY
You used to be a physicist.

ZOOEY
I still am a physicist.

BOBBY
Not while Fritz is in the department. Your thesis is wastepaper. You'll get a doctorate over his dead body.

ZOOEY

Perhaps this can be arranged.

BOBBY
Right. — Meanwhile, you're starving.
I could get you an interview, you know.

ZOOEY
It's prostitution.

BOBBY
Which is not simply the oldest profession: It's the only profession. What do you call ghostwriting term papers?

ZOOEY
For sixty thousand, I suppose.

BOBBY
No more than forty-five to start.
(leering)
And benefits.

Zooey snorts:

ZOOEY
Sure.

BOBBY
You should see these secretaries. You wouldn't laugh.
I mean, how have you been doing lately?

Z. is thoughtful:

ZOOEY
I have to admit: It's been one of those years
when my cock doesn't seem to fit the right way

into my pants....

Meanwhile on the:

25. TELEVISION.

A chorus line of Travolta clones descends the gangway of a flying saucer. Lights strobe along the ramp as they dance down it, posturing horribly. MENACING DISCO MUSIC.

By a remarkable coincidence, this is also seen in:

26. JENNY'S APARTMENT.

- shabby, but very tidy and artistic -
- where JENNY has just come in. Still bearing an armload of papers to be graded, she's staring curiously at the screen.

Shrugging, she walks to a desk at the end of the room and divests herself of her burden.

And exits the room.

While on the:

27. TELEVISION.

— MARIA, lying on the ground, is shrieking helplessly as a Travolta Clone postures horribly (more OMINOUS DISCO MUSIC) and advances toward her. — The Clone, you observe, bears a striking resemblance to the CONSULTANT introduced in the opening scene —

You see this in the:

28. GARRET.

— where Bobby is saying:

BOBBY
.....so I've got her trained now. She can recognize my voice, speak English fairly well, and ....

Zooey is amused:

ZOOEY
"She"? You refer to your computer with a feminine pronoun?

But abruptly there are LOUD NOISES heard beneath.

BOBBY
(alarmed)
What the fuck is that?

Z. cocks an ear, and sighs:

ZOOEY
The neighbors.

— as the sound of a door falling open and bodies crunching into the apartment beneath comes up through the floor —

— breaking glass — loud drunken laughter — something that sounds like a chainsaw cutting into metal —

BOBBY
What are they?

ZOOEY
Students.

— a motorcycle engine turning over —

BOBBY
What are they majoring in?

ZOOEY
Business.

Loud noise of vomiting from beneath, accompanied by laughter and the drunken exclamation:

MALE VOICE (UNDER)
Awesome, dude.....

A sudden blast of LOUD INDUSTRIAL-GRADE ROCKANDROLL.

Z. sighs.

ZOOEY
Out the window to the right there's a switch. It isn't really a circuitbreaker; that would be illegal. Get it for me, will you?

Bobby hesitates:

BOBBY
Won't they figure out that something's wrong?

Z. sighs again:

ZOOEY
The Promethean spark is very dim in

these creatures. Left to their own
devices, it could take them generations
to discover the secret of fire.
Get it.

Bobby shrugs; takes a swig from the bottle; hands it back to Zooey; and crawls over the back of the couch out the window onto the:

29. BALCONY.

— out the window, onto the roof of the house.

He finds a switch, throws it —

— and the noise beneath abruptly ceases.

He's about to crawl back in, when he looks to the brightly-lit windows of the adjacent apartment, and discovers Eleanor in her kitchen window. She appears to be doing her dishes in the nude.

She sees him; smiles.

Dumbstruck, he smiles back.

— and would doubtless maintain this position all night, were it not she leaves the window, with a farewell wave.

He crawls back into the:

30. GARRET.

— and, still grinning like an idiot, asks Zooey:

BOBBY
Who's the girl who does her dishes in the nude?

ZOOEY
What? — Oh: that's Eleanor. She wants to save the Earth.

BOBBY
She live alone?

ZOOEY
(disinterested)
I guess.

His attention is fixed on the:

31. TELEVISION.

— where, again in the laboratory, Doc is saying:

DOC
If they cut our power, we'll have nothing to stop them with but acoustic guitars!

MALE PROTAGONIST
(firing Stratocaster out the door)
A little Hendrix ought to slow them down…
…. take that, you android slime!

— which also is seen in:

32. JENNY'S APARTMENT.

on the television in the living room.

Which is empty.

But the bathroom door is open. It's brightly lit, and apparently occupied.

You hear:

— splashing;
— papers rustling;
— the unmistakable sound of a fart bubbling up through bathwater;
— a feminine giggle.

— and, purely for reasons of scientific interest, advance into the:

33. BATHROOM.

to find the source of these sound effects.

As it were at center stage, there's a large old-fashioned clawfoot bathtub. JENNY is sitting in it, reading a paper. She holds it up with one hand, and runs a pencil rapidly down the center of the page with the other as she scans it.

Arranged in some fashion around the perimeter of the tub: a stack of papers to be read; a bottle of wine; a glass, half-full.

She finishes the paper and tosses it onto a small heap on the floor.

Reaches for the wineglass.

Sniffs delicately before tasting it.

Sips.

Puts the glass down.

She takes a paper off the stack and puts it to her forehead; closes her eyes, and recites (apparently from memory):

JENNY
"Percy Shelley was a pretty cool dud."

She laughs. — Thinks a moment. — Scribbles something on the cover, tosses it to the floor, takes up another:

(continues)
"The Romoontic Pouts"-
(laughs)
"were a long time ago. period. Before videos.
Period. They didn't always rhyme comma or make
much comma sense pregnant ellipsis"

Again she thinks; scribbles something on the cover; tosses it to the floor; and takes up another.

(continues)
"Lord Byron got in bad with credit cards and
went to Italy. Also he had a fair with half his sister-"

She giggles, makes a note, tosses this one to the floor as well. — Next:

(continues)
"Keats, John, was one of the greatest English
Romantic poets. He wrote some of the purest
poetry in any literature. But Keats, dying in his
twenty-sixth year, felt that his work had
such fleeting value that he wrote his
own melancholy epitaph: 'Here lies one whose
name was writ in water.'"

Curious, she traces something on the surface of the water. — Shrugs.

(continues)
Wow. The *World Book*.

(ponders)
Well. At least he looked it up.

Scribbles something on the cover, tosses it away.

Pausing, she takes up her glass.

(continues)
Is this their native language?
(sips reflectively)
Perhaps they were all kidnapped by
gypsies in infancy, and taken
to some corner of the globe where the
sight and sound of English are unknown?
(sips again)
But why did they bother to come back?

She abandons this line of speculation, puts down the glass, and reaches to the floor for a fresh paper. — Looks at the cover:

(continues)
Randy.
(reads title)
"Negative Capability"?
(giggles)
How appropriate.
(pauses)
(sighs)
(stares into space)
(brightens)
But they pay me to do this, don't they?

And begins reading with great rapidity.

Meanwhile, on the

34. TELEVISION.

MARIA, solo, is declaiming fervently, as a STRATOCASTER plays beneath:

MARIA
Two worlds have met here tonight: our world and theirs. We have fought, and for now we have won. But the struggle is only beginning. Between our world, in which people live and work and laugh and love — and theirs: a world in which virtue goes unrewarded, the wicked prosper, and Soul is born of the Machine .....

And back in the

35. BATHROOM.

Jenny's finished the paper. She flips over the last page, looks again at the first one.

JENNY
Wow.
(pauses, very puzzled)
How could he have written this?
It doesn't make sense.

63. FRATERNITY HOUSE.

In the courtyard of a fraternity house, a large loud drunken crowd is milling around:

A LARGE PIT

roped in and filled with mud. Scantily-clad female mudwrestlers are seen struggling within.

Windows overlook the pit. Celebrants hang out of them, brandishing mugs of beer and screaming encouragement.

You witness the occasional defenestration of the careless: they fall into the mud.

There's loud music coming from somewhere.

The crowd is divided into groups of partisans, warring factions, waving banners over their heads and reacting to the progress of the match.

On a balcony commanding a view of the pit and the crowd, you see the ubiquitous BONG, with his cameras, recording the event.

In the foreground, ZOOEY and JENNY lean against a railing.

Zooey waves to Bong.

JENNY
You know the camera guy?

ZOOEY
Bong? Yeah. We're fraternity brothers.

JENNY
(incredulous)
You belong to a fraternity?

ZOOEY
In a manner of speaking. We're sword-wielding cavaliers in the Secret Empire of the Nerds.

On another side, RANDY and MOOSE are watching the bout.

Moose sees Jenny with Zooey:

MOOSE
Is that Daedalus with your English teacher?

RANDY
(looks)
Fuckin' A.

MOOSE
I thought you wanted her.

RANDY
If I want her, I'll get her.

MOOSE
Oh.
(thinks [with difficulty])
How?

RANDY
I'm rich.

MOOSE
Oh, yeah.
(thinks very hard)
But.....uh.....what if she wants something else?

RANDY
(genuinely baffled)
What? — There is nothing else.

Returning your attention to Zooey and Jenny: you perceive the approach of a drunken LOUT, presumably a fraternity brother. He accosts Zooey:

LOUT
(drunk)
Hey Daedalus!

ZOOEY
(politely)
Dude. Awesome spectacle.

LOUT
(in drunken confidence)
The LSATs are coming up, man. I need a favor.

The LOUT is ignoring Jenny, who watches this with fascination.

ZOOEY
Five hundred firm.

LOUT
(in weak protest)
Listen, man....

ZOOEY
I guarantee a perfect score. Your father wants Stanford, right?

LOUT
Yeah, right.

ZOOEY
Five hundred. — I'll need ID and a copy of your signature.

LOUT
Uh.....

Z. loses patience:

ZOOEY
Hire somebody to think about it for you.

And shoos the lout away.

JENNY
(inquisitive)
You take tests for them?

ZOOEY
The GREs fifteen times. The LSATs ten. The occasional final. It's getting harder.

JENNY
The tests are getting harder?

ZOOEY
No, the tests are getting easier. It's getting harder to pass the fake IDs.

JENNY
Don't you think that it's unethical?

ZOOEY
I don't think of it in those terms.

JENNY
But they're passing off your work as their own —

ZOOEY
Yes. But this only prepares them for real life. — Look at these people:

He indicates the mob —

— and now as he speaks, you find your visual attention fixed upon the crowd and the mudwrestling match:

ZOOEY (VOICE OVER)
These are college students. These are people who are preparing themselves for professional careers. What this means, essentially, is that they're never going to perform productive labor: they aren't going to mine coal, or build bridges, or design airplanes, or, really, make or do anything. Most of them are business majors. This means that they're going to become managers: people who take meetings, and, in principle, read and write reports. But in practice they won't even do that. They'll hire others to read and write their reports for them; and then they'll take the credit. So, finally, all that will be required of them is that, when they choose someone to do their work for them, they choose well. So I'm training their judgment, you see: if they hire me to do their work for them, they've chosen well. It's rational behavior; I try to reinforce it.

JENNY (VOICE OVER)
So this is your idea of a rational political economy? And your Idea of a University?

ZOOEY (VOICE OVER)
(laughs derisively)
No.

JENNY (VOICE OVER)
I didn't think so.

{...}

[Later exchange between the protagonist and his mentor:]

115. PLAZA.

…

ZOOEY
So I thought you guys all wanted to change the world.

BARTLETT
Yes. We all wanted to be artists, musicians, poets, scientists. It was the drugs, I think.

ZOOEY
(incredulous)
That made you want to do that?

BARTLETT
No, that kept most of us from doing it. After suffering so much brain damage, few were left who were good for anything but becoming lawyers and accountants.

You might ask why I simply didn't walk into the local philosophy department and start attending seminars — particularly since, for quite a while, I worked on campus at a ridiculous job which afforded me a lot of free time, and could get free tuition.

The answer is that of course I did, but had to give it up because it was too frustrating. The expectation was that I would sit still in lectures and discussions when I understood the subject better than the instructor, but after an hour or so of trying to be polite I invariably felt like I was going to explode.

Nonetheless I kept trying, at least for a while. I once managed a couple of weeks of a seminar on Kant, for instance, before I gave up in exasperation. In the first five minutes the professor attributed a quote to Russell that actually came from F.H. Bradley, conflated the doctrines of the early and the later Wittgenstein, and then yielded the floor to some idiot who made a series of misstatements about quantum mechanics. — There was a former pupil of Malcolm's who occasionally taught Wittgenstein, but of course I never dared try that. I would have killed the poor bastard.

The last time I remember going to hear a visiting lecturer was one winter afternoon in the early Eighties, when some chick showed up from Indiana[33] to talk about her ongoing research in the history and philosophy of quantum mechanics; specifically she was puzzling over the issue of why European physicists sweated the philosophical questions more than Americans did, and rather ineptly discussed possible theories to explain this. At the end of an hour of this torture I faced once again the question of whether I was really going to stand up in the back of the room and deliver a counter-lecture of another

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[33] At least I think it was Indiana. I seem to remember thinking she must know Westfall, whose biography of Newton I admired. (And no, I won't apologize. "Chick", in the argot as I learned it, was the feminine of "dude"; no more, no less.)

quarter-hour in which I weighed all of her arguments, cited numerous additional sources from memory, and systematically reduced her problem to the triviality it was. — A younger Zarkov probably would have done it, but I decided finally I couldn't face the prospect, it all seemed pointless. — Why was I doing this? to make an impression? to what end? were they going to offer me a job? obviously not, because actually knowing what you were talking about had nothing to do with your employability, look at this airhead giving the lecture, an associate professor out pimping herself to score points toward tenure and why was such an empty-headed hack even under consideration for a permanent position? because Indiana, like everyplace else, had quotas to fill, and she was the only woman to show up looking for work. — God, it was depressing to have all this shoot through my head while I was trying to decide whether I should improvise my own lecture on the subject matter. — So I shut up, sat down, walked out into the snow[34] to make my way home, and never went back.

{…}

(Heavy sigh)

The obvious reasons, in brief:

First, European education (more aristocratic than democratic) differed from American in that it placed a greater emphasis on philosophy and the classics — one might recall, e.g., that Hilbert had to answer a question on Kant in his oral examination for the doctorate, and that Heisenberg had explained in his memoirs that he hadn't learned much about physics in the Gymnasium and indeed his first exposure to questions about the structure of matter had come from reading Plato's *Timaeus*.

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[34] I should mention that for some reason all the great epiphanies I have experienced while walking through the Colorado campus have come in winter, when I was wearing an old Navy p-coat I found in a surplus store. A bit of novelistic detail.

(Recall also Russell's complaint about his philosophical discussions with Einstein, Gödel, and Pauli, that they had all been hopelessly corrupted by German idealism.)

Second, American physics traditionally had more of a practical, laboratory emphasis, and if there was a dominant philosophy in the organization of the American academy, it was pragmatism — forget the idealistic architecture described by Heidegger in his Rector's speech, in which Philosophy occupies the highest chamber in the Ivory Tower, and rules all those beneath it by ukase; in the United States, then as always, the primary purpose of education was to get a job. So (inverting the Continental hierarchy) physics tended to be subordinate to engineering.

And this attitude was still dominant: even as I suffered through this lecture a recent issue of the house organ of the American Institute of Physics, *Physics Today*, had featured an inaugural presidential address by William Fowler (Nobel laureate, 1983), about the public image of the physicist as an ivory-tower intellectual; he had emphasized this practical working-class orientation, and to illustrate the theme of his lecture the cover had shown a guy in hood and visor, laboring like any other Nibelung within the bowels of a particle accelerator with a welding torch.

Thus even when American physicists in the period between the wars turned their attention to philosophical questions, they did so from a pragmatic perspective: Bridgman, the most prominent exemplar, was an experimentalist and thus (naturally) a proponent of operationalism.

The Europeans in contrast all orbited around Bohr, who was a disciple of Kierkegaard and a closet Hegelian; his influence on the discussion there was enormous, and encouraged metaphysical speculation among his disciples — Pauli's fling with Jung was only to be expected.

Moreover these cultural tendencies continued after the war. The most prominent theoreticians in the second generation in the United States were figures like Feynman and Gell-Mann, who also came from the pragmatic tradition; most had spent the war years in laboratories, working with their hands: wiring radars, or making stuff blow up. — Feynman had written a memoir like Heisenberg's, but in it he didn't describe coming to physics by reading Plato in the Greek; he began by fixing radios.

John Wheeler did become a sort of mad scientist full of philosophical theories, but he had been greatly influenced by Bohr, and even he worked a great deal on military applications of nuclear physics, reactor design, etc.

American mathematicians were, of course, as abstract and otherworldly as any, even before the war; but mathematics and physics had less direct contact in America in this period than later or elsewhere.

The most obvious example of an acute philosophical intelligence in the postwar generation was Freeman Dyson, who however [a] was really a Brit and [b] began as a pure mathematician. Nonetheless [c] he didn't at all mind getting his hands dirty, as evidenced by escapades like the legendary Project Orion,[35] in which he and the weapons designer Theodore Taylor attempted to build a spacecraft propelled by nuclear bombs.

The future's so bright, I gotta wear shades (1991)

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[35] The most radically beautiful idea in rocket engineering to this day, incidentally — not only would it work, but in many respects it is really the only thing that *can* work.

Nonetheless in a episode of terminal desperation in the late Eighties, I made fresh graduate applications. One was to the department of computer science at Colorado. They called me in for an interview, explained they would admit me if I actually took a couple of courses in the subject — this of course I had never done — I pleaded poverty — they said they'd get me a job — I said all right, what, where — they gave me a list of places where I'd already been applying unsuccessfully since the early Seventies — I smote myself on the forehead — Lucy snatches the football away, Charlie Brown falls on his face once again —

Pause for three years while I try to find money for tuition.
Finally in the Spring of 1991 I score a loan and register for the most advanced course in the department, figuring I have one semester to write a thesis and I had better find out what the most famous member of the faculty is doing. In a complete departure from precedent, I attend nearly every class and read all of Famous Professor's papers. I am seriously out of practice, and feel like my talent has atrophied while I was wasting away in blue-collar-job underemployment. Nonetheless I catch on and figure out a new way to prove the central theorem of the subject. — Then (weird but true) midway through the semester Famous Professor has a heart attack and is confined to the hospital. Since this is an advanced seminar, we all stare at one another blankly trying to decide what to do. The consensus, finally, which I strongly promote since I have no other option, is to carry on with the course while we await Famous Professor's return. Hence the class turns into a discussion group in which on more than one occasion I myself lecture. Finally even though some other guys had been working on it I run out of other questions to resolve and attack the problem of designing an algorithm to sort Famous Professor's abstract structures into a canonical form. A bad solution of this problem, an algorithm that runs as n^4, has already been the subject of a doctoral thesis, but it turns out I can do better than this with my first guess, no worse than n^3, and have an argument that shows one running as n^2 must exist, so I concentrate on refining it; particularly after the Other Guys come up with their own cubic solution, present it to Famous Professor, and

are praised lavishly for proving something I have already dismissed as a triviality.

And, curiously enough though the Other Guys have actually taken courses in algorithm design, have the advice and support of the rest of the departmental faculty, etc., nonetheless I working by myself in a field I have just entered a few weeks earlier manage to come up with an answer none of them believed existed. I have tried previously to explain why it should exist but, of course, these are computer geeks with severe intellectual limitations, they are very poor at dealing with abstractions, and nobody can understand what I am saying. I outline the final solution in a lecture just before Spring Break. When classes recommence two weeks later I discover that Other Guys have taken what I suggested, added enough input from other sources that they could claim the idea was their own, and visited Famous Professor in the hospital with the solution, which he has applauded as a work of genius. My name of course has not been mentioned. Hmmm.....

Other members of class explain this turn of events with downcast eyes. Famous Professor returns and recommences lectures, prefacing them with extravagant praise of Other Guys. Gnashing my teeth, I ponder how to broach the issue. What can I say to him?

Indeed, what is the real problem here? Anthropologist that I am, it is easy to understand. It isn't that that I seem that much older than the other people in the class, but that I look and smell funny — independent, an Outsider. I think for myself, I have my own ideas, I don't behave like anybody's pack mule. Famous Professor teaches "computer science"[36] but is not himself a programmer, he is a mathematician, not the usual idiot savant, so what he needs in a

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[36] With this specific example in mind Feynman once remarked that anything that had to *say* it was a science probably wasn't. "Computer science", properly, is in part a branch of engineering, in part a pre-existing branch of mathematics (the theory of computation). The theory of computation is of course deep and difficult; computer engineering, on the other hand, though hardly trivial in practice is trivial in principle, a mile wide and an inch deep, which is why 14-year-olds can master it.

student, obviously, is somebody who will attend to his wishes, solve only the problems he needs solved, write code for him, and if necessary pick up his drycleaning.[37] He wants a servant. Of the Other Guys, one fits this description perfectly, and has clearly, in the mind of Famous Professor, been identified as the designated Prize Pupil, exactly the student/domestic servant he requires. I look like some alien intruder to him, so when I talk — never mind that this is the scientific world which isn't supposed to work this way — he simply doesn't pay attention, because I am not what he wants to see. — As for the behavior of the Other Guys, why should that astonish me? — "I went to Caltech," I explain to somebody when I am bitching about the affair. "I've seen what people will do to suck up to Richard Feynman. It is only a mild surprise that they behave as badly in the Little Leagues."[38]

So, I write it off. I have to, since the whole point of this exercise is to make an impression. I schedule a meeting with Famous Professor. I carry in a list of twenty questions I have about his research. He answers them with increasing difficulty. Toward the end I start to take it easy on him because he is obviously still weak and laboring to keep up. When I suggest, ever so discreetly, that I solved the algorithmic problem he thought was so important, he doesn't understand what I am talking about. — No surprise there. — However I have another trick up my sleeve. That was just one of the things I was working on, the main idea I have is a generalization of his work to higher dimension. He seems to get this part. I explain that I have worked out a lot of it, but there is still (hint, hint) more to be done. The colloquy ends on an ambiguous note.

And shortly so too does the semester, after which roughly thirty seconds elapse before I have to go back to work, since I am two months behind on every significant bill and cannot survive any longer

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[37] Cf. the character of Kent in *Real Genius* [Martha Coolidge, 1985].

[38] Foolish of me to have been surprised; it should have been obvious such behavior was scale-invariant.

without money. I consider writing up my solution, but face three difficulties: first, the paper will have to go to the journal *Theoretical Computer Science*, where the only publications on this subject have appeared, and it is dead certainty that Famous Professor will be enlisted as referee. So anything I write will be put on hold until his favorites get their own paper published, and probably even afterward. — Second, as soon as I realize I've been suckered once again into wasting my energies on somebody else's problems, I am absolutely furious, and cease to give a shit one way or the other about the subject.[39] — Because what was the point of this exercise? only this: to make a good impression on Famous Professor, who could bestow upon me a doctorate. But manifestly this is impossible, for reasons which have absolutely nothing to do with mathematics or "computer science" or my own merits and abilities.

Anyway, third, I simply don't have the time or energy: see the unfinished screenplay, above.

{...}

A year or so later I am walking my dogs up the hill to the mountain park one afternoon after I have awakened from the sleep of absolute exhaustion, and encounter Prize Pupil. With great enthusiasm he describes to me the contents of his dissertation, which turns out to be exactly what I had described to Famous Professor in our tête-à-tête.

Conclusion: I got ripped off not only by his students, but by Famous Professor himself. Once again I realize it's probably just as well Nozick never read that letter.

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[39] And forget everything almost immediately. There are garbled notes buried in a backpack somewhere, but basically if you were to ask me now (or indeed a month or two afterward) what these structures were, or what results I proved or how, I wouldn't be able to tell you.

[...]

Much later — after I had myself become the homeless academic — by virtue (of course) of knowing the right guy (a starving professor at a for-profit university who moonlighted taking courses for other people's students — behold the future of higher education), I became not simply a ghostwriter of term papers but an online body double for rich Arab foreign students who couldn't pass their mathematics courses themselves. — Which paid shit, as it turned out — tutors are *servants* — but (literal) beggars can't be choosers.

I'm still waiting for Rosanna, though.

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Gulf War Journal (1991)

(1/7) At 7/11 in the middle of the night, watching the clerk, half-interested, leaning on the counter listening to someone, apparently a regular; a philosopher, waxing eloquent on the Fate of Man. — Perfect as cinema, of course, but how many times must this already have been done?

(1/8) That curious vertigo you feel, working the night shift. — Those occasional fainting spells, the flashbacks of the fallen angel.

(1/9) In the apartment building at 2227 Canyon, delivering newspapers. Stumbling down the hall in the usual 3 a.m. stupor, I seem to see a robot waiting for the elevator. — Taking a detour as I think about this — slowly; always very slowly — returning finally from the other side and discovering that it is, instead, some kind of oxygen-bottle-dolly contraption. — Rather disappointed. I had begun to hope for the robot.

(1/11) The comfort we take as paperboys, drinking coffee in the office at two in the morning; waiting for the truck to arrive from Denver, listening to The Miser's stories. — Like characters in *Les Miserables*, galley slaves shooting the shit. — Shackled to our oars.

(1/12) Lepers from Saturn?[40]

The role of formal reasoning in mathematics: this only comes in later, after the blood has been hosed off the floors.

(1/13) Desperate men do weird things. — God, doesn't that explain everything.

(1/16) Dumpenproletariat.

Why is everyone named Mike? Walking through the campus, it is a constant chorus: "Hi Mike!" — "Hi Amy!" (Everyone else is named Amy.) — All so fucking bright and cheerful.

Not simply the same clothing, hats, haircuts, but also postures, expressions, attitudes. Like quanta of some field, created from the vacuum. — Bosons, of course; identical particles collect in fraternities. — So why not the same names.

Some poor geek standing out in front of the Engineering Center, handing out circulars. I somehow have the impression he's refuted quantum mechanics. — He seems a stock character, like the preacher on the soapbox who hung out in Sproul Plaza.

(I think it really was a soapbox. — Was that a deliberate affectation? I have to wonder.)

(1/18) Geekismo? How did that work? Engineer boots? Sliderule

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[40] An alternative title considered for *The Adventures of Buckaroo Banzai Across the Eighth Dimension*.

tieclips? — I might feel more confident about adopting this look if I'd ever known what "Engineer boots" really were.

Appealing to the statistician: what percentage actually are wearing baseball caps? of these, how many wear them backwards? — Science demands answers.

Walking along behind two girls pinning up notices for the teach-in. No sooner have they nailed one to a board than a passing meathead rips it down and crumples it, throwing it on the floor. — They are taken aback: "Excuse me?" they ask. — "Sir? Sir?" — Looking at one another, distraught.

Really, kids: it used to be worse. Much, much worse.

Another bad experience trying to audit a mathematics class: the instructor is offended. Thus far we are batting about seven out of ten on insufferable assholes. I grind my teeth and persevere.

(1/19) Another group putting up antiwar posters. An older chick, a Boomer, coordinating the activity. She sees another of our coevals approaching; they exchange a look, lighting up with that inner glow of moral fervor — we're *protesting* again. — Reliving in the comfortable affluence of middle age the millenarian fantasies of their hippie youth. — It is like a panel out of *Doonesbury*. I want to draw bubbles over their heads.

(1/22) Another asshole, this time one of the computer morons. I ride up in an elevator with him, asking polite questions about his course. This annoys him so much that I pursue him to the cafeteria. — The price of fame, dipshit. What was that they said about you in the *Enquirer*?

Another guy ranting on the plaza: the old-time religion. "The American flag is the flag of Technofascism!" he exclaims. — An

absolute throwback. I can't help but smile.

Note to self: didn't I used to have a watch? I took it off one day when I was cleaning a toilet, sometime in the early Seventies, and never put it back on. I wonder what happened to it.

Later walking Franny and Zooey up the Flagstaff trail. Coming back down toward Chautauqua, a familiar female voice addressing her dog: "Casey... ." — Was that the dog's name? I can't remember. But it is the German shepherd, and the girl, up close, is quite as attractive as I had guessed from a distance. — Zooey stands extremely still while the stranger sniffs at her; Franny, more cautious, keeps her distance. — The girl is apologetic: "We just got him spayed, but it doesn't seem to calm him down." — With atypical restraint, I manage not to retort that the same has held true for me. — An exchange of conventional pleasantries then. — She goes on up; I go on down.

A switchback or two beneath, I look back, to make sure I'll know who she is the next time; just at the moment she's looking back at me, perhaps with the same intent. — This will doubtless prove to be the high point of our relationship.[41]

(1/23) Hulahoop earrings.

(1/25) Distraught. — Really, I can't stand this. I simply can't.

A heart in nuclear winter.

(1/26) Talking pictures.

Scripts that play themselves. — Illustrations that come to life, and begin to speak and move. — The program and its execution. — Beyond the graphic novel. — Continuity. As if to reduce the whole procedure to the programming of a machine: the execution of a

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[41] And, sure enough.

screenplay.

Thus properly a screenplay should be a kind of program. Though in the direct equivalent of machine code, it would, obviously, be enormous.

A sort of flowchart might suffice.

Calling external procedures: "go out and shoot," for instance.

(1/28) Just before 7:30 in the morning, at Grant and College, we see the girl with the German shepherd again. Dressed in baggy Army fatigues. — Some parts, of course, are baggier than others. — We wave.

In class. Trying to be a good soldier. — Positioning myself in the last row on the far right. As ever was.

(1/29) The ignominy.....

(1/30) Nature as a work in progress. — One could only have thought of this after the temporalizing of the Chain of Being.

(2/1) Contemplating the Bulwer-Lytton contest: "I wrote bad prose before it was fashionable, man."

(2/3) Paying the futility bill.

(2/8) Subsiding anxiety. It seems to help to have something else to think about. So I walk down the sidewalk, ignoring my environs, thinking about the transition to convection. About the Dirac periods. About anything but where I am and what I'm doing, and the abysmal depth of my humiliation.

"If everything goes well we'll be seeing a lot of the Moon." — Once again the Moon looks a lot like the California desert. — Rock men.

Stolen from *Flash Gordon*, but now they look like giant Gumbys. — Bullets bounce off them. Now there's a surprise. — "There's a cave! Let's head for it!" — Strange. I'd swear I've seen this cave before. — A lost city underground, inhabited by beautiful women in revealing costumes. — Complications ensue.[42]

(2/14) Rounding the corner on a motorcycle, a guy in a black leather jacket with a longstemmed red rose clamped delicately between his teeth. — Here, I think, is someone who is having difficulty drawing the distinction between Life and MTV.

(2/19) "Joba?! Do you mean the hidden city beyond the Mountains of Despair? …I always thought it was a legendary city… ."[43]

(2/21) Limps. Hunchbacks. As they say, externalized character. — A crowd at a party. They all wear knee braces on the left knee. — One guy with a knee brace on the right knee stands nervously drinking by himself.

(3/14) From the bottom of a deep enough well you can see the stars in daylight. — I think that was the secret of the janitor's closet.

A familiar trope: the serial/sequential slaughter of representatives of each of the most obnoxious types: in *Commando*, for instance, the first to go is a used-car salesman; the lawyer follows in due course. — Every man in his own humor.

(3/21) Behind his house, in fact strictly speaking outside his yard entirely, an elderly man, rather unsteady, clearing a path through the ice still there in the shade, from the gate in the back of his fence to the alley. Fifteen or twenty feet, no more; still, it's obviously a considerable

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[42] Cf. *Missile to the Moon* [Richard Cunha, 1959].

[43] *Darkest Africa* [B. Reeves Eason and Joseph Kane, 1936].

labor for him, and he's been at it for a while. — Wondering, why he's doing this; what the point could be. — But somehow this seems like what you always are doing: attempting some pointless task beyond your strength, carrying it through nonetheless.[44]

(3/22) On the shelf beneath the rear window of an elderly sedan, a sunbaked copy of the telephone book. —Aha, I think: the yellowed pages.

(3/27) Griffith invents softcore: "Mutoscopes directed in 1908 ... include such intriguing titles as *The Girls' Dormitory*, *The Girls' Boxing Match*, *Too Many In Bed*, *Fluffy's New Corset*, and *The Soul Kiss*, none of which have been preserved." — Shannon Tweed begs to differ.

(3/28) Frieda I can understand. — But Helius? What kind of name is Helius? — Lieutenant Scheisskopf has the facts at his fingertips. "It's Helius's name, sir."[45]

(4/1) Dirac periods — scattering — the global minimum of a functional — path integral — renormalization — phase transitions in the coupling constant — topological arguments from the functional equation — compare convection? — limit as box size vanishes — Lagrangian — Schrodinger steady state — angular momentum — observables; expectation values — conserved currents from the Lagrangian — Schrodinger is two pieces of information, Dirac eight, at least two currents — conjugates, topological commutators — magnetic moment of the electron — spin current — effect of box size on accuracy —

(4/3) 2-SAT to 3-SAT, the former polynomial, the latter NP

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[44] Beckett: "With time, and nothing but my teeth and nails, I would rage up from the bowels of the earth to its crust, knowing full well I had nothing to gain. And when I had no more teeth, no more nails, I would dig through the rock with my bones." [*Molloy*.]

[45] Scheisskopf is watching *Frau im Mond* [Fritz Lang, 1929].

complete: suppose x-SAT, a phase transition somewhere between the two values (a continuous dimension trick) — probably at e.[46]

(4/11) The algebraic geometry of languages: a context-free language is analogous to the solution set of a polynomial equation; a finite intersection of CFLs is then analogous to a variety. — What is a scheme?

(4/12) Hydrodynamic interpretation of Schrödinger. Meaning of the "quantum-mechanical pressure" —

(4/14) Walking the dogs through the campus. Wet, rather chilly; wind, the snow still melting.

Fermions and bosons: repulsion and attraction. These are intrinsically quantum-mechanical pseudoforces.

Very curious. If there is a quantal equivalent of the principle of equivalence — a principle that conjures forces out of nothing — it is here. And no accident this is essentially field-theoretic.

(Surely I have thought this before, and expressed it better.)

(4/15) That he may, in the end, perhaps, get the girl. — But what is that then? nothing more or less than that itself: he gets the girl.

Somehow this turned out to be the moral of the Sixties for me: a thing is simply what it is, and not some other thing.

(4/16) Tracking shot: the moon, reflected in a series of puddles.

(4/20) Wondering as always about the finite complexity of the

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[46] Why I would have thought this: thanks to the properties of the fast Fourier transform algorithm, the optimal base for floating-point multiplication would not be 2 or 3 but 2.718281828... .

monads. If the cellular automaton is a model of the field, then it is natural to expect this: the computational power of the vacuum is limited, in fact locally limited. In principle this should be observable.

In the bookstore, a title glimpsed out of the corner of my eye: Our Boners, Our Selves.

(4/24) First hummingbird of the season.

Wondering when the last time was I saw *How to Stuff a Wild Bikini*.

(4/25) A teeshirt: "You can always repeat a class, but you can never relive a party." With teddy bears, for some reason. — This does make perfect sense. In Boulder, at least, business is simply the continuation of the party by other means.

"High School With Money" is not at all a bad title. — For that matter "Photographs of People Talking."

Titled scenes, like chapters. (Woody did that one.)

Different timerates in different planes of the picture: in the foreground, a conversation upon a knoll; in the background, clouds gather with unnatural rapidity for a thunderstorm. — Gance did something like that with the triptych, but this feels more like Cocteau.

Without having overcranked, one could still reproduce slow motion by interpolating between frames. A sort of iterated morph.

(4/26) "The weird thing is..." — the definite article. As if there were ever only *one* weird thing.

(4/27) The *Tractatus* on logic and ethics: the stillness is part of the dance.

(4/28) "...the results obtained by the natives who live by the banks of the Orinoco, [who] bind the skulls of their children between boards to keep them from ever being able to think of things which are too lofty." [*L'Eve Future*.]

(4/30) Jay Ward and Bill Scott imagine Sleeping Beauty as reported in *Variety*: "Doze Doll Does Wiz Biz." — "Doze Doll Dull."

(5/1) This time it is a girl on the back of a motorcycle: black garments, lots of skin, tan like mahogany. I stop and stare, I can't help it, and then start laughing — literally, a living Frazetta, the warrior princess.

(5/5) Two dreams: in one, trying to get Rosanna Arquette's autograph; in the other, orbiting the Earth in a truck full of furniture. — Re-entry, discontinuity, apparent transition to the afterlife, which (no surprise) turns out to be in California with my dogs. — Running in the grass. — Save that thought.

(5/21) An old observation: I know a great deal more about the structure and composition of the Milky Way than Herschel did, or Kant. But I don't know any more about sense-data than Hume did. Isn't this strange? after all these are supposed to be the most concrete and immediate entities. So how can they be so difficult to observe?

One advantage of the "objective" is that you can find out about such things; you focus your telescope upon the Milky Way, and resolve it into stars. The longer you look, the more of them you can catalogue.

But there is no telescope with an inner focus.

(Why is it you think that if there were one, you'd only see empty space?)

(5/22) As the conjectural landscape of cyberspace would have to

be (in Gibson's phrase) a consensual illusion, so (and perhaps this is the strength of the idea, its resonance as metaphor) must be the internal landscape of the Self. An invention. — It would be interesting to go back and extract this point from Wittgenstein: that (as Bloom said) he insisted on the fact that the architecture of the self is largely constructed, learned — that introspection is circular, that you find there no more than what you brought in with you to look for it.

Though I suspect Wittgenstein was rather too disparaging of e.g. Descartes and Rousseau, who invented the game. And certainly the rules and the structure change from culture to culture; contra of course the Oxford epigones.

(5/24) *Raketenflugplatz*. — They don't make nouns like they used to.

(5/27) A walk along the creek. A redhead on rollerblades, smitten with me or more likely the dogs — tries a smile — draws a blank because with my usual sluggish reaction time, I cannot decide how to interpret this data — smiles again, more broadly. Belatedly I realize I am supposed to acknowledge her. — Finally smile back. — Success. — She and her companion disappear down the trail.

Trying to explain this to somebody later, why I don't respond correctly to these advances. Instead I am asking myself: Why is she baring her teeth? Is she going to strike?

(5/28) Tired, but persuaded by the dogs as far as the park at the mouth of the canyon. Here prepared to turn around and drag my carcass back, but a blonde crosses our path and steps into the restroom. Figuring, a few paces more, I walk along slowly, waiting for her to emerge. — Sure enough. — She passes. Zooey tries to hit on her. - She's not a blonde at all, I now perceive; chestnut-haired, actually, unbound, halfway down her back. Cutoff blue jeans, black sleeveless shirt tucked in, sunglasses which actually are (no shit)

Wayfarers. By no means two-dimensional, but it isn't this at all, it's the walk, perhaps the air, remote and mysterious.

So we follow her to Four-Mile Canyon and back. She's paused to strike an arresting pose upon the rocks when we arrive at the end of the trail, so we start back before her. She passes while the dogs are taking a bath, and says hello; a perfunctory smile. Following her down the canyon a couple of miles at a distance of a hundred yards, I am thinking, foolishly, I could watch her walk forever. Pass her on the bridge over the creek (a great one for striking poses), noting the jeans are, in fact, Gloria Vanderbilts, the shoes lowcut white Reeboks, she isn't wearing socks. Looping indecisively around the park a couple of times, trying to make my mind up; she continues into the city, — I follow for a while and then give up. — So much for the birthday of the Turing machine.[47]

(6/1) Dream: riding on a train, looking out the window, passing the station. The dopplered change of pitch: at the change precisely, out, in the scene — the alarm, and abruptly awake.

(6/4) Mose Allison: I'm not discouraged/But I'm gettin' there.

(6/6) As if you were to write down — no, hum — the notes of a chord one at a time, a week apart. Something that resonates, over time, which I cannot express.

(6/7) Entanglement of state with other worlds. Communication by telepathy. Note the implication that, just as with any means of

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[47] A year or so later, I ran across her in the park beside the creek again. I didn't recognize her — something had changed — the hair, the outfit — but she obviously recognized me, and made a production of parading past me to allow me to admire her ass. I couldn't figure out the point of this exhibition, but then — with some effort — recalled the previous episode, recalled her manifest disdain, perceived that this was intended as some kind of gloating reaffirmation of power, and reacted with baffled indifference. — Yes, I'm a pathetic loser — Yes, I fell in love with you at first sight. — No, that has happened a hundred times before and since, and now I couldn't care less. — So fuck you, bitch.

stepping outside space to go elsewhere, whatever you overhear will be a signal from a totally alien world, and you won't recognize it as thought.

(6/16) Dream: turbulence. — On the one hand it seems embodied somehow in paper, perhaps paperwork, something like, sorting a mass of letters, and I have for some reason the feeling that I am master of this problem. — On the other, there is a plasma, I think in a rocket engine, somehow literally a living creature with which the pilot, the engineer must physically wrestle — arms extend from a torso, and they grapple[48] — momentarily he hides, and there is a very cinematic cut to the creature's point-of-view (it almost seems to be labeled, as if with a subtitle, P.O.V.), and the vision's grainy, like the Predator's, infrared.

Something lasting in this vision: the plasma as a living creature. Picture it as an organism, confined by a cell wall. Self-confining. Thinking about this afterward, I wonder, some kind of soliton? but it isn't quite this. — not to wave your hands and mutter, well, nonlinear. There's something more than that.

(Somewhere I have an old paper about ball lightning....)

Having wondered long ago what the defining equations for life might be. Perhaps that. Note that lately again I've spent much time staring with mathematical fascination at the forms of clouds. Can they be less tenuous than jellyfish?

(6/21) Once I discovered I was never going to get paid for the work I had done I dropped all consideration of the Generalized

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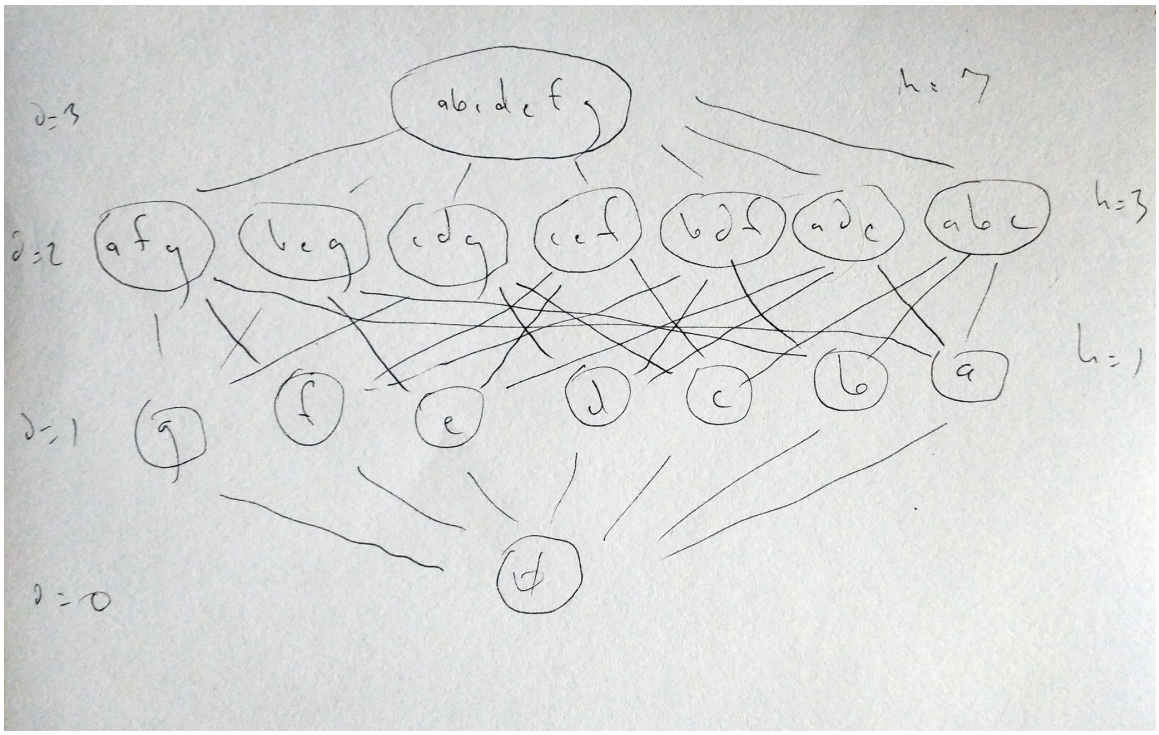
[48] This now seems like an anticipation of the fusion scheme of Doctor Octopus, in the second Spider-Man movie [Sam Raimi, 2004]. I don't recall whether Doc did anything similar in the comics, at least not consciously. But it seems rather a cinematic idea, like something Raimi would have made up. Thus a curious anticipation.

Macaulay Theorem, and haven't thought about it for a couple of years. No surprise then that yesterday while thinking about something else the solution abruptly popped into my head: sure enough, it follows from Möbius inversion; in fact after pursuing many other flights of fancy the solution is basically what I wrote down on the first page of the first notebook I devoted to the subject — consider the polynomial encoding all the information given by inclusion/exclusion, and then, etc.

It still doesn't generalize properly, viz., to the Gaussian case:



no doubt because nothing about the idea of "lexicographic order" is invariant. — Subspaces as sets of vectors and relativize? please.....

But I still don't give a shit about the result one way or the other. And is there any way I can paid for this? — No.[49]

(6/28) Andrew Sarris in passing on Godard: "The difference between American movies and European films — and I am not speaking here of a generically geographic distinction — is that American movies tend to correspond to reality while European films tend to comment on reality." — Wrong. — American movies, as Godard recognized, *construct* reality[50] — what remains, then, is the (hermeneutic?) commentary upon the construction.

(7/1) Dream: unusual: a multiple personality. The curious thing, that the guy changes personalities in midsentence, as it were for comic effect. — What difference from an ordinary individual, I am wondering.

Waking up, the usual flurry of nonsense running through my head — the mind moves laterally almost without (shear) friction in this state, a kind of superfluidity. — It occurs to me that this is a bit like the computer waking up, checking the modules. (The little chain of icons displayed at the bottom of the screen as it finishes booting each.)[51] Running diagnostics.

For obvious reasons this line of thought, mechanization, has been frequent lately. Another: wondering (as I always have) why, when you're tired, you begin to subvocalize more. Or notice it more. Thinking: it's almost as if you could hear the programming instructions going out. Not necessarily from one half of the brain to

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[49] I did later go to __'s graduate advisor to discuss the problem, mentioning that I'd been commissioned to rewrite the never-completed thesis and had in the process discovered a number of new results. Which I outlined for him; but, as usual, big fucking deal — no time or energy to write them up, no reason to suppose they'd bring any useful return on investment.

[50] In the same sense that Harold Bloom credits Shakespeare with the invention of the human. Though here, I suppose, we would have to credit Irving Thalberg.

[51] Characteristic of the old Mac OS through System 9.

the other, but from the CPU to the multiple processors; a sort of SIMP architecture.

(7/2) Walking down the creek. Girls out tubing in bathing suits that stop a couple of centimeters shy of a gynecological examination. I feel like an alien who has fallen from the sky.

(7/4) A children's film: "The Littlest Ninja."

Précis of the Eighties: Babbitt on coke.

(7/12) Frankenstein. The girl dies, he brings her back from the dead. Of course she's now alien, uncanny, her spirit still lies on the other side. But it isn't the point that tampering with the Divine Will must lead to evil—rather, something different. — In fact he dies and fades out as she stands at the controls of the apparatus, preparing to revive him as one like unto herself. Is this a happy ending?

"Your sense of humor is grotesque." — "Thank you."

(7/13) There is motion in apparent stasis, he thought. — And then forgot about it. — Once you have gained a certain facility in constructing these paradoxes, you are easily bored with them.

(7/21) The character of Owsley — designer drugs — Speculative chemistry. Metaphysical chemistry. The chemistry of consciousness, the chemistry of souls.

Making a note to nominate him for the *Time* Man of the Century when the decade runs out. Because who else.

(7/24) A man in his sixties, mediumfat, whitehaired, neatly bearded, bespectacled, pushing a shopping cart which seems to hold all his worldly goods — neatly packed, upper and lower levels, everything neatly folded, a couple of nice new packs. Dressed in tshirt

and boxer shorts; whether these are meant to be outerwear or underwear it's hard to tell; perhaps he is a refugee from Woody Allen's banana republic. — He looks like Norbert Wiener. I imagine him a retired academic, cast off and cast out; the detritus of a university town. — Something like Bunyan's Man of Despair: "I was once a Professor... ."

Reading with one hand as he pushes his cart across the street — muttering to himself in Latin — what? Ovid? Boethius? — Am I to think of him as a role model? a Doppelgänger?

(7/26) "He was puzzled; everything about her puzzled him. Maybe, he thought, I've been living here alone too long. I've become strange. They say chickenheads are like that. The thought made him feel even more glum."[52]

(7/27) Recalling the conversation in which I reminded him he had once been poor, and gloried in it. — "But I was young then," he said, "and my poverty was righteous." — "Poverty is wasted on the young," I said immediately. — And then of course we couldn't stop laughing.

(7/28) When I cleaned out the old apartment, I had an unframed full-length mirror left over and, figuring it was too easy to break, decided to leave it. It was dirty, and, having no better idea how to clean it, I stuck it in the shower and ran hot water over it. And there it stayed.

Somehow this seems appropriate, for an apartment in Boulder. Everyone should have a mirror in the shower.

— Found later, undated:

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[52] *Do Androids Dream of Electric Sheep*.

A fool for love

— It doesn't take a rocket scientist to figure this out, he says.

— And, he continues, I *am* a fucking rocket scientist. I'm Hermann fucking Oberth. I'm Sigmund fucking Freud. I'm Ludwig fucking Wittgenstein. I'm Richard fucking Phillips Feynman. I'm Friedrich fucking Bubba Nietzsche. I'm the fucking Shadow, who knows what Evil lurks within the hearts of men. I'm the hurtling comet, the masked Avenger, the guy who washes chili down with Coca-Cola and never fucking farts. I'm the Silver fucking Surfer, the herald of Galactus. I'm Mister fucking Fantastic. I'm Ben Grimm, the orangeskinned fucking Thing. I'm the Human fucking Torch.

— And she, she's the Invisible Girl. I thought I saw her. But she disappeared.

—414—

Where it all went (1991)

At a party with some old hippies. Conversing with a woman who was once a highway child; now, of course, she's in real estate. She explains she had been a member of one of those hippie-fascist communities formed around some god-king wannabe. I mention the name of Mel Lyman,[53] she says, yeah, like that, I knew some of his people. I tell her I don't understand why anyone would join such a cult, it seems the very antithesis of the search for personal liberation that I thought had motivated us all. What had been the whole point of the movement. She says it was simple, really, like many others she was overwhelmed by freedom, and just wanted somebody to tell her what to do.

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[53] See David Felton, Robin Green, David Dalton: *Mindfuckers. A Source Book on the Rise of Acid Fascism in America.* [San Francisco: Straight Arrow Books, 1972.]

The more I think about this, the more appalling it becomes. Is that the secret of the social contract? that secretly, everyone just wants to follow orders? — I can't quite believe that. — But later, when during my abortive career as a union organizer I discover how badly my fellow workers *want* to believe that management has their best interests at heart, it does not come as a surprise.

—415—

Arts Center (1992)

For a decade or more the guardians of the city's self-image have been insisting on the necessity of converting the old Watts-Hardy dairy into an Arts Center, as a means (so the local paper claims) of repairing the grievous damage wrought by the cruelly accurate late-Seventies characterization of *Newsweek* ("Boulder: Where the Hip Meet to Trip"), that this is a party town inhabited exclusively by narcissistic trust fund babies and their support staff. (Indeed the old joke was that the three people you had to see in any given day were your lawyer, your broker, and your dealer, and with any luck they were all the same person.) But for this reason also a great town in which to pretend to be an artist, so here the Center is at last. Groaning inwardly but compelled by social obligation I attend the official opening. I wander from room to room, viewing wall upon wall of execrable watercolor landscapes. Finally lighting up when I find the one where they're stashing all the good shit, some really nice primitive stuff. Then I realize this is the exhibit from the elementary schools.

Watching a dance performance. "Lay of the Crane. A dance about the Whooping Crane, and its indangered [?] situation." They do look like cranes. — I write Joe Bob's review for him: he likes the girls in their underwear, but wonders why they keep flapping their arms.

Then I watch Karen Steele, who is actually good, of course, smooth, very controlled, the higher Fourier components edited out of her

motion, not a delta function to be seen. — I talk to her afterwards, maybe she still has a thing for me, maybe not, but in any case, seriously: never again. This time I mean it.

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Smoking (1992)

I always envied the nineteenth century Romantics,[54] who could contract tuberculosis and thus live fast, die young, and leave a good-looking corpse;[55] what Mann had said about Art and Disease was ever present in my mind. So I smoked cigarettes as a kind of substitute. But this seemed like a sort of Faustian bargain — again, see Mann, the character of Leverkühn — and it seemed advisable to quit before the expiration of the XXIV years. Though naturally I put it off to the last minute.

{...}

So what happens after the brief flirtation with graduate school? — I go back to the night shift, and work seven days a week without a day off for a couple of years straight thereafter. — It is worse. It is always

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[54] I applied this description not simply to e.g. Keats, but also to mathematical revolutionaries like Abel and Riemann, who met with a similar fate. If I were Spengler I would have some grand theory about the Zeitgeist that sheltered poetry and mathematics under the same tent, but of course it would be silly bullshit. The real principle here is that for a young man looking for heroes among his intellectual predecessors, the guys who died early and only left portraits of themselves as young men were the natural objects of attention.

[55] As a point of cinematic trivia, this line is uttered by, and may have originated with, the teenage punk character in the Bogart vehicle *Knock On Any Door* [Nicholas Ray, 1949] — a role played, curiously enough, by John Derek, an actor whose movie career didn't amount to much but whose subsequent marital history was spectacular, encompassing as it did Ursula Andress, Linda Evans, and Bo Derek.

worse. I keep thinking there must be some light at the end of the tunnel but it never appears. — Still I advance steadily, like the classic rock-climbing algorithm for getting up a chimney, quitting one job for another and working back and forth and edging ever upward, and arrive at the point at which my income is the largest it has been since quitting the Post Office: seriously, something like eighteen hundred dollars a month, almost four times the rent; knowing I must treat this as a windfall and ignore supposed fixed expenses like taxes, I sleepwalk through the music stores shopping for the stereo I have never previously been able to afford, get a new four-head Sony VCR that will do proper freeze-frames so that I can study shot composition, and even pop for my very first (used) Zenith color TV.

Still, this is not stable equilibrium. Some fresh disaster must lie in the offing.

{...}

In the days before the principles of classical physics had been firmly established, indeed before there was any clear conception even of force laws, and all interaction was assumed to require direct contact, there was confusion about causality in mechanical interactions. Descartes, though he had a partial understanding of the conservation of momentum in, for instance, the collision of billiard balls, was not yet clear either on the vector character of momentum or the conservation of kinetic energy (aka *vis viva*, the contribution of Leibniz), which is required to render such problems well-defined. Thus to solve the paradoxes of dualism he suggested the mind might be able to affect the state of the body without violating physical causality by, as it were, altering the outgoing angles of an otherwise underdetermined collision; and suggested the site of this interference could be the pineal gland.[56]

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[56] Here the Firesign Theater fan will recall The Adventures of Nick Danger, Third Eye; though if those were an elaborate cheat designed to get around the paradoxes of dualism I've certainly forgotten.

I come to see that this was wrong. The actual interface lies in the hippocampus,[57] which regulates, among other things, sleep and the immune system.

Why after a week or two on the night shift does everything seem dreamlike? Why do the days blur together? Because the hippocampus also regulates the conversion of short- into long-term memories, and this governs the internal clock that keeps track of the passage of time. This mechanism is damaged by perpetual sleep dysfunction, the inability to rest. — You have a vague awareness of the seasons changing and the day lengthening and shortening, but no real distinction of day or week or month. — Events pass from a discrete solid to a continuous liquid phase. They begin to flow into one another, like the fast-forwarded perceptions of the Time Traveller in George Pal's cinematic interpretation of Wells.

And you are always tired. After a while this becomes the central problem of your life, and every minute not spent working or walking the dogs is spent in a vain effort to *fix that* by trying to fall asleep. You can barely stand up, you are always stupid and pissed off, you talk to yourself, loudly and frequently, and you experience alarming episodes in which you catch yourself just as you have begun to collapse in a faint.

But you have to do it. And so you do.

After a year or so a mild cold circulates among the walking dead, and I catch it. Everyone else gets better in a few days, but I just get worse. I develop a cough that migrates from the top to the very bottom of my lungs, and becomes presently a stabbing pain in the chest (it does literally feel like a knife) that doubles me over in spasms, exciting the commentary of onlookers; more than once someone reminds me that

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[57] In fact as a matter of physiology this isn't correct, but it's an illustration of the impaired state of my mental functioning that I would have spun a bad theory like this to explain it.

you really can break your ribs with such a cough, and I must admit it does feel that way. After a couple of weeks I give up and go to the doctor (in this halcyon era there is still at least one relatively inexpensive[58] walk-in clinic within the city); no great surprise, a chest X-ray reveals pneumonia. I get enough antibiotics for ten days, and, still coughing at the end of that, enough for ten more. By the time I finish this second course I can breathe again. But now I haven't had a cigarette for a month, because I haven't been able to inhale.

So here is the dilemma: should I, as I always have before, pretend this never happened and take up where I left off?

Bear in mind that though I still haven't the faintest idea what is meant by "walking" pneumonia, I haven't missed a night of work in all this time — because I can't, that possibility literally does not exist — and that my job, through which I have staggered faithfully, consists of unloading the delivery truck and tossing a couple hundred bundles of newspapers around the warehouse (hard on the hands if you don't wear gloves, so mine generally look leprous) and then for several hours taking a few dozen of these myself and running them up and down the stairs of the university dormitories. (I have no keys to the elevators, and Murphy's Law entails that there is always some asshole on the fourth floor who insists on subscribing and will complain to the fucking publisher if he has to walk to the lobby to pick up his paper.)

In consequence I have spent all this time coming home from work, walking the dogs around the block, and then immediately collapsing into bed; where it has been essential to sleep curled up on my side, because when I cough, as happens every minute or two, I jackknife convulsively into the fetal position, and I can't allow this to wake me up.

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[58] To be precise: it cost me about fifty bucks, at the time less than a day's labor. (I assume it is understood that I have never had health insurance,)

The whole experience has in short been a burden of misery so colossal that I can't even summon the energy to whine about it — I try to impress myself with my fortitude, but I'm too tired for that too — and I have the overriding feeling that all this must be made to *mean* something, that it cannot be allowed to go for naught.

So. I have always told myself I would have to quit smoking sometime; and even though I have always immediately followed that with "Yeah, right," I see that day has now arrived. I won't go back.

The usual objection, the fear I have justifiably felt on the basis of previous experience (having quit once before for a year, passed most of it as a drooling idiot, and developed an alarming taste for alcohol as a substitute) was always that I would lose the ability to concentrate, but obviously the job has destroyed that already, and this will make no difference.

So that is that.

{...}

And what does this mean? Some of the consequences are interesting. — A couple of months later, for instance, I am explaining the newfound sensitivity of my nose to Stefano as we are driving down a major thoroughfare at 35 miles an hour with the windows open. "I can smell a cigarette at a great distance." I say. "For instance" — I point to a car a hundred feet ahead of us—"there's a guy smoking in that car up there." We pull up behind him at a red light. And sure enough.

Why has "second hand smoke" become such an issue? Because even though it doesn't take more than two or three weeks to break the physical addiction, there is a long period of months or years thereafter when you are still sensitized to nicotine, and vulnerable to relapse. Even the slightest hit may reawaken the dormant addiction, and even exhaled smoke contains enough to put you at risk. — Once enough

people have quit they have to make up stories (and then bullshit statistics) about the health hazard, but this is the real reason they don't want smoke blown in their faces.

I make a solemn vow, never broken, not to be a self-righteous asshole about this issue, but for a very long time I carry a handkerchief I can wet and hold over my nose when smokers are present. To this day I avoid inhaling smoke, and pull my shirt over my nose to filter it out when it is otherwise unavoidable.

{...}

Breaking the physical addiction, however, is the easy part. What is really difficult is life without cigarettes. Nothing is ever quite the same afterwards.

The fundamental dilemma is inescapable. Life with cigarettes is much better than life without them. But life with cigarettes is also a slow death. So what can you do?

In statistical mechanics this is called frustration: a situation in which the constraints defining an optimal configuration cannot be satisfied.[59] — Or, in Leibnizian terms, this is not the best of all possible worlds. — In that one, of course, right now I am sucking down on a Camel straight; but then in that one Jack Kennedy is always president, and we are building spaceships to go to the Moon.

At any rate I passed a number of severe stress tests shortly after the event without affecting my resolve — my landlady's pet drug dealer[60]

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[59] A simple example is a system of two-valued spins on a lattice, in which the minimum energy is attained when adjacent spins point in opposite directions; think of bar magnets, for instance, allowed to point only up or down. On a square or hexagonal lattice this is easy to arrange; on a triangular lattice it is impossible. (The necessary and sufficient condition for satisfaction is that every closed circuit should have an even number of edges.) — The general solution to the Leibnizian problem of compossibility rests upon a relative triviality.

[60] All she would say was "His father has a lot of money." — Fuck you, Ronald Reagan.

threatened to kill me and she evicted me in consequence, my father died and my family went bananas — I have nothing resembling willpower, but I am extraordinarily obstinate — and gradually restored most of my higher functions — though: it was at least a month before I could talk coherently; a year before I could read;[61] three years before I could write again (literally: I was unable to string three sentences together without forgetting the first); much longer than that before I could write a computer program or solve mathematical problems; and I still notice that certain elementary mental operations I could not perform at that time can perplex me momentarily, e.g. now and then I draw a blank on a double negative,[62] or falter trying to figure out whether you over- or under-crank the camera to shoot in slow motion. — I remember staring blankly at a still from *Mister Arkadin*, wondering why it was supposed to illustrate Wellsian irony:

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[61] Even then it was easier if I ate ice cream while I did it. I suspect this was because of the soothing effects of tryptophan, since otherwise my eyeballs tended to leap away from the page.

[62] Ironically one factoid I have retained about attempts to teach English to chimpanzees is that they couldn't process these either.

(Hint: this isn't a good guy.)

On the whole I wouldn't say that my powers of concentration were ever completely restored, particularly the ability to keep a mathematical argument in my head for an extended period;[63] I did notice, however, that by way of compensation my ability to solve problems at a glance was somehow amplified, and thus paradoxically though I often couldn't remember how I had solved some problems before, I could now solve others I hadn't been able to previously.

So was everything for the best despite it all? Does Pangloss carry the argument? — Don't be ridiculous.

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[63] There's a one-sentence proof, based on an idea of Liouville, of the theorem that any positive integer is the sum of four squares. I came across it once in the *American Mathematical Monthly*. The statement was so compressed that I literally read it over and over again for thirty minutes before I understood it. I smoked five cigarettes in the process. Alas, nevermore.

{...}

I remember standing with a cigarette in the Fleming House courtyard one afternoon, shortly after I'd gone abruptly from zero to a pack of Camels a day, when a friend (himself a confirmed nicotine addict) accosted me: "When did you start smoking?" he asked, with an inquisitive grin. — "When I quit amphetamines," I said. — Which cracked him up, as I knew it would, but like all my best jokes it was the simple truth: speed, I thought, was too alluring, it represented a real danger, best to dial it back to something easier to manage, something that wouldn't kill me quite so quickly. — There was a kind of principle of conservation of addictions that applied, which I could turn to my advantage.

(I also had the idea that it would Build Character to have something to quit. Of course this was true, but made the naive Romantic assumption that Building Character wasn't something one should avoid at all costs. My bad.)

So it was here that my career as a junkie came to an end, and left me with no further vices save espresso and Ben and Jerry's. — To these, however, I am faithful unto death.

—416.1—

Smoking, concluded

I was never under any illusions about what would happen if I were to light up again, even once, and since I knew that, and knew that I was not going to smoke any longer, I was never tempted. But I do occasionally dream about smoking — not that I crave a cigarette, though I have heard that others have had this problem —rather that I have noticed offhandedly that I am smoking, that I have been doing so

off and on for a while, and that I am control of it, I can stop whenever I feel like it, it is no longer dangerous. — In this fashion the ghost of a dead addiction speaks to me from beyond the grave.

—417—

Confusion (1992)

Stumbling about after waking: the Silence of the Limbs.

—418—

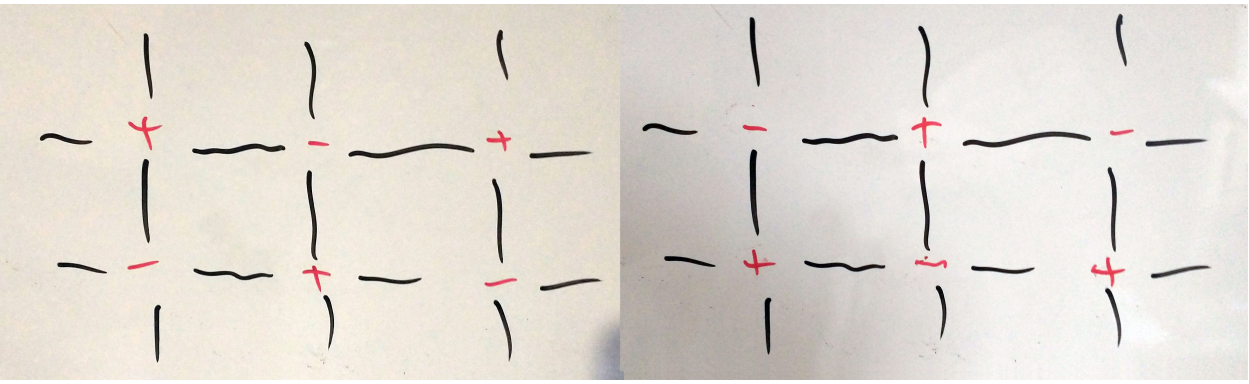
Frustration (elaborated)

That is, the behavior of dissipative physical systems can be described teleologically, as a tendency toward attaining the state of lowest energy. The difficulty is that this state may be ill-defined or may not exist.

A simple model of matter in the solid state illustrating the principle might consist of a regular lattice, with "atoms" of some kind located at the vertices, adjacency indicated by an edge connecting two vertices, and energies computed by summing energies of interaction between nearest neighbors which depend upon both their states.

Thus you might, for instance, try to find the state of lowest energy for a planar network of spins with values ±1, where the contribution of each edge to the total interaction energy is the product of the values at its endpoints. — You can think of the spins as little bar magnets, for instance, which when adjacent will attempt to align their poles north-to-south. — Then it is easy to see that if the number of edges around any closed circuit is even, as with a square lattice, then all the spins can be oriented oppositely to their neighbors, every edge contributes a

net of -1 to the total energy, and there are globally two symmetric but distinct solutions of minimum energy, one flipping all the spins of the other.



If on the other hand there are circuits with an odd number of edges, as with a triangular lattice, there is no way to satisfy the constraints to produce a stable[64] ground state; thus in this model, practically the simplest in which the question makes sense, there is no unique best of all possible worlds.

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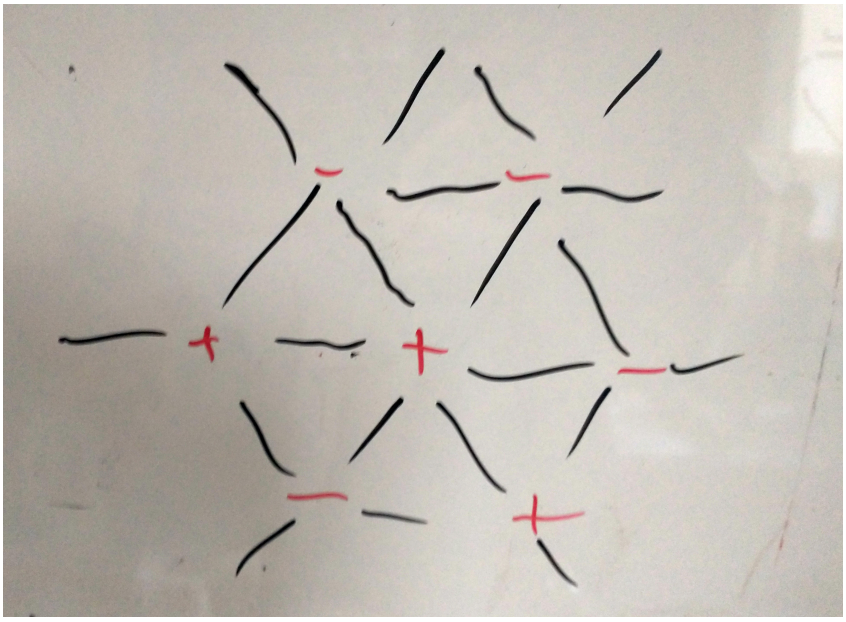
[64] The physical picture here is that there is always some inherent jiggle in the system — heat, measured by a temperature — that agitates the magnets randomly and continuously, allowing them to change their state even if it means temporarily adopting a configuration of higher energy. In the case of a triangle in the state ++-, this could be a transition to +++ and then to any of +-+, -++, +—, -+-, —+. Thus a degenerate ground state at finite temperature is inherently unstable.



In other words if every circuit has an even number of edges then every vertex can be happy, in that it is aligned oppositely to each of its neighbors; if every circuit has an odd number of edges, however, then absolute happiness is impossible, and only an incomplete relative happiness can be achieved.

Obviously in more complicated situations the problem only gets worse, and it is conjectured, for instance, that the peculiarly amorphous structure of glasses is the consequence of the mutual microscopic interactions of the constituents being sufficiently complex that either an unambiguous ground state is nonexistent, or that for the system to find the solution of the equivalent optimization problem would represent a computation which could not be completed within, say, the age of the universe.

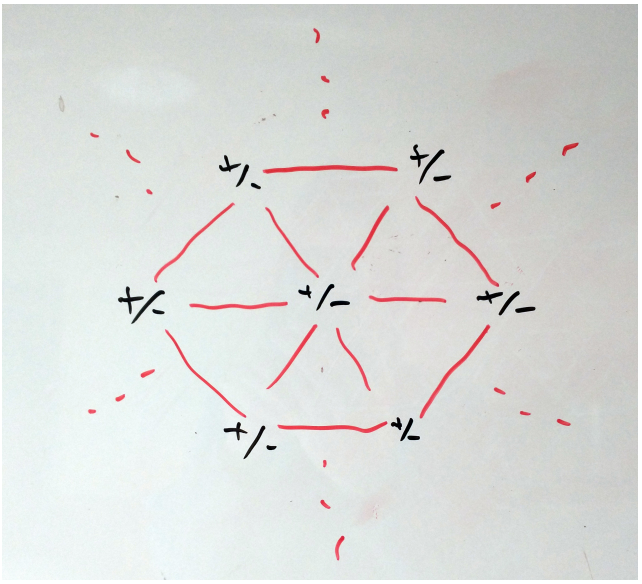
So if you were to insist on interpreting the valuation in moralistic terms — if you were to say, for instance, that magnets can only be happy when they are aligned south to north and north to south with each of their neighbors — then that is the origin of evil: in a world of

more than minimal complexity, it is mathematically impossible to avoid it.[65]

[65] I suppose this must sound ridiculous, but this is exactly what Leibniz meant, and this is how to solve his problem. — As for why he would not have thought of something like this, I imagine it was because his logic excluded relations.

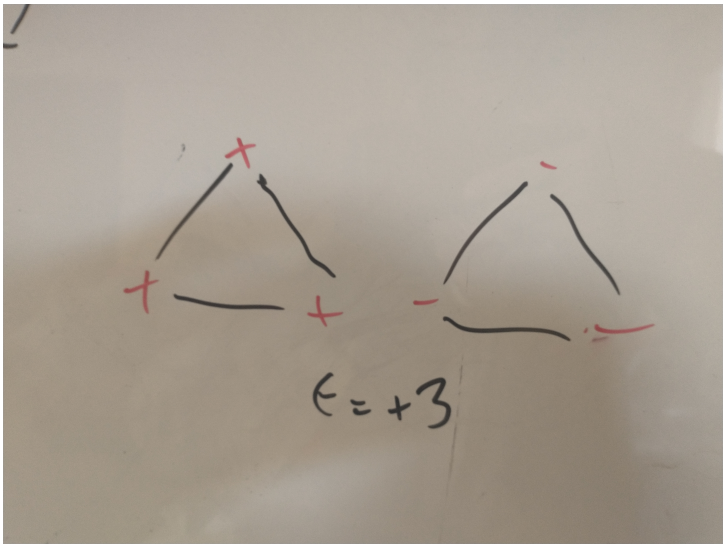
{…}

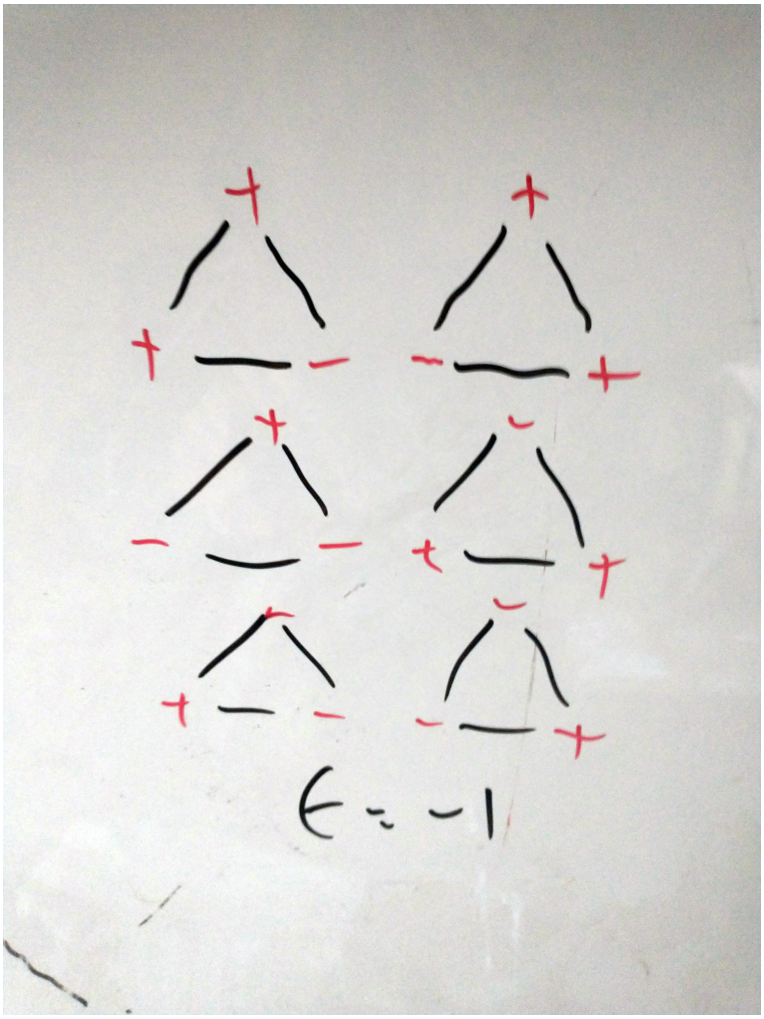
The same picture can be applied to the problem of synchronicity: suppose the universe consists of an infinite planar triangular lattice:



in which again there are spins at every vertex, flipped up or down, and they interact along edges, with a contribution to the energy which is positive if they point in the same direction and negative if they are oppositely aligned.

Then for any triangle there are essentially only two distinct configurations, [1] two spins the same and one different (net energy -1), and [2] all spins the same (net energy +3):

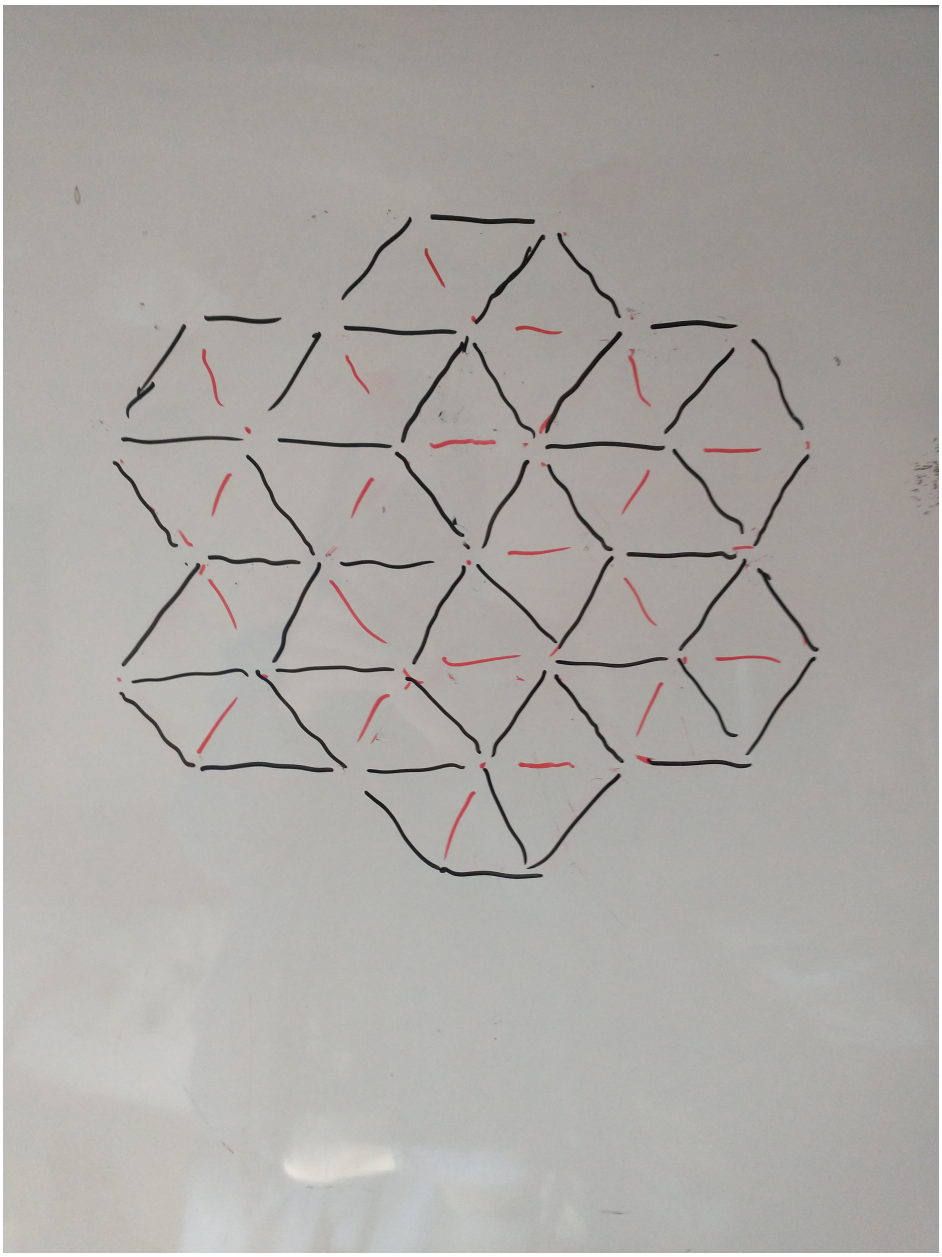

$\epsilon = +3$


$\epsilon = -1$

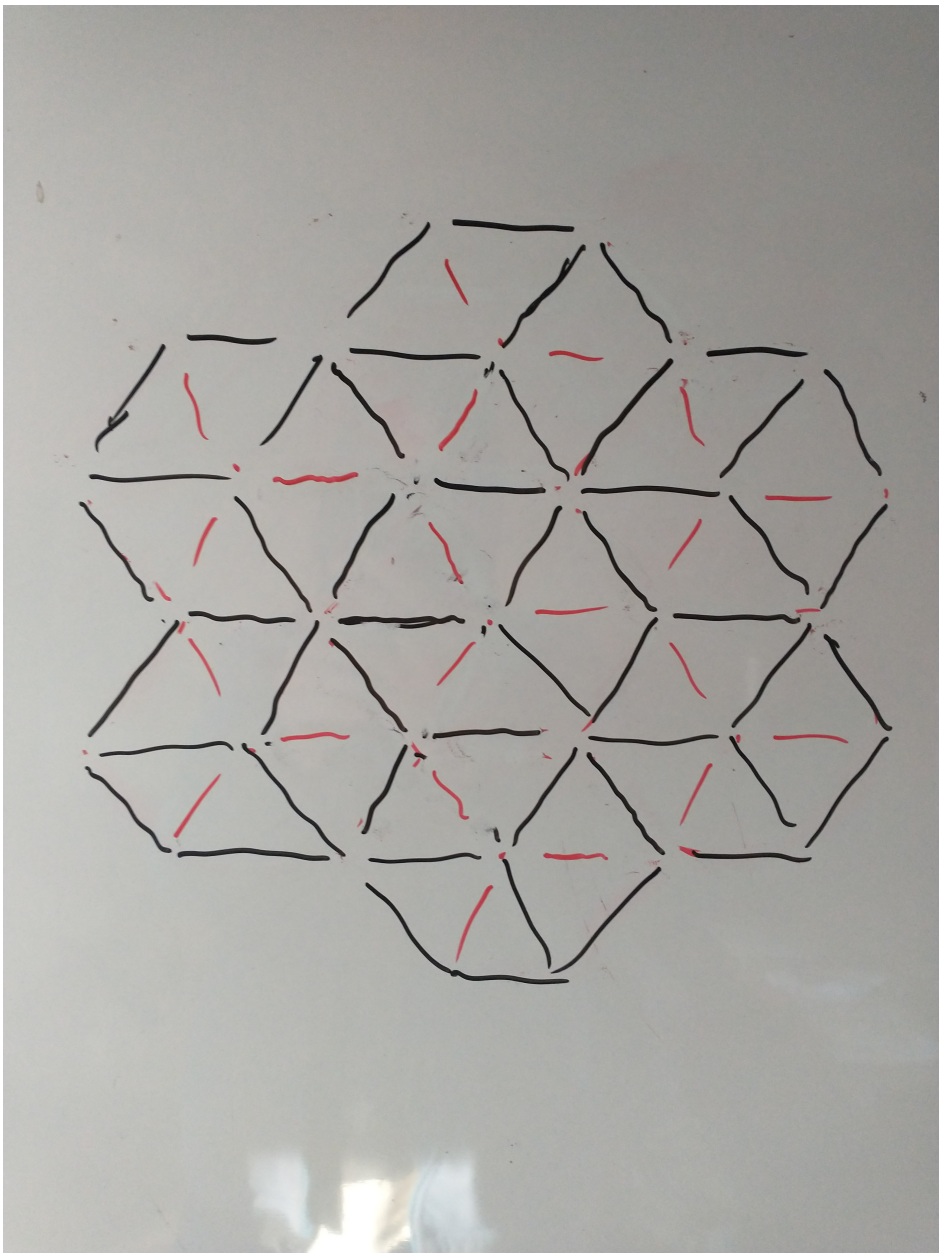
In general, then, how must the spins be arranged?

I won't pretend this argument is rigorous, but rephrase the rules as follows: begin with the triangular lattice, and two-color the edges without forming any black triangles; red edges correspond to pairs of vertices with the same spin, counting +1, and black edges to pairs with opposite spin, counting -1. Then minimal energy will be attained when a maximal number of black edges are colored in, and this occurs when the lattice has been tiled with tiles composed of two triangles with two black and one red edge apiece, meeting on the red edge.

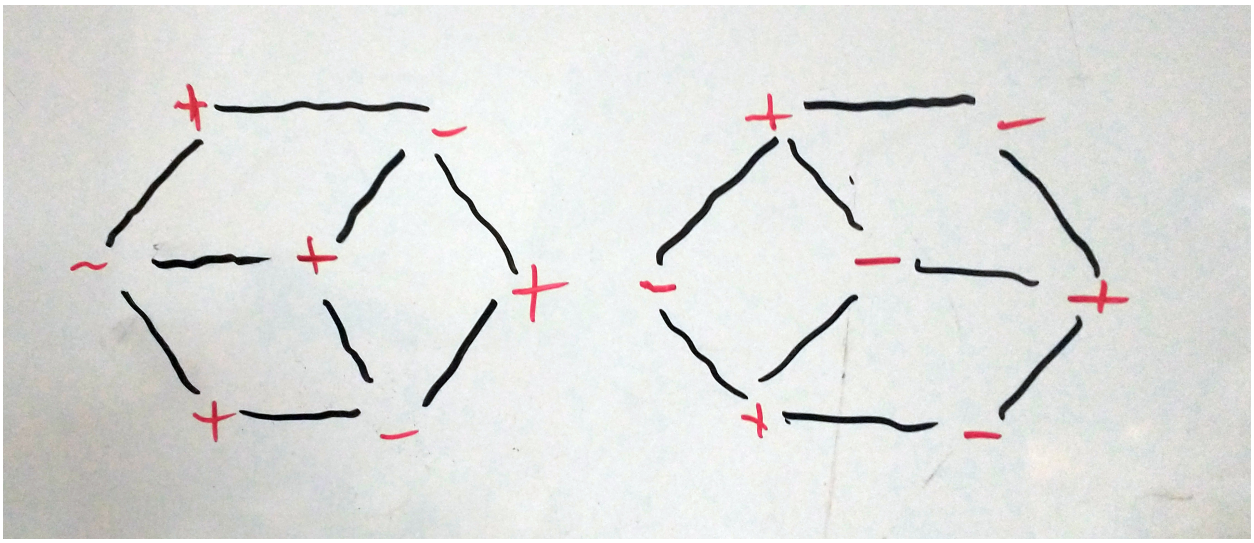
A collection of such tiles with v vertices will have energy (1 - v). Thus for the arrangement of seven hexagons as follows, with 31 vertices and 72 edges, a minimum configuration colors 51 edges black and 21 red, with energy -30:



These tilings are not guaranteed to be periodic, but if the additional rule/constraint is added that the black edges tile the plane in hexagons:



then the arrangement has the property that the spins at the centers are arbitrary, and can be up or down as you please:



— i.e. the degeneracy is (uncountably) infinite. And if the system were to assume this configuration and were subject to thermal agitation, the central spins *would* flip up and down randomly *ad infinitum*.

But if we remove thermal agitation and freeze the state, what else might that mean? That you can code anything you like into it. Out of the set of possible worlds satisfying these laws of physics, you can select one in which the hexagonal cells are black/white pixels, and it's a picture of Mickey Mouse, or a cartoon, or a frame by frame display of *Chopper Chicks in Zombietown*.[66] Or groups of eight hexagons are bytes corresponding to the ASCII character set, and the vacuum is spelling out *The Wind in the Willows*, or *Finnegan's Wake*, or the whole of Borges' Library of Babel at once. Or they're a representation of musical notation, and the vacuum is humming the Goldberg Variations. Such a world could have an infinite variety of meanings superimposed upon it.

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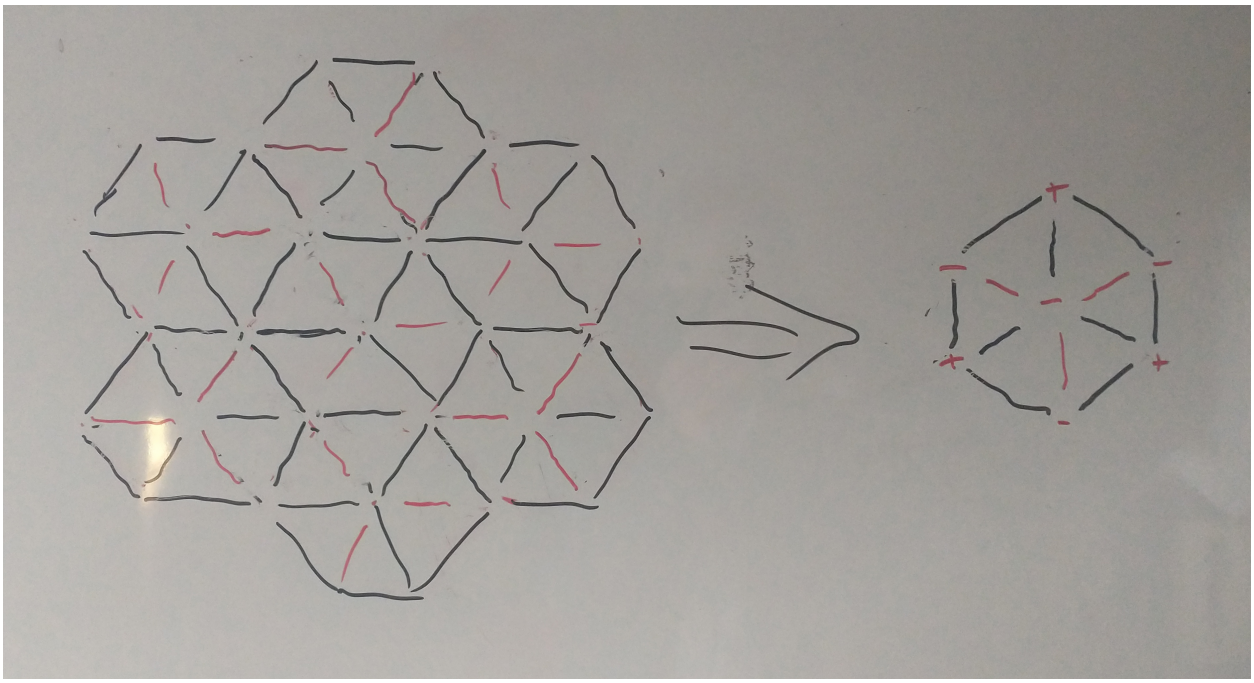
[66] Written/directed by Dan Hoskins, 1989.

{…}

Better yet, call the rules for computing the energy of the vacuum Physics-1, take a minimum, and leave the internal spins of the hexagons arbitrary. Now draw a second series of edges from the centers of the hexagons to one another:



and define a second energy, exactly like the first, in which the hexagons become the new vertices with spins defined by the ambiguous internal values. Call this Physics-2. You can then, without affecting any of the results of Physics-1, try to minimize the energy of this second-order vacuum according to the same rules, the solution will take the same form, and there will be a residual ambiguity which you can attempt to resolve by rescaling again and imposing Physics-3. — And so on.

Thus even in this simple model it is possible to imagine an infinite hierarchy of independent physical worlds built up on one another, all referring to the same primitive data. So that even if the principle of sufficient reason ultimately applied, and there were a reason

determining the value of every spin in the lattice, the theory that would explain it all would have (potentially) infinite complexity.[67] — Worse than that, at every level of explanation, for every Physics-n, it would be easy to fool yourself into thinking you had said everything there was to say about the structure of the world, since every regularity you had overlooked would have been swept under the rug of "initial conditions".

—418.1—

Augustine in *Confessions* VII.12-13 attributes the origin of evil not to a property of substances but to a sort of fault in their interaction: evil is corruption, corruption diminishes that which is good, if it removed good entirely what was corrupted could not exist — "if things are deprived of all good, they cease altogether to be" — therefore "whatever is, is good; and evil … is not a substance" and taken individually, every substance must be good. Thus from the (external) eye of God, evil does not exist. "Yet in the separate parts of the creation there are some things which we think of as evil because they are at variance with other things. But there are other things again with which they are in accord, and then they are good." I think within the language at his disposal this was the closest he could come to saying what I have said here.

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[67] Note, incidentally, that even the infinite tower of {Physics-n} would not determine the values of all the spins: at each level there would be an additional =/- degeneracy from flipping the perimeter spins, and the result would be uncountably degenerate.

Beatrice

"At that moment the spirit of life, which dwells within the inmost chamber of the heart, began to tremble with such violence that the feeblest pulses of my body were excited into resonance. And then that spirit spoke these words: *Ecce ∂eus fortior me, qui veniens ∂ominabitur mihi*."[68]

[68] This is what was left of the translation of Dante Gabriel Rossetti after I got done with it.

—419.1—

Noting the key distinction: with any other girl I may fall in love with as I walk the dogs along the trails, the question is whether she is better looking than the last one I encountered. In her case, it's whether she's better looking than Emmanuelle Bèart.

Walking home at night gazing at the stars, thinking about the Babe With the Yellow Walkman and whether I can write a movie good enough to put her in. Abruptly a meteor descends from the zenith to the belt of Orion; giving me pause, and leading me to wonder yet again whether that thing hanging below the Hunter's belt is really supposed to be his sword.

Realizing belatedly that this is Valentine's Day. — The Fates are sometimes kind, and sometimes cruel; I mistrust them most when they're merely cute.

—420—

Love's labor lost (10/6/1993)

The idea that there should be a gradual advance to a sudden and irreversible transition puzzled me for a long time. But I worked it out finally, and it did make sense. The picture of the volcanic crater — a dimple surrounded by a sort of lip in the dynamic landscape; once the state passes over it, a rapid collapse to thermodynamic equilibrium follows. The real puzzle is that the metastable state can be maintained for so long.

It is like running along the top of a wall. It may seem you can keep this up forever, but eventually you must wobble — teeter frantically for a moment — and then fall.

What makes it irreversible? the usual thing: the information is not lost, really, but it is dissipated among many — "many" meaning, large multiples of Avogadro's number — degrees of freedom. And then all the King's horses, and all the King's men —

I remember a long, long walk on a December day, up the old mining road to the top of Nugget Hill, 8500 feet and ten below zero even before taking wind chill into account; I was wearing only a wide-brimmed hat, and my ears burned. Franny disappeared for an hour on the way down, but rejoined Zooey and me finally when we were nearly all the way home; she always had an uncanny sense of direction. Still I had been concerned, and greeted her with an immense sense of relief. — "Where were you, baby?" I asked. "I thought I'd lost you."

— 420.1 —

One afternoon a few weeks later Zooey and I were out walking along the creek, and she jumped into a pool to take a bath, as was her wont. She splashed about for a minute, filled with the pure joy of light, air, water, motion; and then stopped, confused, and looked around, momentarily at a loss. Her happiness was incomplete: something was missing, and she could not define it.

But I could, of course. And never have I felt such a pang of sorrow.

— 421 —

Pictures of Lily (11/9/94)

The *Scientific American* suggests in their latest piece on "Virtual reality: bullshit or not?"[69] that an adequate representation of the phenomenal world might require drawing 800 million polygons a second. Since they also estimate 10 frames per second, this sounds relatively low; Douglas Trumbull did physiological experiments when he was devising the IMAX format and found a peak rate of audience drool (or whatever) at 60 fps in 70 mm. — Literally there is some kind of reality threshold related to the frame rate here; he says that though you can shoot something like a travelogue in this format, you can't shoot a movie, because it loses the dreamlike quality.[70] — I'd have to see this demonstrated to be certain, but it sounds plausible. So actually reality is 4.8 billion polygons per second, and silent daydreams are 1.92 Gpps. — Obviously this exceeds the bandwidth of any existing video data bus, at least for the time being.

None of this represents the real problem, of course. The real problem is that any robotic feedback device strong enough to simulate the resistance of a table when you slam your fist down upon it is strong enough to break your arm. This means (I rephrase the editors slightly) that the beta versions will put people in the hospital, with annoying legal consequences.

As always they understate the case. The first time a virtual blowjob rips somebody's dick off, the tabloids will go bonkers. — Or, to put it another way: the problem isn't with slamming your fist down on the table; it's with slamming Traci Lords into the headboard.

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[69] I paraphrase.

[70] Confirmed later by Peter Jackson's peculiar decision to shoot the *Hobbit* trilogy in 48 fps; this was one of many reasons I found the films unwatchable.

—422—

Miller in Hollywood (5/13/95)

"...much of Miller's time was spent ... in enjoying the unique possibilities afforded by Hollywood. The puritan reactionary in him disapproved of the place and everything it stood for, and he frequently expressed the hope that the Japanese would bomb it flat; on the other hand he was fascinated by its vulgarity and the freakish behavior of its inhabitants. In one of his notebooks he refers to tales he heard of movie-stars so fed up with the spread of syphilis and the frequency of blackmail that they had abandoned human intercourse completely in favor of elaborate sex machines. He was especially struck by the story of one man who had shot himself dead in front of a mirror while wearing some sort of masturbatory device on his penis."[71]

—423—

The romance of the paper boy

I have to admit the job had its moments. There's nothing quite like cruising down a major thoroughfare at four in the morning, driving with no hands upon the wheel while folding papers into their delivery baggies, windows wide open at 25 below zero, with the radio blasting "They're out there having fun/In that warm California sun." Is there.

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[71] Robert Ferguson: *Henry Miller*.

—424—

Dangerous liaisons

For an extended interval I found it optimal to specialize in delivery to the university dormitories. The advantages were minimal driving, high customer density, the ease with which one could maximize efficiency by combining delivery of all three major newspapers in the same place at the same time (I might even have added the *New York Times*, but political complications intervened); most of all everyone else regarded the university as an impenetrable labyrinth, making me untouchable and irreplaceable. — All this, and I got the summer and vacations off. — The disadvantages were that the route entailed lugging enormous masses of newsprint up and down many flights of stairs — I came perilously close to fucking my back up permanently — coordinating pickup at three different warehouses, at least one of which was guaranteed to have some kind of production delay — a minimum of two hours driving around in circles — and the inexorable fall in subscription numbers from year to year as student literacy declined, and finally disappeared entirely. (It recovered finally, nay, exploded, when the Denver newspapers in their circulation war discovered the virtues of inventing fictitious customers; that created the new problem of where to throw everything out.)

Each of the twenty-odd dormitories had some student trying to pocket a bit of cash holding the fort at the front desk on the night shift; since I had to interact with them to gain admission, I got to know them all, and it was remarkable how many female night owls were lookers. I scored this as another positive: though these nightly encounters by definition could go nowhere,

There were some close calls nonetheless. As I could not resist explaining to Johnny C.:

{…}

Before Sunrise (2/5/95)

….. My job sucks, of course, but there are perquisites. — The girl who tends the night desk in Cheyenne-Arapahoe, for instance: Miss Wonderbra 1995. — I've abandoned my standards, now. Once I might have insisted that she know quantum mechanics. Now I think if she can simply *spell* "quantum mechanics" then she must have my child. — Provided of course she has no standards……

{…}

Will work for food (albeit not qualified to eat) (3/7/95)

I hadn't thought of it previously, but it now occurs to me that that projectile-vomit trick made famous by young Linda Blair in *The Exorcist* may have practical application in everyday life, particularly if you spend much of your time in the University personnel office trying to fill out employment applications. Bad enough that my mind should go totally blank for halfanhour over a question like What was the fifth-from-last job I held, but, then, to come back to the desk at the conclusion of the exercise, hand the completed atrocity over to the imperfectly-programmed bimbette who presides over these follies, and then discover that I'm not qualified (for instance) to do exactly what I'm doing at the moment — ah well. At moments like this you'd like to be able to spew chunks on command……

Tutoring does seem a possibility, though I can't picture this as a steady income; there are, again, positions for instructors at the college-board cram schools (the Princeton Review, e.g.) — Unfortunately though these last are, of course, easily impressed by perfect scores on the GREs,[72] they still want to see a résumé; and they most certainly do *not* want to be presented with the evidence that test scores and

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[72] I exaggerate, of course. Only three out of four. (I wasn't allowed to smoke.)

employability have no correlation……

Perhaps apropos: Miss Wonderbra's name is Angela, and she needs a calculus tutor ….

{…}

Maxima and minima (3/19/95)

In re your remarks on *The Conformist*: somehow the picture of Johnny Cocktail ("I'm a critic") showing up (presumably in trenchcoat) at the premiere of an Italian left-wing movie with a bombshell of mixed provenance on his arm conjures up the milieu of *Foucault's Pendulum*; making me wonder, naturally, whether Umberto Eco read your memoirs. After all, he seems to have read everything else.

Miss Wonderbra batted her eyelashes at me this morning and I agreed to drop by Farrand Hall at two a.m. Tuesday to help her out with Chapter Three. — I don't believe myself. — Am I this shameless? — Is she that gorgeous? — After three centuries of misuse, can the calculus at last find application as a tool for picking up babes? — How would Wittgenstein have analyzed my motives in this situation? — And if I'll do this when she bats her eyelashes, what would I do if she took a deep breath?

Stay tuned.

{…}

Second derivative (3/21/95)

In re the Band of Gypsies, it's difficult to think of any band which included Buddy Miles as having been solid. Though certainly corpulent. — Of course, they did cut Machine Gun.

Umberto and I await your memoirs of the Brazilian/Italian babe.

As for Miss Wonderbra: rest assured you'll have first option on the expose, whether fact or fiction. Suffice it for the moment that it's difficult to keep a straight face when you're lecturing a babe of these dimensions on the taxonomy of curves: just where they swell, and where subside; just where convex, and where concave. Again, it didn't seem impossible that I might swoon, should she stretch at an inappropriate moment. But the Shade of Leibniz stood by me in my hour of need: I steered an even course between the Scylla of dementia and the Charybdis of hypoxia, and brought my bark home safe to the farther shore. Where let me lie face down in the sand for a day or two while I attempt to recover my composure. Holy shit.

Chocolates might not be a bad idea. A bit like Gump, I suppose; but, then, I feel like an idiot. Let's see if she calls me back.

{…}

Desperate living (4/12/95)

Is it necessary to be so defensive? Do you seriously maintain that you cannot write something as good as, say, *Cliffhanger*? *Tango and Cash*? *The Last Boy Scout*? Come on.

The real problem with the screenplay as a form, actually, is that you don't generally get the opportunity to write one, shoot it, and compare the result with your original intention. And if you don't then absent feedback you're just guessing: as, in fact, the people who read it are guessing, the bozos who take the Very Significant Meetings are guessing, the dorks with the red and the green lights and the bags full of money are guessing. Hardly anyone is born knowing how movies work — Renoir, Welles, Kurosawa — and, of the rest who try to write them, hardly anyone gets the chance to figure it out: Woody Allen, John Sayles. — Why, then, do so many seem to think they know?

Why is Eisner powerful? Why is Shane Black rich? — Fuck it, John. Give us a few babes and a camera, and we'll make our way.

But not this week I guess.

The Countess of Pembroke's *Arcadia* was a romance Sir Philip Sidney wrote as an entertainment for his sister. It was a bestseller for a couple of centuries: an enormous specimen of Elizabethan prose (over eight hundred pages in my edition) which opens with a shipwreck which casts the two protagonists upon a rustic Grecian shore. They immediately adopt different identities, engage in swordplay, disguise themselves as women to insinuate themselves into the society of the babes with whom they are smitten, poetize incessantly in a baffling variety of schemes and meters, argue about the constitution of the ideal State, chase the babes some more, engage in further jousts and swordplay while x falls for y disguised as z in order to get to w who's unaware that q is interested in pursuing r, s, and probably t as well if he can get away with it ... probably the most complicated plot in history. ….

… Anyway. — Last night I ran into a couple of people I've known fairly well over the last two or three years, students, a couple of long standing: Jason; Kay. They used to be supervisors on the night security crew, but they both quit last semester and I hadn't seen them for a while. — But, as it happened, we'd been sitting at adjacent tables in the student union for an hour or more before, my business concluded, I got up and walked over to talk. — "Are you tutoring now?" asked Kay. I must have told her I'd been considering it. — "Well," I said. "I was intending to. I wanted to be systematic and mercenary about it. But I haven't really gotten round to it, you see, it's just that this incredible bombshell" — gesturing after the receding Angela — "seemed to want me to help her with her calculus." I shook my head. "Somehow I couldn't resist. I have no character." — And at this they laughed. Very loudly. — For they'd seen, of course; they'd seen it all.

And, you know, I have to admit: when I came through the Northeast door to meet her in the grill and turned around the corner and found her waiting for me, I have to admit — I have to admit — I didn't care whether she was nineteen or not. All I could think was how absurdly beautiful she was. Holy shit.

And you think you're stupid.

—425—

I am told, not for the first time, that my recent actions haven't made much sense. To this I reply: "You do not understand what happens when it becomes impossible to make enough money to live on. Once that has gone on long enough, most of what you do looks senseless and irresponsible, even to yourself."

Poverty breeds desperation. Desperate men do weird things. Some of those things involve women.

Next question, please.

—426—

Disciplinary action (5/11/95)[73]

While walking with the dogs this morning on the Flagstaff trail, three young ladies came jogging up toward us from the general direction of civilization. All of them, I'm afraid, had been smitten mightily by the mammary stick, and one could only hope their jogbras had not slipped past warranty, since, given the severity of their affliction, embarrassing accident was a real and present danger. — Boris, as is

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[73] To Stefano, who didn't care whether this was politically correct either.

his wont, picked out the leader and did his best to knock her down and lick her face; I restrained him after a decent interval (one just sufficient to discover whether he might, in fact, occasion some such embarrassing accident). — And chewed him out, of course; vehemently. — He simply doesn't listen. — Time and time again I have told him: Not the first one; the one with the biggest boobs. — And she was certainly the third. — I don't know what I'll do with this dog. I just don't know.

— 427 —

The evil twin (7/21/95)

> In our case, if we had now grown serious, it was because each of us was living under the sign of his own fate — not in the shadow of a guardian angel, nor hidden in the folds of his robe, but as if at the feet of his own double which was detaching itself from him little by little to take on a bodily and material form. They were strange projections of ourselves, these new beings, and they absorbed us to the point where we lived them as in a new skin, to the point of complete identity, and our final preparations were not unlike the process of putting finishing touches to these frightful, pride-ridden automata known in magical lore as Teraphim. Like them, we were going to destroy a city ... .
>
> — Blaise Cendrars: *Moravagine*. Chapter K.

— 428 —

The Monte Carlo fallacy

— Or, why all articles in the *New England Journal of Medicine* whose conclusions are announced on NPR are essentially bullshit: in all

statistical studies of relatively small populations which attempt to establish correlations between "causes" (e.g. variations in diet) and "effects" (e.g. cancer of the colon), a fallacy is involved more or less equivalent to the one that would be present in an attempt to, e.g., measure the value of pi by Monte Carlo methods by placing m points at random in a unit cube of n dimensions and trying to count the number within the unit sphere[74] — but where m and n are of the same order of magnitude. That is, the number of dimensions of the relevant phase space are at least as many as the data points in these "studies"; and I don't care how may bogus safeguards they think they're building into them……

— 429 —

Purple Death From Outer Space (12/7/1996)

I went down to the Saint James Infirmary
To see my baby there.
She was lying on a long white table
So pale. So cold. So fair.

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[74] Actually throwing darts at an n-sphere is not a good example, since for dimension greater than 10 the relative measure of the sphere decreases rapidly, and the Monte Carlo estimate of pi is usually zero. But the situation with an arbitrary function of hundreds of variables could only be worse. — One might note, e.g., that polynomials of degree 4 with 14 variables can represent arbitrary recursive sets.

When I die dress me in straightlace shoes
Boxback coat and Stetson hat
Put a twenty dollar gold piece on my watch chain
So the boys will know I died standing pat.

—430—

The edge of history, etc. (4/2/1996)[75]

… the reverence with which the Decade of Revolution is regarded by the Bohemians of the younger generation (of whom I expect better — I mean, they are supposed to be cynics) and even some of the older generation (who must have been too stoned to remember any of it) reduces me to helpless laughter. The one lasting legacy of the era, so far as I can determine, is that you can now say "fuck" in the presence of a lady to whom you have not previously been introduced; at least provided she's under the age of fifty. The rest of it was a lot of adolescent posturing that's only seemed important after the fact because of the wholesale loss of the ability to distinguish appearance from reality. (Drugs; television; and, again, an actor got elected president.) … Really, it was all just make-believe. My father's generation fought the Second World War, defeated fascism, and conquered the world. We got stoned a lot and gave it all back to the Germans and the Japanese. Wow, man. That was really heavy.

—431—

Adolescence (5/22/1996)[76]

Yes, I remember it. For instance I recall distinctly taking off down the river myself; and to this day my only regret, in truth, is that I ever bothered to come back.

As for our disaffection, the trappings of rebellion, etcetera: yes, well, we were all too fucking clever to jump on any bandwagons. But were we really so cynical as we thought? I rather doubt it. Not having

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[75] To Richard Strelitz.

[76] To Richard Strelitz.

studied the matter at first hand, I'm afraid I only realized years later that, for most people, going down to the protest march was basically a way to pick up chicks, and the leftist rhetoric of the times was just another pose guys adopted to get laid. — At Caltech (where, you may recall, there were no chicks) obviously there wasn't much point in any of this; our lack of "involvement" was just another corollary of our general social isolation and, let's be candid, sexual frustration. — So, anyway (condensing the rest of the discussion to avoid prolonged rant), though in my putative adulthood I do frown upon reckless and irresponsible behavior on the part of younger males, particularly when it indirectly accomplishes what it's rarely designed directly to do, i.e. pissing me off, I almost immediately analyze my annoyance and discover that the principal motivation for my anger is just the kind of envy I feel for somebody who's managed to do something I never could, namely, Find The Party.

(And, of course, even when I did Find The Party I always felt like an anthropologist, studying the mating rituals of some other tribe, if not another species. — But let's save this for a later chapter of the Memoirs of the King of the Dweebs …)

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A comedy ends with a marriage

I spent the summer of 1980 completely broke but absolutely determined not to go back to cleaning restaurants and let that job finish killing me.

I talked to Dog, though I knew no good could come of it. He said he could get me a job as a technical writer at the computer company which had hired him and promoted him rapidly because he looked good in a suit. I knew I didn't look good in a suit, but out of desperation went along with the fantasy anyway. — "Great," I said.

"Sign me up." — "It's a done deal," he said, "just submit a résumé." — "You understand that I've never had a real job?" I said. — "Fine," he said, "just slant your résumé to emphasize the experience that shows you have writing skills." — "You don't understand," I said, "I've never even had a job that required me to write my own name. How do I slant that?" — This went back and forth for a day or two, since within the bubble that retains the atmosphere it is difficult to absorb the idea that the vacuum surrounding it does not contain oxygen. — Finally he gained a kind of intellectual grasp of the crux of the matter, that even though *he* knew I could write that didn't mean the bonehead who was going to interview me would. — "What about a writing sample?" I asked. "I could do something technical." — He expressed enthusiasm; muttered something about going to Chicago on a business trip; and, while he was camped out at the Hyatt-Regency running up a company record tab on his expense account which took months to talk his way out of, naturally forgot everything we had agreed upon.

I persevered in his absence nonetheless, and casting about for a suitable subject remembered the Birkhoff/Von Neumann logic of quantum mechanics, which seemed like something I could work up in short order. But then, of course, it turned out that I got interested in the subject again, and spent five weeks composing an abbreviated dissertation on the foundations of quantum mechanics, about a hundred fifty pages double-spaced, replete with formulas, extensively footnoted, and citing many dozens of references in the precise manner advised by the Chicago Manual of Style. — The end result was that I realized this approach really did resolve the paradoxes of the subject, though of course I never got interviewed and did not gain entry into the white collar world of paid vacations, free drinks, and checks that clear the bank. — Worst of all, I didn't care. I had been reminded, unfortunately, that I had once been meant for better things.

But mark this down, anyway, as probably the only time in the history of the world anyone was naive enough to suppose he could get a job by employing logic.

{...}

Song

Write a rubber check and put it in your pocket
Save it for a rainy day
Write a rubber check and put it in your pocket
Never let it bounce away
For Need may come and grasp you by the tricep
When you most dread it
And if you heed this financial advice, yep
You'll have some questionable credit —

{...}

The investigation continued off and on, despite many interruptions, and in due course generated a massive stack of notebooks, two or three feet thick. All these were lost, along with half my library, all the rest of my old manuscripts (in excess of a million words), and many prized personal possessions — seized by an irate landlord during an eviction. I never got them back.

I see the pages of formulas sometimes in my dreams, black ink on white unlined paper, sheet after sheet in logical notation. — So lost loves on occasion return to us.

{...}

I retained the original writing sample, however, and after fifteen years during which Dog told everyone I had spurned the golden opportunity he had placed before me, gave it to him as a wedding present. This had to have been an empty gesture, since I'm sure he didn't read it. But just for that reason it seemed peculiarly appropriate.

Anyway, I'm still pissed.

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On taking chances (1981)

Everyone admires this, and everyone insists that others should do it; to fail to do so is ignoble, a failure of nerve. But this is the logic of the spectator. The logic of the participant is different. When you do take a chance, by definition the odds are against you, and you'll probably lose. If you are unusually reckless — bold, fearless, the stuff of which legends are made — and take a really big chance, failure is almost certain. And trust me, it is guaranteed to be costly.

After I quit cleaning restaurants, I could afford six weeks to do whatever I liked. And so I got up every morning at six (that nonetheless felt like sleeping in), made coffee, sat down with a notebook in a gigantic armchair I'd purchased for a dollar from an entrepreneurial bum who scavenged furniture from the dumpsters of University Hill — he slept in one of his several cars and had a calendar in his head, he could tell you the day of the week for any date, past or future — and worked straight through until ten at night. — The pattern was quickly established: I had ideas at the beginning of the day, elaborated them until I got stuck, and then saw my way around whatever conundrum had ensnared me over the evening Scotch and made notes for the morrow. — Progress was steady and consistent, I generated dozens of notebooks with an enormous number of results, and if this mathematical idyll had been allowed to continue uninterrupted I would have solved every problem I had with quantum mechanics.

Of course since that would have made sense it was impossible. I ran out of money, swallowed my misgivings, called in a favor from a guy I knew I couldn't trust, and went to work, for the first and last time, in an office.

The experience was educational: the operation was, essentially, a boiler room, with a dozen or so amoral hustlers working the phones. They were, in theory, generating sales leads for realtors, who were, in turn, supposed to be kicking back a percentage of their commissions to the company; which was, therefore, at least hypothetically, making money hand over fist. Which justified the spectacular commissions it paid its crew of con men; whose paychecks, predictably, went straight up their noses, fueling the manic state they required to keep cold-calling innocent suburbanites and bullshitting them into giving up their personal information for the greater glory of commerce.

Insinuating myself into this smoothly-running machine, I set to work writing scripts for the operators; and discovered in short order that no one seemed to know whether the sales leads were real or simply coke-fueled hallucinations, where they were going, and what, if anything, was being done with them; nor whether any money was coming back — unlikely, it seemed, given that one of the principals spent all his time frantically running about trying to summon "investment capital" from his network of deep-pocketed ranchers. — I didn't know much about business, but I didn't think it was supposed to work like this, and discreet cross-examination of my fellow employees revealed they didn't think so either.

It was no use questioning my patron, the master of ceremonies presiding over this circus; he was an accomplished liar, and would have responded to any direct inquiry with a blizzard of fabrications. Instead I feigned illness, took a couple of days off to write a lengthy report summarizing my conclusions, and submitted it to the principals; who after predictable denials immediately changed their business model and welcomed me into their innermost counsels, because it was obvious I knew more about what they were doing than they did.

After that I saved the company twice more — all this, of course, for 200 dollars a week — but the third time, alas, was the fucking charm: I was getting sick and tired of bailing these idiots out while they paid

themselves several times what they were paying me, and made the calculation — on the numbers, not a bad one — that if I had some skin in the game they would have to recognize that, and compensate me accordingly. So when for the nth time the biweekly payroll crisis came up and the principals dithered over who would have to invent the money to cover the bill, I volunteered: took out a bank loan, cut the checks, and basked in the glory that was the reward of the hero who had saved the firm until the following morning, when the house of cards collapsed, once and for all, and I was left holding the bag.

My patron had assured me, when I swallowed my misgivings and went to work for him, that I'd never have to clean toilets again. I had known better, but tried to believe him because, among other things, this whole episode was an experiment in the power of positive thinking. — One which failed. — And so I spent two more years cleaning toilets to pay the loan off.

{...}

There's an old joke: a guy dies, goes to Hell, and gets the orientation tour, where he is offered his choice among punishments; he sees the damned roasting over fires, impaled like shishkabob, branded by burning pokers, staked out in the desert for wild beasts to gnaw upon their entrails — hounded by their creditors, forced to listen to the complaints of former girlfriends. — Understandably none of this appeals to him. — Finally they bring him to a lake of shit, in which people are standing buried up to their necks, but they're holding cups and saucers and drinking coffee. — "This doesn't look too bad," he says, "I'll take it." — He gets a cup and saucer, wades out into the middle of the lake, has a sip of the coffee — not all that bad, considering — and is just looking around to see if anyone has a newspaper when a whistle sounds and a voice announces: "Coffee break's over. Back on your knees."

{...}

And what was the moral? — Yes, on a cost-benefit analysis it was a good bet, the expected return was positive definite, indeed large — the implicit bargain was that my salary would triple, and the probability that the gambit would succeed was reasonable. — But the problem with this kind of analysis in real life is that the calculation presupposes that you have the opportunity to perform enough trials that on balance you win. — If, on the other hand, the number of possible trials is small compared to the number required to expect positive returns, you're fucked — if e.g. you bet on a one in a hundred chance that pays off a thousand to one, it's a winning bet, but that rarely matters if you only get four or five chances to repeat it.

Is this an argument for the frequency interpretation of probability over the subjective interpretation? — Maybe. — here I go again pretending my personal misadventures illuminate a philosophical argument — but put it this way: suppose you have a hundred individuals (a sort of Gibbs ensemble) whose entire fortunes amount to a hundred bucks apiece, and they are offered the following wager: if they pool their money in a pot and draw straws, the winner will get all of it and the God of Gamblers will reward him with an additional million dollars. This is a good bet precisely in the sense that the expected return both to the individual and to the collective far exceeds their total investment, and on the subjective interpretation of probability one would have to take it. But ninety-nine of the individuals will be ruined, and only one will get rich.

{…}

— So. — Why was I so smart? Why was I so stupid? — As it turned out, there were two things required for success in business. One was the ability to figure things out — the analytical faculty, which I possessed. The other was the ability to tell when people were lying to you. And that I didn't have — though, to be fair, a lot of the problem was that the people I was trying to read were also lying to themselves.

Still, I might have acquired that ability too, in time. I don't know. I never worked in an office again. Unless I was pushing a vacuum cleaner.

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Sex, drugs, rock and roll (10/7/1996)[77]

The point about the difficulty of writing a computer program is roughly this: the distinction between NP and P, i.e. presumably between exponential and polynomial difficulty, is essentially equivalent (in the appropriate formal system) to the difference in difficulty between finding a proof and verifying one. Presumably the former is inherently much more difficult. — And the fact that this is intuitively sound explains, I think, why most mathematicians think P doesn't equal NP. — Anyway, it seems obvious for a number of reasons that writing a computer program is essentially the construction of a proof in a formal system. E.g. you can regard the program as the proof that some given function is recursive. Or wave your hands and appeal to the intuitive equivalence of programming and, for instance, proving theorems in a propositional calculus. (When I was into quantum logic and making up axiomatizations, I once pissed an entire afternoon away trying to prove "p implies p". This is the kind of experience that leaves you with an enhanced appreciation for the iron constitutions of the founders of modern logic.) — Having figured this much of it out, I then found out there's a version of the theory of computation that allows you to state this equivalence exactly. — The point being that the difficulty is there even after you provide the formal specification of what the program should do. (Not that this isn't important!) Anyway writing a computer program ought to be the most obvious example of something that's exponentially hard. (And all the evidence points to it, of course.) There's some curious sort of optical illusion that suggests to people that the difficulties of writing

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[77] To Richard Strelitz.

programs add, that they're linear in the length. But when you think about it it's obvious that it's the logarithms that add; the difficulties multiply.

I half-suspect, incidentally, that the difference in computational difficulty between finding a proof and verifying it provides the arrow of time …

I'm not sure whether there are as yet any problems you can point to that clearly show Nature as it were thwarted by the difficulty of computation; though I have the impression that glasses hover between liquid and solid because the energy surface is so complex that it takes essentially forever for the system to find the true minimum, which sounds like the same thing. — Whether you can stump the field-theoretic vacuum so effectively is another question, of course. But it seems to be very hard to find the ground state of string theory.

I have some ideas about the right way to approach the P/NP question; mostly involving the translation of the problem into a kind of statistical-mechanical one, and analyzing the associated partition function. Since I had what turned out to be this same idea three different ways (there's also a version phrased in terms of a sort of path integral and one that involves a zeta function) I'm particularly fond of it. But beyond the (not entirely trivial) demonstration of the equivalences I haven't had time to do much with it. — It's probably connected to the solvable versions of the Riemann hypothesis (the Weil conjectures) and to what Witten did to relate quantum gravity to knot theory. — If this sort of thing works, of course, it's just another testimonial to the insight of Von Neumann; who said at the very outset you wouldn't be able to prove much in the theory of computation without employing a strategy like that of statistical mechanics. Always steal from the best …

I needed a paperback on short notice in the middle of the night a couple of weeks ago and found Crichton's *The Lost World* at the

grocery. It sucked. Quite obviously Spielberg dictated his requirements (an island, the same dinos, two cute kids but not the same ones because they're too old now make two new ones up, let the girls take the initiative in the action sequences, no one out of the original cast will commit except Goldblum) and the master hack knocked it off over the weekend. He went down to Santa Fe and picked up a few ideas, but didn't understand them and therefore failed to develop them. — But (since I haven't been to Santa Fe) I learned a couple of things. — One was that evolution slows in a homogeneous environment with a single population; that you're better off with separated populations that mix only occasionally. This is more or less exactly my point about the Russians, that it's a shame they're becoming so completely Westernized (the scientists at least). They were more original when isolated. — The other was related, that the Internet (since it is, at least on the face of it, a great homogenizing force) must probably flatten innovation. And, sure enough, the prospect of something like a universal Usenet supplanting the traditional means of scientific communication doesn't strike me as a particularly happy one. If you're wired into that kind of babble all the time I don't see how you have time to hear yourself think…

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Christmas song (12/24/96)

[To a familiar tune:]

Woke up this morning feeling lame
Had something none-too-atypical I had to exclaim
Last night I met a new girl
In this dismal slum
Uh huh
Something tells me she thinks I'm worthless scum
(something tells me she thinks, etcetera)

[uh...bridge]

I dropped my trousers
A couple of yards
She asked if she could see some major credit cards
I told her Baby
I deal in cash
She picked me and tossed me in the trash
(picked me up and tossed me in the, etc.)

She's the kind of girl makes your eyeballs squeak
I thought for a moment I was her kind of geek
So I asked to see her next year
And she wondered How come
(I asked to see her and she wondered How come)
Something tells me she thinks I'm worthless scum.

[Witlessly cheerful organ music. Repeat chorus as needed.]

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Porch monkeys (12/24/96)[78]

Walking through the student neighborhood the other evening, I passed a large boardinghouse and overheard a typical group of guys hanging around on the front porch exercising their gifts for repartee. It used to be unusual for people to stand around outdoors in thirtydegree weather, but it's an important part of the Slacker ethos to hang out no matter what circumstances may oppose it, and, again, though cigarette smoking is once again universal it is no longer permitted indoors, even in houses full of nicotine addicts: *plus ça change*, or the other way around. Usually the conversations you

[78] To Richard Strelitz.

overhear in this fashion are imbecilic and depressing, e.g., the two guys I'd overheard the night before this holding forth on peanutbutter pussy (brown, spreads easily): imitation Gangsta. But on this occasion out of a clear and cloudless ether I heard someone proclaiming loudly to the laughter and approval of his audience: "Don't crush that dwarf! Hand me the pliers... ."

From which evidence I suppose we may conclude that, whatever one might have hoped, though the drivein theater, the hamburger that tasted like one, and a general appreciation of the rules of English grammar have fallen by the wayside, such pathetic fossils as mainframe Cobol and the collected works of the Firesign Theater seem destined to lurch forward into the Twentyfirst Century. — And we beside them. Go figure.

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Lament (1/1/97)

Somebody told me the other day that if I just kept looking for a job, I was bound to get one eventually. I said Harold Stassen kept running for President, but he never got the nomination. My interlocutor asked, Who was Harold Stassen? I said, when I started looking for a job, you would have known him as a standing joke. And didn't that say enough.

The man of destiny.

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High colonic, low ebonic (3/28/97)[79]

Yesterday I wrote a sonnet and opened a bank account. I found myself wondering, naturally, whether there were many people who had, on the day in question, written a sonnet and opened a bank account; and whether perhaps we all might start a Usenet news group and flame one another for posting off-topic. After that I went to see *Ransom* at the rerun theater, and eliminated, reluctantly, the Ron Howard theory[80] from serious consideration in the Ramsey murder: reluctantly, because the idea of John Ramsey running down Pearl Street exchanging gunfire with Gary Sinise is an appealing one, especially with football season still several months away. Then I ate a pizza and some ice cream. Glancing over the daily abstracts from xxx.lanl.gov, I discovered I thought I was reading something about "the quartic lovesick tensor"; and wondered, once again, whether women ought to be kept in the zoo.

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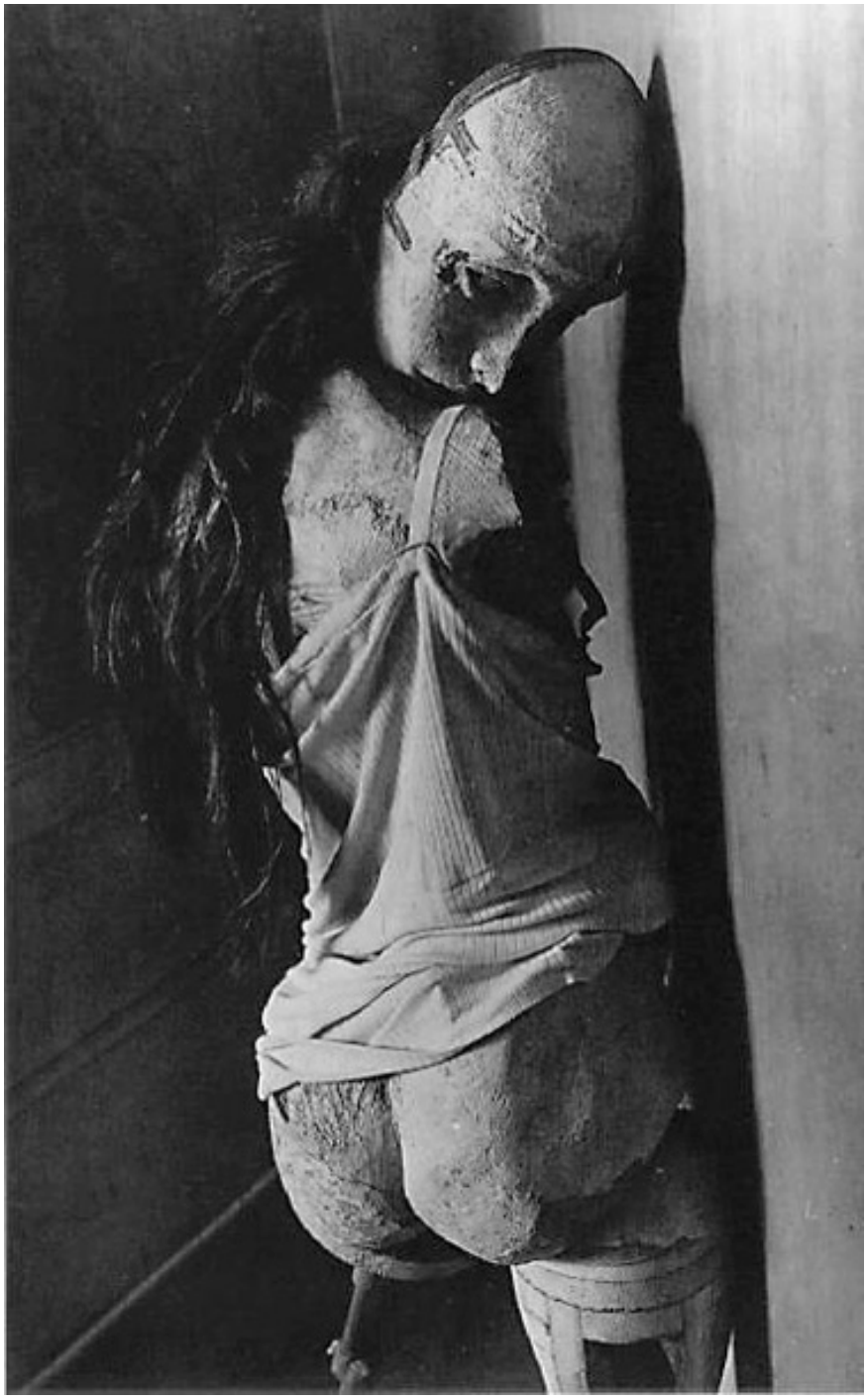
[79] To Richard Strelitz.

[80] To Johnny C. (1/8/97): "…there appear to be the Ron Howard (*Ransom*) theories, which dominated at first; the Fritz Lang (Peter Lorre in *M*) theories, which the police are actively trying to discourage; the David Lynch *Twin Peaks* theories, which are difficult to avoid since everyone seems to insist on fronting their columns with a picture that makes the little girl look exactly like Sheryl Lee in infancy; the John Waters theories, to which I am myself partial — what kind of twisted fucks shop their sixyearold around the beauty-contest circuit, anyway? — and, presumably, the Oliver Stone paranoid-conspiracy theories, which revolve around yet-undisclosed details of the ransom note and its links to Albino, international terrorism, and what the Dog was really doing in Sarajevo … ."



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April Fool (4/1/1997)

Ken addresses Barbie, in the pose of the melancholy lover:

> Were there a thought within this empty head
> It would be you: your buff-blonde fashionings
> Improbable — your form, your stylish things
> That fit you for the hunt, the ball, the bed.
> I'd fall on you like existential dread
> Tear off your several outfits, yank your strings
> And bunnyhumping bust the mattress springs.
> But surfaces deceive. Within we're dead.
> And void. Our plastic eyes mold vacant stares
> Nor beat within these silent plastic hearts.
> No plastic fingers run through plastic hairs
> Nor plastic organs try the plastic arts.
> One cipher to another, out of sight:
> As nothing is to nothing, nothing's right.

—440—

They eat each other (4/28/97)[81]

... Two more remarks about Von Neumann machines:

First, if there were any aliens careening around the galaxy, these would probably be they. After you get done re-engineering biological intelligences for space travel, the pilots and the ships might as well be identical. (I think Cordwainer Smith was the first to point this out; though my scholarship in this area is more than a little rusty.) — And

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[81] To Nick Gautier.

for obvious reasons they'd better be able to live off the land: the robot Deerslayers, as it were. So that gives you the portable-Pittsburgh aspect of the idea. — The necessity of self-reproduction is a little trickier, but you can convince yourself it's logical.[82]

Second, though I don't know that many people saw it there was an amusing little volume by Francis Crick[83] published a few years ago on the subject of the extraterrestrial origins of life. Part of the argument was familiar and you've surely seen it elsewhere: evolution is fairly easy to believe once you have the rules of the game in place, but it's really difficult to imagine the genetic code originating on Earth, etcetera; updated Arrhenius, essentially. The rest of the argument was more ingenious: Crick said he thought once life had evolved somewhere there'd be a natural desire on the part of the presumably-intelligent endproducts (the Arisians,[84] I suppose) to travel the cosmos and spread themselves everywhere; but that, since physical necessity probably forbids this, the next-best thing, i.e., to transmit not themselves physically or even exact copies of themselves but (more or less) the abstract idea of themselves, the secret of life, the genetic code, would certainly be easier, might even be possible, and would be (if you'd been keeping up with Crick drink-for-drink at the cocktail party where he must have made this up) just as philosophically satisfying. — So (says Crick) maybe somebody seeded the universe with bacteria,

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[82] Self-reproduction is just a complete capacity for self-repair; which would be necessary.

[83] Francis Crick, *Life Itself: Its Origin and Nature*. [New York: Simon and Schuster, 1981.]

[84] The ancient race who are masters of the cosmos in Edward E. Smith's Lensman novels.

for instance. And we're all little green men.[85]

So. I'm not sure on the one hand that there is any real difference between these two ideas — I mean, a colony of bacteria (an embryo biosphere) is a Von Neumann machine, if you're casual about timescales. (And if you're going to talk about interstellar flight you have to be very casual about timescales.) — And then on the other hand if you believe this you can make one very odd but very natural prediction — namely: if the genetic code was designed by Arisian biological engineers and sent here from elsewhere, then (since they'd have wanted us to be able to figure this out) there'd be a signature somewhere, a copyright notice tucked away in one of those useless-looking sequences of codons every living creature seems to carry around and never use.[86]

I don't believe a word of this, of course. But it's funny enough that I like it anyway…….

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[85] Crick's argument in somewhat more detail is that the uniformity of the genetic code suggests a bottleneck, i.e. that present-day life evolved from a very small set of precursors; that the earliest known forms of life resemble the forms that could be easily transported; moreover that the erratic nature of evolutionary progress — single-celled prokaryotes appeared shortly after the formation of the Earth, at least three and a half billion years ago, but eukaryotes only after two billion more years, and complex multicellular organisms only in the last six hundred million years — suggests that though the later stages of evolution are relatively easy (the canonical example of the evolution of the eye shows in fact that the characteristic innovations of the higher forms have been invented independently many times) some of the earlier steps might have been difficult and required luck — and that this luck might have been better on some other planet, and might have accelerated evolution there by billions of years. — Thus explaining why they seeded us, and not vice-versa.

[86] Much later, when Craig Venter's group created a designer organism, they did exactly this, encoding several watermarks which included the names of the authors and assorted quotations, among them "To live, to err, to fall, to triumph, to recreate life out of life" [Joyce] and "What I cannot build, I cannot understand" [a rephrasing of the famous dictum of Feynman]. See Nicola Twilley, "What's the point of streamlining Nature?", *The New Yorker*, April 2, 2016, and Gibson et al. "Creation of a Bacterial Cell Controlled by a Chemically Synthesized Genome", *Science* **329**, 5987 (2 July 2010), 52-56.

{…}

Von Neumann machines

That requires a gloss….

These are usually pictured as industrial civilizations in a box: universal assemblers capable of self-reproduction, a kind of artificial life form that could consume energy and material resources to make copies of itself and — we know not what — eat solar systems and turn them into Dyson spheres — whatever.

The natural assumption then is that they would be large, perhaps on the scale of a city or an asteroid to begin with, and grow to unlimited size. But the seed from which one might be grown, the essential bundle of information, the equivalent of the genetic code, could be quite compact. This would be relevant when considering how easily they might propagate from star to star.

One difficulty is that if they reproduce at fixed intervals, their numbers would grow exponentially but the spatial volume they occupied could grow at most as the cube of the time. This would entail the usual competition for resources typical of living things, which may be summarized by saying that they'd end up eating each other.

(One might object that they would naturally multiply to cooperate in organizing their immediate environment — in building the sphere, say — and this would remove the possibility of competition. — That they would function like ants in a colony, in other words. — But ant colonies go to war. with one another, so this makes no difference.)

A way around that would be to ensure they reproduce only when adequate resources are available, but that still means competition, and the war of all against all. Another would be to program a sort of instinct into them that lengthened the time before reproduction with

each generation. It isn't obvious how well that could work either, so this is definitely a problem.

Whether mutual annihilation is the reason or not, however, the Fermi question takes the same form: even at speeds a fraction of the speed of light, embryo machines or their seeds could be propelled from one star to the next in less than a hundred years, and they would saturate the galaxy in a few million years. Even at cometary speeds on the order of ten kilometers/second it would take less than a billion years. So if they actually existed, they'd already be here.

Unless, of course, Crick is right. There's something deep at the bottom of his argument. I'm not sure I have completely understood it.

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Deeper thought (5/14/97)[87]

I've never been especially alarmed by the advance of machine intelligence into game-playing; chess in particular always looked relatively simple, an easy target for very simple tree-search/position-evaluation algorithms. The amazing thing, from this point of view, is that Kasparov could play the machine at all, since obviously whatever he's doing it emphatically does not involve sorting through a few hundred million positions before deciding on a move. — If bridge is harder it comes I suppose as a surprise. But so much the better.

I don't see any danger of machines taking over mathematics any time soon. Perhaps better theorem-proving machinery is possible in the near term. But claims are inflated, to say the least: think how extraordinarily useful a mere proof-verification device would be,

[87] To Richard Laver.

especially with things like the classification of finite groups.[88] Still I don't see anyone stepping forward with one. — There is some fairly solid research going on trying to do related things like verifying language compilers. But the tools are still toys. — Anyway none of this addresses the really interesting capabilities of human mathematicians, like being able to invent set theory or formulate the Weil conjectures and then reinvent algebraic geometry to solve them. I don't see any evidence as yet that the people programming the machines understand these questions; let alone that they can code their solutions.

The most obvious application of the kind of machine intelligence I know to be possible, actually, is to computer programming itself. I don't see much evidence of activity in this field, and I suspect a conspiracy of silence. — In fact I think we ought to get a raiding party of mathematician-commandos together and stage a counterattack: I'm sure we could easily write the software that eliminates their field before they can write the software that eliminates ours. - They think we're humorless? fuck them if they can't take a joke.

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Santa Fe (6/26/97)[89]

One year in the early Eighties I rounded up the Usual Suspects and got them all to agree to go to the Grand Canyon for Christmas; it's

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[88] Note that such tools have now advanced far enough that the Feit/Thompson proof that a simple group must have even order — the first in the series of results that resulted in the classification theory — has been verified. Since the original paper was 200 pages long, and took up an entire issue of the *Pacific Journal of Mathematics*, this is impressive. — Personally, as someone allergic to rigor in all its forms, the idea that formal tools may become available to tidy up and verify long proofs is an appealing one. — Compare Kasparov's observation that, in the post-Deep-Blue era, the best chess players are not humans or machines, but human chess players employing computer assistants to explore strategies.

[89] To Richard Strelitz.

deserted then, I said, it's absolutely beautiful in snow, we'll drink yards of cognac and stagger out in the night and see if we can fall off the cliff, it'll be great, it'll be memorable, we all should do it. So everyone agreed and then erosion set in: first one, then another begged off, then we rolled it back to Thanksgiving, then more people found excuses not to go... . Finally our truck broke down in the Safeway parking lot on the way out of town and my girlfriend and I and our friend Hilary piled into Hilary's Volkswagen and left; and let me say that about five minutes after I got into the car I swore I was never going to do anything like that again, and I've fairly well kept the promise. But on this occasion there were sixteen hours of Hilary singing along with her Joni Mitchell tapes (never again) with my knees bouncing off my chin (never again) in the backseat of the Beetle (never again) before we did finally get there and walked down to the river and camped out in a continuous drizzle for three or four nights until we got tired of it and walked back out. Then we had to get back, of course. Hilary had a couple of friends in medical school doing residencies in Santa Fe, which provided us with a much-needed excuse to stop and get out of the car on the way home; so we did, on Thanksgiving day itself, as it happened. We called around from a gas station and got directions to a place north of town towards Los Alamos, one of those huge elegant Spanish single story adobe houses with big raw wooden beams in the ceiling and a central atrium that served, on this occasion, as a dining room large enough to accommodate the host (a wealthy doctor) and thirty or forty guests, most of them unknown to him and to each other. So we lurched in out of the night, sat down among a large number of mutual strangers, and pigged out; feeling, I must say, pretty much at home. — As it happened I'd read a piece in the *New Yorker* a week or two before this about Santa Fe, and the author, a fairly acute observer, had mentioned that the natives (meaning as always in the West anyone who'd been there long enough to have a mailing address) tended to sort themselves in a pecking order based on the length of their familiarity with the region — not really based on how long they'd lived in Santa Fe, mind you, since too few had, but rather on when they'd first set eyes on the place: in the old days, you know, when it was yet

unspoiled. Accordingly, the author continued, all conversations between two persons introducing themselves to one another in Santa Fe tended to begin with a variation on "When I first got here (in 1955) ... ." — So I was sitting at the table by myself, munching on a turkey leg, and two guys who were obviously strangers to one another sat down opposite me and struck up a conversation. And sure enough the first guy began with "When I first came here (in 1973) ...," allowing the second guy to trump him with "When I first got here (in 1967) ..." but leaving both of them, presumably, with a sense of shared superiority over the mob of tourists around us, many of whom, admittedly, hadn't set foot in the Southwest before the parade at Macy's that morning. — And I don't know but what these two seasoned desert rats might not have found common cause on many other fronts, had I not interrupted with a loud burst of laughter and told them, without the slightest thought for consequence, that their conversation had been struck from a standard template. They both stared at me blankly as I explained this. Then got up in stony silence, and, neither looking at the other, walked away in opposite directions. — For all I know, they're still walking.

—443—

Apologia (7/6/97)[90]

Attempting to address myself more seriously to my duties as house reviewer, I set off down the Boulder Creek bikepath this evening determined to view *Face/Off* for the purposes of critical appraisal; and, had, indeed, bopped absently three-quarters of the way from hither to yon, thinking the usual pleasantly unencumbered thoughts about programming semantics, image processing, and the advantages of the five-act over the three-act parsing of the motion picture scenario, when quite unexpectedly I encountered LeeLoo, the Babe With The Yellow Walkman, jogging/and/or/jiggling in the opposite direction.

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[90] To Johnny C.

Duty and lust warred briefly in my bosom, with predictable results: I turned around and started running after her; not, however, without delay sufficient that she ditched me somewhere behind Boulder High School. Thus we lose on both counts, I'm afraid. At least until tomorrow night.

—444—

Addams Family Values

Gomez: Oh, Fester I'm such a lucky man! I hope that someday you'll know the indescribable joy of having children...and of paying someone else to raise them.

Fester: But first wouldn't I have to get married?

Gomez: Oh...but you're just a boy! there's plenty of time...you'll meet someone, someone very special...someone who won't press charges...

But what could I say to her? Oddly enough, for once I know. I could ask her if she knows the story of Achilles, the greatest warrior of antiquity, the hero of the Trojan War and the martial epic written about it, the *Iliad*. That his mother was the sea-nymph Thetis, an adjunct deity, and that when he was an infant she had dipped him in the River Styx, and rendered him invulnerable — save at the back of his ankle, by which she had held him; there Paris struck him with a lucky bowshot before the walls of Troy, and thus had he met his end; a small but fatal weakness is called an Achilles' Heel to this day.

And so, I would conclude, that is the question in my mind: if I were to walk around behind her, and look at the back of her ankle, could I find an ugly spot?

You just keep thinking, Butch, that's what you're good at.

—446—

Gold Hill

The problem with the gig economy, as if this wasn't obvious, is that you can never stop hustling; whatever deal you have put together is always just about to fall apart. No equilibrium is stable, moments of relative comfort are evanescent, and you can never rest upon your laurels and say, I have this wired.

In my case any patchwork of delivery routes I had stitched together was continually unraveling, assembling and reassembling under pressure of events; as had to be the case given that I was generally negotiating with three or four newspapers at once, contending with organizations whose circulation departments, at any rate, were comprised of liars, thieves, and fools; and the changing calculus of

which managers at which newspapers were making what promises to convince me that they could, this time for sure, be trusted, and which others could, in consequence, be told to fuck off, ensured an environment in constant flux. — All this in an industry in manifest decline, for which the writing, could these idiots but read it,[91] was already on the wall.

But every once in a while the stars would align and I would find myself in a position of relative security. Still broke, desperate, and narcoleptic from working all night seven days a week, but able to walk the dogs when I woke up in the afternoon, lurch out to the movies occasionally, and indulge my taste for pizza and ice cream.

And so it was at this moment. I'd maneuvered my way into a suite of rural and mountain routes that no one else knew how to do; this meant a lot of driving, but gas was cheap, the Jeep ran (at least after everything obvious had broken and been fixed), and after a series of hasty moves I had somehow lucked into a carriage house off the alley at the end of Marine, a block away from the mountain — as good a place as I had ever found in the city, in all my decades trying.

My credit rating had cratered and I couldn't get a telephone, let alone cable television, but no one wanted to talk to me anyway, and my VHS library more than took up the slack.

I didn't have a bank account, but that just meant I couldn't bounce a check.

I daydreamed about the Riemann hypothesis and the solution of the problem of induction, and occasionally mustered enough energy to tap out a few pages on my secondhand Powerbook.

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[91] I first attempted in 1995 to explain to an uncomprehending Director of Circulation that the internet meant his doom. I might as well have been lecturing a brick.

I slept on a really nice couch, and hardly ever thought about the bitch I got it from. On Sunday nights I listened to the last real disk jockey in Colorado play oldies from his secret stash of early Sixtes 45s. The hapless Broncos even won the Super Bowl.

And so I got up every morning at one, piled my companions into the Jeep — not that there was any choice in the matter, if Boris knew I was going somewhere he would sneak out and jump into the car through the window to keep from being left behind — ran by the warehouse to load up, and drove all night a hundred miles through the mountains; stuffing papers into delivery tubes, singing to the puppies, listening to NPR.

At sunrise I paused for a few minutes above Gold Hill, to let the dogs out to run around in the woods. And as I stood there breathing in the mountain air, a half mile more than six thousand feet above Man and Time, I could pretend, for a moment, that life didn't suck

Christmas 1997

Trying to get Boris and Natasha to hold still long enough to pose for a Christmas card:


THE WRONG MAN


THE WRONG MAN

—448—

Apparition (7/13/1998)

Out walking along the creek with Boris and Natasha. Abstracted as usual, but I look up as a girl is running past, recognize the gait, and realize it is LeeLoo, whom I have not seen in a while. — She does not pause, exactly, but looks back over her shoulder as she turns off the trail, as if to make sure we are following her, and then disappears up Sunshine Canyon. Of course there's no chance we can catch up, but we follow anyway, I know where she has to be going, we've climbed this hill many times, and wonder why I haven't seen her here before. — One more mystery —

—449—

Why music criticism is worthless

It's another problem of translation. — You can put words to music, or music to words, at least after a fashion. But you can't *express* words in music, or music in words.

That would appear to contradict Church's thesis, which here can be taken to be the principle that anything can be digitized, thus coded in a string of symbols.

And thus we have, for instance, musical notation, suitably annotated to indicate which instruments are being played, the appropriate metronome marking, and so on.

That does capture a lot of it, up to the level of individual interpretation, but *in extremis* the sound of a performance can be recorded, Fourier-analyzed up to the frequency beyond which the human ear cannot distinguish pitch, assigned one of a finite set of

amplitudes down to a difference which ditto, and so coded with a finite number of symbols and stored digitally — thus the principle of the CD. — As also can, obviously, written or spoken language.

However translation is not about syntax, but semantics.. And what music means — some direct connection it has with brain physiology, or whatever you want to call it — the fact that you don't know what to call it is a dead giveaway — is wholly incongruent with what language means. — Musical phrases do not *∂enote* in any straightforward fashion, for instance, no matter that Wagner made up leitmotifs for his themes and characters, and attempts in the style of so-called program music to describe precisely the seating[92] at a dinner party are always artificial and arbitrary. Beethoven may have intended with his Sixth symphony to relate the musical associations he formed with a day in the country, but he was speaking in a private language, devised for a single occasion; this was not an instrument for communication.

So even though you can talk about music in words, you can say very little. — You can say, e.g., that rock and roll is about fucking, wave your hands for illustration at the unrelenting rhythm, the back beat, etc., and then conclude (correctly) that it is a music of personal liberation, a means of freeing oneself from the inhibitions imposed by artificial and repressive systems of morality. But you can't explain what was distinctive about Hendrix without pulling out a guitar and playing a great many passages to illustrate technicalities. And not many can do that, and they don't write for the *Rolling Stone*.

In fact that is the point, that one can use music to comment on music — thus quotation, imitation, homage in the form of variations on a theme of X, etc.

But to the extent that one can *write* about, say, something that Charlie Parker played, it's a sort of jazz riff in itself, a set of variations (very) indirectly inspired by the performance, which (this is significant) if

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[92] I think the classic example was the number and types of the utensils, but whatever.

you have an appreciation of the music *per se* are usually just a source of irritation.

Where has it been possible to directly associate images with music? Disney's *Fantasia*, of course, though this is clearly the exception that proves the rule.

The best music videos are almost wholly disconnected from whatever message the lyrics are pretending to convey. — It is always a mistake to be literal. — The aim should be to create a surreal flow of imagery, with its own disparate logic, like that of a Betty Boop cartoon, which accompanies the song in a kind of counterpoint.

{…}

Godard said the only way to critique a film was to make another film. Similarly in writing about movies I often find the best way to comment is to rewrite them — why not *this* instead.

In the "classic" period a lot of rewriting was expected of the viewer; not simply in the cases where one had to reinterpret stories which had been altered, as it were, to pass the censor — the analogy Freud employed to explain the indirect form of expression in dreams — the phony reveal at the end of *Caligari*, or what Hitchcock had to do to protect the images of his stars in *The Lodger* or *Suspicion*, or the absurdly bogus happy ending of *Gilda*, or the situations in which the narrator or even the eye of God is obviously unreliable, *Laura* or *Point Blank* — perhaps the reductio ad absurdum is *The Usual Suspects* — but having to systematically reinterpret certain types of situation, e.g. knowing that "kissing" is usually code for "and then they fucked each other's brains out."

But it's largely visual. You can point to a composition and say something about how it works and what it signifies, but the actual meaning, how the image registers upon consciousness, lies outside the

linguistic framework entirely. — "Kane looms", e.g. — What is it about him that darkens the sky?

{…}

Godard[93]

Godard's *Histoire(s) du cinéma* consist of a series of eight films, divided into four chapters of two parts, a bit more than four hours in all. Though the conception had preceded them, the proximate cause of their composition was his dissatisfaction with a series of lectures he gave at the University of Montreal from April-October, 1978, on the history of cinema.[94] The absurdity of pretending that mere words could convey, e.g., an understanding of the evolution of montage, led him back to the principle that "only cinema can narrate its own history," and the realization that he could only explain himself by making another film — a very long one, with which he tinkered for a decade or more before releasing it between 1998-2002. It is an intricate collage, composed of extracts from earlier film which illustrate a set of elliptically stated theses, accompanied by text, still photographs, sound effects, and interludes in which Godard himself, cigar hanging from the corner of his mouth, sits at a typewriter engaged in furious activity. The structure of allusion is so complex that it requires intense concentration even to attempt to follow his argument, and I feel that I am boasting when I say there are some passages in which I may recognize as many as half of the references in the ongoing barrage of cinematic quotation.

A preliminary partial list of themes (1973) included:

How Griffith searched for editing and discovered the close-up;

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[93] Obviously this part was added much later.

[94] *Introduction à une véritable histoire du cinéma* [1980]. The English rendition is Jean-Luc Godard, *Introduction to a True History of Cinema and Television,* edited and translated by Timothy Barnard. [Montreal: caboose, 2014.][Seriously. Apparently an underground publisher.]

how Eisenstein searched for montage and discovered angles; how von Sternberg lit Marlene in the same way that Speer lit Hitler's appearances, and how this led to the first detective film; how Sartre made Astruc wield the camera like a pen so that it fell under the power of meaning and never recovered; true realism: Roberto Rossellini; how Brecht told the East Berlin workers to keep their distances; how Gorin left for else where and didn't come back; how Godard turned himself into a tape recorder; how the conservation of images by the board of directors of the Cinémathèque française operates; the fight between Kodak and 3M; the invention of Secam.[95]

Godard points out[96] that "histoire" in French can also mean tale or fable, that he is constructing a sort of mythology in doing this — "to tell the stories of all the films never made" — *toutes les histoires* — and that the plural "histoires(s)" is meant to suggest there may be more than one of them; more than one version of history-with-a-capital-'H'.

{…}

In re the adjoint problem, whether the translation can go the other way, and words turned directly into images, Godard, puzzling over the invention of the script, decides it must have been the inspiration of a Mafia accountant — a manifestation of the desire for control over the creative process, the producer's desire; the impulse of the gangster.

{…}

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[95] The French video standard, distinct from NTSC and PAL. The standing joke was that the acronym stood for "Something Essentially Contrary to American Methods".

[96] See Jean-Luc Godard and Youssef Ishaghpour, *Cinema: The Archaeology of Film and the Memory of a Century*, transl. John Howe, [Oxford: Berg, 2005.] — The first (the useful) half of this is an interview, and the best way to read it is to ignore the essay-length questions by the interlocutor Ishaghpour, a devotee of the philosophical gibberish beloved of the French, and simply study Godard's responses]

Trying to imagine similar exercises in music or literature.

In the latter case, obviously, we have compendiums like the *Norton Anthology of English Literature*, which is a decent historical survey, not too long to read all the way through, not so short as to be ridiculous.

In the former case, more to Godard's purpose, there are textbooks of harmony, e.g. Walter Piston's, which I read when I was naively trying to figure out how a guitar worked. The method there was to explain the rules, and then demonstrate their application through musical history by giving examples from Haydn, Mozart, Beethoven, et al.

Can something similar be done for the history of (say) montage? Undoubtedly, the course is probably being taught somewhere, but Godard's method, that of the creative artist, is more satisfying.

A not-too-distant comparison might be Stan Brakhage's Sunday night shows in the lecture hall in the Fine Arts building, where he screens avant-garde oddities from his private collection which no one but he has ever heard of, and discusses them from the perspective of his personal acquaintance with the artist. Brakhage is a great lecturer, brilliant and funny, he has been absorbed in his work since adolescence, he radiates artistic energy. But you have to see the strange little films to appreciate his purpose.

Why else do I prefer Russell's to other histories of philosophy, after all? Because whatever scholarly shortcomings it may possess are inconsequential, it is illuminated throughout by his genius.

{…}

The screenplay as an illuminated manuscript, throughout which are interspersed illustrations [moving icons] which expand into portions of the film itself. Surely Godard would love this.

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Dante meets Beatrice (8/14/98)[97]

Continuing my explorations of the West side, I found myself Sunday navigating the old dirt road up the mesa behind the Bureau of Standards, cursing the heat and aiming myself and the puppies down the hill toward Skunk Creek, which (*mirabile dictu*) is actually bearing water these days, a great convenience for overheated dogs and their barefooted escorts. Pausing to contemplate the ancient gas-liquification apparatus, the lodestar of Edward Teller's fantasies in the days when he wanted to build a liquid-deuterium bomb, I wondered once again what would have become of this capital of political correctness if the Livermore lab had been sited here instead. — Thus did Zeus conspire to cloud my senses. — Coming to myself, I looked about distractedly to determine the whereabouts of the dogs and discovered Boris sitting politely at the feet of a striking young lady, a brunette with a long braid running out the back of her baseball cap. She was patting him on the head, and he was submitting to her attentions with uncharacteristic equanimity; for though Boris loves nearly everyone (skateboarders excluded) his manners frequently leave something to be desired. — I wondered why she seemed familiar. — As she passed she smiled and said "Hello there" and began to trot up the hill. — Struck by delayed recognition, I turned to say something. But she was already gone.

—451—

Desiderata (10/28/98)

An investment company fishing for system architects on campus leads its newspaper advertisement with the following: "If computer

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[97] To Johnny C.

scientists designed the world, things would be different." — No shit. For instance history would repeat itself every 65536 seconds and the earth would keep spiraling into the sun because of roundoff error. ("*Of course* the continents are melting. *Read* the *fuck*ing *man*ual.")

—452—

Money and class (1999)

He had gone from Caltech to Princeton, and so described to me the class structure there, which extended, he explained to my astonishment, even into graduate school: even there nerds were members of the lower castes. — Surely, I objected, the power relationship had to be inverted, they must have known by then they ended up working for us. — No, he corrected me, we always end up working for them. That is the law of nature. — But, I protested, shouldn't this piss us off? after all if it weren't for us, they'd all still be living in caves.— Yes, he instantly replied. — But they'd be living in the *biggest* caves.

And so at once I understood capitalism.

—453—

Another man done gone (3/2/99)[98]

I heard an obituary announcement the other day on NPR for Thomas McMahon: a celebrity among engineers, the subject of a number of pieces on public television for his work in biomechanics, designing running tracks, applying the principles of stress and strain to the growth of trees, etc.; also the author of several beautiful little novels, among which his Los Alamos fiction, *Principles Of American Nuclear*

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[98] To Richard Strelitz.

Chemistry, is my particular favorite.

Apparently he was fifty-five. I don't think he augered in (like Schramm); he must have fallen prey to one of the usual afflictions.

The way I met him was fairly typical, rather silly, really. My Eighties girlfriend (the dancer with whom I kept goats) came from Boston; after we'd been living together for a year or two her parents came out to visit and, after assessing the size of my vocabulary and watching me solve the Rubik cube a few times, decided the incongruity between my apparent intellectual abilities and my level of employment could only be remedied by vigorous intervention on their part. So they went back to Cambridge and started lobbying their Harvard friends to hire me, or something. This campaign progressed far enough that I was backed into providing a writing sample (thirty typed pages on physics and philosophy, very funny, of course) which circulated among parties unknown (apparently a few of them were sufficiently impressed that they thought I should write a book, but I have no idea who they were) with, obviously, no concrete result; save that when we in turn went back East a couple of months later I discovered I was expected to go down onto the campus and interview (or something) with whomever they could browbeat into talking to me. This turned out (first) to be an Engineering dean, some friend of the family, who regarded me with obvious embarrassment until I explained to him that I knew perfectly well that academic life was governed by different rules from, say, the construction business, where one might reasonably expect that your uncle might get your son-in-law a job, and that I'd been maneuvered into his office mainly because I'd been trying not to be rude; after which we had a pleasant chat about the Oppenheimer biography then running on PBS. And then (taking Los Alamos as a segue) he passed me on to Tom McMahon. With whom I exchanged the same disclaimers, of course; but with whom, however, weird but true, I then had one of those experiences which is the intellectual equivalent of mutual love at first sight. We sat in his office talking about writing, teaching, biophysics, and the life of the amateur farmer for a couple of

hours; I remember he asked me how I went about learning a new subject. "I mean, do you read, like, Schwinger's book on quantum mechanics, or what?" he asked. I replied that I usually found it most efficient to find something at the beginning graduate-student level (the Big Print And Pictures theory which I still espouse), and asked him what he did. "I think I have it figured out now," he said. "You write a book yourself." And produced the textbook on biophysics[99] he'd just finished writing with a couple of other guys; explaining that he still didn't think he understood anything about it, but at least now he knew that nobody else did either.

That I didn't carry off. But I did take copies of a few of his papers on the application of the principles of mechanical design to the growth of trees;[100] and, sighing mightily the while (for I knew this could not end well) set to work on them when I got home. Sure enough, without much difficulty I found a way to extend his work: there seemed to be three essential parameters that described the typical deciduous tree, a scaling factor (he had a lot to say about this), a branching ratio, and a branching angle, and he'd remarked an apparent correlation among them that he didn't have an explanation for. I made up a variational principle, something about trying to maximize the area in leaf, and got something that looked like the missing relationship out of it. — Went out into the back yard and measured a bunch of plum trees; made a number of heinous calculations (having no computer) longhand; wrote out another thirty-page letter. — And, sighing even more mightily, mailed it off to him. — But from such desperate gestures we never prosper. I never heard from him again; or any of the rest of my unknown admirers, for that matter.

Which illustrates again the principle that you shouldn't drop everything you're doing to attempt to make an impression on someone just because you might get a job out of it somehow. Unfortunately, it

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[99] Presumably this was *Muscles, Reflex, and Locomotion* [Princeton University Press, 1984.]

[100] Cf., e.g., Thomas A. McMahon and Richard E. Kronauer, "Tree Structures: Deducing the Principle of Mechanical Design." *Journal of Theoretical Biology*, **59** (1976), 443-466.

often seems to me that I've done nothing else.

Ah well. A great man in his way, at any rate. His novels are still in print, I think; the most recent one I recall seeing was called *Loving Little Egypt*, and appeared in a Penguin paperback. If you haven't ever read them, look for them; you'll enjoy them.

Maine, incidentally, is the best place in the world to skip stones ...

{...}

I found out later that McMahon died by dumb accident, some kind of complication during surgery. It is not a pleasant irony that he had remarked to me his work in biophysics had brought him in contact with a lot of people at the Harvard Medical School, and he had been appalled by their incompetence.

{...}

I lost my copy of the original letter, and don't recall much of what I said in it. I know that I was not so naive by this time and took pains to be cryptic. I know I said something about Lawvere and Tierney and the logical interpretation of quantum mechanics, but out of all the faculty only Hilary Putnam could have understood enough to be intrigued, and it seemed a pretty slim chance he would ever see it.

As it turned out, the people I did talk to came from another intellectual planet entirely. But at least they weren't idiots or thieves.

I do remember describing my perplexity at the disorganization of mathematics. I said it seemed to me like Germany before Bismarck, divided into a bewildering profusion of principalities and kingdoms ruled by mad kings and beautiful princesses under the mesmeric influence of wicked Grand Viziers, a Ruritanian cosmos out of *The Prisoner of Zenda*, and that no one could hope to attain the vision of an

emperor, save Hilbert once, or Weil or Grothendieck; whereas in mathematical physics at least you could at least tell up from down, and knew what the really fundamental problems were.

As for the variational principle, I made up many versions of that. The latest and greatest exploited the Hausdorff dimension of the fractal surface described by the leaves, and I still tinker with it occasionally. (The reason is typically Pythagorean: when I solved the problem in two dimensions, the optimal scaling factor turned out to be about .65, and every way I tweaked the calculation — by hand, I remarked to McMahon when I wrote him that if he ran across my Fairy Godmother — undoubtedly, I said, a bag lady in Cambridge — he should ask her to send me a computer — the answer got bigger, not smaller; a problem, obviously, since it ought to be .6180339... .)

{...}

Another thing I'd done, much earlier, was to commence a draft of a critique of the principles of philosophical analysis with a mock-heroic description of the origins of the movement in a gangbang perpetrated upon the Muse by a drunken fraternity of philosophers.[101]

McMahon's conceit in his Los Alamos novel was that the invention of nuclear weapons came about in just this fashion. After I read his version, I tore mine up and threw it out.

{...}

He did send me a note later in which he mentioned, perhaps because he had been impressed or perhaps simply as *pro forma* encouragement, that some of the greatest scientists in history had been amateurs.

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[101] About this I remember nothing save that Whitehead always expressed regret for having participated, and that Wittgenstein watched. — It was inspired, I think, by Swift's *A Tale of a Tub*.

But I knew that already, of course. And also knew they'd all been independently wealthy.

—454—

The Phantom Empire (5/24/2005)

... the Grand Vizier, pointing to the cooling stiff of the temporarily-dead hero Gene Autry: "Does he live?" — Guard: "No, but they're taking him to the reviving chamber." — Vizier, squaring his jaw with determination: "That means they'll bring him back to life." — Turning to the Chief Surgeon: "We must start the Revolution at once!" — The Surgeon protests: "But the atom-smashing machine, which destroys all matter, is not yet complete!" — Lengthy moment of cognitive dissonance while the viewer attempts to digest the implications of these statements . — All of these guys, of course, are wearing bizarre outfits which defy the logic of apparel: big ornamental helmets with wings on them, capes, shiny armor, something like chainmail leggings; no two of them alike, since they all came from some kind of De Mille garage sale, and represent the disparate improvisational whims of the costume designers. — Debate now commences whether they should perform brain surgery on the protagonist, who comes to babbling an alien language he has learned in the Land of the Dead. Complications ensue. — Ah, to be wearing a Roman-centurion outfit, working in your secret underground laboratory; in the lost city of Murania, twenty-five thousand feet below the surface of the Earth. Clearly the fun has gone out of being a Mad Scientist...

—455—

Wage slavery

I never could decide whether this had been imposed from without or within; perhaps it was after all only the consequence of some

unconscious desire to do penance for — whatever, my arrogance perhaps — something born out of internal necessity, some need to atone for my sins.

Certainly I never really felt that I had been condemned to Hell, merely to some Purgatory from which it was certain once my penance was complete I would emerge into the light of recognition — the truth would be heard, talent would out, the light would no longer be hid beneath a bushel —

Instead the bushel got tossed into a dumpster, hauled off to the landfill, and buried under a thousand tons of stupidity, ignorance, venality, and incompetence —

— Well. — Surely there's a moral there.

Paging Laura Palmer.

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Slouching Towards Ramseyville (3/15/99)[102]

... As for the grand tabloid scandal, it's nothing other than what you would expect. Boulder, like the other great Boomer magnets, is a place where people live only because they want to be able to say that they live there. This entails an economy and a culture founded on narcissism. Above and beyond the obvious corollaries, e.g. a health club on every corner, whole housing developments comprised of fake Victorian mansions, traffic accidents involving multiple Range Rovers, and a recent City Council election in which every candidate claimed to be employed as a consultant (though only one, as it turned out, had any measurable noninvestment income), there are strange and eccentric consequences, e.g. a daily newspaper that at least once during the Nineties ran a front-page human interest photograph showing a grieving couple standing by their Jaguar, from which some kids had removed the hood ornament, with an accompanying story about the grave threat to the civic order represented by such irresponsible vandalism. (I am not making this up.) — Obviously in such an environment it cannot strain credulity that one should discover a former beauty queen reliving her pageant career through the vehicle of her daughter married to a (quote/unquote) computer executive who seems to have been dicking said sixyearold in his (abundant) spare time; that they should have broken the kid while they were playing with her; that they should have improvised a cover story based transparently on the plot of a recent motion picture; that the local police (motto: "To Serve And Protect The Wealthy From The Lower Classes") should have swallowed this story unquestioningly and let the perpetrators clean up the evidence before their very eyes; that the city bureaucracy, once the truth became apparent, should have made every effort to obscure it; that the district attorney in particular, not simply by virtue of a reluctance to appear on The Celebrity Murder Channel in the role of the next Marcia Clark but

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[102] To [BA].

also because the Ramseys' lawyers (naturally) are personal friends who belong to the same ruling clique he does, should have ignored the case in the hope that it would go away; that, accordingly, to date the only person to have been prosecuted in connection with the case was the poor dolt who leaked photographs to the *Globe* (they found him instantly and came down on him like the wrath of God); and that anyone who wanted to piece together these particulars would have to read them in the *New York Times*, since the local newspaper (see above) has been consistently reluctant to cover the story for fear that it might affect property values. — In the selfstyled Athens of the Rockies (Is Fort Collins the Thebes or the Corinth? Is Paul Danish the Sophocles or the Thucydides? Is the County Courthouse the Temple of Olympian Zeus or the Temple of Pythian Apollo?), a city where the single most common sexual practice is probably masturbation in front of a mirror, none of this should surprise you.

I heard it once that someone new to stardom was asked by one of his old friends what Hollywood was really like, and he said "High school with money." A thrill of recognition ran through me when I heard this. That thrill is long since gone.

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The principle of the eye on the other side of the keyhole — that the touchstone of the reality principle is surprise, the wholly unexpected.

One obvious example is Hawking's discovery that black holes radiate. Until I heard that, the whole theory was just science fiction. The discovery that stuff could tunnel out, and that it did so in accordance with the laws of thermodynamics — that the radiation obeyed a blackbody spectrum — was too incredible not to be true.

Another example was the Weinberg-Salam theory of the electroweak interactions. After a couple of generations of failed attempts to unify

gravity and electromagnetism, the consensus was stated by Pauli: "Let no man attempt to join what God hath put asunder." — But this was entirely different — completely unexpected — the idea was to unify electromagnetism with *something else* — the fact that it wasn't motivated by the usual theoretical selection bias, that it had such radical implausibility — identifying the photon with a triplet of particles weighing a hundred times the mass of a proton! — made it credible. — And then of course the proof of renormalizabilty made it irresistible.

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Notes on the relation of the arts to the sciences

The critical distinction is supposed to be that art is created, science is discovered; that science was always there, waiting for someone to come along and find it, but art is conjured up out of nothing.

I think that this distinction isn't what it appears to be. I think that these are simply two different ("complementary") ways of looking at the same process.[103]

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[103] A similar observation can be made about the distinction between evolution and design.