

The Persistence of Visions

(Reflections on living from the classroom
and elsewhere)

by

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Preface — On Reading this Book

Over the years I have lost what used to be my writer's voice. Actually, my speaking voice and my writer's voice have essentially become one and the same. I write the way I speak and vice versa, and this is most evidently the case when I am writing about something about which I care deeply. Invariably when I give a manuscript to a friend to read, one of their first responses back to me is, "Well, I can certainly hear your voice in it. Your presence is right there in it." With this in mind, let me make a brief explanation of how this book is put together, and how it may help to read it.

I believe in the power of stories. I believe that a story, told from the compassionate heart of experience and listened to with the understanding heart, can have deeper effect, deeper meaning, and ultimately even be more true, than the actual contents of its plot. Stories come in all varieties, and have been used throughout time and across cultures to convey the best wisdoms the teller has to offer. In contemporary society we tend to devalue stories if we seek advice or knowledge. We want the facts, and those analyzed. If we think we are being led out of our constructs of reason and facts by someone, we might dismiss what they have to say with the words, "Oh, that's just a story!"

I think we are on very slippery territory if we do not embrace the power of story if we truly seek wisdom. If we seek visions, stories are indispensable. Although I am not engaged in a work of fiction with this book, I still see what I do as essentially telling stories. I recently read a wonderful little essay by a storyteller, and I'd like to quote from her here because her words are a wonderful example of the telling heart.

The direct involvement in becoming the story makes it an experience, one that occurs at the moment of the telling. A story is not an explanation. It is lived between teller and listener; it resonates far beyond the content. The text alone, separated from the enlivening experience, can be analyzed, but the result is different. It is not a transformative event. In other words, genuine story manifests when it is heard in the moment, when the listener is drawn out of self-consciousness—the thinking mind held entranced by the

ongoing logic of the narrative--and becomes everything in the story. The meaning and the power of the story do not reside in the content alone; rather they unfold in the dynamic processes of listening/creating.

The storytelling is potent because it is physical experience. The whole person is engaged in the making of meaning and story. Mind, body, and heart are synchronized and activated. The embodied listener is alert, with senses heightened, and naturally creates image and meaning from association, feeling, memory, dream, and a ceaseless source of archetypal symbols within. It is this holistic activity of listening, not the conceptual content of the text or plot alone, where true learning takes place. During the event, the inherent and natural wisdom of ear, eye, and heart are given voice. (from "Through the Story's Terror," by Laura Simms, *Parabola*, volume 23, no. 3, 1998, pp. 46, 47)

The topics discussed in this book are at the core of my being. I care intensely about them, and these thoughts animate my life. In the telling of each section and chapter, I am quite literally speaking. I cannot say whether or not they will resonate for every reader, for different listeners respond to different tellers. Still, as I speak out what is in my heart and mind, I am also paying attention to the alertness, engagement, possible points of confusion, and even body language of an imaginary audience. That audience picture comes from somewhere, probably including from a lot of interwoven memories of actual audiences, but perhaps from other sources as well. As I let myself become a storyteller, it is the implicit dialogue that tells me if the deeper truths are resonating. Taking on this role, when I pay attention to the process, also tells me when enough is enough, when bridges need to be presented, and simply when to lighten up.

It is with this awareness and sensibility that I try to write, and informs the overall structure of this book. Each chapter I see as a narrative, even when interspersed with digressions that may not appear of themselves to be very story like. I try to say what I need to say, and hope that each section has something of a narrative arc to it, or, in musical terms, a theme, a development, and a resolution, occurring within an experiential arc. For this reason, I have left out of the main text a lot of detail, quotes, data, sources, and even some telling

vignettes. It would be well and good to leave them out if the stories were for imaginal purposes only, but these reflections are meant to connect to what our lives are often about, and what we may wish to attend to instead.

In order to do justice to any telling of the patterns of our lives, therefore, I owe it to the reader to provide grounding for these ruminations. The functions of the extensive “Notes” at the end of each chapter, is much more than a bibliography. The “Notes” do contain bibliographic sources, organized according to themes raised in the text. There are also a host of other examples, further digressions, and anecdotes with which I wrestled at times, considering that they should be part of the primary text. However, as I read through these ideas, I tried to keep the chapters in the story-telling voice. Anything that went beyond what seemed to constitute a good telling, within an experiential arc of active listening, I left off and pursued in the “Chapter Notes.”

My suggestion, therefore, would be to read the book in its large “Parts,” or at least in chapters, and then to read the associated notes sections, not so much for data-buttreasing, but rather as a companion text. This is only a suggestion. Of course you will decide how you wish to approach the writing. More importantly, you will decide if the writing is worthy, and if the telling compels. I am most grateful to share some thoughts with you.

*Introduction — Upward Not Northward;
Out of Flatland Altogether*

*We must always follow somebody looking for truth,
and we must always run away from anyone who finds it.*
- Andre Gide

*It is so difficult to find the beginning.
Or, better: it is difficult to begin at the beginning.
And not try to go further back.*
- Ludwig Wittgenstein¹

This book is about promptings, questions, desires, and resolutions. It is about things that have happened while I was busy teaching, among other pursuits, but primarily while teaching. This book comes from paying attention to what feels authentic and what feels like a distraction. It comes from living with an extremely low tolerance for putting aside spiritual and intellectual dissonance, while just getting on with things, although there have been many times when I wished I could do just that. It comes from cycles of loneliness when it seemed I could not find a way to express to others the drive to understand what lay beneath the practical and below the technique of whatever we spend our time and energy doing in our everyday lives. My passion was for the more fundamental human reality that was essential to improve our understanding of why we do what we do and that, once openly discussed, could go very far in clarifying what we are about in any life endeavor. Such considerations might either make improvements in the techniques used to solve problems attendant to our current pursuits much more straightforward, or, on the other hand, would cause us to radically reconsider whether our actions were worthy pursuits at all. Doubtless, such a description of loneliness in the search for more fundamental meaning will strike some as a common phase in individual development. Still, it seems important to me to report that I, as well, experienced these anxieties

acutely, and they are an indispensable part of my journey.

For me, this search led to a career in teaching after experimenting in several other careers. To the limits of my understanding, it seemed that being about the work of teaching, all the while pursuing more soul-satisfying answers to the purpose of life and effort, would never leave me afterward in a spiritual funk thinking I had been wasting time, or not doing the best with the insights I had at any given juncture. Further, I now have a much broader conception of the qualities I found through teaching and see these qualities expressed in many other professions, locations, and modes besides those of the formal classroom. So I offer these reflections only by way of what I observed as I followed a chosen path.

This book springs from those wonderful moments of transcendent synthesis when my ruminations were validated while among others who found such pivotal, shared questions to be an invitation to envision what they might wish to do with their lives, rather than as a fearful experience. I have often heard formal education referred to as the artificial antecedent to “real life” or the “real world.” I find the converse to have been true. Where else could one find the privileged dispensation to ask students of all ages and experiences just what they consider to be the meaning of life, of their lives? What constitutes a life well lived, and how does one apply oneself to answering that question and then allow oneself to be directed by those answers? What could be more important in the process of learning anything, or pursuing any occupation, than to face such questions directly? And yet fear is a common and understandable response because such questions beg us to examine the status quo, wondering with apprehension just what we are spending most of our mortality doing. Without the proper environment foregrounding the hope that arises from envisioning what might be rather than the loss of what is, and that conceives of a significant meaningful emergence resulting from this hard work, the serious consideration of meaningful living appears to risk a spiritual free-fall with nothing else to grab on to.

Persistence of Visions finds its voice in conversation, and the conversations I can most readily locate are from the classroom. If there are true insights into these crucial questions, they reveal themselves in the art of conversation most

Comment [1]:

Nelson kellogg 11/28/09 12:47 PM
Seems like you need to say at the end of this passage that a classroom can provide this environment. . . .

Comment [2]:

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. . . or leave this comment out here and put it somewhere else.

broadly conceived; conversation in the presence of others within a community of trust; conversations with the insights of authors, artists, philosophers of the physical and metaphysical, and acquaintances; and with these dialogues to draw upon, our conversations with ourselves and the sublime.

The essays in this book are not an attempt to retrieve the actual content of particular courses I have taught although some of that retrieval is indistinguishable from the deep experiences themselves. Instead, these essays proceed from powerful recognitions of turning points while teaching students ages 16 to 60. I have found that the sticking points for those students were the same fundamental questions that I was feeling my way toward. Expressing these ideas directly, in the true spirit of inquiry, and not with a hidden dogma I am waiting for them to guess, but with evident hope and some suggestions I have found compelling, is an invitation that has completely changed the atmospherics of learning and sometimes seemed to be emblematic of truly life-changing experience itself.

Not every area of reflection found here was always explored in every class I have taught. With high school students, it was often sufficient that the pupils sensed that there was someone with them, a generation or so older, who seemed to them reflective enough to have encountered questions of existence and to have come away with an abiding sense that life is exciting and profoundly worth living, all the while exploring some more bounded intellectual “deep practice” with them, which in my case was physics and mathematics. In these settings, the questions addressed in this book were often introduced implicitly, sometimes obliquely or inferentially, but I think that their presence as subtext was significant nonetheless. I will explore the concept and implications of deep practice in Chapter 8.

At the college level, especially in the liberal studies program where I now teach, these questions have often been raised more explicitly, even with first-year students (age 18) and certainly with older students. In these settings, it often appeared to be critical for students that these questions were addressed. The willingness of the class to move to these most fundamental levels and have something real to consider made all the difference between students experiencing despair, along with its self-protective twin, apathy, and taking flight with their ideas and lives.

Comment [3]:

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Do you mean with others? In the presence of suggests only some are participating.

I don't know when it came into vogue in the academy, but we still seem to be living with the perception that for students to be liberally educated, they have to be, first of all, shocked into a wider perception of the world. After all, most of these college kids (so the stereotyping model goes) simply have to become aware of how little they know. This awareness is best accomplished by giving them example after example of just how tragic the course of human history is, including the lives of most people worth knowing about. A perpetually furrowed brow and dark desperation are the only true signatures that a student really "gets it" and is finally awakened to life as it is. (For a most polished evocation of this temperament, see "On the Uses of a Liberal Education: as lite entertainment for bored college students," by Mark Edmundson, *Harper's Magazine*, September, 1997.)ⁱⁱ

At the same time, the most obvious sign that a student absolutely does not "get it" is if a student were ever so hopelessly naive as to ask a professor a question of real consequence instead of a question that buttressed the correctness of the dismal world view by merely asking for a further example or a clarification of method. Imagine a sophomore in any one of the humanities or social sciences asking the professor, "I understand that most socio-historical events as we have described them are the result of whoever is in power protecting their own position through some combination of greed and fear, which is really quite simple to understand, like Pavlov's dog, and deadly in its consequences. But if we all agree on these concepts, could you tell us if you, personally, think there is any point to human existence?"

I deliberately chose a sophomore because it is just possible that a freshman might not yet have internalized the catechism of higher education. This unwritten dictum is that such questions are outside the boundaries of allowable academic inquiry. The professor's immediate defense against any such rogue question is, if she is kind, "Well, that's something we'll never know, I don't suppose. After all, no one has ever proved what the meaning of life is yet." (Followed by a polite titter of knowing laughter) If the professor is more bitter for having the stride of his marvelous disquisition on human corruption broken, he might snap instead, "Come on now! If you want to know the meaning of life, why don't you go to some church or other? I'm sure there is no shortage of

preachers willing to make life easy for you. Are there any real questions out there? Otherwise, let's move on."

Suppose a student were so persistently obdurate (in the view of the academy) as to insist that she has a right to ask such questions. After all, she had been told that the most important object of inquiry for humanity is humanity itself! She might conclude that if we already know that this study is no more elucidating than an ever-more elaborate set of rules for a meaningless game, then she doesn't choose to spend a half-dozen years and thousands of dollars to get it, when she "gets it" already. And of course her leaving is no threat at all to the institution, her professors, or peers. After all, they don't even have to tell her the unassailable response, for that has been hammered into every college student as well. "If you want a good job, you have to get a good education, and that means a college degree. Period."ⁱⁱⁱ

No, I do not believe that the primary "problem" so often talked about concerning students' apathy is some character flaw that, amazingly and for the first time in human history, afflicted the gene pool of an entire generation. Nor do I believe that it is generated by vacuous media, although as it reflects a lack of courage in society at large to look squarely for hope, dignity, and meaning in the human experience, our entertainment seeks to fill its own existential vacuum with cheap surrogates to authentic living. The reason why students of any age do not find their studies compelling is because there is no vision behind it. There is no sense of positive adventure that, despite the many examples of cruelty, humankind is ultimately on its way somewhere, and we are capable of consciously evolving.

To see evolution in the history of human consciousness (beyond a global economy and more sophisticated ways of inflicting injustice), one does not even have to begin with the sense of the spiritual, mystical or ineffable for meaningful patterns to emerge. Even within the abbreviated conversation allowed in "proper" academia, it takes a deliberate act of cynicism to refuse to see large sea changes in consciousness. The very things that are broadly considered to be major problems found throughout contemporary cultures in varying degrees, such as ethnic hatreds, the rights and education of women, the yawning disparity between haves and havenots, and the interconnected sweep of environmental breakdowns, have only found their voices in common discourse of human

concerns within the last few decades. We can find their exceptional voices in the previous century and in certain cases before, but, I remind my own students, that even as recently as when I was in college, there was no axiomatic privilege for these questions to enter the debates of learned communities. When these issues were engaged, it was decidedly a fringe activity. And whatever the challenges we face, the very first essential stages toward major social changes occur when issues move from the utterances of the fringe, who are most sensitive to seeing the symptoms of illness, and into general conversation.

The challenge for us all is to see these times of great shift as the most powerfully exciting times to be alive. It is a time that calls for the emergence of the visionary, and not a single vision or visionary, but a more generous expression of envisioning among many people. It seems to be simply a human trait to bifurcate at times of great challenge. One response (the most common) is driven by fear, and the other by opportunity, and these two generative forces can be expressed in the same individual from one day to the next. At times these distinct motivations (the push of fear versus the pull of opportunity and positive visions) can even generate the same resolution of response to the problem, though this is not often the case. Even when the course of action is the same, the FEELINGS inhabited by those whose overarching sense is predominated by fear and those who are most accessible to a sense of emerging opportunity are radically different.

The fear-dominated response can move some to action, but it can equally well result in hatred, denial, or apathy. The historian T. J. Jackson Lears described one common modality of response to successive crises of meaning for individual and social life, occurring at the turn of the twentieth century, as “antimodernism.”^{iv} During a time when the fruits of the scientific revolution had become signatures of everyday life, making the ideas behind a clockwork universe manifest everywhere on the landscape; and when professional titles, closely linked to consumerism, had already begun to assert themselves as the most valid measure of what one had achieved in life, or more precisely what one’s life meant, there was a potent reactionary social movement. This response included renewed interest in crafts, and various nature movements, including the formation of the Boy Scouts, intended to reconnect people to some vital moral center in the outdoors. Those individuals who sensed a dissolution of meaning

without any acceptable replacement suffered a brand new malady, labeled by the medical profession of the time as “neurasthenia,” whose symptoms included a lack of ability to do almost anything, including getting out of bed, and whose common medical remedy often included some compound containing cocaine.

The reactionary responses can have much to offer and do include important restorative themes during times of radical change. We have seen them re-emerge during other times of upheaval, such as the communal experiments of the 1960's. But to the extent that they are most centrally driven by a rejection of the current evolution of consciousness—finding humanity's growth stages simply toxic, and supposing that at some more primitive stage we were somehow morally and spiritually superior—they are a cultural anxiety response with no anchor in reality. They have the same flavor and context as the adult who, finding himself overwhelmed with the world of adult action and responsibility, actually imagines he would be happy if he could just return to the life of his childhood. Such fancies about the state of humanity look through the same reality-bending lens as any individually experienced paralyzing phobia or generalized anxiety. Unable to see through to the other side of whatever event or circumstance they confront, these individuals choose instead to create false safehouses for their psyches, made from whole cloth or patched together from various misconceptions regarding the course of human consciousness and the nature of human nature.

There are several severe consequences that arise when trying to solve local and global problems within a world view whose primary driver is fear. No doubt fear has always been an effective organizing principle in human history. But because it finds common discourse in what we find a threat, fear is usually not generative of multiple, positive visions (the pull of the human spirit) but rather finds strength in a monotonic revulsion (the push of terror and pain avoidance). One can only be in a state of fear or panic for a limited time until one becomes sick, exhausted, and depressed. This debilitation is true for the individual as well as for societies or generations. But the root of the problem with fear-driven action goes much more deeply than simply our limited ability to keep a stiff upper lip regardless of how hopeless we perceive things to be. It is the very shrillness of the singular response it unleashes, the lack of creative diversity, that is the most deadly.

Everything we can intuit about life—from the literal biological survival of the organism to the evolution of life forms, to the cosmos, to the most vibrant examples of human civilization—craves diversity, even insists on it. Monocultures of any sort bring about their own destruction. Cancer is simply monoculture in motion, a perverse substitution of the life-giving dance of change for the death-dealing multiplication of amount. It represents a part of the body that no longer knows how to converse with the rest of the body, to modulate and differentiate, but instead obeys one dictum only: keep doing more of the same. In human discourse, the only absolute indicator of a “dead language,” for instance, is stasis. Any language that can, once and for all, be completely elaborated in a dictionary, is necessarily a language that is no longer in daily use. It is only completely definable because it is dead. Complete stasis (definability) is the physiological difference between a body just before and after death. It is the same with ecosystems, religions, or systems of ethics and government.

Perhaps we have had too many supposed validations of the aphorism “nothing unifies like a common enemy,” but if we think this justifies fear as a creative organizing principle for an indefinite future, we are deliberately deceiving ourselves, deliberately truncating our available data. If our primal response is to see challenges as enemies, rather than open-ended possibilities, the power of this least-common-denominator motivation will necessarily devour every bit of divergence, including within ourselves, that spurs new thought, until we prevail in producing unanimity, which is death: intellectual, spiritual, physical. The different natures of fear versus opportunity in provoking change is not a trivial distinction, or a mere shading of meanings. It lies at the very core of what we think life, our own and the collective human experience, is about. It requires our constant attention to avoid this easy, reflexive default position toward the world.

The most obvious example of our attraction for action based upon the unifying force of a common enemy is the persistent recurrence of armed conflict itself. Wars may be enjoined under the banner of some positive-sounding ideal (usually freedom from some sort of oppression), but it only finds its combative focus by identifying a specific target that stands in the way of realizing this ideal, and killing it. The susceptibility of humans to find immediate motivation for

action through the language of warfare is echoed in so many of our crusades. Problems are, and should be seen as, the true gifts of thoughtful living. They are challenges for meaningful, collaborative, and creative synthesis that will produce new contexts to further vision beyond what we can presently know, and the wisdoms, syntheses, and mutualities they can call forth are certainly different from the mere absence of infection by some evil invader. But it is far more easy to see our challenges as being merely how to kill the invader, whether that be a microbe, an army, or an idea. And so we are prone to name our various adventures wars, whether that be the war on cancer, a war against the ungodly, the war against poverty, or, most bizarrely incoherent, a war against intolerance.

The metaphor of warfare does not admit of any greater point to human existence than a continual struggle from the latest fall into some diseased tar pit, gasping back to ground level. And wars can proceed in several ways. They can drag on endlessly, such that the entire context of life, even multi-generationally, is a grim, teeth-grinding proof of persistence against overwhelming odds. We do have authentic examples of the possibility of nobility when such conditions are forced upon an individual or a people, and we shouldn't take these examples lightly. When individuals continue to find purpose and insight through a life that is an enforced nightmare when seen externally, the real lesson is the shining beacon of hope and meaning in even the darkest recesses of experience. Sometimes we celebrate that beacon, and celebration is also a noble act. But without the ability to envision more to suffering and endurance than a kind of warfare, we haplessly fall into an uncritical and perverse celebration of individual despair itself, thinking, romantically, that despair and anger are somehow made of the same stuff as positive striving.

Well, we might say, at least self destruction has emotion in it, and as such, without the capacity to envision for ourselves, it is somehow more authentic to be terminally self pitying or destructive than to seek genuine purpose and joy, for oneself and others. Despair makes for popular movies. Sometimes heroism can make a blockbuster as well, but it must always be cast in terms of finding the enemy and killing it (literally or figuratively), and after the protagonists have killed the enemy in the film's climax, the film invariably ends, preferably with the protagonist dying in the process because we just don't have emotional juice for creative continuance. We don't know what to do with the character or the

Comment [4]:

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Calls to ? Opportunities for?

Comment [5]:

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To envision suffering and endurance as more than a kind of warfare ?

story. There are a few exceptions to this formula in literature, cinema, and other expressive arts, but they rarely find critical praise, unless, perhaps, the stories are so far temporally removed from us that we can afford to grant them some dignity while keeping our precious cynicism about contemporary life intact. There is much to be gleaned from pain, from suffering and melancholy. Recognizing this truth is not the same as saying that *everything* can be learned from these contexts, much less that everything of value *MUST* be learned from these contexts alone.

If any crusade enjoined solely for the immediate emotional endorphin release of warfare is to continue, then it must find some affective substitute as a follow-on. Once you have conquered the known universe by vanquishing the enemy, what do you do with it? Again, if you are addicted to the metaphor of warfare, you become a kind of moral mercenary, looking for your next fight and feeling dead in between these episodes. Another option is to find a new context that provides the same sense of motion-in-striving as fighting an enemy does. However, lacking the ability to ask important questions and to envision the beauty of a continual process of an evolving human consciousness (with all its erratic sidestepping and backtracking included), one settles for virtually any path that seems continually to create a distance between striving and fruition. Among the most infectious and addictive surrogates for meaningful envisioning and striving is material acquisitiveness. The spiritual wasting away that attends acquisitiveness would never suffice to keep introspection at bay by simply having stuff. Rather, it can only blunt the search for purpose if one is willing to accept one's position and meaning in the world using the relative distinction between how much stuff one has and others have. Many other surrogates besides material acquisitiveness exist, and we will visit the subject of surrogates and their qualities more fully in Chapters 4, 5, and 6.

There is another way to find meaning in existence. It is distinct from continually fighting one endless war, distinct from shopping about for the latest battle, distinct from pursuing surrogate targets for fulfillment, and most certainly distinct from the romance of despair. Envisioning is this other possibility, and, ultimately, envisioning is the theme of this book. It involves a change of heart every bit as much as a change in intellectual posture. It can be

taught, but not linearly or didactically, and I do not presume that a book is sufficient of itself to illuminate the practice of envisioning. In some combination of wisdom traditions both East and West, it must be practiced; it should be reflected upon for its own sake. Adumbrations of its power and beauty are best evinced through example, and the experience of seeing (and feeling) with a heart of envisioning often occurs when you think you are doing something else.

At this point I cannot provide a better window on the distinction between a cultivation of the envisioning stance and all other attitudes toward existence than through allegory. In 1884, an English schoolmaster, Edwin A. Abbott, published an imaginative little story, *Flatland: a romance of many dimensions*.^v It is a most remarkable satire of the overpowering tendency for all creatures to be completely saturated with the “facts” of their world as they appear to them and as are commonly agreed upon by social discourse. It is even more concerned with the abject terror (and rejection) that arises when a society is told that their entire articulated context, the obvious realities and patterns of everyday life, represent but ONE way to construct meaning. While these meanings are valid enough within that society’s postulates of fundamental truths, the entire set of patterns can be observed from another vantage point, revealing that their assumed eternal verities were but the surfaces of deeper truths.

The central character, A. Square, lives in a two-dimensional world known as Flatland. The story is written as a retrospective, so Mr. Square is able to explain to us, the inhabitants of Spaceland, not just the social and ethical norms of Flatland, but why they make sense if you only have two dimensions in which to work. Square’s description of Flatland living includes an elaboration of social castes (by geometric shape), of communication, recognition and cognition, and so on. Since the more sides a citizen has, the higher his social standing is, Mr. Square is clearly just a regular stiff, nobody special; whereas, if you have so many sides as to become nearly indistinguishable from a circle, one is an exalted priest. It is A. Square’s fate (one might as easily call it a miracle of salvation or a burden of damnation) to meet up with a sphere, who, in moving through space, passes through Flatland. The sphere’s intersection appears first as a point and then an expanding circle, and so on. It turns out that this sphere is an emissary from Spaceland, on a once-in-a-thousand-year mission to find and anoint an

apostle from among the inhabitants of lesser dimensional worlds who will tell others about the existence of Spaceland.

I will not recount the entire story, but I wish to mention some of the most poignant plot elements. As it turns out, no amount of descriptive language can move Mr. Square to grasp this other dimension, completely absent from his world. The direction “up” is continually construed as “north” since there is no up in flatland. Even the movements of Sphere, in passing through Flatland and changing his aspect for Square does not help. Square is frightened that he is just seeing some deceptive apparition. Finally, in a desperate attempt to rescue this once per millennium mission, Sphere actually lifts Square out of Flatland, to float in space. And at first Square becomes terrified by this new dimension that has no place in his world; he cannot make sense of perspective and, horrified to see “the insides” of his countrymen, he becomes quite ill. However, several remarkable transformations happen in rapid succession.

First, once Square perceives the third dimension, he becomes giddy at the prospects of this greater reality. Certainly, he tells his mentor, there must be some way of “moving” even three-dimensional objects in yet another dimension—as distinct as the third dimension is from the second—and produce yet even more wonderful entities, like superspheres or supercubes. The important thing was that Square had actually SEEN the transformation once, and that revelation was the most world-shattering vision imaginable. It would not be nearly so shocking to continue to manifest higher states of being through similar transformations. But not so for Sphere, who saw Square as a diminished consciousness to be raised to higher awareness. Even Sphere did not get the vital truth of the transformation of vision itself, and was just as dogmatic about his own existence as being the truest and highest manifestation of reality.

In the story, Sphere finally relents his own dogma, and, admitting that he could indeed learn from his student, they proceed together to experience worlds of higher dimensionality before Square is returned to Flatland to evangelize for the existence of Spaceland. Despite his many attempts to elucidate his vision, he cannot succeed in telling his compatriots exactly where “up” is, anymore, as opposed to just “north.” He is imprisoned for heresy, and spends the rest of his days trying to tell his very occasional visitors that what he experienced was real, not just hallucination. But having lost his access to this realm and finding no

way to jar any sense of recognition with others, he falls into despair as the tale ends.

“Upward, not Northward,” haunts me like a soul-devouring Sphinx. It is part of the martyrdom which I endure for the cause of the Truth that there are seasons of mental weakness, when Cubes and Spheres flit away into the background of scarce-possible existences; when the Land of Three Dimensions seems almost as visionary as the Land of One or None; nay, when even this hard wall that bars me my freedom, these very tablets on which I am writing, and all the substantial of Flatland itself, appear no better than the offspring of a diseased imagination, or the baseless fabric of a dream. (Abbott)

One may well see in this little parable the same intentions sought by Plato in his Cave Allegory. Perhaps because I am somewhat of a spatial thinker that Abbott’s story is more vibrant, more resonant for me when trying to describe the somewhat aerial view of existence that provides meaning through envisioning, and I have found it evocative as a teaching tool. Furthermore, while there have been episodes in my own journey that have felt much like the doubting despair of A. Square, I must say that it has become easier, over time, rather than more difficult, to maintain the envisioning perspective and to feel its reality.

For one thing, the joy of recognition in my students always brings me back to envisioning being a lived experience, a touchstone to real purpose, rather than just an act of brute will and suspended disbelief. Furthermore, it has been my happy experience to discover how much company I have in this world view among those I know personally and those I know only through their writings. Some of these individuals have been around for ages, and why I did not find their visions speaking to me until later in life I cannot say for sure. It may be only my personal availability to these visionaries that announces their presence to me from so many places and times, but it does also seem a reality that our present culture is seeing the beginnings of a flourishing of envisioning, deeper and broader than what we have seen before, although, at the same time, the competing voices from Flatland are far more numerous and insistent than ever.

To return briefly to the world of the student, then, to the extent that adults find them disengaged or out of touch, we must be careful not to attribute this

disaffection to some utterly unexplainable defect of character. Nor is it some immense cabal of everyone, under a certain age threshold, meeting in secret and deciding with wicked glee to appear disconsolate and directionless to adults as a way of tweaking their collective noses. It is, in fact, a most natural response to a culture whose most singular characteristic is to motivate constantly by fear of every sort of imminent collapse (and *these* mentors are called idealists), or by the cotton candy surrogate motivation of *getting* lots of stuff (these mentors are called realists), and even the latter are much better at wielding the push of threat (if you DON'T do thus and so, you WON'T have ANY stuff) than any valid pull of meaningful vision. Both of these modes of motivation are nothing more than Abbott's Flatland at the leading edge of existential crisis. Furthermore, it must be mentioned, even with the relative rarity of visionary mentoring, many young people are going to great lengths to find positive visions and mentors on their own.

I hope it is also clear by this point that I am not trying to describe the particular construction of some future utopia. First of all, I think any singular visions of a well-delineated future "good society" are missing the point, at best, and dangerous at worst. The point of our collective evolution is not a point at all, but rather continual strivings whose successive plateaus contain elements more exquisite than our current imaginings. But, on the other hand, to make any positive sense of that evolution, to be generally motivated by the lovely and freeing vision of opportunity, as opposed to being alternately shocked by fear or in a refractory state of numbness, requires something of an aerial view of life, rather than just a series of meaningless reflex responses to painful stimuli. When students (and we are all students) can apprehend and feel that there is a different way of understanding their lives and their connections, laterally through larger spheres of society and vertically through generations, they become eager, creative learners, and they operate on the pull of visions, which is the growing field of creative departures.

What I hope to present are reflections as they simply have evolved through a combination of experience, conversation, and reconnaissance. I would hope that these essays may serve as points of departure, indicating more the *feel* of operating on vision rather than fear. Most, if not all, of the ideas contained

herein have an elaborate genealogy from other writers, past and present, but to admit such does not reduce the whole to mere repetition. Just as a composer does not write a piece of music so that its excellence and universality will relieve anyone so prompted from the burden of ever writing another symphony, I feel moved to record these reflections because they are my best attempt to express something of beauty. Also, the generative episodes for these essays come with a healthy dose of actual experience, a reporting from the field of what I may call applied philosophy, in the presence of others, for whom these modes of inquiry seemed to invite a resonance of spirit, and a recognition of the sense of “upward, not northward.”

Notes for the Introduction

ⁱ Of the two epigrams, for the first (Gide) I am indebted to my friend and colleague Les Adler, who used it as a lead-in for an essay he recently wrote entitled “Uncommon Wisdom.” The second is from Wittgenstein’s *On Certainty*, Harper and Row, 1972, p. 62e.

ⁱⁱ It is worthy of note that the *Harper’s Magazine* article to which I refer preceded a companion piece entitled “On the Uses of a Liberal Education As a Weapon in the Hands of the Restless Poor,” by Earl Shorris, *Harper’s Magazine*, Sept., 1997, 50-59. This article has its moments of grandeur, to be sure. And the project the author took up, to bring a powerful humanities education to a group of the most desperate, in every sense of the word, of New Yorkers is magnificent in its nobility. The article is worth anyone’s reading. However, and this is understandable in its context, there is an overarching tenor of vengeance. If one were to read only these two articles as outlining the potentials of education in extremis, along a single number line with one end right and the other wrong, one is left seeing it in its most decadent, and common, form as being an anesthetic for apathetic youth who already have their membership cards to privilege on the one end; and as a kind of terrorist arsenal for the disciples of a latter-day Spartacus, on the other end. I found myself depressed after each article, feeling that invaluable human resources were being dissipated in both cases.

ⁱⁱⁱ For an example of one 18 year old student’s solution to just such a state of affairs, see “How I Got My D.I.Y. Degree,” by William Upski Wimsatt, *Utne Reader*, May–June, 1998.

I was most impressed with William Wimsatt’s little missive to his generation. Wimsatt had left college to become an apprentice of life, traveling cheaply, with little more than his laptop for recording his findings, seeking wisdom wherever he could find it. It is easy to dismiss such a journey as nothing too far out of the norm for an eighteen-year-old, but Wimsatt is not simply a wandering bohemian, taking time off. He shows a great energy and excitement for his potential to get to the real. And he has concrete suggestions on method for others who might wish to try a similar experiment, including the deep cultivation of significant mentors, and expressing gratitude at every turn wherever one is fortunate to find insights. He has all the enthusiasm we would hope to find motivating youth, combined with a spiritual maturity well beyond his years.

^{iv} T. J. Jackson Lears’ book: *No Place of Grace: antimodernism and the transformation of American culture, 1880-1920*. University of Chicago Press, 1981.

(notes continue on page 29)

^v Edwin Abbott, *Flatland: a romance of many dimensions*, Dover Publications, 1992. Philosopher Ken Wilber also uses the metaphor of “flatland,” in his books *A Brief History of Everything*, Shambhala Press, 1996; and *The Marriage of Sense and Soul: integrating science and religion*, Random House, 1998. I have enjoyed both these thoughtful books immensely, and Wilber’s courage in deliberately arguing for both the reality of the spiritual dimension as well as urging that we are at a time in human evolution that begs for a synthesis of these different, interconnected, realms of understanding, has helped me to be able to articulate the ideas in this book.

I have found a wonderful companion to Wilber's *Marriage of Sense and Soul* in another recent book: *Healing Emotions: conversations with the Dalai Lama on mindfulness, emotions, and health*, edited by Daniel Goleman, Shambhala, 1997. This book is a record of one of several conferences arranged between notable scientific researchers in various fields and the Dalai Lama. A series of short papers are given to all convened, and then a transcript of the conversation of discovery and critical inquiry follows. The intimations of direct spiritual knowledge and laboratory research are fascinating, without torturing either side to say either more or less than they actually do. The sense upon reading all these transcripts is of openness, intelligence, wonder, and gratitude. Sometimes the most telling instances are the parts of transcripts which indicate that both able translators needed time for searching discussion because the phrase or sense of meaning in the reflections of the speaker had either no direct translation, or lost much of the cultural implication even in translating liberally.

Wilber doesn't mention Abbott in his invocations of the "Flatland" metaphor, which at first surprised me as this was the first and most immediate reference that came to my mind. Given the remarkable depth of Wilber's syntheses, it would not be the least surprising if this image presented itself to him directly as the most sensible analogue for the effect of the great reducing agent of pure empiricism as it translates all experience by projecting it onto the metaphysical equivalent of a two-dimensional grid.

I first happened upon Abbott's fable many years ago when going through a public library educational film collection and found an animated, 16mm film of the story (I believe it was produced in 1970). The voice of A. Square was that of a young Dudley Moore, and the voice of the Sphere was wonderfully pompous. There is only one significant deviation between the film and the original. In the written form, when A. Square makes the next obvious transcendental leap of expecting that there must be even higher dimensionalities, after having seen that there were actually three dimensions and not only his two-dimensional flatland, Sphere finally relents that he may perhaps be able to learn from his own student, and the two take off on a journey of many dimensions. In the film, Sphere remains indignant and schoolmasterly. He becomes angry with Square for even proposing such nonsense, for "there are only three dimensions."

This is a marvelous little instance where, no matter what our reality, and however superior to other's limited perspective we may consider it, the real wisdom comes in being able to perceive transcendence from one's own given reality at all, not to simply hold a new reality to be the natural and absolute limit. In the film, Sphere never gets the wisdom that he catalyzed in his student, and at that occasion casts him back down into Flatland in a fit of pique, considering Square an ingrate. There is only one significant deviation between the film and the original. In the written form, when A. Square makes the next obvious transcendental leap of expecting that there must be even higher dimensionalities, after having seen that there were actually three dimensions and not only his two-dimensional flatland, Sphere finally relents that he may perhaps be able to learn from his own student, and the two take off on a journey of many dimensions. In the film, Sphere

remains indignant and schoolmasterly. He becomes angry with Square for even proposing such nonsense, for "there are only three dimensions."

Part One — On Gratitude

A grateful mind

By owing owes not, but still pays, at once

Indebted and discharg'd

- John Milton, *Paradise Lost*

Chapter 1: *Childhood and the intimations of gratitude*

In my family I was the middle child, equidistant in years between my sister, the oldest, and my youngest of three brothers. I don't know much about all the theories of family dynamics that have been put forth, so I offer this little detail to set a stage only, rather than to add credence to any concepts of niche roles played by siblings. What I can say, quite simply, with the best honesty and accuracy of memory I can muster is that my early years were fairly idyllic. I grew up in what was then a quiet and friendly little neighborhood in central New Jersey. This was the town where my father was born, and my father's father, the only grandparent I knew well, lived across the street and down several houses. By the time I was of an age to accumulate memories, my father was employed as the instrumental music teacher in the local high school and was known pretty generally among the residents.

My early fond memories seem very dreamlike. We lived in what had been an old farmhouse that had been exquisitely remodeled by my father who loved carpentry as an avocation. Our property had some big old butternut trees on it, one of which had a thick knotted rope tied to a branch, good for swinging, and which on occasion had an old automobile tire affixed. We even had a barn on the property until the land was subdivided and a new house built on that space. My early memories, then, were of a sublime, undifferentiated freedom to indulge my imagination. My sister and older brother were in school everyday, my father at work, my mother at home, and I was given pretty much free reign to simply be

outside, wandering around the yard, going into the wonderful, musty, and dark barn or to crawl around under the porch with my toy trucks. I had found through exploration that one of the lattices that sealed off the underside of the porch, which was about two feet above ground level, was broken, and I could fit myself through the opening, behind an azalea bush, and have this marvelous secret place to play in the dirt.

I can trace some of my most fundamental passions to this period, and I will speak of some of these later. But there were certain parts of that childhood landscape, which were simply given, and it took the retrospect of adulthood to realize what these things were and to realize that I was fortunate for them as they are not universal. The most essential ingredients were stability and security. In that time before I had much ability to reckon time and its passing, there was a sense that I simply existed in a context that probably always was. Perhaps it was the lack of punctuation of the day-to-day with events that needed attending to that gave the overall period, from my earliest remembering until I entered school, such a dreamlike fluidity. Of course, developmental psychologists would also be quick to point out certain universals in the sequential unfolding of the self that are fairly robust in the human species, and which protect the self in layers of unknowing even when disruption occurs, and I would not dispute this.^{vi}

Even so, when I do my best reconnaissance of my conscious paths (from the vantage point of middle age), I am most struck by how gradually and slowly my senses of self and the world have seemed to emerge during those early years. I cannot account for this in a teleological sense, but I am fairly confident in being able to assay my story as one with only a very few strongly disconcerting episodes that needed deliberate attention until I was, perhaps, eighteen years old! After that age, there were, to be sure, a number of truly seismic and wrenching episodes, but I had been given many years of very gradual modulation and accommodation from which I derived significant strength and comfort. I say that I have confidence in the accuracy of this account, in part because I have kept personal journals for all of my adult life. And it is this journaling that has helped not simply to keep track of my story but has deepened that story and made it more precious and wondrous. The very best word I can put to the overarching coloration of the world that springs from paying attention to and honoring my

life story is *gratitude*. But it has taken many years for me to be able to embrace the quality of gratitude as a theme for living, and as a most powerful entity in its own right, and not simply a byproduct or cofactor of something else. It is difficult to say with any precision when I first apprehended the state of gratitude as something beyond an ephemeral sensation or response, for that has truly been heuristic in nature, accumulating and coming into awareness over several decades. But I can recall an instance from before that process began with any regularity.

Like most every child, from an early age I looked forward with eager anticipation to birthdays and holidays. The most salient features of these occasions were family gatherings, special foods, but mostly the promise of presents. Presents for me! We would make an event out of decorating for Christmas, most especially, and it was exciting to put up the tree, to decorate it, and (a task I took most seriously) my older brother and I would set up the electric train to go around the base of the tree. But this was really all just prelude, and a suspension of the real payoff which was opening presents the next morning. Perhaps the most painful part of the whole process occurred after my father got one of the early home-movie cameras, an eight millimeter windup job. The preparations of the night before I thoroughly enjoyed, but once I woke up there was only one thing on my mind—get down to the tree and see what I got.

After the camera arrived, however, this final climax was again delayed. My sister, brother and I would come down the stairs filled with greedy excitement (at least I was), only to be told by our mother “Don’t open any presents yet! Wait until Daddy gets the camera set up!” After all, what was the magic of having a home movie camera for, if not to capture for time and all eternity the spontaneous, undiluted joy of children awakening to the wonders beneath the tree on Christmas morning. Even more unfortunately, these early movie cameras were not ready for prime time, not really appropriate for capturing anything unexpected. First there was a hand-held bank of flood lights which my father would have to wire up and check for faults. These were serious lights. They could only stay on for a few minutes until the whole thing became too hot to hold, and just being in their path of illumination was enough for sunburn and dehydration.

So, of course, I had sneaked down earlier to count how many presents were marked for me, to weigh them and shake them, to see which ones held some really fantastic toy that I had made certain had lodged firmly in my parents' memory, and which ones might contain something completely undesirable, like mittens, which I knew I would be provided with anyway so why waste perfectly good space under the Christmas tree with such essentials. And after all this assessment of my prospects, I knew that I couldn't open anything until "it was time," and that wouldn't occur until my father was in full Cecil B. Demille. And to completely set the stage for what was certainly going to be a cinematic classic in the Kellogg archives, this also entailed getting entrances from us kids as we descended the staircase into the living room. I would be in my slipper-pajamas, and my older siblings were more maturely presented in bathrobes, and we would have to come down the stairs as my father filmed and my mother called out directorial prompts from the wings. "Okay, now come down the stairs slowly. No, one at a time now. Okay, Buzzy (that was my nickname, which has over the years vestigialized to the essential "Buzz"), now look over at the tree, okay Brian, now you...okay, and Linnea." If we didn't get it right, or my father's machinery malfunctioned, we had to wait (for a fuse to be replaced, for the lens cap to be removed, etc.) and go back up the stairs and do it again. The procedure continued while we opened presents, especially our main, or most important (from our parents' point of view) present. As I look back on those years, this was the closest thing to child abuse that I suffered.

Now, it certainly wasn't the case that we actually did anything with these films once they were taken. Once developed, we watched them, and without fail the closest thing to artistic surprise we experienced was recognizing ourselves. We did show them on rare occasions when we had some close relatives over, and the only entertainment value was evinced in one aunt or uncle marveling over how much one of us had grown in just a single year. And I don't think it was simply the novelty of it that attracted my parents to the Christmas filming ordeal. They wanted to document the children as they grew up, certainly. And they wanted a record of the joy peculiar to a known event. Today these procedures are much easier, and much more forgiving of the possibility of a missed moment with the advent of home video, and this is now ubiquitous. But at that time it wasn't so simple, and in fact I didn't know anyone else, among

friends, neighbors, or relatives who was subjected to the Kellogg-Kodak torture ritual.

It was sometime during this period that the thought occurred to me that the experience of gift-giving was fundamentally different for my parents, the givers, and for me, the givee. They were really happy to give stuff away, and this seemed to me to be both obviously the case and completely inexplicable. I couldn't say that I didn't like the experience of giving since I had never given anything away, but as I pondered it, I was certainly glad that there were people who did enjoy this at the same time that I couldn't fathom the attraction. For kids there is a formal process whereby we are accounted as giving gifts, but I knew this to be a sham and I didn't for a second think that everyone else did not know it as well. This was the process whereby someone else (my parents) would get a present for someone and put my name on it. I would of course be thanked for the gift, but by sometime around age eight this started to become embarrassing to me. I knew that what was going on was something fundamental that separated me from what everyone else was doing.

It may very well have been this simmering embarrassment that prompted me to try out this gift-giving thing. So one year I told my mother that I wanted to know what it was all about since I was now convinced that I was completely in the dark about this. I remember asking my mother why people gave gifts, really. In truth, I don't remember how she responded at first, but I am fairly confident that it was something about giving gifts because you love someone or like them, and that while a present isn't that love itself, it lets the other person know how you feel and it makes them happy. What I do remember is that my mother's genuine response, in words she thought I could understand, made no sense to me, and even alarmed me a bit because I still didn't get it. In fact, I think it was probably similar to the time I asked my parents about "the facts of life," having been prompted to ask that question by my older brother while seeing some rabbits involved in the act and thinking they were fighting... and asking my brother why someone didn't stop them. That first explanation, delicately worded (as my parents were very much old school in those things), completely eluded me as it had no correlation to my experience. I found out later that my older brother was in the other room listening to the whole thing, including my bizarre questions as I tried to get clarification, which sent him

rolling on the floor with his hands over his mouth to stifle the laughter. But that was another time.

I pushed further on the issue of giving and asked for details. Exactly what happens? What happens to you when you give me a present? What do you do? What do you look for? Finally she said that it was enjoyable to see the look, the surprise, on my face when I opened a gift. She probably said more, but this was the one observation that made sense to me. This was operational. This was outwardly physical. This was within my experience. You bet. Even at that age I had felt joy in some things, including just seeing something new and not necessarily something that I would own. I thought the Three Stooges were funny to watch, and I knew that laughing made me happy even though it wasn't something physical that I would own. Great. That's enough. I've got someplace to start. There is something about this giving process that I knew I could understand, something I had already experienced (happiness in something I had seen, but would not own) that I could translate into this other sphere and then watch for it. In a very fundamental way, I think, I had some vision that this single insight would help move me toward the world of adults, that is the idealized world of adulthood from which I felt completely apart and distinct.

There isn't a grand finale to this little vignette, some huge awakening of spirit, but I'll finish the episode for closure and to put it in proper perspective. I remember that I did determine to buy a present for someone else. My elementary school was having some kind of rummage sale in the gymnasium, and I found a little trinket and bought it for my brother Brian. It was a plastic horse's head, replete with a synthetic mane, the base of which was a pencil sharpener. It cost me fifty cents, which happened to be exactly the amount of money I had, so it was also the only present I bought. This was my big entree into a very adult performance—giving because you want to. Granted, my reasons for wanting to were quite distant from those my mother explained. It would be some years before I would come to understand that I really did love my brother. At that time I knew only that he was someone I was supposed to love while I thought of him as the one who would lead me around by squeezing my neck when no one else was watching.

The big moment came. Brian had MY present in his hand, and I wanted to be sure he knew that this was not somebody else's present with my name stuck

on, so I told him that I bought it at school. I was eagerly awaiting for my brother to break into some wild emotional dance of surprise, like a cartoon character who got plugged into an electrical outlet, even though I had never seen him do that before. But then again, he had never before actually gotten a present from ME before, his little brother, so, since I lived in a Buzzy-centric universe, it wouldn't be outside of human comprehension that the heavens would open wide and cherubim and seraphim would proclaim creation's fulfillment at this moment.

It wasn't that Brian acted badly, not at all. As I remember it, he was very nice, acknowledged the gift and thanked me, and gave me a perfunctory hug. Considering the reality of this little, hollow plastic figurine with a pencil sharpener (which he probably never used), I now see this as a pretty generous response for a twelve-year-old. But I was looking for a sign from the heavens, and this wasn't it. I also don't think it disturbed me for more than a few minutes since, after all, there were presents of my own to attend to! However, I don't remember returning to the urgency of giving gifts myself for a few more years. I had tried the experiment, and basically gotten a null result. I could live with the incongruity that there still was something going on for my parents that was out of my realm of understanding for the time being. If they really get a lift from giving gifts, I'm all for helping them out in any way I can.

By present lights something much more significant happened through that little episode than even the foreshadowing of a desire to understand the world beyond my own limited interests. It was the search for correlates, and the engagement of an experiment. Forty years later, it seems to me that what happened that Christmas was not just a funny snapshot from childhood. Instead, it seems that subsequent missions to discover meaning, values, and purpose have been essentially the same experiment, more sophisticated, perhaps, and with more history to bear, but withal the same initially tentative explorations. What seems most surprising, though, is that all these years later the answer I was seeking to that initial, painfully naive question of "why give?" is central to everything else I have sought and found thereafter. That answer is gratitude.

At its most fundamental level, gratitude is a condition of the heart that simply is, that doesn't need explanation. In fact, it seems to defy definition. There is an analogous concept in physics, which goes by the name of

fundamental quantity. In classical mechanics there are only a few fundamental quantities: time, length, and mass. A combination of these three quantities are the only ingredients in Newton's laws of motion, but it is not possible in Newtonian physics to eliminate any one of these three and still explain the world. A definition of any one of these necessarily involves the others. What is length? Well, you know, it is like the space between this point and that one over there. Really. What kind of space? Well, you know, it's like how long it takes to get from here to there. What if I go fast or slow? Well, yeah, if you go faster then you get there sooner. What do you mean by fast? Well, it is how much length you go through in, say, one second of time. And so on. One is left, finally saying, "Okay, we have to agree simply that a second is a measure of time, and I can show you things linked by time like snapping my fingers every second and saying something like, you know, what it felt like when I snapped my fingers and then didn't snap them and then snapped them again. Well one of those feelings we both had when I wasn't snapping, that was an awareness of time passing."

If you think that the preceding imaginary dialogue is silly, that is precisely because we are talking about a fundamental quantity. And in fact, although the exercise seems futile, it is extremely valuable to practice if one has never done it before, as it can reveal extraordinary aspects of what we consider to be most essentially human. The above dialogue is something I have used when I taught physics. It reveals the power and necessity of making assumptions, but especially of recognizing what one's assumptions are. Invariably, when I have challenged beginning physics students to define one of the three fundamental quantities in Newton's mechanics, they first became perplexed or annoyed, but they soon gave way to wonderment that there are certain things that we simply have to put into the category of "Well, you're human like I am, and therefore you know what I mean." If one is trying to define time, for instance, you can stand next to someone with a watch or pendulum and snap your fingers as it moves and say something like, "Okay, see that, do you have that rhythm, well while you were waiting for the pendulum to come back again, that feeling of anticipation is the feeling you get when you notice time going by." Ultimately, what we are depending upon is that the FEELING of anticipation is so fundamentally human that we can call upon the other person to note that feeling, assume it is the same

as ours, and then say that that is the feeling associated with paying attention to time. We have to at least assume that every human being simply knows what it feels like to anticipate something, anything. If that is not shared, there is no way to communicate anything about time. In fact, conversation itself is not possible.

But notice what else is going on in such an exchange. For one thing, time itself is still not defined, and there is no such thing as “having” it. All we can discuss are all the responses that attend the perception of time, of living through it. Even the mental concept of simultaneity doesn’t get us further back in getting hold of the fundamental quantities and qualities of time. Once we agree that we simply have to accept a common sense of fundamental quantities and qualities (and the same holds true for mass and distance), then we can go about devising an entire system for higher order knowing and description which corresponds in ever more layered ways to our lived experience. So at the bottom of any system of knowing is the assumption that there are certain things we can all say we have a similar sense of, and then move on. But it is most valuable, every once in a while and in any area of knowing, to see where our postulates are, and if they truly are fundamental. We get our first paths in toward such deep knowing by noticing what we don’t bother to explain, and then examining how we say we know what it is we are talking about. ^{vii viii ix}

Although I could not have put it in such terms at the time, this is exactly what I, as a young child, was doing when I asked my mother about giving a present. And the very best I could do at the time was to latch on to some kind of experience that I had in common with my mother’s. At the time, the only commonality was the happiness I had felt upon seeing an expression of positive surprise in someone else, so I went with that. It was a first step.

The concept of fundamental quantities and qualities is not only found in every area of modern academic inquiry, then, but in all the great wisdom traditions, and, to the extent we are willing to encourage such contemplation, to the practicalities of everyday living. Perhaps for Paul the Apostle, the spiritual correlates of time, length, and mass were “faith, hope, and charity.” In his first letter to the Corinthians, he spends eight verses enumerating first all sorts of virtuous actions (giving to the poor, prophesying, performing miracles) which, if not undergirded by charity, or pure and selfless love, amount to nothing. Then

he lists all sorts of stances and emotions which cannot be entertained if one is living through such love (impatience, envy, strife, iniquity, dissembling), before saying, almost in desperation, that he ached to say exactly what this spiritual stance was, but words and his own humanness were not up to the task. One can sense in these passages that there was a transcendence to be conveyed, an equivalent to “upward but not northward,” and the best he could do was to say that certain emotions and actions, which he hoped his audience had all experienced in their lives, attended the heart of one suffused with perfect love (translated as “charity”) and certain emotions and actions were absolutely incompatible with such perfect love. But none of these conditions actually apprehend the thing itself; they simply attend it.

When I was a child, I spake as a child, I understood as a child, I thought as a child: but when I became a man, I put away childish things. For now we see through a glass, darkly; but then face to face: now I know in part; but then shall I know even as also I am known. And now abideth faith, hope, charity, these three; but the greatest of these is charity.

— I Corinthians 11, 12, 13 (King James)

Paul does his level best in this passage to convey an understanding of a heart that is not governed alone by prescriptive actions of virtue and proscriptions against evil acts. It is not because he lacked eloquence that his disquisition is somewhat tautological, and that he eventually has to repair to analogy. The best he can do to hold these spiritual qualities before his readers is to give examples of the sorts of ancillary things one might observe while living in such a state of awareness. The hoped for connection is that, okay, you have all experienced some semblance of what I’m talking about just from being human, right? Well, Paul might be imagined saying to his listeners take the memory of that and extrapolate it as far as you can. You have all felt a selfless regard for someone or something at some time in your life, haven’t you? Well, retrieve that episode and make it perfect and infinite. That is as good as I can do to describe, here in flatland, what I mean by perfect love, or charity. And you can’t just get it once and for all. It comes and goes, for me, Paul, as well as for you because this feeling is of the spiritual realm, and for the time being, we are stuck here in flatland. But by setting your mind and heart on those images and feelings and

acting accordingly, you will get better and better at living in that state of grace. Just start, and you can because you are human, and the rest will follow.

Every wisdom tradition incorporates elements like the example above. Every path (whether shamanism, Buddhism, Hinduism, Judaism, Islam) requires that there be some transcendent experience that, however muted in a particular individual, can be recalled and experienced by anyone, simply by virtue of being human, and that this experience can be called upon as a fundamental quantity and quality to serve as an exemplar and catalyst for deeper experience in this realm. There is some small number of essential emotional states, images, and performances, which are so intertwined with the fundamental quantities and qualities (which themselves cannot be defined), that by practicing these acts and evoking these states, you are most likely to recognize the ineffable other and become its familiar; that you may take on its nature; that you might awaken that pattern in your own being, which might otherwise remain dormant.^x

Just how important is it that we recognize what our fundamental quantities and qualities are in life? So far as I can tell, it is the most significant aspect of our common humanness. These are also those elements which so often confound, elude, or exasperate us when confronted with individuals and cultures distinct from us. One of my favorite examples of psychic freefall occurs when I have had students read "The Stranger," by Albert Camus. The central character, Mersault, is the quintessence of the individual stripped bare of all cultural expectations who lives his life as a pure stimulus-response organism. He carries no internalized states of reflection that might give rise to delusory (considered within an existentialist-phenomenological world view) states, whether guilt, despair, love, or ecstasy. He knows performative rules such as earning a living, which allows one to eat and find shelter, and the absence of which are physically uncomfortable: behavioral stimulus and response. Everyone else in the story reacts to Mersault, trying to read common connection between their interior lives and his exterior actions. Mersault knows how to navigate these rituals for the most part, but the endless calls for interior resonance are completely senseless to him, and because they require the work of a response, he finds these communal conversational rituals annoying. The thematic crux of the story occurs when he commits a murder. In point of fact, it is by chance that he has the revolver at all when he kills someone he doesn't know, and about the

closest he comes to an explanation of why he pulled the trigger is that the sun got in his eyes.

The social gravity of this act, be it homicide or manslaughter, now forces Mersault to have his life evaluated by the culture at large, in the incarnation of a jury trial. After all, this was a public event, and society had long ago decided that episodes such as this could rend the entire fabric that binds societies together if not accounted for and dealt with. Everyone tries their very best to locate some human motive by which they might understand this taking of life, but Mersault continually leaves everyone with nothing to understand. We all need stories to make sense of things, even if that story seems inhuman to us. But Mersault has none to offer, only a sequence of meaningless events, a spreadsheet of what happened but nothing of any interior state, admirable or reprehensible.

When I have given this book to students and let them discuss it without any prompting on my part or any background on existentialism, these students invariably try—and sometimes with excruciating twists and turns—to find the same humanness in Mersault, those interior states that we all presume others to simply possess as a birthright. “Oh,” they say, “I don’t think it was fair that the trial focused on Mersault’s failure to weep at his own mother’s funeral! I mean, maybe he was actually so filled with grief that he was in shock, and even he couldn’t bring himself to say this because he was in denial, or something.” They work and work, trying to see how they can create a satisfying story for Mersault that would explain things the same way we all understand them. And in doing so, they could easily have been Camus’ jury and townspeople. This need to feel that, deep down, there are some unassailable and universal states of heart that we all share in some degree, some fundamental qualities, is extraordinarily powerful.

After spending some time with Camus and his stranger, the students have come away with a much more bright awareness of our assumptions about commonalities in human experience. They need to be able to consider that all these deep interiors might be just so much Darwinian behavioral-affective legacy, as threatening as that very consideration is, if they are to come away with any understanding of human attributes.^{x1}

It is important periodically to make the effort to invest ourselves in possibilities of world views alien to us, and such exercises are the correlates

within the arts, humanities and social sciences of trying to identify and describe fundamental quantities in studies of the material world as described earlier. Having given Camus serious attention, however, I find it difficult not to jump the gun when I am with my students, and just blurt out, "If we are all just B.F. Skinner's behaviorist children, if we are no more than autonomous attraction/aversion machines and there isn't anything more to it, then why did Camus go to all the trouble of writing a book to tell us this? Certainly his central character never would have, and Mersault would have seen his creator's efforts as a pathetic waste of time. There are easier and more certain ways to provide for the body's physical comforts than by writing books." But giving students the time and intellectual space to try out ideas, to be confused, to emend each other's observations, and to come to new plateaus of understanding that truly are their own and not necessarily congruent with my own, this suspension is one of the exquisite tortures and rewards of teaching.

If nothing else, an exploration like this for students is valuable as it puts them in an attitude of avoiding judgment and congruence too rapidly when confronted with new experience. That very hesitation and embrace allow nearly every action, observed or performed, every encounter and conversation to be a catalyst for creative departure and life-changing insight. It cultivates a love of surprise rather than a fear of it. Sometimes, we mistakenly conflate one's ability to inhabit other worldviews with a defect of character, a relativism born of cynicism or existing because the person who invests herself in such modes of apprehension has no core character at all and is, therefore, not challenged by the alien. I am speaking of quite the opposite here. By going deeply into fundamental qualities to see what may survive, to be willing to invest oneself in the world of the other is an act of greatest affection for life itself. It requires courage born of gratitude. Without gratitude and wonder, such excursions can easily bear the mark of a killing ego or dismissive cynicism.

This reminds me of another teaching experience, though not my own. My wife, Nancy Uber-Kellogg, wrote her dissertation in the field of rhetoric and composition. Her particular research involves, as she puts it, "the moments of bafflement, impasse, and mutuality" that occur when Anglo teachers of writing and composition work with Native American students. To understand these engagements, she secured the cooperation of several such teachers, at state-run

colleges and tribal colleges. One particular episode seems to speak to both an understanding of and respect for fundamental qualities. One teacher mentioned, in discussing methods he used in generating dialogue and critique among students about their own writings, an encounter he had after class with a middle-aged student who grew up on a reservation.^{xii}

This teacher had been stressing the need for the students to critique how a particular student had written a story, and he was frustrated that while the students listened attentively to their peers, the nearly universal response consisted of nods of assent indicating that they too understood the story being read. He wanted them to critique how well the student had written the story, not whether they agreed that the story had veracity. This particular woman stayed after class and told the teacher that he was asking them to do something fundamentally different from everything they had learned. They could critique the stylistics of another student's story, but that was not the point of telling stories. The point of stories in community, as she had experienced it, was expressly to find that resonance of experience, for everyone to find their feet on the ground in the same acknowledgment of "what is." The point is to find occasion to "nod in assent" and thus be connected and reconnected. Thus, the story needs a hearer, and it is the job of that hearer to make the effort, in active listening, to help the story be true in its deepest sense, not to hold oneself apart and judge the teller.

The focus of this section of this book is on gratitude, and it may seem we have strayed far afield from such a simple concept by this point. And indeed, gratitude is simple, but only by way of its being a fundamental quality. It is simple if we think of it as we usually think of fundamental qualities, and that is to say, "you know what I mean," and move on to the rest of our conclusions or explanations. Yet it is the signature of fundamental qualities that they have a way of seeming to be anything but simple once you give them their due and, with open heart and mind, probe their depths. So it is with gratitude.

I don't wish to give the impression that one could establish a well-defined and stable taxonomy of spiritual states. At least I don't think that I could construct a metaphysical version of Euclid's *Elements*. Such a schema would also run contrary to the intimation I share with some others of a holographic essence

of things as they are, which I'll take up in the second part of this book. I turn my attention upon one particular mode of consciousness, namely gratitude, because I feel that it is as close as I have come to a fundamental quality, and because it seems to be so readily available to us, perhaps the most proximate of all the transcendent states to daily life.

The first reason why it seems that the experience of gratitude is so significant in moving beyond flatland is that its very experience requires one to move beyond one's individual concerns and autonomy. Developmental psychologists tell us that we become aware of others as beings like ourselves, and not simply parts of the environment to secure things from, somewhere in middle childhood, perhaps between the ages of six and eight. The glory of this evolution is that it allows us to participate in a human world of meaning and not just of cause and effect and our own immediate needs. I must presume that my readers, having passed through these stages, will understand that I am making a major distinction between gratitude and other experiences like mere happiness or pleasure, without having to go through an entire catalogue of everything gratitude is NOT, as Paul the Apostle felt constrained to do in evoking a response to more difficult concepts like faith, hope, and charity.

Notes for Chapter 1

^{vi} For a brief overview of the major effort to categorize and elaborate personal developmental stages one might turn to Erik H. Erikson, *The Life Cycle Completed*, Norton, 1985.

^{vii} In the discussion of fundamental quantities and qualities I chose to use classical physics both because of familiarity for me (of quickly paring it down to an interactive exercise in a classroom setting) and for the reader in calling on concepts that are common to everyday life. All systems of explanation and description have such concepts, and they are the very essence of what must be illuminated to understand how our humanness understands its existence. Because the physics of Newton has real world (common, human scale) application, it is a natural to opening up such an exercise. In the western tradition the hallmark of any system of inquiry is that its elaborations follow coherently from its fundamental propositions, and an example of the power of such methodology might be Euclidean geometry.

We often think of points, lines, straightness and curvature as being fundamental quantities in Euclidean geometry, but these are secondary constructs resting on the most fundamental quantities before one can construct a system of geometry. The most fundamental properties defy description in any simpler language and must simply be held to exist and to be comprehensible to any other sentient being. Those are that, 1) there is such a thing as space, or extension, that can be said to exist between objects, real or representational, and 2) there is such a thing as location within space. These seem to be so obvious that, not only does it seem silly to need to assert their existence, but the very act of doing so leaves one reeling. Once these are established, then points, lines, angles, curves, projections, and all the rest make coherent and even practical sense.

^{viii} I had a bumper sticker years ago that said "Physics is Good for You." Bumper stickers are hardly the most reliable sources for deep meaning, but in this off-handed little professional boosterism, there is actually a tradition that is millennia old. In the Middle Ages, when formal western universities were founded, the core curriculum consisted of the quadrivium and trivium, seven subjects in all considered absolutely essential for one to be considered educated, and geometry was one of those core endeavors. Why? Because its rigorous logic and paring away of all higher presumption to its indivisible root assumptions was considered an essential tempering of the intellect. Not a tempering of the sort that "if it was good enough for me, it's good enough for you." though one can never assume that such human foibles were not as well part of the authority of the "schoomen." Rather it tempers the mind to find itself in accord with the ultimate reason of the world as it is, not deluded by the mere multiplication of exceptions, side-cases, or the multiplication of words.

Another one of the seven essential disciplines was music! And again, this was not, at least in its ideal evocation, to be studied so that one would show a cultural sophistication and be able have interesting dinner conversation. Rather, the Greeks, including Pythagoras, Plato and Aristotle, had discerned an elegant mathematical relationship between consonant tones and dissonant ones. Those combinations of notes that were

pleasing to the ear (e.g., octaves, major thirds and fifths) when played together also arose from basic arithmetic relationships on the instrument on which they were sounded, such as the length of the string on a lyre, or the resonant length of a pipe or flute. They further concluded that the motion of the celestial bodies would also have similar ratios in their periods and thus produce the music of the spheres, and that such music, imperceptible to the human ear, was exquisitely beautiful. Thus, a study of music was yet another avenue by which a student could attune his inward spirit with perfection. These were intimations of the perfection of the cosmos, and thus intimations of the imperfect imprint we and the terrestrial world bore of our ultimate source of existence. Again, the basic attitude was not that we could master the physical world or improve upon it, but that perfection existed and we might hope to find its traces and, in the process, begin to sanctify ourselves.

^{ix} And since, in this ancient worldview, the cosmos was fundamentally a matter of geometry and proportion, one was in touch with the spiritual, permanent, and undefilable. In my historical investigations I have found a similar sentiment in the arena of experimental physics in the United States during the decades around the turn of the twentieth century. The renowned researchers of the day were convinced there was something essentially moral, ethical, something purifying to the baser human instincts, of learning how to read nature aright through the discipline of the experimental laboratory.

^x I mention the commonality of fundamental qualities and quantities in all spiritual wisdom paths in their early formulations, which I discuss in greater detail in chapter 3. Many others have taken up the challenge of tracing these connections, through practices that survive to this day in formal religions that find their roots in ancient practice. However, the best single introduction of which I am aware is Lex Hixon's *Coming Home: the experience of enlightenment in sacred traditions*, Larson Publications, 1995. Hixon's sweeping treatise is not merely an academic exercise in finding concordances of doctrines. Rather, it is also a first-hand account of the practices and experiences that are the generative force behind these traditions.

^{xi} Besides Camus' *The Stranger*, another favorite work of mine to get at the same idea of the tenuousness of the social construction of our realities is the play *The Balcony* by Jean Genet. It concerns a cast of characters, representing various archetypal stations in civilized society sequestered away in a most surreal bordello, while a real shooting war threatens to bring down the rest of society outside the walls of the bordello. The function of the bordello, rather than selling sex-as-love for money, is equally a prostitution of authentic life. Here the characters are able to act out their cherished, and purpose-giving roles as they would be played out in larger society, if not for the war. At one point, a character playing out the role of a judge, becomes frightened that the prostitute is not fully willing to play her role of defendant, and tells her, in so many words, that without her acquiescence in her role, he, as magistrate, would cease to exist.

^{xii} For an account of the episode see Nancy Uber-Kellogg, "Moments of Bafflement, Impasse, and Mutuality: Anglo composition instructor's stories of teaching Native American students," doctoral dissertation, Purdue University, West Lafayette, IN, 1999.

Chapter 2: *Why We Have Forgotten Gratitude: A brief excursion*

Gratitude requires that we be grateful toward something or someone other than ourselves. It is worth pondering just how different that single element is from every explanation of how things work in flatland, and every plan for getting things done, let alone what it is that is worth doing. Perhaps it is the radical departure of what we so often call reasonable, rational, and desirable from the simple experience of true gratitude that underlies so much of what we hear from so-called gurus of policy and management, whether in business, international affairs, or the vast industry called “self-help.” So, I’d like to take a little excursion here, the historical scenic route, without losing sight of our focus: gratitude. In doing so I feel I must admit that this is a bit of trying to get at the thing itself by looking at what it is not, or at least by getting a glimpse of what happens in its absence.

The godfather of the field of expertise known as scientific management was Fredrick Winslow Taylor, whose work in the early years of this century are looked upon, correctly, as revolutionary, but also as a bit odious and somewhat embarrassing by today’s standards. It was Taylor who first noticed that the human capital used in the American industrial society had not been given nearly the attention that the physical capital had. Engineers had brought real brilliance to bear on the innovations that resulted in new modes of power and their increasing efficiency, and industrialist innovators like John D. Rockefeller had given much thought to maximizing resource interconnections, but in all these operations there were humans who ran the trains and other machines, kept books, and performed all sorts of routine duties in maintaining the humming enterprises.

Taylor decided that the human component needed attending to in order to maximize the efficiency of the whole operation. The insight here is based on the assumption that the entire business is not so much like an organism with machines in it, as that the enterprise was a machine with humans interspersed through it. While we bristle at such remolding of the human condition to fit the means of production, the idea was not wholly new. As historian John Kasson has

demonstrated in his monograph *Civilizing the Machine: technology and republican values in America, 1776-1900*, the idea had proponents who thought that, with proper attention, such accommodations need not result in the human disaster in health and spirit that one saw in industrial Manchester, England, but could actually tame our more animalistic tendencies and make us fitter in essential human virtues. ^{xiii}

And so Taylor undertook his famous time studies for shop-floor management, and began applying his insights for the efficient restructuring of human tasks and physical layout at industrial sites while employed by the Midvale Steel Company as an engineer in 1881. The worker was part of the machine, but comprised of different stuff, so any sensible engineer would look to find the best working parameters of a given machine and design work to comport with it, rather than overloading the machine and having it seize up from excess heat and be off-line. It only made sense. And so, one might consider someone shoveling coal into a boiler furnace. Perhaps one strapping worker might actually take pride, much like “Yank,” in Eugene O’Neill’s *The Hairy Ape*, in being able to wield larger shovelfuls of coal than anyone else. However, a clever analyst like Taylor might discover through purely empirical means that this self-same laborer will wear himself out, and that by taking just half the amount of coal in each shovel will ultimately prove far more effective in a ten-hour shift. You, as manager, might have to insist that your proud boiler-room attendant actually take it easy, within specified boundaries. This isn’t bleeding-heart humanism, it is just good business practice. While F.W. Taylor held patents and made many mechanical engineering innovations, he is most widely known for his integration of material production and human factors, outlined in a little book, *The Principles of Scientific Management* (1911).

Following Taylor’s example of process engineering and human factors, the husband and wife team of Frank and Lillian Gilbreth became management consultants of considerable note. Lillian was a trained psychologist and Frank an engineer, and together they perfected the method of work analysis called “time and motion studies.” These were studies of different kinds of manual work, essentially a series of stop-action analyses much as trainers and Olympic team consultants might use in studying the performance of a race horse or a world-

class discus thrower. The Gilbreths even extended their analyses to the surgical operating room. The “scientific management” movement spread everywhere, from running factories, to the urban planning movement, to home economics. It was Frank Gilbreth who coined the term “therblig,” a rough, but pronounceable inversion of his last name, to represent something like a fundamental quantity: it stood for the smallest unit of identifiable work in a given human task. Two of the Gilbreth’s children, Frank Jr. and Elizabeth, later co-authored the book *Cheaper by the Dozen*, sentimentally and humorously depicting the tricks of economizing they had experienced in a home of twelve siblings run by parents whose strongest chord was efficiency.

Taylor and the Gilbreths were pioneers acting within a very sound intellectual framework. That framework, material efficiency, was a natural outcome of the industrial revolution, which saw, firsthand, the power of an engineering mindset in producing goods, and thereby greatly improving the human condition and the universal pursuit of happiness. At least, in a material world rapidly losing any stock of its own condition beyond the commodities we accumulated, the steady rise of that wonderfully revealing statistical invention, the “standard of living,” seemed to prove that our condition was undeniably improving. It is not too great a stretch to say that the engineering mindset was the intellectual progeny of the Scientific Revolution birthed two and a half centuries earlier. But whereas the mechanical universe ruminations of Descartes, Galileo, Newton and a host of others (who successfully killed off their competitors, the Renaissance Naturalists like Paracelsus and John Dee) might provoke their contemporary ivory tower philosophers to reconsider what these bold ideas implied about God, soul, and freedom, it wasn’t until these ideas were made real and populated the physical world of everyday living, in transportation, communications, and modes of work, that there emerged a colloquial sense of the way things work that could easily spread into the human realm of everyday assumptions.^{sivxv}

Even Taylor himself waxed rhapsodic in envisioning that material well-being, and the rational approach to solving its inequities would do more than simply raise the efficiency of factories, but would redound to the larger good of societies in their entirety.

Think of what this means to the whole country. Think of the increase, both in the necessities and luxuries of life, which becomes available for the whole country, of the possibility of shortening the hours of labor when this is desirable, and of the increased opportunities for education, culture, and recreation which this implies. . . . Soldiering will cease because the object of soldiering will no longer exist. The great increase in wages which accompanies this type of [scientific] management will largely eliminate the wage question as a source of dispute... Is not the realization of results such as these of far more importance than the solution of most of the problems which are now agitating both the English and American peoples? And is it not the duty of those who are acquainted with these facts to exert themselves to make the whole community realize this importance?^{xvi}

In 1888, before Taylor had detailed his method of management, Edward Bellamy published a futuristic novel, *Looking Backward*, which foresaw a future (perhaps a technological variation of a Marxist inevitability) utopia, where the perfection of the mechanized means of production and a scientifically rational polity, would result in universal well-being. This included the right for citizens to retire, at age forty, from their various productive labors needed to keep society producing its goods and services and to devote the rest of their days to leisure and creative pursuits, including the arts, crafts, and literature.

So attractive was the vision it depicted that a groundswell of popular enthusiasm inspired the formation of one hundred and sixty five "Bellamy Clubs" in the U.S. Between 1890 and 1891. While lacking the stylistics of great literature, this book inspired such individuals as John Dewey, Eugene V. Debs, and Thorstein Veblen, and was a major organizing force for the Populist Party. Dewey, Charles Beard, and Edward Weeks listed *Looking Backward* as second in importance, only to Karl Marx's *Das Kapital*, of the most influential books published since 1885. Indeed, it is not difficult to place Karl Marx in community with Taylor, the Gilbreths, and Bellamy. Each was responding to both the evident productive power of the industrial age, and each thought that the benefits of a better distribution of those material blessings would signal the crowning achievement of human civilization.^{xvii}

Historians, beginning with Richard Hofstadter's landmark 1955 study *The Age of Reform*, have found the Progressive Era in American culture to be a

treasure trove for the archeologist of social change. This period is tightly defined as extending from 1896 to 1920, or including the Presidential administrations from William McKinley through Woodrow Wilson. For the current discussion, I would like to expand our chronological window a bit, through the administration of Herbert Hoover, our first president who was also a professionally educated engineer, for reasons that will become obvious. This period has proved so intriguing because it seemed to shout with every kind of political, social, cultural, and technological excitement, all within one generation.

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These social and cultural gyrations were not just ideas for various stripes of philosopher to consider in theory, but were responses to facts on the ground: immigration, suffrage, sweatshops, telephones, automobiles, monopolies, mechanical flight, electric lighting, cinema, photojournalism, diseases and their cures, the abandonment of the farm and the population of cities whose greatest and most common denominator across the ethnic and cultural constellations was an amusement park. And a world war. Even if the inauguration of these massive changes and the social responses to them can be seen in twenty-five years or so of American history, the essential tenor of how we perceive challenge and structural response, in government, business, and every area of life has remained to this day very largely defined by the patterns progressivism established in the early years of the twentieth century.

Historians of the last forty years have had no shortage of themes by which to try and bind together a time and place that, in retrospect, seem to be so much movement and passion, in so many directions, all corralled under the moving and protean tent termed progressivism. Seeming confederates simultaneously launched movements for freedom and the abbreviation of freedoms. There was suffrage and prohibition; religion in the cause of social rehabilitation and equality, and the specter of intellectual elites unabashedly advocating a golden future through eugenics; massive mobilization and consolidation of industries, and policies for hygiene and worker safety; tremendous energies devoted to harnessing and harvesting the country's natural resources encouraged by government policy, and the rise of a federal scientific effort to conserve these resources. This was the age of the heroic inventor, and while patents continued to accumulate in Thomas Edison's works, by far the world's largest research

enterprise for applied physical science in the public interest, producing a large number of inventions for the public domain in electronics and aviation, was at the National Bureau of Standards, often considered in the popular culture to be the bastion of conservatism by perfecting physical standards of measurement. What, besides the sheer dynamism of activity, could be said to be the unifying thread of these wildly disparate endeavors?

Much might be said, and has been said, of the collective consciousness and unconsciousness of that period, of the power of identifiable symbols, like Lindbergh's flight or Babe Ruth's slugging percentage, in both apprehending and defining the spirit of the times. Perhaps. There is another, seemingly much less romantic theme that runs through this period, and continues to this day. That is the siren song of the engineer. It is the theme of an intellectual technique that brings to bear measurements, standards, case-study data and problem-specific expertise on any problem, and then resolutely solves it. It is the perfectly human response to chaos in the technological age. We may think of the engineer as the anonymous lab-coated technician, and it is true that there are very few engineers known to the public. There were several who managed to personally coincide so exquisitely with a major new technology that the larger society knew their names, at least for a brief time. But none achieved the name-recognition immortality of the great scientists of the same period. They were, different from the great philosophers of theory, practical people, whose endeavors required a certain training, to be sure, but so did farming. They were us,^{xxi xxii xxiii}

Were these changes really as profound to the popular consciousness as I seem to be implying? Was it just the hype one might expect at the close of one century and the opening of another? We could cite endlessly from popular periodicals of the time marveling in the utopian promise of the age, as well as of the demonic forces at play. And we could responsibly infer that, since these were widely read, they must have struck a resonant chord with the public. A collection of personal journals would be nice, but these are always rarities for historians. However, we have one extended journal from the period that seems to rise above all others in providing a penetrating view of a most sensitive observer, and one with the experience to synthesize the way very few individuals are ever afforded.

The autobiography, *The Education of Henry Adams* is the final great work of the preeminent American historian of his time.^{xxiv} First published in 1907 at the age of 65, it provides one of the most powerful narratives of a life spent dedicated to understanding the unfolding of human events, experienced firsthand, in all of literature. Henry Adams was born into the family that nearly described and circumscribed the political elite that gave birth to the nation, including Presidents, legislators, and diplomats. He knew the individuals with power for political world change personally. He chose the academic life, becoming a professor at Harvard and traveling widely. His autobiography is written in the third person, not as a fly on the wall or disinterested reporter, and certainly not with any pomposity. Instead, his choice of voicing seems to come from a sort of aerial view, where he could view the entire panorama of his journey at once while still remaining honest and intimate.

He had wrestled greatly to not just account for historical developments, but to explain them, as the progeny of a long line of rationalists would naturally do. And so it is most striking that such a well-respected scholar should not, near the end of his life, simply sum up his life work with the appropriate trimmings to assure its coherence and importance to make his peace with mortality and immortality. Indeed, he did quite the opposite, accounting all his supposed understanding of historical forces as of almost no lasting value.

The attempt of the American of 1800 to educate the American of 1900 had not often been surpassed for folly; and since 1800 the forces and their complications had increased a thousand times or more. The attempt of the American of 1900 to educate the American of 2000, must be even blinder than that of the Congressman of 1800, except so far as he had learned his ignorance.

What were these “forces” which seemed to break the world free from an understandable narrative, and a pattern that could be well understood in trying to apply the lessons of history to predict, or at least manage, the future? The key, here, is found several chapters earlier in a section titled “The Dynamo and the Virgin.” Adams wished to understand the great movements of human history, not just the account of it, but how to account for it. Why do regimes rise and fall, why do worldviews hold sway and how do they decay, why do cultures

seem to strive for anything, what inspires the individual, legendary or common, and what traces do societies leave behind?

In the west, political and religious history were tightly intertwined since the Middle Ages. Among the most awesome artifacts that attest to the worldviews that gave meaning to Europe of five hundred years ago are the great cathedrals. These were the magnificent facts on the ground that made manifest their culture's destiny. Church and state found a unifying symbol here. Typically a cathedral was in the making for over a century, so the original designers and builders would not live to see its full form. The slow process of quarrying rock and fitting stone was understandable close up and piece at a time. But the fully realized structure defies understanding. The amount of work required to construct a cathedral, especially considering the methods used, is very difficult to get one's mind around.

They remain breathtaking to this day, even with our skyscrapers and mile-long bridges. But place such a building in a landscape that is otherwise very nearly horizontal, and to enter is to experience the very sky splitting open. In a daily world of earth tones, its stained glass windows shattered the very sunlight into the most vibrant spectrum and illustrated, for those who could not read, the moral precepts by which one might hope to enter heaven. And an earthly choir could indeed sound otherworldly in such a space that had no relation to anything in the natural world. Cathedrals were an invocation of the supernatural. Henry Adams knew his history, and he had been awestruck in the presence of the great cathedrals of Chartres and Amiens. His vivid mind could easily see nation states mobilizing under such standards, even if the gaze of a particular king or prelate were not directed heavenward.

Then there was the Chicago Exposition of 1893, the first world's exposition to feature electrical lighting. The Chicago Exposition was a spectacle nonpareil. It featured an outrageous juxtapositioning of architectures, trying to evoke classical civilizations from lath, wire, plaster and concrete. It was filled with the latest mechanical wonders from around the world, as well as gaudy and sensuous entertainment, the more exotic the better. But more spectacular than all else, it was filled and outlined with electric lighting.

It had been just about a century since electricity had made the transition from occult force of nature to a dependable, configurable servant. It could

literally turn night to day, a truly Promethean dream if ever there was one. Far more rapidly than the advent of the steam engine, the electric motor would change the working landscape and make the industrial age a *fait accompli*. What would it be like for the average individual to cause miracles at the flip of a switch, to be able to move mountains (of people, of freight) while hardly lifting a finger? No one, no emperor or king, had ever been able to create so much “effect” with so little “cause” as the age of electricity would make possible. How would this affect our sense of ourselves, our very understanding of life, of history? These were the sorts of forces Adams was contemplating. And he would not find his revelation in 1893, but at the Exposition in Paris, in 1900, on the home turf of the great cathedrals. But his own words, describing his realization of the inspiration of the old world in collision with the realities of the world being born are better than my own.

As he [Henry Adams] grew accustomed to the great gallery of machines, he began to feel the forty-foot dynamos [electrical generators] as a moral force, much as the early Christians felt the Cross. The planet itself seemed less impressive, in its old-fashioned, deliberate, annual or daily revolution, than this huge wheel, revolving within arm's-length at some vertiginous speed, and barely murmuring—scarcely humming an audible warning to stand a hair's-breadth further for respect of power—while it would not wake the baby lying close against its frame. Before the end, one began to pray to it; inherited instinct taught the natural expression of man before silent and infinite force. Among the thousand symbols of ultimate energy, the dynamo was not so human as some, but it was the most expressive. (Adams)

Adams goes on to contemplate how this vision of both latent potential among the human race, and its physical reality captured in the spinning generator before him brought him to see all previous evocations of power, influence and authority in history as weak and ineffectual compared to this fact on the ground, and he was forced to confront his own intellectual framework in explaining, let alone predicting, the story of humankind.

Satisfied that the sequence of men led to nothing and that the sequence of their society could lead no further, while the mere sequence of time was artificial, and the sequence of thought was chaos, he turned at last to the sequence of force; and thus it

happened that, after ten years' pursuit, he found himself lying in the Gallery of Machines at the Great Exposition of 1900, his historical neck broken by the sudden irruption of forces totally new. (Adams)

I have found these passages from Henry Adams to be riveting and even hypnotic, and yet without considerable background in just how revolutionary this time of breathtaking change in the culture was, my young students have found them mystifying or opaque. And for me, as a student of the history of science, it seems that Adams had found the epicenter of wonder in these new “forces” as he called them. We have been talking so far not just about technologies as devices, but as physical exemplars of the undeniable miracles achieved by pursuing the engineering ethic. Of the various engineering disciplines and technologies all bearing fruits in 1900, nothing could match the production and control of electricity for historical drama. No realm of natural philosophy had moved so rapidly from occult (in both the original sense of the word as meaning “hidden,” as well as the connotations of mysticism and otherworldliness) to limitless application.

Electricity was primal, and lightning was certainly associated with fire itself. Static electricity devices could generate lightning in miniature, and was both a favorite parlor entertainment for well-heeled Europeans of the eighteenth century as well as the central signature for the animal magnetism espoused by Mesmer, as he hypnotized Paris with his cult of transcendental techniques before the French Revolution.^{xxv} ^{xxvi}By the turn of the nineteenth century, Galvani had showed that he could make severed frog’s legs jump when stimulated by his galvanic cells, the first electrical batteries. This seeming connection between the world of the dead and living through electricity had the potential to actually explain the essence of life itself, or so it seemed, and Mary Shelley’s *Frankenstein* was the extrapolation of that idea to the ultimate human effort to rob the gods of their supernatural status.^{xxvii}

From these early glimpses of fleeting electrical phenomena proceeded, in the course of just a few decades, a fully elaborated theory of the nature of electromagnetism itself, and saw the production and dissemination of one of its first applications, the telegraph, that at once virtually obliterated time and space in the delivery of information, perhaps the most significant bottleneck

throughout human history for the patterns and cohesions (and their opposites) of cultures. And now, only a few years later, the generation and distribution of electricity would be able to completely remake the pattern of virtually every human activity.

With the advent of windmills and watermills the metaphor of useful work began, piecemeal, to change from what one could accomplish by the application of muscle power, whether human or draft animal, to things one could get nature to do virtually for free. Free, that is, once one had accumulated the necessary capital and expertise to build a mill, and secure the rights for the land usage. The steam engine, originally built as a stationary power source to pump water out of coal mines and later as a source for factory and motive power, allowed one to place that source of power nearly anywhere, regardless of prevailing wind patterns or flowing water. But even the steam engine hardly provided the illusion of limitless power, of the harnessing of mystical force. And no other branch of scientific inquiry had so quickly and effectively made the transition from mystery, to theory, to elegant mathematical description that permitted the engineer or technician to produce a design on paper and have it work in reality.^{xxviii xxix}

The workings of a steam engine, while in later incarnations intricate and subject to high-level mathematical analysis, was still a fairly apparent (and transparent) technology. The operating principles could be made sensible to anyone in a few minutes. Electricity was not nearly so obvious, and the actions it produced, whether mechanical work in a factory, lighting, motive power, or transporting our very presences anywhere at the speed of light, were the miraculous equals or superiors to most any display of the supernatural invoked by the shaman, priest, or wizard in the most fantastic of legends. What is more, whereas the success of the wielder of mystical power of legend required that he be chosen and personally worthy in some way, as well as deferential to an authority beyond this world, the miracles of electricity could be produced at will, by anyone with a few years training, and used with equal effect and reliability by saint and sinner alike.

What, indeed, would human events become when our daily lives were suffused with the application of forces and effects not just made easier through this technology, but out of the realm of human experience without these forces,

and when no more attention was needed while performing these feats than turning on a switch, turning an ignition key, or logging on to a computer? In fact, what is the nature of human consciousness when these miracles have become so mundane that we are often thinking of something else entirely while setting in motion causes and effects that a very few generations ago would have been beyond belief and comprehension, what then do we make of the world and ourselves? What religion, what attachment to sacraments and rituals could possibly survive intact, maintaining its historical ability to inspire awe in the infinite, and humility in our own weaknesses, when faced with a continual onslaught of miracles of our own design?

Electricity, as the scientists and engineers have always known, as a useful source of power is not actually free, either. At some remove there always has to be some other cause, whether wind, water, fossil fuel, or the sun. But this is not at all how it *appears* to the end user, and it is this appearance which makes every bit of difference in the electrical age becoming a metaphor, a generator not just of power for productive use, but a generator of the very idea for how the world is and how we live in it; indeed, as the apotheosis of the engineering approach to all human enterprise. Though my words are not the same as Henry Adams', and I have the benefit of a century's worth of hindsight, I think that this gives flavor to Adams' vision while contemplating the dynamo. It was nothing less than adumbrations of the powers that contemporary society takes for granted, which broke Adams' historical neck.

It is this engineering ethic, the method of multiplying layers of observations and rational technique, first evoked by Francis Bacon three hundred years earlier, that suffused nearly every sort of response to the centrifugal society that was turn-of-the-century America. The tacit postulate was that not just an accumulation of data, but the heuristic process of winnowing out spurious results, would necessarily and asymptotically approach "Truth." Thus, taking cue from the example of the applied physical sciences, began the grand era of the social sciences in academia, and in the world of government and social engineering, the proliferation of specialty bureaucracies of every imaginable kind, including the regular convocation of blue-ribbon panels of experts.

It is also intriguing to note that this era saw the virtual invention of behaviorist psychology.^{xxx} From the late nineteenth century until about WWII there were two major branches of psychology that prospered in the American research university as proper academic (not medical or therapy-based) disciplines. The older strain consisted of those scholars whose focus was the interior self, those who tried to fathom the nature of consciousness. Their approach and writings are often lyrical and even literary, and their arguments hinged as much upon the beauty of their rhetorics as anything else. The young Turks, at first publishing in the same journals, were the behaviorists, most notably John B. Watson and later B.F. Skinner. They were not only skeptical of interior states, but considered it absolutely foolhardy to talk about them. There was no way to get DATA on interior states, and so a researcher couldn't DO anything about it or with it.

At first it seemed that it was out of respect for the recognition of this default of test-and-measure in cognitive realms, that the behaviorists decided to examine exterior response only, rather than interior states, and so behaviorist psychology (in areas like reflex response experiments), began looking more and more like physiology, which was already a well-established discipline with research money available. But if the divergence of these two disciplines began by one side simply throwing up its hands and saying, "all well and good for consciousness, but we can't measure it," the sheer volume of data-gathering and a cultural valuation of the engineering ethic soon turned ambivalence into certainty. Since you can't measure consciousness, it doesn't exist. Consciousness studies virtually disappeared from professional journals by 1940. And in comparison to the genteel academic consciousness psychologists, the European revolutionaries including Freud, Adler, and Jung, appeared further beyond the pale of consideration for the American behaviorists. Such imaginal studies dealt only with humans, and its theories seemed as vaporous as the dreams and metaphors upon which they were constructed. The behaviorists, on the other hand, could read the book of nature in any organism, by provoking it and observing external behavior, and then by cataloguing these results and looking for patterns subjectable to statistical analysis.

By studying which stimuli provoke which responses in an organism, from a paramecium to a human, you haven't merely explained what is available for

observation, you have said everything there is to say! Everything seemed so gloriously manageable, if we simply had enough data. Watson went on to study the behavior of infants, and held considerable sway in the popular culture with ideas like the toxicity of touching. Children, according to Watson, should not be touched too much as this is bad for their development. But, if benighted parents needed (for their own sentimental illusions) to be in physical contact with their offspring, then he allowed that perhaps a light, glancing kiss before bedtime would not do too much harm. [Watson lost his professorship at Johns Hopkins in 1920, following the revelation that he was having an affair with one of his graduate students. He went on to make a name and fortune for himself on Madison Avenue, in the emerging profession of advertising.]

B.F. Skinner was inspired by the work of Watson and Ivan Pavlov to become a behavioral psychologist himself, and was not abashed to move from his animal studies to the human realm. In the 1940s he developed what might be seen as an engineering follow-on to Watson's theories for ideal environments for infant and child development. His "Air-Crib" was to isolate the infant from every sort of "harmful" influence (germs, sound, inconstancies of temperature) to serve as a mechanical interface and supplier of an infant's needs until, perhaps, age two.

It is in this context, when nearly every opportunity seemed to find its hopeful expression and nearly every problem its solution in the application of what I have called the engineering ethic, that it does not appear at all remarkable that the approach of technique born of empiricism would find its way into the realm of personal success and fulfillment. In part this is because the individual still had to make his or her way through life in a world dominated by rational control, material efficiency, and the engineering ethic. With so many techniques to manage the capriciousness of lived experience, whether for an entire society or an individual, what was one to make of one's own life and meaning? In an age of interchangeable parts, how did you know how well you were doing in your personal project of living your life?^{xxxix}

Between the 1880s and the 1940s the number of professions had proliferated and saturated our culture. The United States and the rest of the west had moved from the scholastic model of the Middle Ages, where the only three recognized professions, for which university education was requisite, were the law, clergy,

and medicine. By the mid-nineteenth century the first branch of engineering to become a profession with a degree was civil engineering, proceeding from the French model of military engineering and growing with the building of the railroads. Other engineering professions, such as mechanical, electrical, and chemical, would arrive by the turn of the century. Many expert trades that followed the genteel pattern of family association and apprenticeship gave way to a (perhaps) more democratic degree certification. The vast majority of workers at the turn of the century were still comprised of farmers and unskilled laborers, but that was changing rapidly.

At the same time, as many cultural historians have documented, the intricacies of consumerism hierarchies was well under way. By the time Alfred Sloan of General Motors defined the annual model change and the de-facto status ranking of the different makes within the G.M. Line, the culture was left with several ways to announce their personal success to their fellow citizens: professional position; income; and the brands of goods they owned. Since personal success itself was now a commodity with outward signatures, it stands to reason that, just as Taylor and the Gilbreths found a market for industrial consultancy, others would find a market for personal success consultancy.

There was a lot of preaching from various pulpits, religious and otherwise, about success in the secular rather than spiritual realms. But the single name we associate with separating such consultancy out as a professional calling was Dale Carnegie. He began with courses and books on public speaking (e.g. *Public Speaking and Influencing Men in Business*), but found the full power of this message in his huge best seller of 1936, *How to Win Friends and Influence People*. Whereas Fredrick Taylor's *Principles of Scientific Management* seems a bit dated by today's readers, feeling as Charlie Chaplin's hapless factory worker in "Modern Times" that people are certainly more than labor-saving machines to be routinized and maximized, Carnegie's book doesn't seem so out of date at all. Granted, the language is a little antiquarian and sexist for current taste, but if you just update his lexicon it would fit very comfortably among the volumes of today's business advisement and professional self-help books. Over sixty years later it appears that the hugely profitable publishing enterprise for every aspect of how to "get ahead," are little more than variations on the themes set down by a genuine

American Horatio Alger: Dale Carnegie. It is very difficult to find anything new in the endless parade of new books that wasn't already said by Carnegie.

The key for publishing success seems simply to coin a new phrase for some supposedly original technique. Make your co-workers feel that they are important. Make them stakeholders. Show appreciation. Make a good idea seem like it is the idea of the person you are working with/for. Give others credit. Ask probing questions that incorporate the solution you have already imagined, and let others "discover" it. Avoid negative people. Convene team efforts if possible. Look the other person in the eye. Make customer satisfaction your number one product. Even the supposedly late twentieth century cutting edge wisdoms, such as "market yourself," or "you have to see your professional future as the management of YOU, Inc." seem like so much jitterbugging to the same old music.

As we've seen, behaviorism came to define the world of the mind as only the world of the physical brain and nervous system. That is, eventually by sheer weight of journal articles and grant money to say that stimulus-response was not merely the only thing available to empirical measurement, it was the only thing that WAS. Similarly, the confluence of the engineering approach to nearly every area of human enterprise, along with the rise of professions and a well-delineated and universally-understood language of consumerist status made it very difficult for anyone to make a case for other realities or methods in measuring the quality of a life. Success meant achieving prestige and its outward signatures. Failure was the absence of those things, and the personal advice business existed to help make the individual a success. The outward signs amounted to the thing itself. If your subordinates, your superiors, or you yourself manifested the outwards signs of success, signs that you were satisfied, then they and you were successful and satisfied. Anyone could engineer success and satisfaction if they just had the data and skill. Even V. I. Lenin considered himself, foremost, a great engineer and scientist, and he had an especial admiration for Henry Ford, who saw himself as both an industrial and social engineer.^{xxxiii}

Now, I need to make some admissions at this point. Avarice, pride, social standing, and every sort of asserting one's personal ego above others were not invented in the U.S., or in the early twentieth century. Every one of these human

tendencies is described and, within the spiritual traditions, inveighed against from every culture where we have records. We also have help in how to avoid these predispositions in every one of the great wisdom traditions, whether the Upanishads, the Tao te Ching, the Koran, or the Bible, as well as from the great philosophers of antiquity. Manipulation of others is nothing new, and Machiavelli did a fair job of codifying technique in this area.

Then what is significantly distinct about this period of history we've been discussing? It seems reasonable to say that one truism we can make about the early twentieth century American experience is that the "facts on the ground" we have been discussing had dominated the physical and cultural landscape to such an extent that this change in quantity constituted an undeniable change in quality. Or, as Stalin once said in reference to the Russian machineries of war that were seen as technologically inferior by other nations, "quantity has a quality all its own." When the everyday lives of nearly an entire society are saturated with change, with new ways of making livings and defining who they were, with new techniques and technologies for spreading the gospel of consumerism and the fitness of the engineering ethic for both understanding what is and modifying it, then it is possible for a broad-based sea change in what a culture values for all its citizens and how to achieve it.

And if the accumulation of so much technique among so many millions set their minds about understanding and using so much arcana, it also left little room in the individual and collective psyche for a grace so simple, so bereft of technique, as gratitude. As a fundamental quality which takes one outside of oneself, and completely beyond the realm of cause and effect and technique, one might conclude that it is difficult, if not impossible for our attention to be absorbed by pure gratitude while engaged in nearly anything that makes up the context of our everyday lives. Nearly every aspect of our busy-ness is primarily about intensifying our heuristic techniques to correct and re-correct our actions and the actions of others to keep our enterprises, our businesses, schools, industries, health care, let alone our homes, children, and financial independence from flying apart.

Notes for Chapter 2

^{xiii} John Kasson's first book, *Civilizing the Machine: technology and republican values in America, 1776-1900*, Penguin, 1977, has long been a favorite of mine. This little book actually brings alive the dynamics of the collision between the emerging industrial state and some of the most significant thinkers of the time on the meaning of life, work, virtue, community, democracy, and the power not just of economic forces of production but the power of symbols once they become facts on the ground. This heady mixture of possibilities and threats, as they were unfolding, is presented with elegance and the sense of being "close to the ground," as anthropologist Clifford Geertz recommended. I don't think this little book got the attention it deserved, although it was well-received. On the other hand, Leo Marx's book *The Machine in the Garden: technology and the pastoral ideal in America*, Oxford, 1964, succeeded more in its place in the historical canon. This is also a fine study, and clearly and passionately evokes the fundamental distinctions between the tonalities of city, farm, and wilderness during the nineteenth century. But I also think that Marx's book, painting a different picture of industrialization much more attuned to the more fearful of the pronouncements of the transcendentalist literary figures, simply arrived at the right time in its publishing, with the literati already primed to dismiss the technological world as malignant.

^{xiv} I just make a glancing mention of the historical arrival of what we would call the modern disposition toward investigating and codifying the material world, also known as the Scientific Revolution, and its triumph over Renaissance Naturalism. Most readers will have encountered the former phrase but may be unfamiliar with the latter. As in all world-changing revolutions, the encounter between these two world-views is extraordinarily rich and very illuminative of the ways it is possible to think about reality and humanity's significance. The single best source on the dimensions of this epoch can be found in the collection of scholarly essays, *Occult and Scientific Mentalities in the Renaissance*, Brian Vickers, ed., Cambridge Univ., 1984.

^{xv} Just a few general observations may entice the reader to explore further. The Renaissance Naturalists, whose purview included what we call the alchemical pursuits, were inheritors of the Platonic notions of embedded qualities in the gross terrestrial world, hinting of a perfect order beyond. However, distinct from the purely mental contemplation of orders and symmetries, they also held that an intimate knowledge of deep reality could also produce the ability to evoke change in the physical world. One might say that they were engineers, of a sort.

There are several significant differences between the Naturalists and anything we might construe as modern applied science. First is the heavy reliance on metaphor to deduce order. (For example, if one wished to strengthen one's brain you might take to eating walnuts, since walnuts look, on the inside, somewhat like brains in miniature!) Secondly, you can't force nature to do anything "unnatural," that is, you can only configure matter so as to make apparent qualities inherent in the matter itself. These first two principles can actually be understood, in the language of the day, as the search for "sympathies," and "antipathies" in nature. Thirdly, the experimenter was absolutely part and parcel of the object of the experiment. If one were to publish instructions for an

alchemical “recipe,” for example, and someone else were to replicate those instructions with a null result, it was perfectly reasonable to conclude that the second individual did not possess the necessary spiritual virtues to persuade nature to cooperate.

Further complicating the collision of the Naturalists and Modernists is the fact that many of the celebrated heroes of the Scientific Revolution were themselves suffused with inclinations and interpretations from the Naturalists. The most notable of these was Newton himself, who, while producing the masterpieces of early empirical and theoretical science (*The Principia* and *Optiks*), was also a devoted alchemist and numerologist.

^{xvi} The quote from Taylor is found in F. W. Taylor, *The Principles of Scientific Management*, Norton, 1967, pp. 142-44.

^{xvii} See Edward Bellamy, *Looking Backward: 2000-1887*, Signet, 1960. The information on the Bellamy Clubs, etc., are from this edition’s forward, by Erich Fromm. For the best study of the history and reception of visions like Bellamy’s during this period, see Howard P. Segal’s *Technological Utopianism in American Culture*, University of Chicago Press, 1985.

^{xviii} In addition to the Richard Hofstadter monograph referred to in the text (*The Age of Reform*, Vintage, 1955) I would like to mention just a few of my favorites. An excellent source of primary material from principal actors on the national stage is Richard Hofstadter’s (ed.) *The Progressive Movement, 1900-1915*, Simon and Schuster, 1963, Touchstone, 1986.

My favorite source for intimate detail of both immigrant experience, and the lives of other disenfranchised persons is a collection of autobiographical vignettes first published as a series in *The Independent* between 1902 and 1911. It was recently published as *The Life Stories of Undistinguished Americans, as told by themselves*, Hamilton Holt, ed., Routledge, 1990. For a panoramic view of the sheer velocity and divergent paths of change on all social fronts, and the attempts to reign these into something coherent see Robert H. Wiebe, *The Search for Order, 1877-1920*, Hill and Wang, 1987.

For a powerful study of the experience of the African-American in the south, Joel Williamson, *A Rage for Order: black-white relations in the American south since emancipation*, Oxford, 1986. Roy Rosenzweig’s *Eight Hours for What We Will: workers and leisure in an industrial city, 1870-1920*, Cambridge, 1983, explores the evolution of manual industrial labor as a way of life amalgamating disparate cultures, and the institutionalization of (in the words of Daniel Boorstin) the fungibility of timed-labor, and its negotiated payoff of leisure and amusement. One slice of the response of more privileged segments of society to the culture is explored by Lewis A. Erenberg, *Steppin’ Out: New York nightlife and the transformation of American culture, 1890-1930*, Univ. Chicago, 1981.

^{xix} Three significant studies of the precursor conditions to the progressive era are: Alan Trachtenberg’s *The Incorporation of America: culture and society in the Gilded Age*, Hill and Wang, 1982; Burton J. Bledstein’s *The Culture of Professionalism: the middle class and the development of higher education in America*, Norton, 1978; and *The Organization of Knowledge in America, 1860-1920*, Alexandra Oleson and John Voss, eds, Johns Hopkins University Press, 1979. For the interaction between business, society, and technology I

recommend two more studies: David F. Noble's *America by Design: science, technology, and the rise of corporate capitalism*, Oxford, 1979; and 'Thomas P. Hughes' *American Genesis: a century of invention and technological enthusiasm, 1870-1970*, Penguin, 1989.

^{xx} My mention of the importance of the early work of the National Bureau of Standards as a model and signifier for the resolution of the forces at play in these decades is based upon my own doctoral dissertation: "Gauging the Nation: Samuel Wesley Stratton and the invention of the National Bureau of Standards," Nelson R. Kellogg, Ph.D., 1991, The Johns Hopkins University, available through University Microfilms International, order number 9216584. For a history of the eugenics movement, see *In the Name of Eugenics: genetics and the uses of human heredity*, by Daniel J. Kevles, University of California Press, 1986. And finally, for sheer comprehensiveness, as well as ingenious synthesis from many other historians, few single volumes are more informative than Daniel J. Boorstin's *The Americans: the democratic experience*, Vintage, 1974.

^{xxi} There are other historical essays where the author finds a unifying thread similar to mine, though usually not in precisely the same words or with the anonymous engineer, who at that time was fighting a battle simply to be considered as a culturally-recognized professional, as was the case with law and medicine. For an essay that finds the progressive theme to be an overarching optimism for design solutions to any problems, see John Chynoweth Burnham's essay, "Psychiatry, Psychology, and the Progressive Movement," in *The National Temper: readings in American history*, L.W. Levine and R. Middlekauf, eds., Harcourt, Brace & World, 1968.

^{xxii} However, one historian of technology, Edwin T. Layton, has done more than any other in describing the patterns of consonance and dissonance between the evolution of the engineering professions and the larger culture in the decades around the turn of the century in his classic study, *The Revolt of the Engineers: social responsibility and the American engineering profession*, Johns Hopkins, 1986.

Other studies demonstrate the mutual generativity of specialties coming out of this mindset, and their locations in this period. See, for example, *Disenchanted Realists: political science and the American crisis, 1884-1984*, By Raymond Seidelman and Edward Harpham, State University of New York Press, 1985. As the social sciences strove to become more and more empirical, following the lead of respectability well-established in the physical sciences, they also had to set up professional subcultures, diverging in an effort to establish independent authority (see "Boundary maintenance in American sociology: limitations to academic 'professionalization'," by Henrika Kuklick, *Journal of the History of the Behavioral Sciences* 16 (1980), pp. 201-219.)

^{xxiii} Among the few engineers known to the larger public were Charles Kettering of General Motors, and Charles Proteus Steinmetz, the wizard of General Electric.

^{xxiv} The material here is drawn from Henry Adams', *The Education of Henry Adams: an autobiography*, Houghton Mifflin, chapters 25 and 34.

^{xxv} Robert Darnton, *Mesmerism and the End of the Enlightenment in France*, Harvard, 1968. This book is a fascinating study of the wild passions and enthusiasms catalyzed by Franz Anton Mesmer from the time he arrived in Paris in 1778 through the French Revolution. This early work of Darnton's captures the social and cultural chaos of both

the wealthy patrons of the salons as well as the frustrations of a group of young radicals who would be central to the political uprisings. And Mesmer, having found middling interest in his homeland, appeared on the scene at the perfect nexus to catalyze the imaginings of both groups. The young Turks included those of middling intellect and not born to privilege, who, colluding with the bored rich through this mixture of parlor demonstrations and the promised assurance of supernatural energy and what it portended for its adherents, proved a volatile mixture.

^{xxvi} One must avoid the literalisms of trying to impose one historical episode on another, expecting to see replications in detail, much less using such episodes to prognosticate or write policy. However, it is even more wasteful (and much less fun) to avoid drawing any patterns of recapitulation in human affairs. And Darnton's little book continuously calls the reader to see the profound echoes in this slice of *fin de siècle* France and the cultural gyrations of the United States from the 1960s to this day in producing every possible stripe of guru, who has succeeded in drawing especially members of the economically privileged into one scheme of utopia-on-earth after another.

^{xxvii} For an examination of Mary Shelley's influences, both from the popular knowledge of Galvani's work, as well as possibly from her husband's (Percy Shelley) own dabbings in electrical experiments, see Maurice Hindle's *Introduction to Frankenstein, or the Modern Prometheus*, Penguin, 1985. For a wonderful exegesis on the influence of mill technology on cultural expectation of work and the patterns of society, see Jean Gimpel's *The Medieval Machine*, Holt, Rinehart, and Winston, 1976.

^{xxviii} I still find the work of Jacques Ellul, in *The Technological Society*, Vintage, 1964, to be among the most significant and penetrating analyses of our time. Among other contributions to the understanding of the human condition, Ellul insists that we not succumb to the easy labeling of technology as machines, however intricate. The machines themselves are tools. The heart of technology stems from the underlying ability of humans to invent techniques. Thus, the plow is an instrument for carrying out the technology (technique) of agriculture. Keeping accounts in lists of debits and credits is technique and the essential technology itself, regardless of whether one keeps such reckoning by moving beads, writing in a ledger, or entering the data into a spreadsheet. This powerful insight allows us, in our assessment of what we are doing and becoming, to ask the most fundamental questions of technique, human activity, and human values, rather than indulging in the useless reifying of a particular device as boon or bane. Ellul also examines in great length the basic notion that we become our techniques in the most fundamental ways.

^{xxix} To illuminate the power of this more comprehensive vision of the meaning of technology and the fact that it is a most profound human tendency throughout history, I sometimes like to use the example of the invention of money and its evolution with my students. As a revolutionary new technique, the invention of a freely translatable symbol and fungible symbol of work, worth, and commodity, few, if any, technologies have had a more profound effect on civilization than the invention of money. See the excellent article by Heather Pringle, "The Cradle of Cash," in *Discover Magazine*, October, 1998. The accompanying articles in this theme-dedicated issue include the potentially profound

effects attending the future of money, including the political and psychological aspects of such things as the introduction of the “euro” in the next few years, and the implications of a cashless society.

A contemporary reevaluation of the power of the physical presence of technologies in the landscape, both real and imaginal, is Langdon Winner’s extraordinary book, *The Whale and the Reactor: a search for limits in an age of high technology*, University of Chicago, 1986. In connection with this discussion, see especially the first two chapters, “Technology as Forms of Life,” and “Do Artifacts Have Politics?”

^{xxx} The single most comprehensive work on the history of experimental psychology is Robert A. Boakes, *From Darwin to Behaviourism*, Univ. Sussex, 1984. Supplementally, I reviewed the American professional journals (e.g. *Journal of General Psychology*, *Psychological Review*) covering the period discussed to get a sense of the rise of the empiricist-behaviorist, and the professional marginalization of figures such as E.C. Tolman. An excellent historical work on the collision of these two major themes in American academic psychology, including the toe-to-toe warfare between Watson and representatives of traditional (pre-behaviorist) psychology (notably William McDougall of Harvard, see *Purposive Explanation in Psychology* by Margaret A. Boden, Harvard Univ. Press, 1972.

^{xxxii} It is fascinating that the rise of the social sciences, as would be recognized today in their academic clothing, erupted at the same time as these fundamental changes in every area of living and ascertaining personal and social meaning were accelerating. One of the most illuminating documents to come out of the early twentieth century, therefore, is the landmark study of every aspect of life in a particular city (Muncie, Indiana), that is overflowing with insights obtained from the townspeople themselves of what they thought their personal and community lives were about, and what fundamental assumptions were undergoing radical change. *Middletown: a study in modern American culture*, by Robert S. Lynd and Helen Merrell Lynd, Harcourt, Brace and World, 1929.

^{xxxiii} For a lyrical tour of American life in this period I would again refer Boorstin’s *The Americans: the democratic experience*, op.cit. For an examination of the methods, themes, and resonances between the engineers of the new consumerism and their public’s response to purchase image and character, see Roland Marchand’s *Advertising the American Dream: making way for modernity, 1920-1940*, University of California Press, 1985.

Chapter 3: *Beyond Childhood: cultivating an even deeper gratitude*

Most often we succeed in holding the many different responsibilities of adult life together. And that is, we usually conclude, accounted to good work on our parts. We have studied hard, either formally or through hard knocks, to get a bead on the way things work, and then have applied ourselves to it. It is we who have succeeded, by dint of smarts and sweat, when things don't break down. We deserve a pat on the back and a few days vacation, if anything. Not much to be grateful for there, but a surreptitious knock-on-wood might be in order. Our vigilance also primes us to pay attention not so much to when things go right, as to beware that they might not. Our very bodies are usually performing unimaginably intricate and subtle dances that amount to health. Only a fool (or a visionary) would spend much time walking about in amazement and gratitude that while commuting, paying bills, or eating breakfast, once again, her body is doing everything it needs to for her to exist. Yet, even more incredible, in the overall scheme of things, is the fact that we can be conscious of it. If it required our detailed knowledge of how all those systems worked and for us to plan, and intellectually see to all their essential modulations and conversations our bodies perform to take our next breath, we would at once freeze up and die.

I fear that in the last chapter I might also be understood as announcing that I had found the enemy to gratitude and deep awareness, and it is the "engineers," however we describe them. Whenever I find myself in this territory with students it is easy and natural for them to take me as an anti-modernist, a machine-breaker, a Luddite. The above pages can easily be read as a prelude for some screed against science and technology, and a call for a return to some earlier epoch when humans were somehow better off, if not just innately better. And that is not at all the case. Just as a personal note, I am fascinated by technological devices and always have been. Even as a very young child, without any prompting or even parental role models, I found gadgets, and electrical gadgets especially, to be the most interesting and compelling things I could get my hands on. As some children might collect seashells or stamps, by the time I

was eight I had a cardboard box of electrical devices, mostly motors, that I would pry loose from a toy or a discarded appliance. One of my hobbies, to this day, consists of going into my little shop and fashioning an electronic circuit for the sheer contemplative joy of it, none of them built to do anything practical (my favorite was a hoax UFO).^{xxxiii}

In the engineering ethic as I have described it above, that is the accumulation of disembodied data to be applied for the control of any process or activity, the epitome of the “engineer” might be more the realm of the political economist or industrial psychologist. The individual who delights in creating devices of any sort might find more kindred association with the craftspersons of any time or culture.

Secondly, it might be presumed that I am saying that what is wrong with the machine age and the post-industrial, or information society would not have had such deleterious effects if we had just known a little more, if we just could have managed to understand the human spiritual needs a little earlier, if we just had a better grasp on our place in the natural world and had been able to blunt our greed with a lighter footprint on the planet’s ecology. I am not saying this either, but the reasons are a little more nuanced and I ask the reader’s indulgence in seeing it through.

It is always enjoyable and tempting to engage in “what if” thought experiments. Everyone who creates anything—whether music, poetry, buildings, a new recipe, the inauguration of a new relationship—is involved in a continuous interweaving of “what if” trials and results. It was the entertaining of a great “what if” thought experiment that led Albert Einstein to his theory of special relativity. Asking “what if” requires that we hold thoughts about things apart from the fixed reality before us, and it requires that we be able to comprehend something of time itself, especially projection into the future. In other words, such thinking is profoundly human. Historians, however, have always made strong warnings of making projections into the future from the past. The reason one studies history, the former Librarian of Congress Daniel Boorstin once said, is not so much to infer practical policies for the present, as it is simply to better understand the human experience. The study of history, as the study of art, music, or paleontology, is its own reward and justification.^{xxxiv}

For the authors of fantasy or science fiction, written or cinematic, there is no need for such restraint. Time travel, or travel through space to a parallel universe, are among the most popular conceits in the genre upon which one can create a truly engaging plot in which the characters can struggle and reveal their flaws, powers, and charms. What if you traveled back to the age of dinosaurs and inadvertently stepped on a single butterfly, would Truman have lost the election, would language be the same, would humans have evolved at all? It is great fun as an exercise of imagination, but outside of that we can't simply play at histories.

It is not simply that the true dynamics of the human condition as it works out its physical and metaphysical realities are not programmable for their complexities and variables that cautions against taking liberties with alternate histories. And it is also not merely because anything we might impose on actual historical episodes must of necessity lack the richness and thick description of what actually occurred in all its varieties of perception for the individuals and communities involved. There is also a moral caveat here. To seriously consider that periods of time would necessarily have been better, more right, for civilization is to engage in the most spiritless form of the engineering ethic. Such positions devalue the very dignity of human existence.

At its very core, an attitude that continually sees only the errors in the past and present is the historical equivalent of only taking note of our physical bodies when they break down. There is no sense of the wonder of process itself. Beauty and goodness are simply the evasion of the distasteful and the suppression of the bad. There is no point to gratitude since the point of life amounts to little more than dodging bullets. In short, for those technologists of culture, life, writ large, is little more than the concatenation of individual lives in succession. Put another way, there really isn't any point at all.

Would anyone seriously propose that the only point of infancy is to survive to childhood, and the only point of childhood is to survive to become an adult, to produce another infant while the parent shuffles toward death? Actually, as I write this I am knowingly rebuking the mainstream of reductionist-determinist thought that has held sway in the academies of the west for several centuries now. Perhaps I simply stated the proposition too baldly, some might say, and in so doing made a burlesque of responsible scholarship. But the picture boils down

to something very much like that no matter how much you dress up the picture-frame. The purely analytic eye, the philosophers of flatland, banishing gratitude as just another affect that can be completely described and recreated with the right electro-chemical tweaking of the brain, would be forced to admit, if they were true to their own postulates, that we really are pretty much like butterflies. Basically, our lot is to arise from the union of gametes, grow to adulthood, make copies of ourselves, and die. The only real difference, ultimately, is that so far as we know we leave more complicated fossils than do insects, including language and changing techniques. I have seriously tried at times in my life to entertain the idea of pure mechanism, however much we gussy it all up with newer mechanisms like complexity theory and indeterminacy. And I must confess, it just doesn't work for me. I *can* talk that talk...but I feel like a clever liar when I do so, like a covert agent trying to pass myself off as something I am not.

Another personal disclosure: earlier in life I held fast to religious dogma.^{xxxv} It became more and more difficult to maintain such a strict catechisms of literal interpretations of the nature of God, human history, and destiny. As I learned more, both academically and personally, it became increasingly difficult to come up with what have been called "harmonies," in attempting to justify dogma with what I knew not just as disembodied facts, but as felt truths. When confronted with conflicting accounts of episodes and guidelines for life, there comes a time for everyone when they must take what they have learned and what they have experienced, and then contemplate their conjunctions and look for resonances. When I came to the point in my own life when the greatest intellectual attempts to rescue my dogma-infused belief system resulted in dissonance, and the most profound sense that to continue to mend the fabric of religious doctrine was dishonest on my part, then I had to abandon my attempts to resuscitate the corpse. I could not pretend to gain sustenance from the same ceremonies, from merely doing the outward performances and hoping to segregate my consciousness into times when I would be a responsible academician, and times when I would suspend my disbelief to hope to be nourished from my religion. Some may be able to live that way. I wasn't. And the pain of pretending to things I did not believe was greater than the pain of the other path: free fall in an existential void, and losing my story of meaning.

Occam's razor (the disposition that, given the choice between two explanations for any reality, one is constrained to embrace the simpler and more elegant) slit my spiritual wrists, and the result felt like the evaporation of my soul. But I was determined to ride it out as best I could, and not simply wrap myself in another script to staunch the flow. I decided that it was highly possible that I would never again locate certainty in meaning and purpose, and that being the case I would simply do my best to live, each step of the way, by whatever I most genuinely felt was right.

It was sort of the converse of Pascal's bet. Blaise Pascal, the pious mathematical genius, realized that he could not say for certain whether his Christian beliefs, including the prospect of salvation or damnation in the afterlife, were based in reality. At least they were not rationally provable to others. So he made a simple decision tree out of this conundrum. If he lived his life as a libertine and it turned out there was no hell, then he could have the advantage of indulging in worldly pleasure with no penalty. On the other hand, if he lived circumspectly and there were, in fact, a heaven or hell waiting, he would have reaped eternal reward. The other possibilities were living as a libertine and finding himself in hell, or living piously to find that there was no reward. It is a fairly simple decision tree for a logical mind. The most a life of indulgence could guarantee was material reward during a fairly short mortality, and the worst was eternal damnation. He decided, as a sort of spiritual-actuarial bet, it was best to live the pious life.

I had always thought Pascal's wager to be sort of the ultimate joke on centuries worth of clergy threatening their congregations with hellfire for their wicked ways.^{xxxvi} My own decisions for how to proceed with my life didn't provoke much levity in me, even though I have a tendency to see something delightfully absurd in almost anything. I decided that I simply could not live by stories and precepts that I could not bring myself to believe any more. I decided that if there were a spiritual fabric in the cosmos, whatever that may be, that lying to myself had to be contrary to it. If I were part of that very fabric, a product of it, then apprehending that spiritual reality could not come from a state of war with not just my intellect, but my heart and instincts.

My wager was of a different sort than Pascal's. In fact, it wasn't really a wager at all; I simply proceeded as I felt I had to proceed. I wasn't worried so much about getting locked out of heaven or thrust down to hell as I was of getting locked out of my own heart. And so I decided that I would have to come to peace with not having ultimate answers. At very least, if any came to me they would arrive not because I forced the issue, but in their own time. Meanwhile, I wished to act as best I could so that, regardless of any ultimate realities, I would not be left with regret or anguish. I just wished that the sum total of my intentions and actions might be the expressions of my best wisdom, at whatever stage in my maturity I found myself at the time. That is all easier said than done, but simply saying that much, and writing it to myself, helped me to pick up and go on.

These were painful days, to be sure. But gradually a different sense began to emerge. I was teaching high school at the time, and I found myself experiencing gratitude in new, more freeing ways. If I didn't have the ultimate global map to guide me, at least I had a sketch of the neighborhood. I realized how fortunate I was to be able to fill my days with work that felt right, that had immediate spiritual and emotional return every day. That isn't to say I never got exasperated, or was always the model of grace and decorum. However, there was an overarching sense that I could take joy in what I was doing, and a fairly secure sense that I would never look back on my work as a waste of time. I felt real gratitude in this, and that gratitude was of a more mature, more lasting and less grasping kind than any I had previously experienced.

It was over the course of years, not days or months, that this awareness of gratitude, for life itself and for the opportunity to be a creative agent, gave me a new operating vocabulary. My life began to feel full and flowing. This opened me up to conversations, internal and external, which spoke of a transcendent reality to life. I cannot detail precisely every event, every reflection, every inspiration to locate some precise turning point. Even to go back to my journals to try to recover that would prove futile because it wasn't so much an event as an unfolding process. This process was every bit as real as any other lived experience. It became obvious, but never a mundane fact, that we are engaged in a profound unfolding, that life is full of meaning, and that awareness quite naturally produces gratitude. Gratitude itself seems to be both beginning and

consummation, cause and effect, in conversing with matters of the spirit. Gratitude is the very language of that conversation.

If living with and through gratitude is so rewarding, then why do we so often default to the giggling conversations of flatland? I don't know for sure. I can only make guesses. Perhaps we are so infatuated with the engineering ethic that to admit that there is more depth to our existence than the purely empirical is tantamount to admitting that we cannot control everything, even in the ultimate abstract where we had all possible data. Perhaps what is threatening about such an assumption is that it looks like uncertainty, even chaos. Maybe it is too much for our constructed egos: it unhinges the authority of the expert, and for the rest of us who have been trained to respect the authority of expertise it leaves us adrift.

Just maybe we don't have the courage to put the realm of the spirit to the test! We would just as soon not have the private corners of our hopes—that life really does have transcendent meaning—explored, by ourselves or anyone else. Let the technicians and scholars have their realm, and let us keep that separate from our spiritual paths. That way, whatever empirical inquiry can tell us we can always just, quietly and privately, move the boundaries of our need to have some hint of mystery in the cosmos accordingly. And perhaps we fear that ultimately everything WILL be explained in physical-empirical terms, and that the explanation alone is tantamount to a dagger in the heart of spirit.

The flush of romantic love is only a torrent of neurotransmitters in the brain you say? Okay, we might not like it, but we can accommodate it somehow. It is possible to clone sheep, monkeys, and mice? Well, okay. I'd still like to think there is something beyond mere manipulation, thank you very much, but I won't tell you what it is yet. After all, I may not be a genetic engineer, but no one is going to make a fool of me!" But the real threat to the life of the spirit, of gratitude, transcendence, and purpose is not knowledge itself. It is the fatal mistake of confusing knowledge of how things work in flatland with the authority to insist that flatland is all there is.

I have heard so many jeremiads about American education: the system, the curriculum, the students. (And yes, I have at times indulged in such head shaking myself.) My goodness, what have these students been doing for the previous twelve years? They can't distinguish between a well-reasoned

argument and pandering propaganda! They don't know anything about history, literature, and worst of all science. They can't distinguish between a continental shelf and a galaxy. And on and on. I think these academic concepts and intellectual skills are important, indeed, but my sense of the difference between knowing them or not, for the individual or a culture, seems quite distinct from many who have chosen to take up the banner of "learn or become extinct." I wish my students to know these things for much the same reason that Daniel Boorstin gave for studying history: it is rich, it is wonderful, and the more ways you stretch your mind in a community of learning, the more you will be able to explore, including things that neither student nor teacher can imagine yet. But the anger and disgust that sometimes infects cultural critics, insisting that the whole canon must first be mastered (memorized, if necessary) before one is deemed worthy to pronounce something worthy, and only then to extend the boundaries of human understanding, is deadly.^{xxxvii}

I don't wish to pursue this too far at this point, for I will take this up later in a more satisfying way. I simply want to address our proclivities for banishing the transcendent, especially from our formal curricula where our children spend so much time ostensibly in training for adulthood. There is an implicit irony in the academy, which seems to be continually ignored, perhaps deliberately in the service of (to paraphrase Pierre Duhem) saving the phenomenon, where the phenomenon is the authority of experts.^{xxxviii} In our plans for general education we have precious room for direct experience.

We expect our undergraduates to know some fundamental things in order for us to certify them as appropriately educated and prepared for participation in adult society. Let me just take a simple example. Most colleges require that students complete a patchwork quilt of courses we call general education. A course in descriptive astronomy is a frequent offering. We would like them to get at least some basics from such a course, such as the workings of stars, our evidence for our most current cosmologies, and some scale and scope for distances, ages, and the number of celestial bodies. We tend to use textbooks, slides, websites, and lectures to make these concepts coherent. A fortunate class might actually be able to look through a telescope once in the semester, but that often isn't considered necessary.

How do we know there are rings around some planets, and moons other than our own? Well, people from the time of Galileo have seen them through a telescope. Do we even bother to remember, first of all, what an absolutely stunning watershed it was to look through a telescope, an instrument that was not a part of our own eyes, and believe that what we saw through that artificial device was to be believed? Do we even mention that what we refer to as the Scientific Revolution was every bit as much a revolution in perception as it was in the gathering of data and the formulation of theories? The use of instrumentation, whether the telescope or microscope, the air pump or barometer, the electroscope or the galvanometer, all of these required us to trust in an artificially constructed intermediary to tell us things that we could not apprehend without them. And we BELIEVED them! That is revolutionary.

Some instruments, we might say, just amplified our natural senses. But many of these early devices (and most of what we use for research today) are not simply amplifiers, but they are actually translating one kind of evidence into a completely different kind of evidence, and we took this display to our senses and their interpretations as reality!^{xxxix} Now that is something quite stupendous in the history of human thought. If we cannot impart some sense of just how revolutionary this is, how can we hope to impart any sense of romance and mystery and, yes, *gratitude* in all this information? And yet we consider our students somehow deficient, somehow dulled to learning, if they don't remember any of these facts after the final exam, which is usually the case.

It so happens that many years ago I bought a homemade telescope for about ten dollars (at a garage sale) and although it was a tricky proposition and required a lot of patience and adjustment, one night I was able to actually see the rings around Saturn. The mount consisted of a brass pipe fitted to the barrel of the telescope and there was no clock drive to keep up with the earth's rotation. And I really didn't know what I was doing. But by trying a couple of different eyepieces, and trying my best to keep from shivering, I was able to see those rings that before I had only seen in books. I was ecstatic, and I had to run inside and get the rest of my family out in the driveway to see it. I made an important discovery that night: that I could see this magnificent spectacle, invisible to the

unaided eye, for myself. And yet we expect our students to become driven simply by our second, and often third-hand interpretations and recitations of what is.

Compare this to the great spiritual wisdom traditions. Every one of those paths to enlightenment began as an invitation to primary experience.³¹ It is only after some of these traditions became so overlarded with dogma, with prescriptions and proscriptions, and with a meticulously articulated human chain of authority that the experience of a religion could devolve into outward performance and the mastery of rules. But every tradition, east or west, began as direct experience of the “other,” of the transcendent. Primary experience within these traditions still exists, though such seekers are often relegated to the margins compared to the organization of large numbers of adherents within identifiable and allowable boundaries. But the origins are found in mystical experience. It wasn't just a neat idea if you could experience transcendental conversation yourself. You really weren't getting what it was all about unless you yourself had some primary experiential involvement. By comparison with the evacuated received knowledge we expect our students to embrace, the spiritual experiment seems downright enlightened!

Well, the proper academic authority might say, pitying my lack of sophistication, everything that we teach our students COULD be verified if they had the time and patience, and some of them will enter graduate studies in areas of expertise where they will experience these data firsthand. But there is so much to learn that you must be reasonable. There is so much these students have to cover, and it is an inescapable factor in this age of the explosion of knowledge that for a lot of what they are taught they must trust that there are, in fact, legions of people who do know these evidences first hand. The scientific method may be based upon observation, test, and variation, but it is enough that they know that these things have already been done and agreed upon in the professional court of reason.

I think the clerics who presided over the Inquisition might have been able to front a defense not very much different. All right, then, we don't kill and torture people for being heterodox; that would be so “unenlightened.” We just dismiss them. Go ahead on your metaphysical questing. See if I care. How do you plan to prove to me that you have got hold of something real? That is, how can you prove something upsetting to the worldview I am already invested in?

And of course, since the parameters for proof are already defined as residing completely in flatland, there is no hope to prove anything. The reality is of a different nature from the limitations already set. And to further make the case of its futility, the properly trained critic could heap up plenty of flatland evidence of his own. Bring us your best mystic, your best visionary, your best spiritual exemplar. Now, you say you are able to actually access an apprehension of reality not simply physical, go ahead. All right, now, you are properly entranced and we have a real-time PET scan going on your brain right now. See there? Your synapses are showing increased energy usage in this region, and over here. We've seen that before. It happens when people hallucinate, it is very well documented. So, that solves that. Your so-called esoteric experience is no more than an activation of certain parts of your brain, and we call that hallucination, and that of course means delusion! Well, that's all it is then. Hope we didn't shatter your metaphysics too violently.

This may sound far too facile for the kind of restraint we like to think we use in discussions within civil society. But this is not a straw man I've set up. I have seen explanations very much like this to supposedly disassemble "nonsense notions," so we can get back to serious issues. And yet even flatland itself keeps offering us intimations of the numinous, the sublime, the more profound meaning to life. But to argue for Spaceland when constrained to use the vocabulary of flatland forces one to use analogy. For example, it is not a very great stretch of the imagination to allow that our techniques for functional brain scans might some day soon allow us to track the time-variations of response of every neuron through some massively parallel computing machine. If not every neuron, then perhaps we could get the resolution so fine that we are satisfied that the recording of activity in microscopic groups of neurons is a very close approximation of brain process. Now, take a person so monitored and blindfold him. Now, whack him on the thumb with a hammer and watch the electrical storm that ensues. If our mapping were accurate enough, and our means of stimulation discrete enough, it is possible to imagine the same subject sitting there wired up and blindfolded, but now we will simply playback and transmit the neural patterns that the brain itself generated when he got his thumb whacked. Remember, this is a thought experiment, so don't worry too much just now about the current state of electronic sensors and transducers. At least in

theory we would not find it beyond reason if our poor test subject experienced a whack on the thumb, even though there wasn't a hammer in sight. Which experience was real?

The clever neuroscientist or cyberneticist might see the lame trap I've set and reply, "why, they're both real. They are both perfectly valid experiences, and so far as the subject is concerned, one may not be distinguishable from the other. What have you proved? Next question." But that is not the point of this exercise. The point of this exercise is the following. You have just produced two very real and (in this thought experiment) indistinguishable experiences for a person. I deliberately chose the physical perception of pain because it is free, in its immediacy, of complicating association, and therefore easier for the neuroscientist, and the rest of us, to imagine this as a truly possible controlled experiment. You have admitted that two radically different external stimuli, from the perspective of the observer, produce the same felt experience, and you have satisfied yourself by saying that the physical state in the brain can be measured and provoked by either method. What possible justification can one use to say that if one were able, somehow, to find physiological correlates to a transcendent experience (so-called by the person experiencing it) that you have then also absolutely the cause of that state? "Ah-hah! We see the pattern in the brain. Therefore that is the beginning and end of it. The correlate IS the generator of the experience!"

I would reply, "Well, what did you expect? If it is part and parcel of our mortal existence that we have this intricate body to mediate and interpret the physical world around us, and someone reports a change of perception that produces an accompanying physical and emotional state, wouldn't you expect to see its traces in the living brain? That in no way says that those correlates were not provoked by something else, say the metaphysical analogue of a hammer blow as opposed to an electrode. Furthermore, you have already defined what constitutes evidence, and that is only the correlations of response in that physical brain." I do not intend this little example to constitute anything like proof for the reality of what I call the things of the spirit. I cannot do that, for that is an issue of primary experience, which I cannot define in terms acceptable to the materialist.

What disturbs me is the ferocity with which^{xii} so many seem bent on enforcing the same presumptions that fueled the rise of behaviorism, as discussed in the previous chapter. This disposition, in its first generation, is a dismissal of everything that cannot be observed with the instruments at hand because it implied an inability to control, to intervene, and for the experimenters to be the sole authors of what is, sooner or later. And it seems, in the history of ideas, to be a short trip from dismissal of something as irrelevant to the insistence that it doesn't matter. And that is, so far as the intellect is concerned, no different from saying it doesn't exist.

The problem is that Occam's razor cuts both ways. I can explain altruism, first in ants and then in humans, as just another buttress for the Darwinian fortress. Seeming altruistic behavior is simply another case of random genetic variation and selection. For certain social species, if they did not develop a differentiation between workers, soldiers, queens, etc., they simply proved insufficiently robust at surviving whatever complex of environmental stresses they were in. When explaining human altruistic behavior, we are assured that we are not explaining a true difference in kind but just a further elaboration of that quality. Gratitude, by extension, can be explained as an autonomic response that has helped us survive to make the next generation. Sure, we are allowed to call it genuine if we insist, just so long as genuine means being true to an acquired trait. Gratitude, from the insistent catechism that description (or better yet predictable manipulation) is equivalent to having the thing itself, is just a complicated set of physical attitudes and expressions (facial or verbal), which, lucky for us, we developed when we experienced another sentient creature doing something that helped us. Its expression is accompanied by certain surges in hormones and neurochemicals, which make it pleasurable. And, equally fortunately, seeing that outward display given to us, we have also evolved a complementary biological response, which is pleasurable. Furthermore, through the increased mental ability to project into situations of the future, extrapolated from the past, we also cultivated the ability to foresee that certain actions would provoke the whole symbiotic response of pleasure and, lucky again, would ensure our survival.

So, we would be wise to write on an exam in evolutionary psychology, even if we tend to think of gratitude as possibly being emblematic of something much

deeper and sublime, that it is really just so much natural selection, further elaborated by cultural conditioning, so much accumulation of pleasant sounding poetry, so much psychological delight in *thinking* we have found deep experiential resonances with others of our clan, which serves to further heighten the mutuality of physical survival. Is there something in this line of reasoning which seems, just the slightest bit, overwrought?

There is always a predisposition to seek explanations within the dimensionality where we can be the manipulators, if not the creators. Working only at this level guarantees we will have lots of company, and the unaided human psyche finds great comfort in the presence of company, in the assenting nods of those who *get* our stories. At very least we will avoid the pain of incomprehensibility on the part of everyone else, and being declared either foolish or crazy. (And being perceived as foolish or crazy, by the way, is a quick ticket to the digestive tract of a saber-toothed tiger, which, of course, is why we've inherited genes that tell us to avoid any such outward behaviors.) If one is going to argue for a reality that is not simply within everyday experience, it is much easier to discuss a lower level of dimensionality than a higher level.

For anyone who has ever had a course in trigonometry (perhaps with relief that the ordeal is over) you may recall that, among other things, you were constrained to learn formulas and deal with squiggly graphs or abstract entities: the undulating curve of a sine-wave graph, for instance, that looked like a slinky but which you had to make some kind of numerical sense of. But there is a very interesting origin to these mathematical trigonometric functions. They are also grouped under a single category known as the circular functions, and while they are wavy, and not straight, they don't appear to be very circular. The circular essence of them is actually not hard to make sensible. Draw a circle on a piece of paper, and draw cross hairs on top of that circle (X and Y coordinate axes). Now put a dot on the circumference of the circle. Imagine this dot to be a marble, tied to a string to a point in the middle. That string is your radius, and as long as you keep the string taught, the marble will always be somewhere on the circle. Now move that marble around the circle at a constant, slow speed. If you have patience, you can actually make this little model with cardboard or plywood.

Now take your little apparatus into a darkened room. You may need an extra set or two of hands to do this. Put your little model on a long, flat, smooth surface, like a dining-room table and in a darkened room have someone shine a flashlight along that surface toward the marble. What you will see is an illuminated surface with the shadow of the marble behind it. Now slide your apparatus slowly along the table with the flashlight, while you move the marble around the circle at a constant rate. Again, this is probably easier with two people. As you move the stuff sideways, you will see the shadow of the marble undulate up and down, you won't see the shadow tracing out the circle of what you perceive to be its true motion, what you get is a sine wave. In fact, you can put the whole thing on a larger paper affixed to the table, and have someone move along with you with a magic marker tracing out the position of the shadow, and lo and behold you get that nice undulating wave whose graph you struggled with many years ago in the math classroom.

What we have done is a downward translation in dimensionality. We have taken the obvious two-dimensional movement in a circle, and we have isolated just half of that motion. We have said, well, while this marble moves around a circle, how does it move if we just look at it from one side? If we all lived in one-dimensional space, in "Lineland" these would be the only kind of motions we could make. For the inhabitants of Edwin Abbott's "Flatland," there are correlates to events that happen in "Spaceland." In the case of Mr. A. Square, he happened to be the only one to see the sphere on his mission of enlightenment as he passed through flatland. And what A. Square saw as Sphere passed through his plane of existence, flatland, was first a dot, then a small circle which gradually enlarged until it reached a maximum size, and the proceeded to shrink until it again became a dot and then disappeared altogether.

A. Square was stunned, and more than a little disturbed. Like Henry Adams beholding the dynamo, he had seen effects beyond his vocabulary, and like Adams, he was both terrified and uncertain whether he should worship this apparition or flee from it. Doubtless, the wise elders of flatland, had they observed this event first hand would have applied the recondite geometry of flatland to account for what they saw, and thereby to deny its other-dimensionality. We, as inhabitants of Spaceland, would look at their complex and tortured logic as merely the description of the traces left by a projection into

two dimensions of what was in reality a manifestation of three-dimensionality. In this charming little allegory we are immediately drawn to historical comparisons with things like the abuse of Galileo's astronomical findings at the hands of the authorities of a different worldview, straining to keep that worldview, and their authority, intact.

In fact, we might marvel at how complex analysis can be marshaled to hold at bay a much more simple, to us obvious, and elegant apprehension of the way things are. Certainly, it is the very toppling of such complex delusory tactics to deny new syntheses that is, correctly, the hallmark of the Enlightenment. Don't deny complications in your worldview, for they can be the very fissures through which grand new insights come. But do not succumb to the grasping of holding your intellectual scaffolding together either. Above all, beware of your postulates, and have the courage to regularly consider what might come to light if they were different.

It is very easy to cast the intimations I have made for a spiritual reality and meaning (of a fundamentally different nature from our accumulations of data and theory, stimulus and response) as just a reactionary denial of the grandeur that has produced all areas of inquiry since the Enlightenment in the west. I hope that is not the impression I have made. As I've mentioned before, I believe that the general disposition known as "antimodernism," which is often allied with the assumption that there existed some more perfect society in the distant past to which we must return is not only flawed, but psychically dangerous. It sees glory in stasis, and there is not a shred of evidence in the world that nature itself values this. Such a disposition denies the dignity of humanity. It places humanity outside the realms of what ought to be. And such a fixation on primitivisms, rather than honoring the core nature of the early wisdom traditions, places it in a museum. Just as a fascistic devotion to the stimulus-response explanation of "all that is" moves its adherent further and further from the heart of gratitude, so does viewing such an expression of the human intellect as solely toxic and unnatural prevent us from the truths that a spirit of gratitude can provide. We become haters of our natures, and ourselves and that is a stance of anger, not appreciation.

What I am urging is not denial, but a new tone to our syntheses of who we are. That tone does not see everything we do not like in our individual and

collective past as a humiliating mistake or, worse, a grand waste of time. We no longer see the infant as just an immature and miniature version of an adult, putting in time until biology delivers a more self-sufficient body, and education produces a more competent agent. From a larger canvas we shouldn't see past cultures as moderns-in-waiting (which is out of vogue in the academy anyway), nor as strings of precursors some of whom got things just about right while we are stranded on the far side of wisdom getting most things wrong. Either view is an attempt to make ignorance bliss, when in fact it is just the absence of wisdom.

We are in the right place and time, if we would just allow ourselves to be grateful for that. Yes, the tempos and intransigencies of contemporary societies can seem very toxic from the view of the evening news. But even our excesses can provide insights not available to cultures past. As our landscapes change, our built landscapes, our cultural and imaginal landscapes, our scientific and ideational landscapes, then we, both intellectually and spiritually, respond. If we have the heart for it we can understand both who we are and who we may become, with insight and wisdom previously unavailable. Embrace opportunity. Be grateful, not afraid or anesthetized.

It is impossible to consider the connections between artifact and interpreter if there are no artifacts. What is the difference between orality and literacy, which inquiry opens up vast and subtle wonders of the nature of human experience? This question, and the insights it produces, cannot be entertained without the written word, and the differences produced between one individual reading and writing and the differences in community and purpose, good or bad, that can arise when the many can participate can only be considered when the innovation of mass publication (in any form, books, electronic media, the Internet) are facts on the ground. Why bemoan the insights of the sciences just to keep ancient stories from dissolving?

There is essential wisdom in those old stories, but their details were simply ways of trying to give imaginal footholds into the realm of the transcendent for hearers who were immersed in their own flatlands, and even for the visionaries who also had to find correlates of the other in their own here-and-now. The core experience of the spiritual would be cast in different stories today, and the fact is that they ARE being written today as well. But our psychological reflex is often to flatten out meaning in existence, so that we all can democratically inhabit the

landscape of least common denominators and not worry that we are “missing out on something,” the worry born out of fear that our few decades of mortality are all we have and, in the phraseology of the “me generation,” we want to have it all, and we want it now.

The only sure way out is by primary experience, which endows us with a new vocabulary available for conversation in the apprehension of that deeper realm. And, for what it is worth, I feel that the most elemental quality we can cultivate that opens the door to the spiritual is gratitude. But this gratitude needs to sing the song of celebration, and of welcoming the contours of our paths to wisdom, if we are to be able to see wisdom when we encounter it. This is a gratitude that thrives on experience. It is a mature gratitude, not an amnesiac return to ignorance and innocence.

Some have tried to find the source of gratitude in simplicity itself. I don't think this is completely wrong. If gratitude is a fundamental quality that lies not just within the constructs of intellect, then it is sometimes easier, more understandable, to present it in forms where the details of adult life are absent and not allowed to confuse the vision. The great philosopher-theologian C. S. Lewis described a few episodes, both delicate and overpowering; from his childhood where he is sure he first experienced something of the transcendent. Or as he put it, “something quite different from ordinary life and even from ordinary pleasure; something, as they would now say, ‘in another dimension.’” One was a simple recollection of an afternoon with his brother, and the other two occasions occurred while reading. He reports this sudden immersion in otherness, in those early years, as evanescent, unbidden, and a complete surprise leaving him yearning to recover that sense.^{xliii}

The Benedictine monk, David Steindl-Rast similarly tries to locate the very edge of the transcendence of gratitude in surprise:

Do we find it difficult to imagine that gratefulness could ever become our basic attitude toward life? In moments of surprise we catch at least a glimpse of the joy to which gratefulness opens the door. More than that—in moments of surprise we already have a foot in the door. There are those who claim not to know gratefulness. But is there anyone who never knew surprise? Does springtime not surprise us anew each year, or that expanse of the bay opening up as we come around the bend of the road. . . . Things and events that trigger mere

catalysts. I started with rainbows because they do the trick for most of us, but there are more personal catalysts. We have to find our own, each one of us. . . . Once we wake up in this way, we can strive to stay awake. Then we can allow ourselves to become more and more awakened.^{xliii}

The playwright Eugene Ionesco seems to concur in his estimation of the nature of childhood. "The end of childhood is when things cease to astonish us. When the world seems familiar, when one has got used to existence, one has become an adult."^{xliiv} I think what Ionesco describes here is not an essential condition, but rather makes a poignant observation of what is generally the case. Most children, if afforded a childhood unencumbered by too much tragedy, do seem endowed with a capacity for wonder, surprise, and joy that we, as adults, longingly see as the free air of just so much innocence, never to be recaptured once we are inured to the complexities of life. With all respect to this view of the world as it can so easily be apprehended, I am positing something quite different. The only proof I can offer is personal experience, with hope that it will find some resonance of recognition in you, the reader.

What I am suggesting is that these childhood experiences of surprise are indeed intimations of the soul and spirit, but they are just that, fleeting intimations. Furthermore, it is possible to do more than revisit those memories as an adult, finding brief episodes of respite from a brutish world. To re-encounter and cultivate gratitude as an adult, to actually have that disposition as a natural companion and interpreter of adult life is to inhabit a state of grace more profound, filled with greater possibility than the child's. Without gratitude life becomes at best a steady ramping up of worldly stuff, whether position, influence, celebrity, or money. At worst it becomes imbued with an air of inexorable decline, physically, emotionally, and (as we become more jaded about the entropy of our flatland) spiritually.

As I recall the individuals who have most elevated me, I clearly see in their natures a regular conversation with gratitude. My very favorite authors, addressing nearly any subject, seem filled with gratitude, whether they are writing fiction or describing the latest theories of cosmology or biology. While they may not be using the word "gratitude" expressly, it feels as though that is the very motivating force behind their work. In fact, it is that book itself, or

symphony, or selfless affectionate act, which is the very expression of that gratitude.^{xlv}

To be in the presence of someone whose fundamental presumption of existence begins and ends with gratitude is transformative itself. Sometimes others in their presence are somewhat confused as to why it is they feel more alive, more aware, more joy, and a sense that nearly anything is possible when in the presence of such a person. If they themselves are not yet conversant with the vitalizing force of gratitude, they sometimes describe being with such a person in any sort of outward expression that they can locate to make a projection into flatland. "I don't know. She just is enthusiastic about what she does. He really seems to enjoy being with us. Everybody seems to come up with more interesting things when she is around. I never laugh so much as when he is here, I mean, my face hurts afterwards. My conversations with her are the best I've ever had, and I've never had so many ideas to think of before--it almost makes me dizzy." That is not to say that gratitude can only be expressed by hyperactive extroverts, not at all. People also tend to feel peaceful, part of some deeper connection, more able to see, feel, and reason. They feel accepted, not just by the other person, but in their own hearts, and they feel far less defensive and protective of their former certain prejudices.

To cultivate gratitude also requires time alone. It needs time to contemplate the sublime, and to listen. But it doesn't end there. The cultivation of a soul of gratitude inevitably yearns to commune with others, to open imaginations and spirits to experience the wonder of existence, and to find their own paths and voices in expressing their own visions. Gratitude is the language of envisioning, it is food for the soul, and it is the essence of celebration and hope.

Notes for Chapter 3

^{xxdiii} There are not many works, outside of the fantasy and science fiction genres, which address the delight that some find in gadgets or mechanisms not because of what they can accomplish as labor saving devices, but simply because of an inner fascination with devices. Over the years I have considered this and have only a few responses as to why this is so. First of all, the inveterate tinkerer may be of a kind not often given to written disquisitions on the subject. Most often, their text is the device itself, not commentary on it. Secondly, as C. P. Snow noted years ago in his essay "Two Cultures," it has long been a conceit of the literary classes to take some measure of pride in not knowing anything about the sciences, and especially applied science or engineering, while expecting anyone properly educated to have a certain fluency in the history of the expressive arts. I tried to bridge this gap myself with an essay I wrote but never published, entitled "The Garden in the Machine," which was a deliberate inversion of Leo Marx' book on industrialism and pastoralism, *The Machine in the Garden*.

Still, there are a few which go fairly directly at the aesthetic of the machine itself. In the past, when I have wanted students to get a feel for the love of the device I would have them read Tracy Kidder's *The Soul of a New Machine*, Avon Books, 1982. I have tried Samuel C. Florman's *The Existential Pleasures of Engineering*, St Martin's Press, 1976, with less success. Florman does have some good chapters, especially chapter 10, "Look long on an engine. It is sweet to the eyes." But he also tends to get more than a little stentorian at times, and that wears thin. For an examination of the types (using biographical vignettes and historical episodes) who have been drawn to mechanical innovations, I still enjoy the rather dated *Men, Machines, and Modern Times* by Elting Morison, MIT Press, 1966.

^{xxdiv} The comment of Daniel Boorstin is the best I can do at recalling what he literally said during a short television interview. His remarks stuck in my mind, but that is all.

^{xxdv} The reader must forgive me if I don't elaborate all the details of my spiritual journey, and the doctrines that proved so unsettling. First of all, that could easily be the subject of a book by itself if I were of a mind to write it. Further, I have no battle to wage against any religion, organized or disorganized. I have read too much that is precious and timeless by those who hold to one tradition or another to dismiss a particular religion as a valid means for apprehending the transcendent.

Interestingly enough (to me at least) is that I remember the book I was reading when I first realized that my attempts to harmonize my religious and academic sensibilities would not hold, and I don't think it is a book that has ever been blacklisted by any church. It was Thomas S. Kuhn's *The Copernican Revolution: planetary astronomy in the development of Western thought*, Harvard, 1957.

^{xxdvi} It is nice to be able to have fun with Pascal's wager, but I don't want to be unfair to the seventeenth century mathematician. If anyone ever worried more about piety, duty to God, and every sort of metaphysical question and agonizing guilt that could visit an individual, not many could surpass Blaise Pascal. And if I see the wager as a poke in the eye to sanctimonious preaching, that certainly wasn't Pascal himself was working through. (Pascal, *Pensees*, Penguin, translation 1966. "The wager," pp. 149-155.)

^{xxxvii} The production of essays on the failures of education is itself an industry of commentary. I hope the reader will not be disappointed if I don't cite a single one. I try not to keep that stuff around the house.

^{xxxviii} Pierre Duhem, *To Save the Phenomena: an essay on the idea of physical theory from Plato to Galileo* (first published in 1908), University of Chicago, 1985.

^{xxxix} See *Leviathan and the Air Pump, Hobbes, Boyle, and the Experimental Life*, by Steven Shapin and Simon Schaffer, Princeton University Press, 1985, for historical insight into just how profound was the change of evidence for insight into physical reality, from Aristotle's injunction to trust eyesight above all the senses to the translation of phenomena unseen to the naked eye by instrumentation. To understand better just how far this interposition of elaborate and subtle instrumentation and interpretation has moved in twentieth century physics, see Peter Gallison's *How Experiments End*, University of Chicago Press, 1987. For a theoretical examination of the socio-cultural fabric of understanding in modern scientific networks, see Bruno Latour and Steve Woolgar, *Laboratory Life: the construction of scientific facts*, Princeton University Press, 1987.

^{xl} The significance of primary experience can be found in all guides for meditative practice. But for a cross-cultural analysis of this elemental quality see, *Shamanism: an expanded view of reality*, Shirley Nicholson, ed., Theosophical Publishing, 1987. For a more intimate, and for me compelling, journey, I again recommend Lex Hixon's *Coming Home: the experience of enlightenment in sacred traditions*, op. cit. There is another account of the collisions of perceptions of lived realities that I must recommend, and that it the autobiographical account of Malidoma Patrice Somé, *Of Water and the Spirit: ritual, magic, and initiation in the life of an African Shaman*, Arkana (Penguin), 1995. I know of no other account like it, nor of any other life experience like his, and to attempt to summarize it would be to diminish it.

^{xli} The field of evolutionary psychology (and evolutionary philosophy) is a recent synthesis of several disciplines that has recently gotten a lot of attention and has produced some fascinating and provocative studies by scholars like Robert Wright and Patricia Churchland. It is indeed fascinating to see the correlates between species survival and attributes like communality, sociability, and even selective sacrifice. Might such an explanation provide essential insights of where we, historical and prehistorical human society, developed our systems of ethics and government, to include such things as guidelines for sexual behavior and integrity, both their prescriptive and proscriptive aspects? Sure. Why not?

But explaining mechanisms does not mean one has explained away other essences that attend our behaviors and beliefs, or that there is another reality, out of flatland, of which behavioral manifestations are the traces. Of course we have had to adapt to our ecologies. To posit that we haven't so adapted would be, well, unnatural! I think it quite possible to imagine that if we evolved on a planet where, say, the gravitational constant were just a bit different than it is, perhaps musical harmonies would be quite different and the experiments of visual artists might have taken turns otherwise unavailable. That doesn't explain away the transcendence of the arts. Furthermore, it is mere description. I

can't run the experiment of tweaking gravity and watching for the evolution of cultural forms. Neither can one run the experiment of alternative worlds in evolutionary psychology as anything more than a computer fantasy game.

^{xiii} *The Essential C.S. Lewis*, Lyle W. Dorsett, ed., 1988, Collier Books, pp. 23-29.

^{xiii} *Gratefulness, the Heart of Prayer: an approach to life in fullness*, Brother David Steindl-Rast, Paulist Press, 1984, ch.2, "Surprise and Gratefulness."

^{xiv} The citation from Eugene Ionesco is one I located some time ago, and used it as an epigram for my unpublished essay, "The Garden in the Machine," mentioned above. Alas, I have lost the original.

^{xv} For evocations of gratitude by mystical poets through time and across cultures, I would recommend the very lovely collection, *The Enlightened Heart: an anthology of sacred poetry*, Stephen Mitchell, ed., HarperPerennial, 1993. I would also recommend Viktor E. Frankl's classic, *Man's Search for Meaning* (1939), Simon and Schuster, 1963. This book, and there are many others that work in this theme, finds gratitude and purpose even in the most horrific of human experience. I have also greatly appreciated the graceful and inviting book on this subject by Thomas Moore, *The Re-Enchantment of Everyday Life*, HarperPerennial, 1996.

Part Two — Deep Practice, Synthesis, and Envisioning (Thoughts on education and what is worth doing)

Chapter 4: *The Power of Surrogates*

If gratitude is the yearning of the soul to express itself, and the language of envisioning, what is to prevent us from living every day with gratitude? Does it take some extraordinary mental effort? Is the experience of gratitude as a normal state of mind some esoteric art, available only to only mystics, ascetics, or people just out of touch with reality? Obviously, I don't think that is the case. Still, I realize that there is at least some shadow of truth in the problems of living in an ordinary, workaday world, having some difficulty in reconciling the demands placed upon most of us, and experiencing gratitude. In fact, there are some extraordinary contexts we find ourselves in that can make the embrace of gratitude seem elusive, almost impossible. What I would like to explore, in the next three chapters, are the conditions and presumptions of those contexts.

This is a difficult subject for me to write about, primarily because in order to do it justice, and not leave you, the reader, dangling with some nice sounding platitudes that have no bearing on the day-to-day struggles, I have to fully place myself in those contexts themselves. I cannot hope to explain these contexts to anyone's satisfaction, or hope to come out the other side with some sort of hope, dignity, and especially vision intact unless I can first go to places that are contrary to where my heart is, and return again. This is the realm of surrogates. It is the realm where we suffer the longings of our true selves, but, for a variety of reasons, try to satisfy those longings with replacements. These replacements are not the genuine food we seek, but offer instead palliatives to mitigate the longing, and when the efficacy of one palliative wanes we hope that a new, more potent surrogate will come into view.

i) *Money Changes*

I once heard someone say that in a democracy, everyone should have the right to pursue their desires, and they should also have the right to an education so that they can have better desires. Americans today are living in the convergence of extraordinary desires, with social and cultural trends not simply in contradiction, but often, to use the geometrical analogies of flatland and spaceland, on skewed planes. Of course there are the simple contradictions. At least we can make them simple with a least common denominator reckoning, and these have always been part and parcel of democracy. We want more government services, but we don't want to raise taxes to do it. This is hardly a new observation, and I wouldn't be at all surprised if any number of today's journalists, pundits, and speechwriters have a single macro command on their personal computers for the preceding sentence, as well as for other shopworn phrases such as, "what the American people want . . .," "what we need is less government, not more . . .," "there is a great core of concerns in the country that is not being addressed inside the beltway . . ." and "people vote with their pocketbooks." But just because an utterance is a cliché doesn't mean that there isn't some truth behind it. The very problem with clichés in talking about anything that matters is that their very repetition, rather than provoking deep consideration, glazes the eyes of understanding, reifying the functional conclusions of flatland rather than giving breathing space for ideas truly beyond the script of simply "what is."

When I was in graduate school studying the history of science I had a colleague whose special interest was twentieth century research programs. In trying to understand the significance of scientific innovations he had a simple mantra "follow the money." In other words, if you want to understand why scientists pursue certain questions or projects, as well as the sympathies or antipathies of government, academia, or the public at large there was one investigative tool that would invariably give you your answers money. In this way of thinking, once you have the invention of money in a society, you could pretty much deduce what that society was about by using this marvelous universal solvent of values and intentions.

Well, I didn't much like this single blunt instrument as a way of figuring everything out. The fact that perhaps research projects might originate with an affection for the inquiry was not part of my graduate student colleague's intellectual map. My only proof of its inadequacy was my personal experience. I had studied science as an undergraduate because I genuinely loved the subject (*not* because I was especially gifted!). In fact, when I finally decided to change my major to physics, it was with a sort of resignation. I knew so little about professional realities at that age that I thought there were only a tiny handful of actual physicists in the world, and they were sports of nature of such superior ability that some part of society paid them to contemplate the origins of the universe, sort of like setting up a poet laureate position for science. I didn't have any illusions, even at that age, that I would become one of their number. I only knew of the historical legends in the field, and I really didn't know you could make a living at it. And I remember one day saying to myself, "but I like this; so I don't care if I'm going to get a job at it or not, I'm not going to spend time in college not learning what I want." I'd worry about an occupation later.

What surprised me in graduate school, then, was how easily this particular student could persuade others in the department. It wasn't as though nothing else was discussed in seminars, but whereas other lines of analysis would often provoke discussion, both strident and subtle, whenever this individual would trot out some statistic on money available, whether for the Royal Society at the time of Newton or NASA in the twentieth century, it seemed to ring with finality for the rest of the class. When I would bring up the possibility of an aesthetic to the research, or to the biographical sources of historical figures to illuminate personal passions, it was very much like arguing from a different dimension. The denominators were definitely not in common. What remains fixed in my consciousness to this day is how little justification one needs (none, really) to make virtually any analysis of modern society based upon money.^{slvi} Why is this so, and when did it start?

Clichés do get reified, and metaphors matter.^{slvii} Time is money, and money talks. Does that mean that time talks? Actually, I don't think that is a joke, or a faulty syllogism. I think time talks very eloquently, and much more to the point than we would like to admit. What we spend our time doing says more than

anything about what we value. I know what you're saying. Not another sermon about work and leisure. Not another self-righteous preacher trying to make us feel guilty. Or maybe you are ready to just chalk it up to the chatter of somebody out of touch with real life. Egad, how like a college professor! Okay, I'll admit to some degree of all of the above, except for the feeling guilty part. What I would like to do is some more excavating and exploring, some feelings and movements toward different perceptions, which is really what I hope is the tone of all the reflections in this book.

In a market economy we are expected to earn a living, doing something that others think is valuable, and hence they pay us for it. We get paid, most often, with money. [Apparently, this is no longer the case in post-Cold War Russia. I have recently read reports where teachers are being paid in things like coffins, headstones, and vodka!] It is impossible to overestimate the significance of the invention of money on civilizations, and individual life experience. It is very nearly as significant in human history as the evolution of language itself. In some ways it has even greater effect than language, although it seems unlikely that money could have ever been invented without language.^{xlviii}

Money, under the right conditions, is instantly translatable in several ways. Unlike spoken or written language, in a global economy a standard currency translates across cultures and societies with very little translation going on at all. Words have different meanings, phrases and stories have a history of episodes and characters and assumptions mixed in, so that even when one goes through the laborious process of learning another language you are still not home free. You still can't truly get the intention of the speaker without considerable time immersing yourself in the culture, and still you are bound to trust that your common humanness will translate much of the felt experience behind what is being said or written. Even with lots of monetary currencies in the world, all that is needed to translate currencies is a simple multiplier the exchange rate.

But there is an even more fundamental way in which money translates our lives like no other aspect of society. If you were a hunter-gatherer you "went to work" each day to eat. What you hunted or gathered is what you and your family ate and used for shelter. You moved around a lot, but you moved as a clan or tribe. There isn't much likelihood that someone else in your group was going

to accumulate a bunch of exotic stuff that others didn't have access to as well, so if you wanted some ornament or tool, you probably made it yourself. There isn't much need even for bartering in a nomadic hunter-gatherer situation. There isn't much translation of goods and services necessary. Not much this-for-that. Or, to quote from Robert DeNiro's character in *The Deerhunter*, (holding up a rifle cartridge to his friend) "This is this, it's not something else, this is this!"

With the advent of stationary agrarian culture and currencies, "this" could indeed become "something else." A few specialties arose, such as metallurgy, in which someone could do something very different from creating food to eat and yet eat very well. And if all you raised was wheat, it didn't mean that all you could eat was Wheatena. I don't wish to belabor the obvious, but over the millennia it was money that allowed the translation of one thing into another, of one set of life efforts into other results. "How much corn do you want for that stool?" is a transaction that does have a solution, but only if that particular furniture maker happens to be in need of corn. It is money which allows for the lubrication of such goods and services translations that gave rise to the modern material world, as well as to the rise of paid professions which caused an explosion in the number of ways in which one might, literally "make a living."

We all know the rest of the free market story. If all things, food, furniture, advice, gets translated into cash, how do I know if all the time I spent making this kitchen table is worth the one hour of therapy I got? Well, that doesn't need to be figured out in a free market. Sure, for a short time either the carpenter or the psychologist might get ripped-off, but sooner or later Adam Smith's invisible hand comes in and sets everything to rights. Adam Smith, you may recall, is considered the seminal thinker in modern market-based economic theory. He published his best-known work, *An Inquiry into the Nature and Causes of the Wealth of Nations*, in the auspicious year 1776, though Smith was a Scotsman, not an American.

In a very abbreviated version, Smith's thesis was that if an economy were truly free to create and trade goods and services without the interference of things like governmental regulations that clog up commerce and regulate inequities, then people would act in their own enlightened self-interest. That is, they would try to make money. They wouldn't make things other people didn't

need or want because they couldn't sell them in the marketplace. They wouldn't price-gouge their customers because they would be undersold by a competitor. In short, if everyone could truly act in their own enlightened self-interest, there might be discontinuities in the short run (people mistakenly producing the wrong commodities or at the wrong price), but soon the whole of economic activity would make it seem as though all the individuals participating in the market were guided by a sort of "invisible hand," that would produce the most good for the most people.

This was a powerful idea, and the most perfect evocation of the epoch historians call the Enlightenment, which also produced Isaac Newton. Here we have the clockwork universe applied to the most unclockwork of realms, the social realm. The magical hand doesn't have to be built or invoked; it is just part of the free market system, or so the theory goes. In fact, the only thing political intervention can do is mess things up. The invisible hand was given the status of a law of nature, like (very much like, in fact) gravity.^{slis} You may as well try to pass a law that says that no one should be subjected to falling down, and then appoint a brigade of gravity police to catch anyone who may be falling, with the end result being, of course that everybody would be colliding and falling.

In some ways it was even more elegant than a law of nature. In the first place it was an incredibly bold venture to try to find a natural law in the messiness of human affairs. But the theory was also ahead of its time in another way. This was not simply a statement of what is, and you can see it in the regular motion of this pendulum in my laboratory. Smith was positing a heuristic system. That is, it is self-informing. It may start out a bit erratically, but there is a feedback loop, namely the market system itself, which would produce soon maximize efficiency and bring about good social effects. Furthermore, people would act in each other's best community interest, by merely acting in their own self-interest! This would irrevocably happen. Who needs ethics, moral codes, or any manner of human improvement sermonizing? If you were dishonest, disrespectful, or just plain lazy, you would very soon see the results of your unacceptable behavior right in your pocketbook.

ii) *The Invisible Hand meets the Pastoral Ideal*

Adam Smith does present a clean model for economic affairs, which would have a special claim on the hearts and minds of those caught up in the thrall of the Enlightenment. The model works well, or at least it is possible to coherently argue the point, within a society that is large enough to have multiple suppliers of all essential goods and services, and yet small enough for the parts of that society to be known to each other. This latter point is often overlooked, but it is precisely the problem that thinkers like Thomas Jefferson were passionately concerned with in order to avoid the social mess that European industrialization was already producing. This precarious balancing act, if it could be effected, has been termed “the pastoral ideal,” by historian Leo Marx.¹

The basic concerns of the pastoral ideal were germinated by a much more complex appreciation of both the individual and society than as merely producers of goods and services who would, by the natural-law heuristics of Adam Smith, quickly evolve into an efficient economy producing the most benefit for the most people. Jefferson worried that the United States might *not*, in fact, inevitably form a society of production that would also promote human rights. It just might require careful planning for anything like the good life (however one individual wished to define it) to prevail, or, equally important, a larger polity composed of communities with a felt responsibility toward each other, and where informed conversation preceded decision making, the *sine qua non* of a healthy democracy.

And so, Jefferson and others contemplated just what sort of layers and configurations of a large society might promote a continual progression toward the individual good life in a democratic system. And this is where intangibles like trust, communal good and altruisms, the daily ebb and flow of productive engagement, and a common idea of public virtues come in. The United States was largely an agrarian country from its inception through the nineteenth century. The real history becomes immeasurably more complex with half of the country depending upon slavery as the driving force of its economy, and many other scholars with much greater knowledge and insight into this fact than I could bring to bear continue to examine its meaning. So, the reader must forgive me if I discuss a largely theoretical landscape that was expressed only in pockets of the country where even they could not have been immune from the existence

of slavery in the rest of culture. It was this theoretical landscape upon which the pastoral ideal was based.

In this ideal, there are certain social aspects of the landscape and human nature that must be factored in. In the large national picture, no serious thinker was contemplating that the United States could completely avoid the industrial revolution and not become an economic vassal state to Europe. We had to do some of our own manufacturing on our own soil in order to avoid being held economically hostage. We needed to be able to manufacture tools and mills of our own, at the very least so that the agricultural products could be bought, sold, and exported, as value-added commodities, like clothing, tools, and certain foodstuffs. On the other hand, there are some very significant aspects of the life of the freeholder individual farmer that seemed essential.

Say you live in a New England farming village of, perhaps, five hundred people. You may have some citizens whose lives are not farming, directly, and these would constitute both manufacturing and service. Certainly there would have to be a blacksmith to produce and repair farming-related devices. The town might also employ, by public agreement, the construction of a schoolhouse and the salary of a teacher, and for clergy. There might be a retail establishment, and, perhaps, a lawyer. But think again of the landscape. Think of what you, an average citizen, would do and observe on a daily basis, as you got up each morning and went out your front door. If most of the farms are of modest size, say thirty or forty acres, your little burg would have a radius of interaction where it would be quite possible to know everyone, at least the principle households of every other farm.

When you got up in the morning to do your chores, depending on the season, you knew exactly how it felt, in time spent buying and selling, planting and harvesting, and overall application of muscle power and skill, to run your farm successfully. Not only that, but you had an extremely good sense of what the other people in town were doing, and what it felt like for them. Your closest neighbors could even be *seen* doing pretty much what you were doing. In all the patterns of daily life, your sense of self was continuously reconfirmed by the patterns of the others in your community.

If the town were to decide on a referendum, allowing a railroad to come

through, improving Main Street, or even floating a bond to build a firehouse, you cast your vote with others whom you pretty much understood. Of course, that does not guarantee perfect harmony. Every community has its differences and its curmudgeons. A bachelor-farmer might decide that he doesn't want to help pay to build a schoolhouse and educate other folks' kids. They aren't his kids, and besides, those with kids also have an extra asset, namely the children can help with farm work for a number of years before they leave home. He, on the other hand, has to tough it out all alone, and it just reinforces his perspective that life has never been quite fair to him. But this situation is a far cry from having the town suddenly overrun by gangsters from the big city, with the people under siege by a group of "outsiders." This is much more like dealing with the random mild eccentric in your midst. It even calls for a kind of shrugging empathy from others. Still, everyone can easily fathom, be they well-liked or marginalized, what the other person's life efforts amount to, and it is within this transparency of the patterns and rhythms of lived experience that communal decisions are made, and this common experience expectation can hold individuals personally and communally responsible for those decisions.

To summarize the hypothetical example of the pastoral ideal described above, one might say that, without having to intellectualize the ethics of a community, the coherence and mutuality born of close association are simply given. Things like understanding, trust, and, by extension, empathy and compassion arise from the very physical proximity of the community and the transparency of their life-patterns. But is this kind of homely example of tranquility and altruism not merely an ideal, but a fiction which never had a real life exemplar?²¹ Nearly every deep insight into the human condition comes as an essential paradox. The utterance itself is true given one particular experience and presuppositions. Change the experience or the underlying postulates and the precise opposite conclusion may also be true. Or, to paraphrase the great twentieth century physicist, Niels Bohr, the opposite of a truly profound idea is also a profound idea. However, there are some ideas whom another great physicist and contemporary of Bohr's, Wolfgang Pauli, would characterize as "not even wrong." An old aphorism that I would put in the latter category is "familiarity breeds contempt." My handbook of famous quotations tells me that this is an observation of Aesop, from his fable "The Fox and the Lion." It also

tells me that Mark Twain outwitted the fableist with “familiarity breeds contempt—and children.”

Contempt is an exceptionally powerful word, and we should be very careful in using it. For a person to be considered contemptible, in its truest sense, is almost beyond imagining, beyond hatred and loathing. It does not need the intensifier “utterly,” as in “utterly contemptible,” which words we often see together. It indicates such extreme revulsion that the person holding it sees nothing redeemable, nothing explainable, nothing human or in any way of the natural world in the other. This is not for the other to be alien in a way of simply being different, but as antithetical to any normal human impulse. There are only a few characters in history who have seemed only contemptible, but many more who have segregated their lives into parts ugly and at least moderately human. So, it is in part simply the undiluted power of the word, which, for me, when coupled to something breezy like “familiarity,” is so jarring as to be senseless. So, let’s couple it with another word which is both less extreme in degree than is contempt, and also keeps the same personal scale of relationship (“this is my perception of the person” rather than being tantamount to a global truth). We could use, instead, the word “hate.” Hate is much less potent than contempt. It is possible, we are told by those who say they are capable of hate, or who claim that they are experiencing hatred at the time, that it is possible for them to hate someone and even have a certain respect. Contempt has no room in it for even a modicum of respect.

Does familiarity breed even hatred? Not usually. Real familiarity, by which I don’t just physical proximity, but regular essential interactions and, most especially, communication, does not breed hatred except in exceptionally rare instances. These include situations where the parties are extensively damaged in some psychological or neurological way, in which case it is difficult to come to terms with the situation within the contexts of even a liberally-defined spectrum of human response; or perhaps, through extreme social trauma occasioned by those outside the relationship of familiarity, as in armed ethnic or religious conflicts that sweep through a village, otherwise peaceful. The reader may be thinking of any number of other injustices from the evening news, and that is what we are given as information about what is going on. Again, what is really going on, in most cultures, in most epochs, for most of the time they cohere, is

conversation. Just as health is the normal state of most bodies, most of the time, getting on with community and living has been the normal state of most groups of people. And just to keep this seemingly undifferentiated state of affairs going on (certainly nothing to talk about on the evening news) requires an extraordinary communication and negotiation all the time. But I digress (just a little).

Even for people within our communities variously defined who seem completely at variance with our perceptions and solely focused on their own isolated agendas (like teenagers!), if they are known to us, if we communicate and associate and cooperate with any regularity it is impossible to have a regard of anything remotely like hatred. We may worry, keep our distance, implore, ignore for a while, or be frustrated, but these are just the dynamics of difficult conversation. Real aversion to another who was once a regular associate can only grow when conversation stops.

iii) *And Your Point Is?*

So, what does all this have to do with money, let alone the supposed theme of this chapter, the power of surrogates, whatever that means? Well, we're getting there. But we have to add in a bit more cultural history to get the background right. We need to get from the nineteenth century to somewhere near the present. First of all it is important to remember that the concept of a pastoral ideal was an iffy one at best in early nineteenth century America. This ideal, if it were to prevail, would have to be one of vision, consciously decided upon. It would also depend upon the maintenance of some profound transparencies. If communities grew so large that it was impossible to know everyone, or at least to be able to account for their presence in relation to someone else you did know, where then would be the human empathetic element of community? If the patterns and doings of our livelihoods became utterly alien to others in the community, how would they understand what we felt, believed, and why? There would inevitably be large centers of commerce, if the country were to remain connected to the rest of the world and even to itself. But if the essential coherent unit of life, after the family, were not to be the transparent community in conversation with itself, known to itself, then where would we

find our existential feet?

The indications from England, the first nation out of the gate in industrialization, were that the pastoral ideal would require constant vigilance, modulation, accommodation, and conscious choice based upon a firm grasp of the ways of the world as well as of which paths would allow pursuit of some consensus of good life, and which paths would be by their natures poisonous. It is one thing to consider such public philosophy when the cultural landscape remains open. It is quite another to be a serious public philosopher when every aspect of living, the entire economic, aesthetic, physical, technological, and ideational landscape has already moved to another, very different, threshold. One must always deal, if a philosophy is to be any use at all, with the “facts on the ground” at the time. This is not really a prescription as much as an observation. One cannot help but respond to the world you are in.

And so we move, for the purposes of our discussion here, to one final change in money and work, namely the final establishment of the imperative that “time is money.” In our whirlwind tour we have briefly glimpsed the evolution from “this is this,” or pre-barter, to barter, to the symbolic intermediary of money. Here goods are assigned an intermediate valuation, depending on a host of subtle human perceptions, only one of which is “supply and demand.” But what happens when what you do for a living is, not so much to bring something about on your own terms, from a bushel of wheat, to a shirt, a patent medicine, or a musical performance for which you are paid, but instead, you pay out hours of your life in return for that symbolic intermediary, money? What happens when the hours you expend to get that money is simply part of a large process, and not that ultimate thing itself? What happens when you do that specialized work in an anonymous factory into which you disappear from your community in the morning and reemerge at night? After Edison invented the time clock, there were undoubtedly many workers more than willing to “punch the clock,” though not necessarily according to operating instructions.¹⁵

There was nothing in the pastoral ideal to make sense of the new and widespread fungibility of the world of work. There was popular refrain about soldiers returning from the First World War “How ya’ gonna keep ‘em down on the farm once they’ve seen gay Paree.” However, by that time the folk wisdom it may have reflected about the attraction of novelty and the exotic to young

people wanting to join the ranks of modernization and all it entailed was already dated. The exodus had already begun. Still, it was more lyrical and romantic to attribute the abrupt desertion of the family farm to an encounter with the famed center of European culture.

A century earlier even this romanticized explanation would not have had a lot of meaning. Obviously, at the time when Jefferson was concerned with the sustainability of the pastoral ideal, or even when Henry Adams was trying to make sense of the flow of history, very few Americans could afford to go to Paris. But if you had, once you got back to the United States where would you go? If you were Henry Adams you would stay in Boston, which had its own learned and cultural dimensions, or you might go to Washington, D.C. If you were among the educated elite, you could certainly be gainfully employed by a university or as a diplomat, but there weren't many of them nor any great hew and cry to fill empty positions-in-waiting. However, things were very different in the Progressive Era. All was motion. The job opportunities, and the adventures of the world being born anew, were in the cities. Families scattered and fragmented like never before. But the worst was yet to come.

As work became more anonymous and opaque, we needed other ways to speak *for* ourselves. That includes speaking *to* ourselves with the psychological assurances that we were doing alright with our own lives. It is also speaking with symbols to a larger community with which we couldn't have actual verbal, face-to-face conversations to establish that we were, indeed, successful at life. In a culture of relatively stable life-patterns, especially within the dimensions of pastoralism, there is often a simple congruence between the signatures of a life well-lived (according to what is possible to do in such a society) that would be affirmed by one's community, and the qualities of a life well-lived arrived at through individual spiritual and philosophical introspection. If one couldn't distinguish between honest reflection from within and social acknowledgement from without, we could very easily substitute the latter for the former. This is very considerably the condition of modernity and post-modernity, and it is an essential conflation driving the success (if indeed it does succeed in the long term) of the much heralded free market global economy, for reasons I hope to make clear.

Already by 1899, American economist Thorstein Veblen had coined the term “conspicuous consumption” to characterize the way the monied class expressed their worth. It wasn’t enough to simply have things in an increasingly anonymous society of professions, specialized and hidden work. The right kinds and amounts of physical property, and their profligate display, would announce the *de facto* aristocracy in a country that prided itself on not having an aristocracy. That is alright in the nineteenth century when the owners of corporations want to make sure they have properly announced their authority. But what happens when those oligarchies depend upon millions of employees who themselves are settling out in strata of relative wealth, education, expertise, and authority? Not everyone was a Carnegie, Rockefeller, or a Hearst. Why work so hard driving the economic engine, why work so hard for education and professional accreditation if you can’t distinguish yourself for those labors to the world, or at least your neighborhood?

Fortunately for the leisure class, the very things that were producing their wealth were the sale of the very sorts of things that could differentiate one person from another. The very icons that could tell the individual that he or she was a success, and receive the all important feedback from the rest of society that they were succeeding, were for sale! And this feedback loop ran faster and faster, epitomized by Alfred Sloan’s General Motors hierarchy and the annual model change. A Chevrolet sedan announced a young working-class household on its way up....to the next model. And the ladder in General Motors automobiles was well differentiated until perhaps the last quarter century. It went essentially from Chevrolet to Pontiac to Oldsmobile to Buick to Cadillac. If you were a “professional” you probably ought to at least be driving an Oldsmobile.

And of course, automobiles were simply one of many ways to announce yourself. But the automobile is also probably the single most significant fact on the ground to trace the trajectory of social values in this century. To say that Americans love their automobiles is an understatement of inestimable proportions. In truth, the total picture of time-for-money-for-goods and services, the fraction of time and effort that the average American citizen can account to being spent *out of their entire mortality* to the automobile is unknown. At least I can see no way to get any sort of accurate fix on it except to stand in awe of its

immensity.

It isn't just the price of purchasing an automobile, insurance and repairs, fuel, etc. If we count all the business that exists solely because the automobile demands it, we would be hard pressed to find any independent variables. The creation and maintenance of the amazing automobile infrastructure includes government agencies at every level; untold billions in physical assets in roadways, bridges, tunnels; and businesses that would not exist at all if not for the automobile. These businesses once included the mining of raw material and its shipment, the production of components and final assembly, aftermarket accessories, automobile dealerships, used car franchises, advertising, and of course the petroleum industry from raw material to refining to retail (filling stations). Note that I said that the attendant businesses *once* included these appendages. Not only have all of these businesses exploded since the 1930's, but we have added a host of others to the list that simply don't make sense without the automobile. To this must be added motels, fast food, a large chunk of the domestic tourist industry, and drive-through everything, including churches. Finally, the very physical construction of our communities are built primarily to accommodate the automobile so that for most people not living right in an urban core with good public transport, you simply can't get anywhere to do anything at all without an automobile. Have I left anything out?^{liii}

But this is a culture where time is money, and money measures who and what we are. The majority of working Americans spend more time behind their steering wheels than any other single spot, except perhaps in bed, and for some in a chair in front of a screen, television or computer. That time behind the wheel is, except for professional drivers, not time for which you are paid, but in the "time is money" equation this is also an expense. If it were possible to make a full accounting of all the ways that the American productive economy pays for the use of their automobiles and then converted that into some measure of average wage time, I would not be at all surprised if the answer came out to be something more than an eight hour work day! And that answer is completely absurd, since there are not more than twenty four hours in a day, we know we are at work for eight (many of us certain that we are doing something different there from just supporting our automobiles and their infrastructure, after all our

most expensive debt is our mortgage or rent) and we know we are sleeping for something like eight of them, if we are lucky. Which can only mean two things. Part of the remaining time we think we are doing something else actually involves cars, or we do lots of other things while we are driving them. At least one of the things we are doing while driving is announcing to the real community (the mobile one—that is, the one we see the most of) who we are.^{iv}

I have learned a lot from my students, about all sorts of things. I have great respect for them, and many of them are not only eager to learn for its own sake, to deepen their understandings and appreciations, but are also doing this under very strenuous conditions, working to support themselves while going to school. I needed to say this so that the following comments appear in the context of general observation, not as an indictment. The tuition at state-run universities is generally a bargain compared with private institutions, and our school is a bargain by a considerable margin even when compared to most other public institutions. Several years ago our administration tried to float a tuition surcharge, and put it up for student vote, with information about what could and could not be expected without some additional revenue. The maelstrom that followed was, to my knowledge, unprecedented in our little school's history. The issue became a line drawn in the sand for forces of good and evil, even among faculty. Again, for students of very modest means, especially single parents who must work as well, there is no doubt that seemingly small changes in a household budget can become "go/no-go" decisions. It is difficult to tell who was who in the ensuing firestorm. Perhaps some of those stridently against any fees were from well-to-do families, but were firmly convinced this was wrong out of empathy for others. I would hope that to be the case.

But I always sensed a strange disjuncture when I would come to work in the morning during that time. At that time I had just bought a new compact car, the first new car I had ever owned. (I know, what a pathetic martyr!) But I was always surprised by the number of student cars with sticker prices beyond what I could afford. Of course, there were also some old bombs, the kind of car I recognized from my student days, but there were plenty of late model sports cars, sport utility vehicles, and the like. Now, I know I am playing devil's advocate here, and I am just thinking out idle impressions. But I couldn't help wonder how many kids felt they had every right, and didn't even blink in this

assumption, to own and drive a thirty thousand dollar automobile, but were outraged at a proposed three hundred dollar fee. To be fair, perhaps these populations were completely separate, and if so my ruminations upon pulling into the parking lot were of no more substance than any visual discontinuity in one's personal landscape. The student body has a wide socio-economic variance, which I know from personal acquaintance with students whom I consider truly heroic in the burdens they have shouldered. Perhaps what I saw was just (laid out as a piece of installation art that would arrive every day in the parking lot) the automotive motif of disparity, and the surreality of our consumer culture.

I have, on several occasions, asked my students if they have ever just gone for a drive in their cars without needing to get anywhere. Now, this is a fairly ridiculous question, and appropriately I would at first get some unbelieving stares back as though they must not have quite understood what I said. When I asked "why," I got answers like, "I just drive to unwind sometimes," "it clears my head," "it really is one of the few spaces where I can be sure I have it to myself and nobody is going to bother me." And I know what they're talking about. I have sometimes felt that way myself.

Alright, so we like our cars, and we spend an amazing proportion of our mortality, our "life-capital," to use them. So what am I saying, that perhaps we should become a little more aware of lugging two tons-plus of metal around to move a single one hundred and fifty pound body, that maybe we should get out more—and not by getting in the car? No, that is not what I am saying. That much is so obvious that it doesn't need to be said. My fascination with the automobile as a cultural lens goes much deeper than that, because at its core I think it allows us to penetrate the meaning of what we do. I think it can illuminate much of what we are devoting, as a culture, most of our time and energy to doing, and what we are trying to get the rest of the world to do as well. And we are trying to get the rest of the world to follow us for two reasons. The most obvious is that our consumer culture needs consumers. The second reason is more subtle, but I think is even more profound. That is, we want company. Psychologically, if we can get everyone to agree on a similar path to success then it seems to put the ground under our feet, at least for a while. If we have lots of company in our pursuits, the very fact of similar assumptions relieves us of the truly difficult questions, such as "why do this instead of that."

It puts distance between our functional, daily selves, and any inner self that might be so careless of our sanity as to ask what we think of our own mortality and what we are doing with it.

And what is it that we do, that begs for the comfort of lots of others doing the same thing to avoid spiritual freefall? We pursue surrogates, and in their essence surrogates are all the same. A surrogate, as I wish to use the term here, is an action or thing which is a response to a very real felt need, but which is not the thing or action that the soul is asking for. The true fundamental quantities and qualities are those which, if supplied, not only satisfy the most apparent, or first-order, desires, but they also cultivate ever deeper-dimensional desires with ever deeper-dimensional rewards, one of which is always profound gratitude. We can reckon lots of surrogates that we pursue, which were not invented *sui generis* by the industrial society, but which have been so amplified by the historical particulars discussed above, that these surrogates have not yet completely run out of gas.

I must really take care not to sound too preachy, here, and I must continually remind myself that what I would really wish to do through this writing is examine and observe, to possibly open a different insight, to help myself and anyone else understand our fundamental quantities and qualities, our truest postulates, and to ask questions of them in the spirit of gratitude, not frustration or desperation. In other words, I am aiming primarily to open the windows of understanding enough for us to envision; completely accepting the certainty that different individuals, thinking and feeling with empathy and unencumbered by delusion, will nonetheless generate different visions. That, after all, is one of the glories of the human experience. We are not all here just to provide a critical mass of the species so that we don't go extinct. If my observations seem skewed, or saturated with some political or cultural agenda please forgive me. I am simply doing the best that I can with the intimations and visions I have participated in, and my fortunes and difficulties of particular experiences and associations.

I needed to say this now, at this juncture, before continuing, and it is my sincere hope that my writing aids in positive reflection, not to be used as ammunition in pitched battles between any groups certain that they have it

right, once and for all. Any such motive will have missed the true feeling behind my words. I don't think any of us has it "right," as some fixed point, not because I think we have all got it wrong, but rather because I tend to believe in the potential of the evolution of understandings. And that means, among other things, that wherever we have arrived, individually or collectively, is where we ought to be. We create our own starting points, of what it is possible to think and do, because of where we are. However, part of that glory of human experience is awareness. If anything can be accounted as wrong it is to deliberately waste wisdom. We need to seek wisdom, and seek to be wise together, and then discover what new wisdoms are available to us in our new landscapes.

I hope this discussion of the power of surrogates does not just sound like an old-school moralist. That does not mean that I consider these reflects to have no moral correlates, consequences, or responsibilities that is the stuff of the very material philosophies which have given us the intellectual tools to blithely hollow out our spiritual lives, especially in our communities of commerce and politics. What I mean by "old-school moralisms," are the sorts of dispositions that yield an array of simplistic dismissals for actual or perceived problems with society. Some of the most pliable (not affected by critical examination) have familiar preambles e.g., the past was always 'better,' in some way; any of the myriad complaints about "kids these days"; or the millennialist sentiments that the whole world is rotting like decaying garbage because we are all stuck in some cosmic drama that we are constrained to play out to the final scene; etc.

Without recognizing what our true desires and best fulfillments may be, surrogates will come screaming in to fill the void. If we fail to realize the power of surrogate needs filling in for real ones, we might just waste time, at least our mortalities, and that is a shame considering the alternative. There are some who tend to think that our present inclinations as a culture and a planet, may provide their own correctives. In other words, in some ways of thinking, we will all be forced to become ecologically aware, for example, as the evidence of not living sustainably comes washing up on our shores, infecting our food supply, etc. Then, when we can't get away from our own waste we will be constrained to think respectfully of this world.

I don't know about that, but in a way I really hope this is not the case. And I

don't simply mean the obvious, namely that I hope we will not bring ourselves to the brink of disaster before we bring ourselves to our senses. What I mean is that I think it is an ignoble proposition that the only way for us to act outside our own narrow interests, is when the larger world comes crashing in and threatens to strip us of our own narrow interest. And what I find most ignoble about this, is that it represents just the latest version of simplistic Enlightenment philosophy, which certainly has brought us amazing knowledge, but not necessarily wisdom. It is simply moving from the clockwork universe and the "invisible hand" of Adam Smith, to the next level of "getting things right," not due to any higher sensibility that may pull us, individually and collectively, to be more giving, more compassionate, more considerate and less acquisitive, but just irrevocably, because, after all, "it's the law."

If we are even the least bit conscious, when we see toxins piling up in our own back yard, we will become afraid and angry, and if enough of us do that than we will, as a society, become more ecologically minded. And our disposition towards the biosphere are just one example. Our culture is filled with experts of every stripe who are convinced that systems of law which must rest at an immediate level of "enlightened self interest" will act as mechanisms, if properly adjusted and with the right feedback loops, so that we will all stop doing the "bad stuff," that populations fear. Societies absolutely need laws. We can't wait for Plato's "Philosopher King" to take over. Furthermore, societies are, in fact, populated with individuals of all ages, and all levels of psychological and moral development which don't always comport with their age. Yes, society is messy. We all do have to live together. But I find it depressing to entertain the thought that none of us, or most of us as we mature, can be counted upon to act through altruism, compassion, empathy, and maturing levels of wisdom through honest reflection.

I know that the social-progressive mechanists could trot out case after case, whether in ecology or the machinations of war or biases of every sort, that could be marshaled in testament that we really are just billions of stimulus-response organisms. But I also know of far too many examples, up close and personal, giving eloquent testimony that we are not all that way, that we don't have to be that way. In fact, to act only from the most immediate self interest is not the true human condition at all, but evidence of spiritual amputation and anesthesia. That

is anesthesia in its most literal sense to be cut off from aesthetic.

In considering our dependence on surrogates instead of authenticity, the drug analogy of anesthesia is actually quite apt. We know pretty well, from modern neuroscience, what many stimulants and opiates do in the body and brain. We can map what lights up, which synapses, receptors and transmitters, and which clusters of the brain are engaged when things like cocaine or heroin circulate. We know, at least in the flatland projection of the physical correlates in the body, when an individual under a functional MRI scan is sensing extreme pleasure, pain, anxiety, visual imagery, calm, and on and on. We also know that opiates and stimulants, to name just two broad classes of drugs, are not merely a potential threat to the physical body in perceptible ways, but become psychologically damaging as well. If they are used as a surrogate placeholder for an authentic need in one's life, many of these substances require their usage at increasing dosages and greater frequency. Again, we can argue this case from neurobiology. We can actually map the tolerances build up, we can see the atrophy of brain receptors or the waning of the body's own ability to produce its own endorphins, or whatever.

I would suggest that this is a physical observation that does have its own validity, but that there is a psychical element often involved. If one feels one's existence is flat and colorless and then ingests some euphoria-inducing concoction, the stimulation of the pleasure centers is intense in very large degree because that state of mind contrasts so starkly with the undifferentiated state of ennui that preceded it. And so the effect of increased dependence is not simply a matter of an increasing physical tolerance to the substance's effects; it is also a matter of trying to recapture the intense pleasure DIFFERENCE one first experienced. Our five physical senses seem predisposed not so much to notice unchanging states, but rather differences in those states. I would argue here that our psychological perceptions of inner states follow a similar pattern. Even in the nineteenth century, physiologists were very interested in understanding and measuring these threshold differences of physical perception.

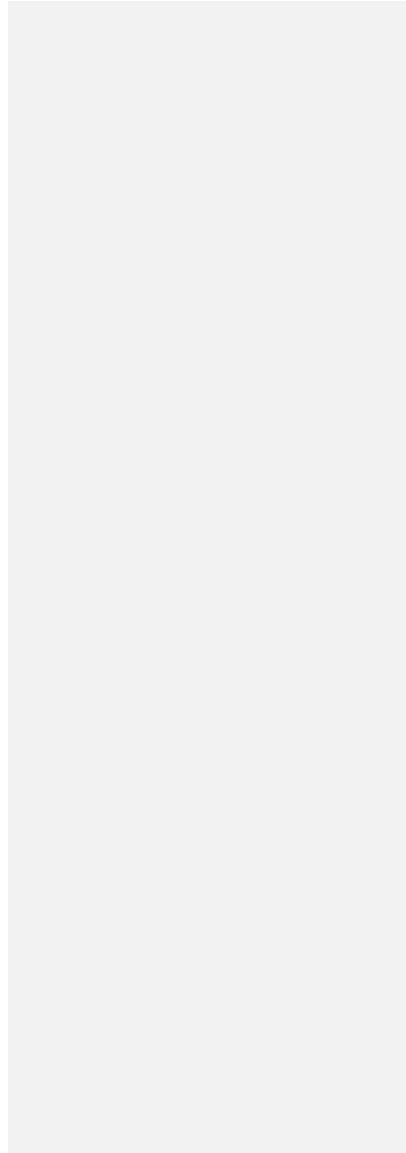
If you place your hand in a cup of warm water you immediately notice that the temperature differs from the air around it. But in a very short time, you won't be able to tell much of anything, except the visual perception that your hand is in water. If you change the temperature of the water, by adding a little

hot water or an ice cube, you will notice that for a while until you become acclimated to it. And again, these are within reasonable limits of ranges where the body is not jeopardized by burning or freezing. If you are placed in a dark room and someone lights a candle behind you, you will notice the difference between utter darkness and dim illumination. But if there are already one hundred candles lighted in the room, you won't notice the difference in illumination of the one hundred and first being added, even though the total difference in illumination between the latter case and the first.

Furthermore, it is not only a non-linear proportionality that is the essence of the discrimination capability of our senses, but time is also involved. You would notice if the water temperature in the cup were to change from seventy degrees to eighty degrees in one second. But if this were a continual, regular increase over half an hour, you wouldn't notice it. So even from a physiological standpoint we are predisposed to notice, first of all change, not stasis. Secondly, we are more aware of greater proportional changes of degree (of any stimulus) than simply changes in the degree of stimulus. And thirdly, we are even more aware of sensation when it is not only changing, and the proportional change of intensity is greater, but when the *rate* of change in time is greater. These seem to be the hierarchies of stimulus in the order that we take notice of them, as opposed to assigning them to parts of our environment that do not require our attention. I would like to suggest that there is a similar correlate beyond sensory input, but for other things that rise above the great oceans of "what is" and seem to demand our attention.

If we lack the sensory response of good company and friends, meaningful work and a sense of contribution, we may very well substitute the merely physiological response of neurological euphoria or disconnection. The paleobiologist would explain that these physiological-neurological urges are extremely valuable products of evolution, which produced such survival traits as sociability and mutuality, aversion and protective response, and reproduction and mate selection. I don't know. Maybe they did arrive that way. But however they got here, a description can only describe. An intervention (prodding the brain in one way or another to produce euphoria, for instance) can only reveal a connection. I hold out for spaceland, for upward not northward. I hold out that,

however elaborate our explanations become, they are only this world's correlates to something greater which, for lack of a more precise word, I call the spiritual. I hold out for this not out of desperation, but because it feels true to my very best intimations. I hold out that the spiritual dimension to our existence is real, not because I feel diminished if I don't, but because, like A. Square following his experience of other dimensions, I would feel like a liar.



Notes for Chapter 4

xlvi The strangest, most bizarre example I have ever heard about the reduction of anything to dollar-value came to me by way of my good friend, Kendall Haven. Over the years Ken has worn many hats, and is currently a professional storyteller and writer. However, in the 1970s he was a scientist for the Department of Energy, Lawrence-Berkeley Labs. Specifically, he worked as an environmental scientist in LBL's Energy and Environment Division, and was the regional studies group leader when he left. Among the sorts of things he and his colleagues did was to make environmental assessments of proposed projects, such as a power station, in the California Coastal area. We are all used to the idea of environmental impact statements being required for all sorts of things these days, ranging from pollution and its effects of human populations and other layers of the biosphere. However, beginning in the early 1970s, these studies, at least at the DOE, even included more difficult concepts, such as the aesthetic changes to the landscape incurred by certain construction projects. The northern California coast is one of the most magnificently beautiful areas on earth, so one might be very glad that such considerations were included such reports, but how did they do this?

Ken's group used rubrics developed by the Bureau of Land Management, beginning in 1972, and which became further codified with the passage of the Coastal Zone Management Act in 1974. The first unit of measurement they used in assessing the aesthetic value of a landscape-altering proposal was called the "Recreation Day." This is a dollar value assigned to the daily useage of a portion of the landscape for recreation (camping, sightseeing, etc.) Soon other units were added to the spreadsheet, including the value to an individual for a specific amount of time, called the "Recreator Day." Of course, when considering this, one must account for the aesthetic differences an individual may attribute to different natural landscapes, so they then had to add in another factor called "Viewshed," and of course, "Viewshed Assessments." All of these had to be assigned a dollar value. How do you put a dollar value on these increasingly baroque categories? Well, you couldn't just assign one by fiat, that would defy the basic premises of good social engineering. These dollar values were obtained by doing surveys, asking people how much, in dollars, these aesthetics were worth, and then weighting and amalgamating the results.

And the process went even further than this, since someone living right there at the proposed site would have a very different idea from others in the population. Ultimately, then, the guidelines for the worth of a project versus its aesthetic (and we aren't even talking about the biological impact) should include others. These data included things called "Opportunity Costs," and were again obtained by sampling questionnaires. For instance, if one were considering a project that might affect the complexion of the Grand Canyon, as an example, the actual project may be planned far downstream from where its impact might be felt. In fact, it might even be felt on the east coast! How? Well, you might sample the opinion of people in New York who have never been to the Grand Canyon, and might not ever go. However, one must consider that a New Yorker would at least have in their minds that at some time in life, they would have the "option to go." Therefore, you would do some sampling asking what dollar value a New Yorker places on

the possible aesthetic value they would place on the Grand Canyon, by virtue of the fact that they may choose to visit the place at some time.

The process seems not just a shaky proposition, but positively surreal. But this is the only way one can make decisions from an empirical, seemingly dispassionate standpoint. When we turn over our difficult choices to panels of experts, a long and engrained tradition in this country, they have no choice but to reduce all variables to some kind of a common denominator, and it speaks volumes about our culture that the only one we can locate is money.

It is also remarkable that among laissez faire economists these sorts of translations are postulated as obvious laws with more insistence than ever before, and that any diversion from the principle of the "dollar as common denominator," will not only get our society into serious trouble, but it will catapult us into the very worst of Dark Ages-Part II. One example can be found in Steven Landsburg's *The Armchair Economist: economics and everyday life*, Free Press, 1993. Chapter 24 is titled "Why I Am Not an Environmentalist: the science of economics versus the religion of ecology," and in it he decries the catechisms his preschool daughter had to endure about recycling and care for the earth as the most benighted form of forced religious doctrine, for which he, as father, was constrained regularly to provide the deprogramming. "The naive environmentalism of my daughter's preschool is a force-fed potpourri of myth, superstition, and ritual that has much in common with the least reputable varieties of religious Fundamentalism. The antidote to bad religion is good science. The antidote to astrology is the scientific method, the antidote to naive creationism is evolutionary biology, and the antidote to naive environmentalism is economics. Economics is the science of competing preferences. Environmentalism goes beyond science when it elevates matters of preference to matters of morality. (pp. 223-24)

^{xviii} "Metaphors matter"—This is a most important concept, namely the ways in which we comparatively value all sorts of incommensurable things: e.g., money; satisfaction; progress; the psychic diversions of mere change and motion as good in and of themselves; professional titles as an indication of success and significance; belonging to a group of fellow believers as an indication of our correctness of vision; etc. And the essential tool in these incommensurate comparisons, and their ultimate reduction, often, to money, are metaphoric intermediaries. John Hopkins historian JoAnne Brown has recently finished a book, *Matters of Life and Death: Political Hygiene and Historical Memory in the United States, 1865-1945*, (not yet published), in which she examines the preeminence of the metaphors used to mobilize public sentiment, including its manifold distortions that tap into other extant sentiments of a popular culture of the times, and the extraordinary fluidity that these metaphors have in adapting themselves to seemingly distinct urges of widely divergent groups with their own agendas. See "Why Metaphor Matters," an interview with Professor Brown by Dale Keiger in Johns Hopkins Magazine, February, 1998.

Another interesting tidbit I recently ran across was a book review titled, "The High Priest of Hype," by Marilyn Harris in *Business Week*, August 17, 1998. She is reviewing the book, *The Father of Spin: Edward Bernays and the Birth of Public Relations*, by Larry

Tye, Crown, 1998. Harris finds significant shortfalls in the execution of this book in the author's inability to synthesize the data in search of support for his purported theme, which are stated as using Bernay's life "as a prism to understand the evolution of the craft of public relations and how it came to play such a critical—and sometimes insidious—role in American life." If, as Harris maintains, Tye doesn't answer this question, there was one other quote from the book that caught my attention. Bernay's was a nephew of Sigmund Freud, and a "contemporary observer observed that while Freud 'is interested in releasing (and directing) the pent-up libido of the individual, his American nephew is engaged in releasing (and directing) the suppressed desires of the crowd.'"

Another example that has recently made a great impression upon me (out of many possible) illustrating the ability to enlist and mutate one set of desires into something completely different and to great effect. The recent excellent study of millennialisms through histories and across cultures, *The End of Time: faith and fear in the shadow of the millennium*, by Damian Thompson, University of New England Press, 1996, abounds with such examples. One portion of the study that I found breathtaking is the chapter "Seoul: The Apocalyptic City." The amazing growth of fundamentalist Christianity in Seoul is analyzed in detail, but especially through the particulars of the dogma which melds together such seeming incompatibilities as "end time;" predictions of the golden epoch centering in South Korea; an unbridled enthusiasm for participation in the global marketplace; and prophecies of the rapidly approaching technological and material-wealth dominance of South Korea over Japan!

Of course there are other truly grand metaphors to be found in cultural history, and I have always found the evolution of the metaphors of time to be always wonderful for students to contemplate, and in this connection I am fond of Edward T. Hall's *The Dance of Life: the other dimension of time*, Anchor Press/Doubleday, 1984; and David S. Landes' *Revolution in Time: clocks and the making of the modern world*, Harvard University Press, 1983. Other monographs have addressed the potent symbolism of projective military power (e.g., Carlo Cipolla's, *Guns, Sails, and Empires*, Sunflower Univ. Press, 1985); architectures (e.g. Alan Trachtenberg's *Brooklyn Bridge: fact and symbol*, University of Chicago, 1979, and David P. Billington's *The Tower and the Bridge*, Princeton University Press, 1985); the history of space exploration (e.g. Walter A. McDougall's *The Heavens and the Earth: a political history of the space age*, Basic Books, 1985); and even the engineering mindset itself (see Thomas P. Hughes' *American Genesis: a century of invention and technological enthusiasm*, Penguin, 1989).

^{xlviii} For a wonderfully written introduction on the invention of money and its meaning, I recommend Heather Pringle's article "The Cradle of Cash: when money arose in the ancient cities of Mesopotamia, it profoundly and permanently changed civilization," in *Discover Magazine*, October, 1998.

^{xlix} The attractive Enlightenment disposition of finding the equivalents of laws of nature, like gravity, that once understood and incorporated into our social systems will, of their own accord, solve our problems and constrain us to be "better" individuals and societies by acting within that "enlightened self-interest" has never left us, and is if anything even more sought after today. This hardly needs to be buttressed for anyone who even

occasionally listens to the pronouncements of our political leaders and panels of experts. It may have been Thomas Hobbes who, in 1651, first reached for an overarching "theory of everything," including human affairs, based upon the material laws of matter in motion in his *Leviathan; or, The Matter, Forme, and Power of a Common-wealth Ecclesiasticall and Civill*. To understand the revolutionary power of such an argument, see George B. Dyson's *Darwin among the Machines: the evolution of global intelligence*, Perseus Books, 1997, pp. 1-13.

I think (if I were of a mind to) I could easily do commissioned speech writing for the White House, State Department, Commerce, and several others, not by dint of my being a great speech writer, but simply that the formulas, especially from the administrations of Reagan to the present are so familiar.

For example:

Q: "Madam Secretary: why is it that the President is urging Congress to grant fast-track approval of most-favored nation trading status to China (for example) at the very time when we have strong evidence, both by our own sources and by non-governmental organizations (NGOs) that human rights abuses continue unabated, that prison labor is being used to produce goods for export, and that political prisoners continue to be arrested, held without due process, and even executed."

A: "I'm glad you asked that question, and believe me it is very much on the mind of the President and is a formal part of our diplomatic initiatives. However, first of all we cannot act disproportionately in our responses to any sovereign nation. We continue diplomatic efforts to promote the respect of basic human rights. At the same time we recognize that China (for example) is a developing nation with enormous hurdles to overcome in becoming, fully, part of the community of nations. And it is in this larger mission of integrating China into the global market economy that, in fact, we find the greatest hope of liberalizing the social democratic forces within their country. This is by far the most effective way to encourage, and even to guarantee, the ultimate respect for human rights and human expression. We are not, as some of you have suggested, turning our backs on the abuses of human rights. Rather, as we see it, a pragmatic approach with real hope of effecting these changes is far better than a merely ideological policy that would isolate China, and potentially make things much worse. While I am not making a direct connection between human rights and commercial concerns, I need not remind all of you that mainland China is the home of one-fourth of the world's population and is on the verge of perhaps the most extraordinary economic and technological advancement in the twenty-first century. It would be nothing more than foolhardy for us to ignore the potential benefits of good relations between our two countries as we approach the next century."

Apparently a recently published book tries to make the case that, historically, democratic republics do not make war against each other, in essence also producing a kind of Newtonian "law of nature" equivalent to the systems approach toward eliminating a great evil (war). See Michael Mandelbaum's review of Spencer Weart's *Never At War: why democracies will not fight one another*, Yale Univ. Press, 1998, in *The New York Times Book Review*, Sept. 20, 1998, p. 17.

¹ The best descriptions I know of the “pastoral ideal” are found in Leo Marx’s *The Machine in the Garden: technology and the pastoral ideal in America*, Oxford Univ. Press, 1964; and John F. Kasson’s *Civilizing the Machine: technology and republican values in America, 1776-1900*, Penguin, 1984. One finds many of these foundational ideas among the many contemporary communitarian movements. See also Robert Bellah, et. al., *Habits of the Heart: individualism and commitment in American life*, University of California Press, 1985; and R. Bellah, et. al., *The Good Society*, Vintage, 1992.

ⁱⁱ On several occasions I have asked my students to describe their home communities. The descriptions vary greatly, of course, with some students having a few examples of childhood groups of best friends but no idea of their parents’ sense of community. I recall one student’s description of a disaster that occurred on her block as a child. Fire swept through the neighborhood, taking out a number of houses and sparing others. What followed was a pattern we often see when the hardship of natural disaster strikes. In the aftermath everyone helped see to the welfare of their neighbors, among whom there previously had been no remarkable interaction. Rather than packing neighbors off to the high school gymnasium to find shelter, neighbors took each other into their own homes, apparently for weeks. As the enclave found normalcy again, this student reported, they formed a really tightly knit neighborhood. They became close friends, they held street parties in commemoration of the fire, and when someone moved away, it was not some anonymous disappearance but considered a very real loss to the neighborhood. After about ten years had passed, however, few of the original neighbors who had suffered together were left, and the new families that moved in never were grafted in (through whose fault, I don’t know) as replacements in a precious community, and the once grand association became a mere memory.

These sorts of association by outside imperative are common, and they frequently produce the sorts of friendships that somehow seem deeper and more lasting than any others. Combat veterans often tell similar stories. One of my favorite books for illuminating the experiences of marginalized Americans at the turn of the twentieth century is *The Life Stories of Undistinguished Americans, as told by themselves*, Hamilton Holt, ed., Routledge, 1990. The first vignette is “The life story of a Lithuanian,” (Antanas Kaztauskis), who as a young man emigrated from his homeland to Chicago, and worked in the infamous meatpacking industry. He tells his story very matter-of-factly, and yet the hardscrabble existence he eaked out is most strenuous, including the intense loneliness, and the repeated abuses such as the payoffs to police necessary to get a position in the workline closer to the plant to ensure a day’s works. Soon, Mr. Kaztauskis is becoming street-smart, and suspicious of nearly everyone in authority, and for very good reasons. When he is brought to a union meeting, there is a natural hostility among different ethnic groups, since they suspect each other of stealing jobs from the other, and our narrator is particularly suspicious of the Irish. However, he soon discovers a genuine trust and cross-ethnic camaraderie in his union membership.

“The union is doing another good thing. It is combining all the nationalities. The night I joined the Cattle Butcher’s Union I was led into the room by a negro member. With me were Bohemians, Germans, and Poles, and Mike Donnelly, the President , is

an Irishman. He spoke to us in English and then three interpreters told us what he said. We swore to be loyal to our union above everything else except the country, the city, and the State—to be faithful to each other—to protect the women workers—to do our best to understand the history of the labor movement, and to do all we could to help it on. Since then I have gone there every two weeks and I help the movement by being an interpreter for the other Lithuanians who come in. That is why I have learned to speak and write good English. The others do not need me long. They soon learn English, too, and when they have done that they are quickly becoming Americans....So this is why I joined the labor union. There are many better stories than mine, for my story is very common. There are thousands of immigrants like me. Over 300,000 immigrants have been organized in the last three years by the American Federation of Labor. The immigrants are glad to be organized if the leaders are as honest as Mike Donnelly is. You must get money to live well, and to get money you must combine. I cannot bargain alone with the Meat Trust. I tried it and it does not work." (p.20)

Before I came across this book, I had known of the labor movements of the late nineteenth and twentieth centuries. I had heard of the brutality of the conditions and the inequities of the workers. But I still didn't quite grasp the absolute love for the union communities, just how central the unions were in defining who these workers felt themselves to be, and the near religious devotion to them that seemed to be part of the cultural landscape several generations ago, until I read this simple, homely, first-person story.

Finally, for the little anecdote on page 98 about Wolfgang Pauli's dismissal of an idea being "not even wrong," I am indebted to Timothy Ferris' wonderful book *The Whole Shebang: a state-of-the-universe(s) report*, Touchstone, 1998, p. 82. As an undergraduate I had heard the same quote, but I remembered it as being attributed to another physicist of the same period, Paul A.M. Dirac.

ⁱⁱⁱ There are several important sources that examined the rapid and complicated transformations in earning livings between the mid-nineteenth and mid-twentieth centuries in America. I still feel that the single best synthesis of the broad sweep of changes is Daniel Boorstin's classic *The Americans: the democratic experience*, Vintage, 1973. Of especial importance here are: Part IV, "The Urban Quest for Place"; Part V, "Leveling Times and Places"; Part VI, "Mass Producing the Moment"; and Part VII, "The Thinner Life of Things." For a specific treatment of the rise of leisure inventions among the working class and the social stratifications, see Roy Rosenzweig's *Eight Hours for What We Will: workers and leisure in an industrial city, 1870-1920*, Cambridge University Press, 1983. Also, for the amazing understanding by certain prominent entrepreneurs of the unfolding cultural forces and their potentials, see John F. Kasson's *Amusing the Million: Coney Island at the turn of the century*, Hill and Wang, 1978.

ⁱⁱⁱⁱ For the search among the middle class for meaning there are some exceptional studies. Nothing can compare to the contemporaneous sociological study of Muncie Indiana by Robert S. Lynd and Helen Merrell Lynd, *Middletown: a study in modern American culture*, first published in 1929 (Harcourt Brace Jovanovich) which is still reprinted as an

unprecedented and benchmark-setting book in sociological anthropology. It is truly remarkable how the concerns of average citizens in mid-America at that time can be seen in today's society. It would be useless to attempt a summary; this book simply needs to be read to be appreciated.

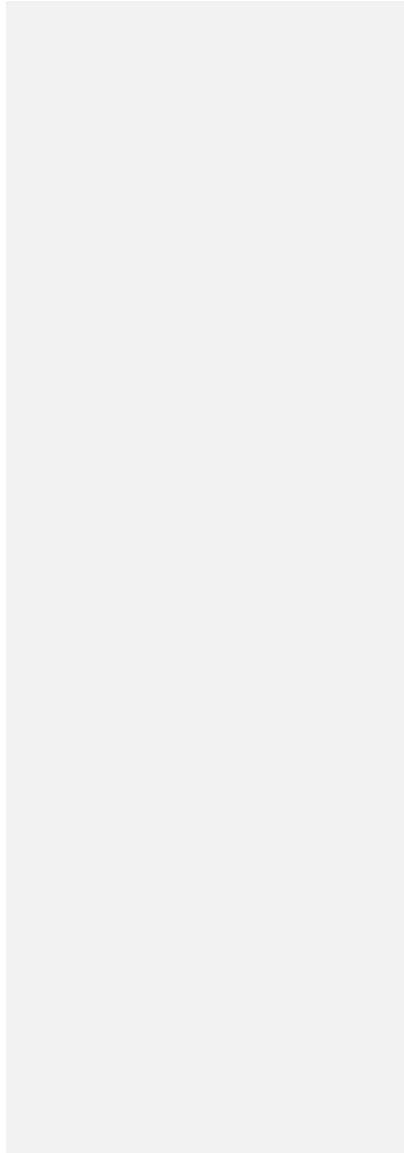
For the rising concern with identity-by-profession (e.g., "career") and the attendant mission of higher education to provide certificates of that identity, see Burton J. Bledstein's *The Culture of Professionalism: the middle class and the development of higher education in America*, Norton, 1978; and Laurence R. Vesey's *The Emergence of the American University*, University of Chicago Press, 1965. For the profession of marketing, whose specialty was in deciphering the uncertainties of American identity and exploit them, see Roland Marchand's *Advertising the American Dream: making way for modernity, 1920-1940*, University of California Press, 1986.

For an extension of the fluidity of meaning and identity into the current period, see Kenneth J. Gergen's *The Saturated Self: dilemmas of identity in contemporary life*, Basic Books, 1991. Two other books attempt, with varying success, to both account for this fluidity and to understand the means possible to reconstitute our understanding of ourselves and navigate the landscape, which they do not see changing its trajectory. See Robert Jay Lifton's *The Protean Self: human resilience in an age of fragmentation*, Basic Books, 1993; and Walter Truett Anderson's *The Future of the Self: inventing the Postmodern Person*, Penguin Putnam, 1997. Of the two, actually, I feel that Lifton's is a bit more considered. He is working from a research background of several decade's investigations into cultures in the most profound crises of existence imaginable (e.g., Holocaust studies, Cambodia in the wake of Pol Pot). And finally, I think that an intriguing and well-written companion to the preceding two books is Peter D. Kramer's *Listening to Prozac: a psychiatrist explores antidepressant drugs and the remaking of the self*, Viking, 1993.

In my example of the automobile as a touchstone to creating identity, it would be hard to find two examples more different in this respect during the early years of the automobile industry than Henry Ford and Alfred Sloan. Ford is one of the most remarkable figures in the twentieth century, for a variety of reasons. He was very self-consciously a social engineer, and his revolutionary \$5/day wage and the low cost of his cars were deliberate attempts to have the very people who worked on his assembly lines be the sort of population who could own his car. Sloan's vision of the automobile as a constantly moving "carrot" for consumer identity desires wound up being more in touch with the cultural currents. See, Stuart Leslie's *Boss Kettering: the wizard of General Motors*, Columbia Univ. Press, 1983, especially the chapter "Keeping the Customer Dissatisfied." For an analysis of Ford, see Thomas Hughes' *American Genesis*, op. cit., chapter 5, "Taylorism + Fordism = Americanism."

^{iv} It is impossible to overestimate the importance of "car culture" in absolutely remaking our physical landscapes, and with it the rhythms and patterns that we now consider absolutely normal and indispensable. This coincided nicely with a much longer tradition of defining a new middle ground in the American landscape, the suburbs. For a history of that movement, see Kenneth T. Jackson's *Crabgrass Frontier: the suburbanization of the United States*, Oxford University Press, 1985. For a prehistory to Crabgrass Frontier, see

Mary P. Ryan's *The Cradle of the Middle Class: the family in Oneida County, New York, 1790-1865*, Cambridge University Press, 1981. For a contemporary analysis of what we are now cemented into, see James Howard Kunstler's *The Geography of Nowhere: the rise and decline of America's man-made landscape*, Touchstone, 1993. For a more general study of the meaning of different kinds of space for the human social psyche, see Winifred Gallagher's *The Power of Place: how our surroundings shape our thoughts, emotions, and actions*, HarperPerennial, 1993; and Tony Hiss' *The Experience of Place: a new way of looking at and dealing with our radically changing cities and countryside*, Vintage, 1990.



Chapter 5: *A World of Acceleration (or, why jump from a window?)*

To the extent that we are pursuing surrogates, what are they? The easy conclusion is the accumulation of stuff and money. And the propensity toward acquisitiveness has a history, represented somewhere by some people, as long as the existence of humankind so far as we can tell. So, by itself, this doesn't tell us very much that we don't already know. Neither does the fact that acquisitiveness beyond the needs of comfort is a surrogate for other things, such as power, authority, or even mating privileges tell us much that might be peculiar to our times, though it remains a timeless aspect of wisdom to be aware of this. In fact, at times the relative wealth of an individual or a nation has also been conflated with its spiritual worthiness, its divine selection, and a signature that it was called upon to keep doing what it was already doing. This is also most important to keep in mind as a historical referent.

What I think distinguishes the leading, and rising, economic powers of today, and the disposition of the individuals making their ways in those economies, is the attraction of motion, and not simply motion but *accelerated* motion a difference in our sensations. Of course, I am not speaking only of physical motion, but that is included and that is why the automobile seems such a potent and informing signature of our condition. In the brave new world of global market economies, we get prognoses and diagnoses daily on the news and in leading-edge disquisitions from experts who sometimes really do know a lot. We label these economic and social analysts from radical left, to radical right, to center, depending largely, we suppose, on the degree to which they favor tinkering with the machine over letting the machine run by itself.

But the fact is that, even though the machine has got humans in it who can change their minds and dispositions, there remains the fundamental assumption that we are dealing with mechanism here, and the very word mechanism is often invoked when talking about market dynamics. And, as we have seen, this description is a direct result of our understandable awe of Enlightenment thinking, and the Promethean marvels that followed. This mechanism may

misbehave (go chaotic, or worse, random) for a while, but it usually doesn't, and if it does "misbehave," everyone agrees that such conditions warrant attention and usually adjustment. The most wondrous aspect of this worldview is that, like a law of nature, it will prevail and bring us into harmony with its fundamental truths. It relieves us of responsibility, especially communal behavior, and if the machine does misbehave it need not concern the majority of us. Like a locomotive built upon sound scientific and engineering principles, only the technicians need be concerned with occasional lubrication and adjustment.

i) *A brief excursion by way of physics*

I have so far made great use of the metaphor of the machine. In actual historical appreciation of how market capitalism has been understood, this is so ingrained that it is not even a metaphor, as long as one does not confine the definition of a machine only to a chunk of iron with pistons and wheels. Instead of Newton's laws of motion (which is solely about how masses move when they are pushed or pulled), we can directly substitute the laws of Adam Smith, which predict how wealth moves when pushed or pulled by supply and demand.^{lv} The cross-over from Newton to Smith, including everything from 1) inertia, 2) friction, and 3) acceleration are not just metaphors, but directly translatable into 1) unrealized demand, 2) the absence of laissez-faire government, and lastly 3) the unfettered market economy. Whether or not a modern economist knows this connection to Newton's physics is not important, because they use the same rules in translation anyway. Therefore, economists would do well to know something about the physics behind the economics to understand what it implies. And it turns out that, whatever you may have heard about physics as a subject to be avoided at all costs in school, its essentials, and even some of its more abstract concepts, are not all that hard to grasp. In fact, I have found it vastly more transparent than economic theory, and it just may be the easiest way for us to explore, without all the jargon of international finance, what is going on. This book is not intended to be a primer on the high school physics you may have never taken, but with your indulgence I think the next few pages will best set the stage for understanding this great economic enterprise we are all

supposed to be devoting our livelihoods, if not our lives, to preserving and expanding.

The current situation of predicting market behavior is mathematically a bit like predicting the weather. At one time scientists thought it might, in theory, actually be able to predict something as complex as weather and climate if one simply had enough variables accounted for. In its most sledgehammer version, you might have to know the exact position and velocity of every molecule at a given instant, and the future input of energy from the sun, and run as many simultaneous equations as there are discrete particles. Well, no one actually gave that much thought except for philosophers who wanted to prove whether or not there needed to be a creator or not. But with the increasing sophistication of physical insights and mathematical techniques like thermodynamics and fluid mechanics, it still might be possible to divide the atmosphere and the earth's surface into enough blobs of stuff, and trace their interactions as though they were discrete bodies, and then maybe your calculations might just be possible by computer, and reasonably accurate for more than a few hours at a time.

But already in the 1960s this approach as well proved inadequate, as it was discovered that small changes do not always tend to return to their original stable values, or equilibria, but might actually send whole systems zooming off to vary for a while around a new equilibrium condition, such as temperature, precipitation, energy capture, etc. This new stable equilibrium, around which the measured values now make their usual oscillations of values, is called a *strange attractor*. The insight was that things in complex systems like the atmosphere (or, as it turns out, in the human body) don't always return to normal, if what you mean is what you already *have* in terms of annual temperature, annual rainfall, average number of tropical storms, etc. Nonetheless, complex systems with natural feedback mechanisms *DO* find *SOME* new equilibrium state, and then may oscillate around those new conditions.

Think of a marble rolling in a salad bowl. This is the case of the "spherical pendulum" in classical mechanics. Left by itself, the marble lies at the lowest point in the bowl, in the middle (if it's symmetrical), and at rest. If you swirl the bowl around, or reach in and push the marble, it will start rolling around, not just around in a circle but also curving up and down. Eventually (when you stop

pushing it!) its oscillating motions will get less and less until it loses all its energy (to rolling friction and sound) and it lies still at the bottom, in the middle again. Now imagine you have your kitchen table-top covered with salad bowls, with the ball bearing in one of them, maybe in the middle of your table, and push it around. If you don't push it too hard, it will swirl around in the bowl where you put it. If you really give it a good shove, it might move with such energy that it hops right out of that bowl, but lands in another bowl, where it then swings around wildly for a while, but, left alone, will eventually reduce its oscillations and rest in the center of that bowl.

These bowls are a rough analogy to the aforementioned strange attractors, and every one of the bowls represents some set of conditions around which stable oscillations (think variations) can occur, be corrected (to the parameters of this new attractor) by feedback mechanisms. What I have done is give an analogy that visualizes the effect of "not necessarily everything returning to normal" from a kitchen table example of classical physics. But within this model, you are not really surprised when you give this ball bearing such a shove that it hops out and into another bowl. In chaos theory what is surprising is that seemingly innocent inputs can induce amplifying effects beyond the ability of the feedback loops in the current equilibrium system to contain itself to those conditions. That is one reason why it isn't foolish to consider unpredictable results from adding carbon dioxide to the atmosphere. The earth's weather system will always, over the long run (until the sun runs out of fuel) oscillate around some set of equilibrium conditions involving temperature, humidity, precipitation, prevailing winds. The point is that exactly WHICH equilibrium values it settles on, we don't know. And it may not take much change to have us settled into a fairly unpleasant strange attractor. We speculate that Mars may once have been in a stable equilibrium with conditions favorable to the evolution of life. Right now, it is also in a stable equilibrium. Big difference!

I have started with analogies into seemingly simply physical phenomena, but which you can still see at the level of a kitchen table experiment. In order to fully appreciate the informing analogies of physical dynamics to socio-economic dynamics, we need to look at what are actually simpler examples because these simpler examples are the ones that market dynamics have been thought to obey throughout most of economic theorizing, and I ask the reader's patience in

establishing just a few more examples. Here is a simple one that can actually be done on your kitchen table with much less clutter. Let us suppose that you can clear off an area of your kitchen counter of about six feet long, or you have a long, smooth tabletop, or use the floor, as long as it doesn't have a carpet on it. Now take a little flat piece of wood. A ruler will do nicely, as long as it is one of those cheap plastic ones with the indented groove running down its length.

Here is the experiment. Lay the ruler flat on the surface and place the marble on the ruler. If your surface (counter, table or floor) is level, and you gently place the marble in the middle of the ruler, it should stay put where you placed it. If you now hold the marble still while you gently slide the ruler-marble combination along the floor at a constant speed, you can soon let go of the marble and, even though it is moving across the floor, the marble will stay at the same place on the ruler. The ruler and marble are moving at a constant speed, but relative to the ruler, the marble is at rest. This is not so easy to do, and in fact you have an automatic visual feedback mechanism to help you. If you are changing the speed at which you are sliding the ruler, acceleration or deceleration, you will see the marble slide backward or forward on the ruler.

In the ideal world of classical physics, it is at least possible to imagine ideal conditions, situations where you can imagine frictionless sliding surfaces, perfect levelness, etc. In the first case, where ball and ruler lie still, you have the case of Newton's first law, where things at rest tend to stay at rest. You also have that (harder to see, though) example of the first law in the second situation, where things in motion tend to keep going in a constant straight-line motion. You don't see it as easily because you recognize that if you stop pushing, the system slides to a stop, which is the retarding force of friction. You get closer to seeing the ideal case with an ice hockey puck being set in motion and continuing in motion as roughly the same speed until it encounters something else, like another hockey stick. However, if you continue to apply only enough push on the ruler to overcome the sliding friction of the ruler on the floor, no more and no less, you will see the marble stay put on the moving ruler and moving with it. If you push harder than that on the ruler, the ruler will accelerate (Newton's second law). The ruler speeds up, but the marble tends to stay where it was, or in the condition of constant speed across the floor that it previously was.

If a continuous force greater than other countervailing forces is applied to anything, it not only moves, but also increases the rate of its movement. That is, it not only moves (its velocity), but it picks up its rate of movement (acceleration). Gravity, at least close to the earth, is considered a constant force. And so if you drop something, it will not only move downward, but the rate at which it moves downward also increases. Until something begins to fall at a speed where the wind resistance begins to be considerable compared to the force gravity is pulling on it, that object will pick up speed at a regular rate. High school students learn that this acceleration due to gravity (until wind resistance becomes a factor) is thirty-two feet per second, every second, or an increase of about twenty-two miles per hour.

This means that if you were to drop a marble from a building high enough that it took a few seconds to hit the ground, and you had people stationed at windows all the way down with little speed detectors, the marble would have increased its speed of falling from zero (you were holding it in your hand) as it falls. After one second, the marble would be falling downward at a rate of about 22 miles per hour; at the two second mark from when it was released it would have reached a speed of about 44 miles per hour; it were still falling at three seconds, its speed would have reached about 66 miles per hour. That is, in each second it is adding to its speed an additional speed of 22 miles per hour. In reality, you can't actually do this experiment for very long as a high school physics class exercise, because during those three seconds the marble has already dropped a distance of 144 feet, so you need a very high building, and secondly, the faster it goes the more effect wind resistance has, and so you get further from the case where the only force acting is gravity.

Now if you were to plot these different situations on a graph, you find an interesting, but simple relationship. If you plot where the marble is as time goes on, and you let the horizontal axis of your graph represent *time ticking off in seconds*, and you let the vertical axis represent where that marble is, that is, *how far from you measured in feet*, you get some interesting lines. When the marble is sitting still, the graph of where it is as time ticks off is a horizontal line. If you stand right next to the marble, then that horizontal line would lie right on top of the horizontal axis, which when it hits the vertical axis, it intersects at the

number zero. The marble is right next to you, zero feet away, and no matter how long you wait in seconds (time ticking off, moving along the horizontal axis) the marble and you stay in the same place.

If the marble rolls away from you at a constant speed and you graphed that, the graph would be a straight line again, but slanting upward. If the marble is rolling at a rate of one foot in every second, then as time marches on the marble is farther away from you. If every mark on your time axis is one second of time, and every mark of distance on the vertical axis is equal to one foot, the graph would be a forty-five degree slope, cutting diagonally through your graph. If you want to know how far away the marble would be after three seconds, you would count along the horizontal axis three marks or divisions, and then move up from that time mark directly upward until your pencil hit your graph line, and then read across to your distance axis to see what the number is. And low and behold, when you move three units in time, and read across to the distance axis, you find that the distance is three feet. This isn't surprising since you knew it was moving along happily covering one foot in every second, so after three seconds you would expect it would be three feet away. Gee, you didn't need a graph for that; it was obvious. But the very act of graphing gives you a powerful tool to work with things that aren't so obvious that you could quickly intuit in your head.

In fact, the slope of this line is equal to one, meaning that for every second the marble rolls away from you another foot, one for one. The slope of the *graph* of the marble at rest is reckoned as zero. For each second you move across the horizontal axis (time ticking off), when you read up to your graph of position you always get the same number. If you started your measurement by standing three feet away from the marble, then its position is three feet, not zero. But if you or the marble doesn't move, then no matter how many seconds you wait, the distance is always three. This graph would be a horizontal line as well, but it would be a horizontal line with a constant number on the vertical axis of three. It would be a flat and horizontal line, which was simply three units up from the horizontal axis. And no matter how many seconds you waited, the height of that line would always be the same. No change with time.

What happens when not only is the marble moving, but also for every second it moves, the very speed at which it moves picks up, like the marble dropped from a window? Well, the graph of its position as time clicked off would definitely not be a horizontal line, because it is definitely moving away. It would not even be a straight inclined line, because in each second it is not only moving away, but also the rate at which it is moving away is increasing. The graph of this change of position would be a parabola. It would start at zero and rise by the next second (it has moved during that second), and the line representing how far it moved in each successive second would get steeper, since as it picks up speed it is covering more distance during each second. In basic mathematics we call the degree of increase of a graph its slope. At a constant speed, that slope is a single, unchanging, positive number.

What is the slope of a curve, like the graph of the distance of a falling body from when you let go of it? That is harder, and so we say that we can try to say what its average speed is during some short amount of time, say between the second and fourth seconds. And so we look at our curve and find out what the average distance covered for the first two seconds is, and then compared that to the average speed is during the next two seconds, and you get a very rough idea of the rate at which speed is changing, or, the rate at which the rate of covering distance is. This is now a rate of a rate, and we know that we have gotten just the most basic idea of this rate of rate of change. In fact, the rate of covering distance is not changing like that; rather it is continually changing, even within the third and fourth seconds, and within every part of every second.

So, even in first-semester college physics we use a branch of mathematics devised by Newton to be able analyze things that can change continuously in time (even in very complicated ways) called the calculus. And using calculus we figure the rate of change of something that itself has a rate of change by finding out the mathematical function that describes what is already an abstract picture, namely the graph. And of course the graph is a mental construct, which already doesn't look like a marble, distance covered, or anything else, but is a translation of things that happen in time into a picture of change. At least if a farmer were to construct a bar graph, where the height of the bar represented how much wheat he has in his silo in different months, you can sort of imagine those little bars to be miniature silos, and their height on the graph to be actual physical

depictions of miniature silos, relatively full or empty. The translation into a graph of something like the motion of a simple falling marble is more abstract, but we have gotten used to it over the last three hundred years since the invention of the calculus.

The particular tool in calculus to measure things that change in time is called the derivative, and it allows us to measure rates of change at an *instant* of time. And so the *first derivative*, (as it is known) of the function of change of position with respect to time of the marble standing still is, appropriately enough, zero. Its position doesn't have any change as time ticks off. If the marble is moving at a constant speed, the first derivative of that mathematical relationship is a constant number that is not zero. If it is moving away from you at one foot every second, the first derivative is one. Fair enough.

However, when the marble doesn't merely have a rate of movement away from you, but that rate is changing, when you perform the operation known as the first derivative you don't get a number, you get another mathematical function representing speed, but this formula now includes a place in it for you to put in the elapsed time you are interested in, and get a number (speed) at that exact instant. Exactly how fast is the marble falling at the instant my stopwatch tells me I dropped it two and a half seconds ago? You can now get this number. Supposed I wanted to figure out, from my graph of the position of a falling body, the rate at which the rate of speed is picking up? Then you do the same procedure again on the first derivative, and you will get another real number telling you how much you can expect this marble to pick up speed as time moves on, not just what its speed is, or how far it has moved. What you have now done is calculated the *second derivative*. If a constant force, like gravity near the earth with no complications like friction, act on something like a marble, then this *second derivative*, which tells you *acceleration*, is a fixed number.

Okay, let's just go one step further. Suppose the force isn't constant but rather is increasing. The object is not only moving (speed), but also picking up the rate at which it moves (acceleration), and the rate at which it picks up the rate at which it moves is also increasing. Okay, so we have simple position with no change (first derivative is zero); we have constant motion (first derivative is a constant); we have regularly increasing motion (first derivative is now a time-

dependent function itself, but the second derivative is a real number). Do physicists have a term, like, displacement, speed, or acceleration, to represent a changing rate of acceleration (found by taking the third derivative)? Well, by this time physicists prefer to just stay with the formulas themselves. But they do have a term for this rate of change of rate of change of rate of change. It is called “jerk,” for the obvious reason that if you were to push or pull on something with a constant force you get smooth acceleration, but if you jerked on the string attached to it, even its acceleration would change.

And finally, there is a fascinating little function of change that occurs everywhere. It has the marvelous property of not only being a rate of a rate of a rate of change, which it is. But that last part, the rate at which acceleration increases, is not only an amount, but it is an increasing amount that itself grows according to how much acceleration you have at any given moment. You might think this must be so far removed from any reality, that this whole thing is just a brainteaser. But in fact, the little mathematical formula is with us every day. It is called an exponential function. The most bizarre thing about an exponential is that it has no end of rate-increase dependencies folded in. You can calculate the rate of increase of this graph at any embedded level; the rate of rate of increase, the rate of rate of rate, on ad infinitum, and at every level you keep finding another level of rate-dependent increase! What absolutely strange manner of beast is this? Well, we have lots of them. If you were to put a microorganism in a big petri dish, with lots of nutrients and ideal conditions, they would multiply at just such an exponential fashion. These functions tend to zoom off to infinity, no matter how humble they begin, in a big hurry.

There is a legend, whose origins may be apocryphal, of an ancient Chinese mandarin who apprehended this. The story goes that he was brought in to the emperor to solve some problem of state, which the wise man did. The emperor, so impressed, asked the wise man to name his reward, up to dominion over half the kingdom. The wise man pointed to a nearby chessboard, which has eight squares on a side, for a total of 64 squares. His proposition was thus place one grain of rice on the first square, the two on the next, then four and so on. Keep this up for each of the squares and that will be my reward. The emperor laughed? Why such a ridiculously modest request? No problem, a few days rice for the old man, at best, the man must not only be humble but a fool. As it

turned out, the old man was a fool in the ways of imperial politics. This is an *exponential function*, of the simplest kind, a doubling function, the mathematical relationship is $y = 2^x$, where x is the number of each successive square. You will notice that the independent variable, “ x ” is the exponent to which one raises some other number, and that changing exponent represents the number of each successive square, but it could equally be something like equal units of time ticking off. If you carry out this doubling function [that is, the example represented by $y = 2^x$] for the sixty-four squares, the number of grains of rice you end up with on the last square is very large indeed.

It turns out to be about two with nineteen zeros before the decimal point, and this is just the amount of rice to be placed on the last of the 64 squares, not the sum of the previous 63! Now, I don’t know how many grain of rice goes into making a pound, but given a few hours it is countable, maybe in the thousands—I’ll be liberal. That takes up three zeros, converting pounds to tons takes another three zeros. Another three and you are in the range of thousands of tons, another three in the millions of tons, and you have already gone beyond the complete global production of rice in the *modern* world. And you still have yet to use up the next seven zeros, which would mean multiplying by another ten million! So, roughly, the sage was merely asking for at least something on the order of the total imaginable annual production of our entire earth multiplied ten million times. According to the version I heard, once the emperor got done laughing he had the wise man executed.

So, does nature really provide us with such anarchic processes? Well, yes, sort of. The petri dish of multiplying microbes is very real, but so are the boundaries. No matter how large the petri dish, in very short order the number of microbes will be so large that they will have eaten all their nutrients, and they begin to starve, and that is precipitous. They are all dead very fast, much faster than even their growth curve. Microbes, and all other living things, tend to do something else as well that inhibits exponential growth. They produce waste products, and these products are toxic to them. So in a monoculture—just one kind of organism in a closed system—they not only rapidly deplete their resources, but they equally rapidly poison themselves. Not exactly sustainable growth.

In an ecosystem there must not only be a constant supply of energy coming in (sunlight, for example) that can become nutrients, but you also need all the other feedback mechanisms of biological supply and demand that convert one organism's waste products into another organism's food, and often that food is the secondary organism itself, but the higher up food chains one goes the more complex interchanges take place before that next level gets its essentials. Hence, there are far fewer bears, for example, than beetles, not just in population numbers but also in total biomass of the two organisms. But every system is still subject to these feedback loops that only allow populations to reach a replacement rate, although that replacement rate is further complicated by local conditions, the arrival of new organisms and the extinction of others. To their credit, today's mandarins of economics tell us that they are not completely unaware of these added complications to the market mechanism.

ii) *Another brief excursion in accelerating acceleration global free-market capitalism*

Having looked at some of the characteristics of the dynamics of purely physical systems, that is, non-social realms such as the classical physics of matter in motion, we can now use some of these concepts to look for continuities, or discontinuities, when these same explanations are applied to the social realms, especially market economics. First a little disclaimer. In the next few pages I hope to explain some basic operations of the systems inherent in a market economy. This is the briefest of overviews, and for those who are already informed in this area you may wish to just skip ahead. This is a stage-setting background to illuminate what we, in our life's efforts, are really about, and it is not intended as indictment of the current state of global capitalism, nor as a precursor to a technical fix or any social policy agenda. Neither is it a dire warning about the catastrophes that could be around the corner in the global marketplace, or suggestions about how to avert them. Others have written with far greater scholarship on these issues, some of which are in the notes section for this chapter. The purpose of this particular overview of practical economics is to illuminate the human activity of succumbing to the power of surrogates and what personal responses to such an understanding might bring.

As in all parts of this book, my primary audience, as I see it, is the individual. And my purpose is to perhaps open ways for us to see our individual lives as they are inevitably worked out in the larger spheres of culture and history, to help provide catalysts for asking ourselves the best questions possible, perhaps even helping to foster the courage to ask those questions. It is with these disclaimers (so as not to waste the time of those who know all this) that I make the best descriptions I can of what our material cultures are doing. The disclaimer also includes a ready admission that I am not an expert. I have never had a single course in economics! (Conversely, I have never failed a course in economics!) And my complete ineptitude in matters of business and finance, if measured by my own failure to accumulate wealth, could be used to dismiss my understandings out of hand. So, with no credentials and no reason why anyone should find authority in my own financial success, I blithely plunge ahead. If you use my analysis (somehow, I don't know how) in your own investment strategy and wind up broke, go ahead and sue me; you have my permission.

As it so happens, we have also depended upon the operation of such mathematical relationships described above (all rates of change, including exponential) in our economic systems, and not just recently, but going back for many centuries. Let us start with a really simple, homely example. Suppose you were a cobbler, and you wanted to set up shop making shoes. However, you needed one thousand dollars to build your shop and to get some tools and raw material, and you don't have a thousand dollars. Then you might go to someone you knew, of good will, who believed that your ambition and skills would indeed turn out to be a successful enterprise making shoes for the local population. If this were a family relative who were a smart businessman and also wished you well and could afford it, he might lend you those thousand dollars, with a fixed surcharge of 10%, and a maturation of the loan of ten years. What he is depending upon is that you will be able to make good product, attract clientele, and turn a profit.

In this antiquarian reckoning, then, at the end of ten years you, the cobbler, would pay back the principle and premium, or \$1,100 dollars. After all, you, the shoe maker, had the advantage of the money up front, without which you could not enter the threshold requirements of a business, and your lender gambled on the outcome of your success (you might go bankrupt and leave him in the lurch)

and do without the use of that part of his money, in exchange for which you paid a service fee of \$100. Seems fair enough, and in fact by any way of reckoning, considering the risk and anxiety, a pretty good bargain. If all other things remained equal (no inflation, etc.) the lender would have more money than he started with by simply acting on faith that he would. And in fact, if he lived to a ripe old age the lender would not just be \$100 richer, because when he got his principle and premium he would then have more money to lend to another promising enterprise (or several) and make even more money by successive lendings.

Now this might not seem to be a fast way to acquire more wealth, simply by dint of the fact that you had some to start with, and on scales of lending and return, with payment maturity times like these. You would not be so much a wheeler-dealer as you are simply performing a modest, local public service. The borrower in such a parochial little setting is paying a fixed fee for the service of time-sensitive, ready cash. The lender, providing he lives long enough and no lending deals fall through, does actually experience the relative advantage of an exponential growth function even if he keeps doing the same thing, because on his next loan he can put up \$1,100 dollars and get ten percent on this, which is better than he did before. His lending capital would increase slowly, but surely, and his profit on each transaction would actually increase. But this doesn't amount to very much considering the natural life span of any individual. It really helps if he can make many such loans at once.

Not only does he get more money for more loans, but the occasional small business failure can be absorbed by the total of profits. And if he wants to keep increasing the rate at which he gets profits he will continually make the new accumulated capital available for more loans. There are other ways to get more profit, faster, and to reduce the inevitable out-of-pocket losses. First, charge higher interest rates, then make the maturity dates come faster. However, all of these variations on the theme of lending as a way to make money, that is to make the very movement of money a profit-producing "product" of its own right, have the value of utilizing the magic of the exponential growth function available to the lender (with each new transaction), but do not directly place the burden of this exponential increase on individual borrower.

This burden shifts to the individual borrower when a loan is not secured as a one-time proposition with a fixed fee, but when the payment schedules of an individual loan are subdivided and the premium turns into a time-dependent interest as the fee. Even if the interest rate is contractually defined as fixed, the interest accrues on remaining capital as a function of time. This is an exponential function, even if that time-dependent rate is set at a seemingly modest level. Again, in contemporary society we hardly give this a second thought. Of course that is how things work! That is how most of buy our essential automobiles. It is how home mortgages work. And in a most exaggerated way, it is how credit cards work.

I apologize to those readers for whom this example is not just patently obvious, but seem to be uselessly antiquarian. To bring us back to market economies, what does all this have to do with money, producing and consuming, surrogate living, and acceleration? Let's just take it a step at a time. Obviously, from the example above, the more money you can lend to more independent shopkeepers, the closer you could come to actually making a useful amount of money off the very fact that you have money to begin with, and that includes having enough loans out there and some kind of risk evaluation such that one loan tanking doesn't ruin your profits. But what if someone comes up with a scheme that requires so much capital expenditure that no one seems to have enough, but which scheme forecasts to make enough profit that within, say a decade, the profits would not only match the initial capital investment but profits would be realized over that investment. This predicament is the generative condition that produced the idea of selling stock. And again, in its initial conception it is very simple.

We know that the idea of selling stock in the capital investment of an enterprise goes back to at least well into the middle ages. A particularly illustrative example is provided by historian Jean Gimpel in his book *The Medieval Machine: the industrial revolution of the middle ages*.^{lvi} England and France saw an explosion of mill works, both water and wind driven, during the Middle Ages. The principal uses for these mills was to drive a few simple machines, either grinding wheels to grind grains, or to drive reciprocating hammers used in either metal fashioning or fulling, the latter a process to produce high-quality

and high density fabrics. It took considerable capital to put up a single mill, let alone a mill-works of multiple mills, and it also required the services of *bona fide* high tech specialists.

A grinding wheel consists of only two pieces, an upper and lower stone of considerable weight. But to fashion such stones required extreme expertise, especially in the carving of the curved cutting ridges, as well as the fit and bonding of both stones, each made of several large wedges. Specialists had to be called in to dress the stones (restore the cutting edges) with regularity. Similarly, the housing and gear-works were beyond mere carpenters of stationary buildings. So, to erect the basic structure was extremely capital-intensive, as well as buying access to water source, making efficient roadways for raw goods producers to reach the mill, etc.

The initial idea, then, is that an entrepreneur forms a corporation of stockholders. If the total investment is to be fifty thousand pounds, for example, an extraordinary sum, you might get a total of fifty wealthy landowners to jointly contribute one thousand each, and what they would own, jointly, is the entire enterprise. What they would annually receive is one fiftieth of the total profits after operating expenses, including the people running the mill and maintenance. If the mill's profits were actually double the initial capital investment plus operating costs over the course of, say, ten years, then every shareholder would get their original money back, in annual payments, in ten years. If they remained shareholders for another ten years, all else being equal, they would each be a thousand pounds richer. That is capital investment, and return on capital. You wouldn't invest more in acquisition of share than you could afford to do without. That is, you don't need that money right now for household (or fiefdom) expenses, and if things go bust (the mill burns down), that is the cost of your wager.

But of course things never stayed that simple, not even in the Middle Ages. First, let's assume that the physical and economic landscape remains fairly simple. Perhaps over the course of the aforementioned ten years the millworks, of which you own one-tenth, has shown that it can produce not only regular returns on the investment, but the infrastructure improvements your corporation has made (improving roads to a wider population of farms) has

actually shown a rise in annual profits. Rather than just stay with your steady, and steadily increasing income, perhaps you decide to sell your investment papers (your one-tenth holding) to someone else. You could show him the rising profitability of your corporation, and reasons why this rise should keep rising. And the demographic projection (people have to eat bread, there are more raw goods being produced, perhaps prices for bread are rising) could indicate that another person would not merely recoup his or her own investment, but even more over a similar ten-year span.

If you sold your shares for your original investment, you would have doubled your personal wealth at the sign of a pen! If you could show your secondary purchaser a convincing rise in the rate of return, maybe you could sell your original thousand pound investment for two thousand! Now you're really rolling in pounds. But such a sale, except to a rich idiot, would depend upon convincing evidence that he was looking at a dependable trend line. We need to take stock of what we are describing here. Even in this uncomplicated, even primitive, example of capital investment, one is actually making money on investment, not just by providing the service of having money to loan at interest, but by betting on the future.

And of course there are complications to consider even at this meager level of investment sophistication. What if another group constructs another mill in the same agricultural area? In a static economy, that could cut your business in half, and your profits even further since, even if you lay off some of your employees, you wouldn't likely half your operating costs. But we are still in the range of fairly rudimentary arithmetic in all these calculations. If you have a nice robust river rolling by, which doesn't show evidence of running too high or low, and other mills passively dip their own single water wheels at its edge, along property lines they control, well, that's competition. It doesn't really change the efficiency of your own mill, but it does introduce other businesses vying for customers. So it would be nice if you could get some sovereign authority to intervene and only allow so many mills within a region that you could, with the available transportation infrastructure, be a profitable service provider.

One can already see the possibility of the dilution of profits, which would take a hit on the shareholders' regular returns. But in the secondary market, the person to whom you sold your one-tenth share, things could be really ugly. This

person has put out twice the original share value, only to find out, to his chagrin and anger, that with the construction of another mill too close by, not only is he not getting a regular dividend, but he has just laid out twenty thousand pounds for paper that he cannot turn around and sell for a thousand pounds, because the future earnings projection took a nosedive.

You may see all sorts of direct correlations to the present already, but remember; so far we are talking about wheat or corn, in an insulated society with real boundaries for its goods, and no foreseeable eclipsing technologies on the horizon for (in hindsight) several more centuries. And even within this achingly primitive scene there are further things that can cause incredible change. The example of the robust river, with single water wheels dipped in at its banks can still cause an arithmetic depreciation in the real, on-the-ground capital investment, and at least a second order problem for a secondary buyer of stock. Let's try one more simple adjustment (well within the technological paradigm of the 13th century). Suppose that the new millwork is built off your property (of course), and downstream. He will have access to the same river, the same flow that you do, right? So, what's the harm, except that unless it is too many miles downstream he might overlap with your customer base?

Just suppose that this new corporation wants to drive more mill wheels, with greater velocity, the combination of which (within limits) are not additions to productive capacity, but multipliers. How to do this? Build a dam. If the water is flowing down at a particular grade, with a certain reliable input, and the alluvial geography is reasonably constant, everybody gets to dip in a waterwheel. If you erect a dam, however, you can take the free kinetic energy (of running water) that everyone has, and make a lot of it occur at one place...at YOUR place. You can create an artificial falls where much of the downward flow of water, rather than occurring gradually over the stretch of the river, now is concentrated in one location. You get to run mills at a great rate, and a lot of them, through proper gearing and ganging of drives. Meanwhile, you are not just competition for the millwork upstream with hugely increased production efficiency, but you have killed them off from any profit at all! Their waterwheels are now sitting still in what has essentially become a reservoir. These one-time barons of capitalism can't even decide just to become a little "mom-and-pop" shop for the really local customers who would like to be able to walk their

product to market. They can't grind (or full, or make horseshoes) AT ALL! And, surprise, this is exactly what did happen. And it happened in around the year 1300! Yes, the free-running market releases more than productive capacity. The multiplier effect of ever-increasing return on investment also releases the ingenuities of destructive advantage.

We can further safely assume that the original stockholders in these Medieval millworks were themselves wealthy landowners, who got right to landownership because of family lines who, somewhere back, simply took it over. Once they owned land, they could then have farmers occupy it without owning it, planting mostly what they were told, in exchange for the right to live, literally. That meant shelter, the right to raise some of their own food, and protection against the possibility that another landowner or foreign prince would want to take over ownership by force. In the feudal system there was little opportunity for someone who already did not own land and the means to production to procure it.

The ability for someone to simply own a chunk of the earth, and thereby any resources, including human, which might come from it (timber, ore, agriculture, and human productive power) simply because he was born to it has a depressing arithmetic to it. If you place this system of ownership, where the surface of the earth is a constant, but population grows exponentially (for a while) the countervailing trend lines end up looking like the aforementioned petri dish, with a few appointed microbes inexorably sucking life itself from whatever is left. This is why economic historian Robert Heilbroner, in his classic textbook, *The Worldly Philosophers*, put both Thomas Malthus and David Ricardo, two English economists (of course that term did not yet apply as a profession, and Malthus was a parson) who straddled the turning of the nineteenth century, together in a single chapter entitled, "The gloomy presentiments of Parson Malthus and David Ricardo." The former saw the future of a geometrically increasing population, tilling an arithmetically increasing amount of land until it runs out (like the spreading of the microbes across the petri dish) and the latter felt that simple land ownership, and all that it implied, was completely contrary to innovation, the actual production of goods, and was essentially the bane of any productive economic system.^{lvii}

iii) *Uncle Hilding: my first introduction to market capitalism*

The reader need not worry that, having taken so long with the fourteenth century, that I will detail the succeeding centuries at glacial pace. The reason for even giving this background is still in the service of this section of the book, and that is understanding the nature of the surrogates that we can unconsciously give our lives over to, without asking, individually, at the level of fundamental quantities and qualities, why it is we spend our mortality doing what we do. It is to help understand both what we do and what the nature of its attractions is. As I have already said, it is not helpful to stop uncovering layers of meaning at the obvious layer, namely that we are greedy creatures and want to be “rich,” whatever that means.

Let me digress with a few anecdotes from my own years growing up in New Jersey. As a kid, I might never have even heard the words “stock market,” if it were not for one of my favorite relatives, my Uncle Hilding who was married to my Aunt Clara, both of whom lived in an apartment in New York City. (In point of fact, my Aunt Clara was not my aunt, but at least my great-aunt, or something else.) My Uncle Hilding still had an accent, and not a New York accent. He was perpetually of good cheer. Whenever they drove out to see us, he always wore a three-piece suit, and he loved to smoke cigars that smelled like burning chestnuts. He didn’t wear a top hat or affect a cane or drive an expensive car, but otherwise (I recognized later) he had a certain similarity to the iconic character on the board game Monopoly. My Aunt Clara, on the other hand, looked strikingly like the portrait of George Washington that hung in all of our elementary school classrooms. All the kids in my family agreed on this, and when first one of us had the nerve to say it (not in Aunt Clara’s presence, of course) the rest of us burst out laughing, like this was the most incredible common secret that we had all thought was our own.

In fact, to fully appreciate her aspect and mannerisms, my Aunt Clara was twice the man that George Washington was. I feel both giddy and guilty at revealing this to persons I don’t know, (you know, a vestige of speaking ill of the

dead). So, to assuage my own conscience, I should also mention that once my wife and I were walking down a street and went past a toy store window with stuff on display. One of the things in the window was a "life-size" figure of the Star Wars character Yoda (the little, smiling, alien Zen-teacher, with bald head, huge eyes, pointy ears, and grey elephantine skin), and my wife, reflexively and with no malice, blurted out, "hey, he looks like you!" That unnerved me a bit, since she meant it sincerely. She has since agreed to say (at my prompting) that I look a little bit like actor Nicholas Cage, even though I've been compared to all sorts of images that make me wince, but never once has someone said of their own volition that I looked like Nicholas Cage. And if it is difficult for you to see any possible way to morph Yoda into Nicholas Cage, well I don't blame you.

But I digress with my digression. The original digression was my Uncle Hilding. I was told that he "made some money in the stock market," by purchasing, some time after the Depression, some blue chip stocks, the only one of which I remember being told about was General Motors. I don't know what my Uncle Hilding's assets were; I don't think they were huge, but when I asked what he did, I would get some answer like, well he invests in things, like the stock market. And we got some tangible things from him. We didn't see the two of them all that often, but when they did visit, my parting with my Aunt Clara was a hug and kiss, but my Uncle Hilding always insisted, with a huge grin, that you shake his hand. For a while this confused me that he was so happy, but insisted on shaking my hand. It didn't take long to get. He would always secretly press a dollar bill into my hand, and tell me not to tell anyone about it. This obviously gave him great pleasure, and it was almost always far greater than the sum total of coinage that I would have at the time.

We also, along the way, got two cars from Uncle Hilding when he decided he didn't need them any more, and it seemed like our family could benefit. One was a 1946 Plymouth, very bulbous, and which remained indelibly imprinted with the smell of cigars. My sister used this when she got her driver's license, and which, when it didn't run any more, we sold to a teenager who wanted to fix it for \$25, probably hoping to be a rebel without a cause. The other was a Rambler Ambassador, six cylinders, column shift, which my Dad used as his commute car, and which I was allowed to drive when I got a license. I used to like to try to make the tires "burn rubber," which in fact I could only do by

popping the clutch when the car was on gravel. One day, coming back from my friend Vinny's, I left their driveway doing this, and the car made first a big bang, and then the most miserable grinding noise. I was able to nurse it home. Knowing I would be in huge trouble if I didn't tell my father that his car wasn't exactly working, I did the George Washington thing (probably because of my Aunt Clara's family-line connection) and told my father that something was very wrong. Of course I added that I had no idea how it happened; it just happened. [So, Dad, this is a terrible thing to admit since you're no longer with us, but, the fact is, I broke your Rambler and I knew it.] Okay, and while I'm at it, let me also confess that I was also the reason why the Chevy you replaced it with suddenly started burning oil one fine day, by seeing just how fast I could get it to go in second gear. The answer, not that it matters anymore, was ninety.

Anyway, the fact remained that even by the time I reached high school, I had only the most primitive idea of what money was. So far as I could tell, the most advanced financial instrument that really mattered was called a family budget. This is what my father did every few weeks when he sat down at his desk, paid the bills with the checkbook, some envelopes, and a roll of stamps. I had never written a check myself when I was a freshman in high school, but I had seen my parents do it and that made sense. Family finances, in my relatively carefree upbringing, was one of those things that my parents never brought me into—that was part of what it meant to be an adult and a parent. I knew that money didn't grow on trees, but that it had to be managed. The closest thing to being privy to the frustration of keeping a household budget was when I would hear my father say, "Claire, there are three checks that don't have anything written down in the ledger. What were they?"

I had understood that there was a thing called interest. When I was about seven or eight my father took me to the bank and we put several dollars into a savings account for me, and my Dad told me that if I just left it there, the bank would pay me for that. I thought that was magic, and it took some years for me to understand that the reason they did that was because my couple of dollars, along with everybody else's money, meant that they could let other people have big chunks of money, for adult things like a house, and that they would charge them just a little more to have that money when they needed it then they were paying me to be able to use it. That made sense too; I could get that. And by the

time I was in was in high school I thought I understood how you got money in the first place. My experiences thus far had been having a newspaper route for a while, and then jobs where people would pay me to do things they didn't want to do themselves, and finally for a small business installing swimming pools, where I got paid by the hour.

When you worked, it was definitely not this for this, but this for that. When I weeded somebody's garden, they didn't then come over and weed my father's garden. I knew that because I did that, too. Instead they paid me money. Money was definitely connected with things like blisters for me, from ages twelve to eighteen. My mother was a part-time nurse, and so she sold hours of work as well. My father was a public school music teacher, and I knew that they paid him for the year's work, and that seemed to me really high finance, but he also taught private music lessons in our house, and that was most certainly hourly work because I would see it happen right in front of me. My Dad gave a one-hour lesson, and the student would hand him a five-dollar bill at the end.

I had heard about the Great Depression, of course, since my father and mother had lived through it. I couldn't fathom how or why this thing had happened, but for some reason everything just sounded impossibly dreadful. My grandfather had lost his factory job and had to go from house to house in his neighborhood doing odd jobs for other families, and even with this experience, he still maintained and passed on to my father, a heroic if antiquarian notion of work, which I heard repeated by my dad on several occasions "If you can get a good job working for a good company, you just stay with it." Even when I was growing up during the post-war boom, my father saw this wasn't something to be implicitly trusted, considering that he had seen his own father treated with abject disregard, for following the very advice he ardently believed in. I think that, in this regard, my father saw himself as somehow just a bit more sophisticated than his own father, by being able to see a disconnect between cause and effect, but it didn't go much further than that. My father still believed in being a good and honorable employee, wherever you happened to work, but there was that lurking suspicion that this was not the same thing as the equivalent of a law of nature.

But back to my Uncle Hilding. When he passed away it was determined that my Aunt Clara would move in with us. And the closest approach I ever got to

family finances was when I was told, discretely by my mother, that we could not have moved into our new house which would have enough room to accommodate Aunt Clara had it not been for Uncle Hilding's stocks. This was when I was thirteen or fourteen, and now this thing, this investment that my uncle had done, became something of interest to me personally. And just as I had asked my mother what happened that made people want to give presents half my lifetime earlier, I now asked both my father and mother what these stocks were. What was up with that?

I believe it was my father, this time, who explained stocks to me, as much as he understood the concept. It went something like this. If you wanted to start a factory, and you had a good idea but not much money, you might convince other people who did have money to help put you in business. But rather than getting a loan, like going to the bank (which I already understood), you would sell them shares in your company, and then you don't owe them money because they are partners. What you do "share" with them is the money you make, and those are the profits. So you all own the company, not a bank, but the amount of money you get back is divided up by everybody who helped put you in business.

So far I thought I got it, and I just kept that basic model in mind. What I couldn't figure right out as easily was why Uncle Hilding's stocks supposedly represented more money than he paid in the first place. I figured that the profit you made was supposed to be your little fraction of the profits. I could also understand that your little monthly check didn't have to add up to a constant amount (which I thought was pretty good already), since if you owned an itty bitty piece of General Motors, and that fraction remained constant but the company grew, then your little payout would also grow! Hooray! That seems really great. Everybody wins.

In my wildest imagination I could even vaguely see the outlines of it being possible to have enough of these stock things in a company like General Motors where you could make enough money to live on without doing anything else. Not only would it be possible for you not to have to build the cars yourself, but you wouldn't have to weed gardens, nurse, or teach music. Surely, I thought, there must be an end to this! I mean, at the end of the day surely somebody has to actually do something, right? And such a figure who could make money without doing anything was a purely imaginal creature. I could imagine being

the little guy on the Monopoly board, but I could also imagine being the king of Spain. I also realized (overheard) that to get into our house my parents weren't using the monthly money they would have gotten as shareholders of Amalgamated Widgets, but instead they had to sell those shares. I had no idea who bought them. Perhaps somebody else who figured they had a lot of time left on this earth so that their little monthly checks, represented by little pieces of tail fins, would pay them back more than they had spent to get them. In that case, I supposed it was okay.

When I had asked my father what stocks and the stock market were, I don't think he was just watering down his sophistication to match my age. I honestly think that this was as close as he could come to understanding the beast. If I had asked him if he were in any way connected with the stock market, I'm pretty sure he would have said, "absolutely not." And when I heard again about the stock market crash of 1929 in my American history class in the tenth grade, I didn't feel like I understood anything any better, but rather only worse. I heard the teacher explain that "investors were speculating, betting on the market, but when that market turned down everybody tried to get out, and it just crashed." My memory isn't all that good at remembering things that I want to remember, when I want to remember them. It comes up with all sorts of stuff I don't ask for at the oddest times. And so I wouldn't like to say that I remember that this is the exact wording that my American history teacher used. But as I try to reconstruct the classroom, I think I probably have it close to the way it went. Speculation. Way out of control. Spending money they didn't have. Everybody tried to get out, but the whole thing crashed and (the most memorable part of the disquisition) people jumped out of windows.

iv) *Why do people jump out of windows?*

Of course in the tenth grade, that image stuck, and this was the next time, since our Aunt Clara moved in, that I felt some there was a real discontinuity between how the world worked and how I experienced it that I should be able to understand. People actually DID jump out of windows. I really spent some time trying to figure that out. What would ever make somebody, a real person, jump out of a window? I couldn't get there from where I was. The closest I could

come was if someone were trapped in a building, and there were a fire raging behind them, and there were no other way out but to jump. It terrified me to think that way, but I actually tried to imagine if I would have the nerve to ever jump out of a window, even if there were a fire behind me. I really wasn't sure if, in that final moment, that the mere thought of a terrible fall, and the absolutely minuscule chance that I might somehow survive it, would not drive me back into the building where I knew I would die but at least I wouldn't have to fall. Why would anyone, ever, jump out of a window when there wasn't certain death waiting if he or she did not jump? I was completely mystified. And somehow it was connected with this thing called a stock market, which now I was certain was beyond understanding.

The more I asked, the less satisfactory were the answers. Now, one more time, what were these people doing? The way I figured it, as a young teenager, if you owed somebody something, of course you had to pay them. I didn't know what bankruptcy meant, and I suppose that I figured that if you owed somebody money and refused to pay (or couldn't pay) that you would go to jail. I didn't know that there weren't such things as "debtor's prisons" in modern society, and I didn't know enough history to even know the term. If I had known that there was not a debtor's prison, it would have made my confusion even more intense. Why jump? If you lost all your money, well, that's tough all right, but then you just start over again and go back to work and make some more, right? I probably heard something like, "people were spending money and investing money that they didn't actually have." First of all, how do you do that?

The closest I could come was from seeing episodes of "The Untouchables," on television. My brother Brian loved that show (my Dad, by the way, hated it, and whenever he caught us watching it he would make us shut it off) and Elliot Ness was always breaking into some place or other bringing someone to justice. Once in a while it involved some appropriately evil person who would loan somebody money, in a very bad way. When that person couldn't pay up, they would send some goons around and actually break the guy's leg, or threaten to kill him. That was the sort of motive that made sense, even if just a little, that could make somebody want to jump out of a window. But of course, that kind of thing was illegal, which is why Mr. Ness was always trying to break up those rackets and send the perpetrators to jail.^{lviii} I couldn't in any way figure out what

it was that these investors did, by 1929, which was legal, and which could possibly make them want to jump to their deaths.

By the time I graduated high school, I still didn't know, and I just figured out that whatever finance and investment and stocks were about, which I lumped under the term "economics," it was not only beyond me, but it was beyond me in a way that made me decide I would never be interested in it. So I never took a course in it. Long after I had begun studying physics in earnest, and I could do the math to find the rate of change of almost anything, and even could recognize math functions that at times don't have a derivative (they are not well-behaved, in the parlance) I still had no idea what anyone was talking about whenever I heard a few seconds of the goings on in Wall Street that day. As far as I was concerned, the whole thing might be from another planet, but it was also the sort of thing that if I were to explore another planet I wouldn't want to stick around to figure it out. It would be far less interesting and informative than watching someone collect stamps.

What, after all, were these people betting against? Wasn't it illegal to bet anyway, excepting in Nevada? The first time I heard about the futures market, I think I must have laughed. What IS a pork belly, anyway, and who would want one, except for the original pig? And if you bought a bunch of them, where on earth would you put them? Needless to say it came as something of a shock when I finally put a few derivatives together and got some inkling of what was going on, and why the news wouldn't let go of it, and why everybody seemed to think--automatically--that virtually anything that happened or threatened to happen in the world of investment was, *de facto*, of greater importance than anything else in the world with the possible exception of war, and perhaps the really bad thing about war (unless you're in one) is that it can mess up investments. I still couldn't quite figure out why anyone would jump out of a window over it, but I was getting closer.

I know this must seem impossibly tedious to most anyone who already knows these things, and so I have tried to make my own incredibly torturous and boneheaded awakening to these ideas the story line, rather than simply explaining economics. And I promise that I am not toying with you, the reader. Yes, I am also having fun as I write this, and certain juxtapositionings of

meaning and turns of phrase make me laugh, and I hope it makes the reading more enjoyable, rather than annoying. But the essence of the things I am trying to understand, the places these reflections go, have taken my whole life. So it may come as no surprise for me to admit that I am not an exceptionally quick study. Instead, things tend to hang around in my head, and in my journals. Beyond that, who can say? So with your indulgence and good humor, I'll continue for a bit, trying to figure out why anyone would leap from a window, and see if we can't actually find some wisdom patterns that bring together these ruminations on surrogates, economics, and acceleration, and if it turns out as I hope, we will leave this part of the conversation with deeper gratitude, and also some more ideas to explore.

We have one example of why one might jump, admittedly from a highly crafted and sentimental film. *It's A Wonderful Life* has, in recent years eclipsed the traditional seasonal favorite movie ritual, *A Christmas Carol*. You have most likely seen it. This Frank Capra movie was made in 1946, and the central character, George Bailey, is played by Jimmy Stewart. We are given a brief biography of George, who grew up in a little Norman Rockwell town and had great hopes for the adventurous life of exotic travel. But while everyone else seems to move on and "make a name for themselves" in the whirlwind world of possibility, George stays behind. His brother returns from WWII a decorated hero, and a friend becomes a mover and shaker in the big city. George runs the savings and loan his father started, settles down and has a family, and lives in a house once ramshackle and abandoned which the Baileys have fixed up, though it still carries the reminders of its humble past.

George is an excellent fellow. He's honest and charitable. Whenever a new family is able to move into their own home thanks to the savings and loan, he holds a little celebration for them. We know that the entire village is so much the better for George Bailey ever having lived in it, but he seems to miss the picture. He keeps his travel suitcase packed for some time, thinking that anytime he will sprout wings and experience the world, but duty always calls him back. He would likely have just gone on doing what he has always done, and one would hope that at sometime, perhaps in old age, he would have the time to

appreciate his own life's fullness. But life (or at least the director) has something else in mind.

The archenemy of George Bailey's low-intensity goodness is the evil Mr. Potter, unflinchingly played by Lionel Barrymore, and he wants to buy Bailey out. The bait he uses is a fat salary, business work that is more high-flying and not tied up in the niggling details of trying to help out individual people. And the kicker was that this opulence might also allow George to travel and see the world. George nearly falls for this; the childhood dreams are held out as reality and, for a moment, he becomes transfixed. But at the last instant catches himself and repudiates the whole deal.

The little savings and loan had even survived a run on the bank when George Bailey, personally, describes the banking system to a bunch of panicky townspeople that the bank doesn't actually keep all the cash in boxes that they have put in their savings, but rather uses it to help other people do things like get their mortgages, people they know, folks right there in the room. To meet their household needs he takes the cash they do have, and asks each neighbor, in the presence of the other, how much they actually need right then to meet expenses and does it out. They make it to closing time, having averted the riot, satisfied people's needs, and taught them all a lesson in simple financial capitalism along the way. The clock reaches closing time, with George Bailey holding on to the last dollar bill they have!

That was a close one, and it might have seen its resolution if not for a crucial mistake by the hapless Uncle Billy, who manages to leave a big portion of their cash assets in Mr. Potter's office when he dropped by just to get in a few bragging rights for the good guys. It was Christmas Eve and they were still around, not engulfed by the tentacles of the Potter octopus. Potter gets the cash, realizes what it means, and decides to come in for the kill. He threatens George that he will spread word of malfeasance at the savings and loan, which will put them out of business once and for all, and Potter won't even have to bribe George with a fat cat job! George Bailey is faced with an existential crisis.

As soon as Uncle Billy realizes he has lost their assets, George goes over the top. What does everything add up to? He has lost his senses in the immediacy of the moment, and so he can't construct any reasonable narrative for what his life really means. In short, he is in a panic. And that is the nature of panic or acute

anxiety. It completely distorts the world and one's place in it. You focus on futures over which you feel you have no control, and the past tends to evaporate. The epicenter of the huge distortion is an impossibly compressed present. George is truly out of his mind he imagines going to prison for embezzlement, he imagines his family destroyed, and he imagines, already, that he will be seen as having betrayed real people, the people he lives with and knows face to face, and embraced. And that is why George jumps out the window. Actually, if he jumped out the window of the little savings and loan, he would have fallen about two feet, so he jumps off a bridge into freezing water hoping to end it all.

Now, the dramatic tension arises as we watch this because we know it is wrong. It isn't just wrong that anyone should commit suicide, but even in this wildly skewed world George is tumbling through, we know that everything is not as it seems. It isn't just that there was foul play. We have had the benefit of seeing George's entire life in a short time, and we haven't forgotten all the good he has done, and the good person he simply is. If only he could just see what we do, then he wouldn't jump. We see the narrative, and he has lost it. There is more to this tale than just a heart-warming message of reassurance. The pain for George is especially acute because all this is happening, not anonymously, but among the very people he has lived with, and he, in his panic, imagines that they will find him contemptible. We ache to give him a little distance, to give him a little vision and a voice. If he could just bring himself to sit down with his family and explain why he feels the world is falling apart, certainly they could expand his vision. But he doesn't. He can't hear anything or anybody, and like an explosive dervish lashes out at everything on his way to end it all.

What Capra has done here is to spin a little tale of twentieth century capitalism in a setting very close to the Pastoral Ideal. When the connections are close enough, and people seem to get the patterns of each other's lives, then commerce isn't simply an exchange of this for that. Commerce is part of a conversation of lives, where half of the vocabulary is what you do and half is who you are. To live in a community like this, and then to imagine that this life-long conversation could be erased or subverted, is indeed a threat to one's meaning. George is delusional, but the fuel for his delusion is not silly or trivial. In short,

we can understand *why* George wants to jump; we just wish he wouldn't do it. We also know that if he could fix his vision, he would not commit suicide.

Luckily for George, there is a divine intervention, by way of a wonderfully hapless angel named Clarence, and George gets the vision he needs. And once he gets his vision, he embraces life and everyone in it. Yes, they are financially saved at the end, but to watch the film more than once, you know that this isn't George's epiphany at all; it is just a little tidying-up coda. Because his real thrill comes when he rediscovers his meaning, and he still has no idea if the financial problem will be fixed. It would be nice if it did, but he isn't remotely thinking of that when he bursts through the door of his home and gathers everyone up in his arms in the penultimate scene. And it definitely isn't the literal meaning when, in this magnificent scene where everyone is gathered, his own brother, the celebrity gives a toast "To my brother, George. The richest man in town."

Here's the point. The first time I saw that movie, it made sense to me. I could understand why George felt he couldn't bear living one minute longer. Going back to my tenth grade history class, if the teacher had told us that hundreds of little bankers in towns like Capra's Bedford Falls had jumped out of their windows in a stock market crash, I think I would have understood that, even at age fifteen.^{lx} In point of fact, I don't know how many financiers jumped from high office buildings in New York City in 1929, and I don't know who they were. But if there were any, I couldn't make any logical leap myself to figure out what was so devastating that they couldn't go on living. It didn't make sense, and it would continue a mystery to me for many years to come.

Of course, even in 1946 Frank Capra's movie was already more of a historical tale, and an imaginary one at that, than a representation of how a market economy actually works. In order for it to have its emotional pull, it required that the principle players personally know each other, and the script even had its equivalent of the pastoral ideal's curmudgeonly, outsider, voting against any public improvement that did not directly redound to his bank account. That was Mr. Potter. He was willing to, in petri dish fashion, grow on the resources of the town with no regard for the fact that he was also poisoning the petri dish. He was depending on the fact that, so long as there were others living in the same geographical area (Bedford Falls) whose tolerance for a lower

quality of life was reached before his (namely, he could insulate himself from the meaner aspects of life with money), then those other people would also see to cleaning up the mess without him. Or, in the words of Leona Helmsley, “the little people pay the taxes.” Mr. Potter had long ago figured out that, by his reckoning, he didn’t have to curry good favor of anyone, and he could live without the very things whose imagined loss drove George Bailey over the edge, namely community, friendship, and trust.

I continued to be confused by many such things through college and beyond; by the things adults apparently did in a world of high finance where I could find no correlate to my personal life. As a student I was earning hourly wages working as a tutor and teaching assistant in the physics department. I was making a little more than four dollars per hour, which was, I think, about double the minimum wage at the time. I shared a rented basement with five other guys, which was very cramped but we got along pretty well. I think our rent started out at twenty-five dollars a month, for a total of one hundred and fifty for the basement, utilities included. I wasn’t making enough money to save anything, and I had a student loan at a fixed rate, but things seemed pretty good to me, and sustainable. Even the luxuries, like going on dates, were pretty affordable since most things you could do on campus were gauged to student budgets.

Of course, if one of us wanted to make a quantum leap in living, like starting a family or getting a house, the current conditions couldn’t prevail. But that was what graduation was supposed to be about. Hopefully you could get a job that wasn’t hourly wage, and you would have a discontinuous change to an adult life. Such personal-narrative discontinuities seemed natural to expect, since they had biological correlates, like going through adolescence. Everybody had to get different kinds of union cards stamped on the way toward being able to act in the adult world, and my union card just happened to be getting a college degree.

When I would occasionally hear things like the economy needs to be growing, or how terrible it was when standards of living were not increasing enough, or were even flat, I was perplexed. I was thinking like a physics student, at best, and I couldn’t figure out what the problem was. They weren’t talking about steady-state growth, but growth on growth. First of all, everyone was saying that you couldn’t go on having exponential population growth, no matter

how big a sphere you're planning to put them on. As long as the surface area was fixed, like a petri dish, the trend lines of available nutrients, area, and waste products would eventually (make that rapidly) converge. It didn't matter if at the time one-tenth of the world's population was industrialized, or if there were parts of the Savannah sparsely populated. In physics I was quite used to extrapolating mathematical functions, and in some areas of physics, like cosmology, you could often figure that your theory was converging on something like reality if your predictions came out to "within an order of magnitude," meaning a power of ten.

So the economics problem, as I saw it, was completely incoherent. The insistent calls for an economy to grow, and not grow at a fixed dollar rate but at an exponential rate, in order for it to be considered stable and healthy were simply non sequiturs. I figured that these folks who made these calls were obviously smarter than I was. This simply had to be the case because they were saying these things, getting paid smartly to say them, and I couldn't make sense of it. Furthermore, I could never get a fix on the terms they used, things ranging from the stock market, to securities, futures, and commodities markets.

I originally came up with two ideas that I tried to make do to tell me that I wasn't crazy or just as dumb as a piece of shale, and allow me to put this economics thing away and say, "okay, I get it so all is well." One was, well the population is, in fact, growing. If we could just get it to grow at an arithmetic rate instead of a geometric rate, then I can see how you can continue the trend line of economic growth for a lot longer, meaning there are more people who need (in an ideal world without extreme privation) basic stuff, and that means more production, so I guess that could turn out to mean more nodes of production and exchange and people have a slowly increasing standard of living. Of course even this had a limit. And, knowing something about the actual living conditions of most of the world's population, even arithmetic growth for everyone seemed somewhat embarrassing as the overarching explanation. It is not sustainable. What was I missing?

Then I came up with one other idea which I understood and could even count up as a good thing for increasing standards of living in the abstract, and that was the positive discontinuity caused by innovation.^{ix} And to make this comprehensible to my limited brain, I had to posit a closed society as a

microcosm of what is ultimately a closed world. This is how I was trained to think. There was a joke among us physics students about how differently we thought about the real world from, say, engineers or technicians. There is a meeting convened, the purpose of which is to come up with a better automatic milking machine for dairy farmers. First a technician gives a presentation, complete with a working prototype, and a process that accommodates how cows actually behave, and is reliable. The engineer produces a more theoretical model, which requires all sorts of throughputs for all dairy operations, and doesn't have all that much to do with an individual farmer and a typical cow. Then the physicist addresses the audience, by saying, "Imagine a spherical cow."

So I asked myself to consider not why, but how an economy could grow (since we are told this is essential for a market economy to be functioning) and not quickly transcend the physical constraints of a petri dish. I mean, how many shoes does anybody need (excepting, of course Imelda Marcos)? How many cars can you drive at once? And the thought occurred to me, well, what happens when you innovate? For example, in the age of radio, how many radios can you put in a home before they become absolutely redundant, even with every member of the household listening to a different radio program at the same time? Well, not many. Now introduce into that picture the first televisions, and what happens? Well, the most obvious thing is that this new device is not a radio, so you can sell them as well as radios, and no one could think that they needed or wanted a television until there was a television to be wanted. And even in this little example I could see, for a limited time, several kinds of exponential economic growth.

First of all, it was very much like inoculating the petri dish with a few bacteria. For a certain amount of time you will actually see something like an exponential growth in bacteria. Secondly, there was an incalculable discontinuity that would last even shorter than the simple growth in amount, and which could for that very short time (it is really just a brief spike, not so much a curve) even dwarf the economic return based on growth of number of televisions sold. This was a function of sheer novelty. In the age of radio only, there was nothing at all like the instantaneous transmission of moving images; it was of a completely different realm. And so for a short time, there is an experience of extreme excitement, for technologists, for the creative groups using this new medium, for

the public, for sociologists, and for investors. Among all the groups represented above, it is only the investors who have anything to actually lose. If this new technology falls flat, the public does something else or what it did before, the creative people had already come from other creative professions that still existed, the sociologists would have just as interesting a cultural question figuring out what actually did happen. For the investors, this was truly exciting, as long as you define excitement in non-valuative terms. If they lost out, well that has an adrenaline rush to it. But on the upside, if they won out this new invention was so different that there wasn't even a way to value it yet! There was almost no way to put an upper limit on the rate of return possible because it couldn't be compared to anything in existence.

Just what premium would consumers pay to have the magic of the visual and audio of world events, sports, live stage of any sort immediately available in their homes? No one knew. And what I am going to suggest here is that even in this industry—which has so centrally defined our society of the last half-century and which it is so easy to vilify—even in this industry there are at least some elements of capitalism that are consonant with certain versions of capitalism played out within the pastoral ideal. Certainly not the scale and scope. And the idea that we are somehow a national village because we sequester ourselves away around our new technological fireplace of storytelling, the cathode ray tube, and imagine that millions of us are watching the same sitcom together and that makes us a virtual clan is an example of surrogacy closer to a consensual national psychosis than a community.

No, the way it has even a strand of aspect of the pastoral ideal of commerce is that it at least incorporates a version of real risk of real capital in a direct investment of a specific “this for that” transaction. Doubtlessly, this is not how the actual venture capitalism came into the creation of a multi-layered television industry, but it at least had the possibility to have arisen that way. That is, the start-ups in research and development, the building of infrastructure, the organization of content providers, and the assembly of televisions in factories, all this could at least potentially have arisen along the same lines as the medieval mill-works. In other words, a large number of investors are asked to purchase shares in different parts of this unfolding experiment, and they then hold on to those shares. It might take a number of years before the investment begins to

have any sort of operating profit, and there is even the risk that it will not catch on at all, in which case the shareholder is left with a worthless certificate. If the medium does catch on, and begins running in the black, you will start to get premiums on your shares. And if the momentum picks up, your premiums might cover your initial investment in, say, ten years, and thereafter not just continue with no further risk investment but also even increase steeply if the new idea really takes off. You could even become quite wealthy just by your monthly profits on original shares.

This is the model of capitalism, to the extent we were told anything about it in our high school history classes, that we were told was the signature of free markets. Yep, even I could get that much. It seemed pretty close to making wealth from nothing, but there was, after all, a prime mover behind such a financial discontinuity somebody invented something no one had ever thought of before. The arrival of a truly novel idea is itself unpredictable and discontinuous, so it was not incomprehensible that it would produce discontinuous economic rewards for those who happened to be in the right place at the right time.

We have always valued truly discontinuous innovation within market capitalism, and even embraced it as a force to remake our world for the better well back into the period when the pastoral ideal was considered a real-world model for an indefinite future. One of our earliest federal institutions was the Patent Office, whose premise is that the introduction of a truly novel idea is so life-giving to the greater public welfare, and the economic risks to bring it into being were so great, that an inventor ought to be able to count on a certain amount of time by which to benefit, which was, the last I checked, for seven years and renewable once. Someone else merely duplicating your invention, without your permission, could be legally forced to cease and desist, and even pay reparations. But after a fixed number of years that idea passes into the public domain, and the field of competition in production is open.

A corollary to this, of course, is copyright law which originally sought the same sort of protection for other less tangible things, like literature, but which later came to subsume such things as trademarks, so as to protect a manufacturer who had gained respect in the marketplace for quality (that is, trust) from having someone else producing knock-offs, unfairly benefiting from your hard-won reputation for value and at the same time diluting your

reputation. Anyone who claims that discontinuities and uncertainties are unhealthy for a properly operating free market is either lying through their teeth, or is simply ignorant of history. Discontinuity is the very bedrock of capitalism. And yet the “evils of uncertainty” for market capitalism are precisely what we hear, from every economist and analyst, absolutely without contrary opinion. What could they possibly be talking about?

As many readers already know, and may be wondering just how long I could remain so dense and naive, the reason why uncertainty is postulated as bad for an economy, and especially toxic to a global market economy, is because the simple idea of stockholder risk and reward, dating at least to the Middle Ages, is not how we expect our individual and national net worth to increase. The real money is not made in holding stocks through old age. The real money comes from selling stocks long before any share-profit from production would ever matter. And what you are then betting on is that the next buyer will see in your portion of the corporation not continued profit, nor even increasing profit, but an increasing rate of rate of profit. You are counting on this person being there at some crucial time, so that you can make a really big profit, really fast. Again, this is not a profit on fixed value. It is not even a profit on growth of value. It is a profit based not only upon your projection of the future of your company, but on the PERCEPTION of the FUTURE at some FUTURE time, by someone who hasn't yet arrived on the scene. That is your bet. You hope that such a person will be there. If it so happens that such a person does arrive and you recognize it and can sell at a wonderful multiple, and then PERCEPTIONS about the FUTURE after that sale happen to change and your buyer loses out big time, that is not your problem.

A year or two ago we, the general public that reads the news, were introduced to what was for many a new term in finance the derivatives market. In interviews, even on public radio which doesn't have to abide by the dictum of sound bites, when analysts were asked to explain what these things were, the most common answer was that this was a rather arcane instrument based upon mathematics that most of us probably couldn't understand (and that is usually explained away by saying that the decisions lay in some incredibly complex computer program), but it was risky and we shouldn't worry too much about it since the economy's exposure to derivatives was relatively small. Sorry to be so

blunt, but that is once again either ignorance or lying. The fact is that ALL financial instruments are derivatives. They all hinge on not just change, but increasing rates of change over time. The first derivative of displacement with respect to time is called speed, or velocity. The second derivative, if it exists, is acceleration. The third derivative, if that exists in a physical system, is jerk! We now have financial instruments that are so far removed from anything like a produced thing of value for an actual person who might buy it, that the current formulas for accruing wealth are not just derivatives, but second-order, third-order, or fourth-order derivatives. Indeed, for global markets to continue to grow (not just make a profit) it is essential that every economy has a steady supply of jerks.

So, why is growth so important? Why can't we just get sustainable and be about other things, like creating community, probing the arts and sciences for insights into deep and satisfying questions, good conversation? And remember, we are not talking about arithmetic growth in goods and services, which of itself would require a continually increasing participating population all by itself. No. We are talking about growth compounded, that is, growth on the rate of growth. There is only one mathematical relationship that, no matter how many times you take its derivative keeps yielding a positive number, and that is exponential growth. Any exponential growth will explode toward infinity, so the mandarins of economics tell us that we would like to keep that growth EXPONENT sufficiently small so that at least we might be able to live out our current mortalities before the petri dish culture implodes in EVERY way.

How is it possible? Well, in fact, there are several mechanisms by which one could convince oneself that this is possible, but to have any knowledge of simple math and physical reality, you can only indulge in this fantasy by staying sufficiently removed from physical reality. That is, you can only be in the business of moving money that you never see to actually believe this might be possible. But first, one more homely example.

Some time ago I heard about a local business that had just started up. In fact, I had even seen their corrugated steel warehouse that was their business. I was immediately thrilled by the sight of this little, scrappy upstart because they were going to make and sell electric vehicles. I went for a visit one day, partly because gadgets have always fascinated me, but mainly because I had an idea of

my own that I wanted to talk about with their chief engineer. This place was small enough, perhaps twenty people in all, that I could actually do that. While I was waiting in this marvelous, makeshift office (kind of like a big garage), there was a lot of energy and eccentricity. I asked where the restroom was and on my way down the hall was nearly run over by a nerdy guy racing around on an electric scooter. This was a company of an odd collection of whiz kids and aging hippies. And they just might, by dint of innovation and hard work, change the landscape (commercial and environmental) for the better. I was already in love with this place.

While I was waiting, I couldn't help but notice that the two phones were continually ringing, and the two people at the phones were taking down names and addresses and giving brief synopses of the business at a furious pace. I asked what the activity was all about, and they said they were halfway through making an initial public offering of stock! My pulse immediately quickened. How do you get this stock, I asked? Well, they had a little promotional packet, which is what they were answering the phones about; they were sending out these packets to people who had heard about them. I took a packet home. I told my wife about the experience, and my excitement was more than evident. By this time in my life I had taken to listening to economics forums on occasion to try to immerse myself in this great economic enterprise to see if I could figure it out. I knew some more terms and could do a pretty fair job imitating catch phrases that were the sage advice of professional investors. I also liked reading *Business Week* to see what was going on, mostly as a fascinating window on contemporary entrepreneurial society.

Still operating basically from my original understanding of *what* stocks actually meant and *why* they were sold (to build an infrastructure to do something novel), this seemed like the most amazing personal opportunity. This was dynamic capitalism within the Pastoral Ideal! This was a little local company. I could meet all the employees face to face. Hopefully, they would expand and make a thriving business and create some more local jobs. For a person to buy a single company's stock, I knew from reading and listening to financial gurus of national reputation, you should know something about the company and be personally interested in what they do. Was I ever! If I wanted

to, I could not only understand the financial statements of a company this size, but I could read the schematics of the electronics involved and build one of their gadgets myself!

It was local. It was a raw innovation. And it was a product that I viewed as an unalloyed good thing! Sign me up. I know exactly what this means. I'm helping you out to do this thing by risking my money, and it is very risky indeed. I know I can't invest more money than I am able to lose, and I have to be ready to lose it all. But that is okay. I BELIEVE in what you people are doing, and if you fail, well, that is a noble thing anyway. I honestly won't mind. This was the first time I had ever encountered something that was so direct, met all my fundamentals, and it was market capitalism on a community level. Finally, I would get to participate in this thing called investment, and it would be involved in something I could get my mind around and I believed should happen.

The investor's brief I read was kind of dense, and I expected that, full of a lot of "party of the second part" legalese. My enthusiasm started to wane the more I read, but I desperately wanted the basic vision to stay intact. The smallest amount you could invest was \$500, and we could afford that, and it also seemed like the perfect amount so as not to overwhelm the company with meaningless bookkeeping, but was small enough that they really WERE asking for the community to invest, and not just billionaire venture capitalists. So far, so good. Then I got to the part about fixed conditions of how much the company president and chief engineer would retain in total stock ownership. Hmm. Well, okay, I guess that's their right, but this is starting to sound less like the original stock as I had hoped to understand it. This wasn't just operating profits and patent protection on a good idea, but something more. I was starting to feel less comfortable that this actually was a bold risk for a good thing, all happening within Bedford Falls.

Then I got to a truly surprising part of the prospectus, somewhere around page sixteen. It was a little section called "Dilution of Shares." I had to read this over and over because I had never heard of anything like this before, not in *Business Week* or anywhere else. It seemed that if I were to invest five hundred dollars to help them out, knowing I might just lose the whole thing, as soon as I purchased those shares they were going to write down my investment at, as I

recall it, a four to one ratio. This company was going to take 80% of our money and just say thanks. What? I went over it and over it, and it kept coming out the same. This wasn't risk; it was charity, and I think charity is great as long as I know that that is what it is. And I think that charity by itself is a wonderful thing, giving without any hope of monetary return. But this was even worse than a scam-charity, where you give money to help some cause in need and find out that most of it is going to well-to-do administrators, and only ten percent actually helps the needy. That ten percent, at least, accomplished something good, which is why you gave in the first place.

My wife and I were willing to invest our little piece of capital in the American dream and root for the home team, until I got to this part of the document. As best I could tell, if I gave this company \$500, they would instantaneously simply remove \$400 dollars from that amount, and give me a certificate that said I now owned \$100 dollars of stock (whatever that represented in terms of a fraction of the company), and still that measly \$100 was now completely at risk the same way any stock is, particularly in a start-up business. This, obviously, must be a mistake. Who would do that? Why would a local business, comprised of real people whom I could talk to, do that to some other local person whom they would have to live with, at least *potentially* seeing me in the supermarket? All sorts of people do all sorts of things to people they don't know, and for whom they have a reasonable hope of remaining anonymous, like running a criminal phone marketing scam from another country for medical insurance that doesn't exist.

My wife and I had a meeting with the marketing guy, who was more than glad to set up a time for us to talk in person. After all, this was a small, community-based company. And this fellow was another aging hippie, homegrown, and ready to do the right thing with capitalism by being involved with this little company. He was very nice, explained their plans, how they believed in their product, the virtues of localism, and that any startup was a risk and we shouldn't invest any more money than was within our budget. Well, I already understood this part very well, which is why I was attracted in the first place to something that, at first blush, seemed to be a version of capitalism that I actually could make sense of as a social virtue. I was fully prepared to lose five

hundred dollars in a risk, knowing that I would feel it was a heroic bet on the future, a better future.

So we let him go on for a little while, just the three of us sitting at a table. And then I asked him about this “dilution of stock” detail, which was definitely well within the document, not part of the lead-in description of the venture. At first, he simply agreed that this was in fact part of the business structure of their public offering. So, I wasn’t wrong after all. I started to get bolder, and a little more annoyed, since I had the prospectus right in front of me, and put it in the most transparent terms I could, waiting for him to tell me that, somehow, I was wrong.

Finally, I said, “as far as I can tell, if we invest \$500 dollars, you will immediately subtract \$400 from that and give me a paper that says I have \$100 dollars invested. This money actually disappears! You are asking me for a \$400 dollar fee for the privilege of saying that I am completely risking \$100. Is that right? Risk is one thing. This isn’t risk. You are simply going to take that money, and for all I know what you and the other folks around here are going to do with it is use my \$400 to buy more of your own stock, which will not only be at face value but discounted, and with no 80% ‘fee’ attached. Or you could all just go out and buy a yacht.” He didn’t have any direct answer, except to reiterate that, yes, I had read the document correctly and wasn’t I a smart fellow for going through all that technical and legal prose. Yep, I was a careful and informed investor! And once again, they (the company) wanted us to know that this was indeed a risk, and no one should invest more than they could afford.

This was so friendly, and after all these were just numbers and technical legal language. This was nothing so blatant as building a dam downstream from my mill, an actual fact on the physical landscape. I am usually very good about keeping my anger in check, and I succeeded this time as well. But I can’t say that I didn’t have a brief flash of an alternative response besides just leaving the meeting cordially.

Well, we left and didn’t invest any money at all. And my disappointment was manifold. I had been excited thinking that I was going to get to participate in this thing called investment, and here seemed to be an example, finally, right here in my own backyard, of market capitalism which had every attribute that I had been told was the socially-helpful reason why it developed and should be

sustained, and why it was actually good and not just a scam pyramid scheme. And these folks, instead, were actually not going to try to make money the “old-fashioned way,” going back to the Middle Ages. They were going to make money the *truly* old-fashioned way, going back as far as history itself. They were going to just take it.

This was my first-hand introduction to buying an actual stock. Not many people actually do buy stocks in a company as an outside individual investor the way my Uncle Hilding did. But many millions of Americans invest in the stock market through things like retirement or pension plans, and mutual funds. And in this case we pay other people, people we almost certainly never meet in the grocery store, to buy those stocks for us. You may say, “well, actually I do know my financial advisor, or the name of the person who handles my account in my pension or mutual fund, at least over the phone, and it has been Angela, somebody, who has always answered the phone for over 18 months now.” Of course, Angela answers the phone in Des Moines and you live in Atlanta, but still . . . But still, Angela isn’t on the floor of the New York Stock Exchange anyway. And the layers of disconnect between what you hope is your retirement and the person who invests it has greater levels of remove than even the “six degrees of Kevin Bacon” game, a popular pursuit among some humanities graduate students.

It reminds me of the story of a shaman explaining his cosmology that the earth rests on an elephant, and the elephant stands on a hippopotamus, and on and on, until at last there is a turtle. The visitor then asks, “and on what does the turtle rest?” “Oh,” replies the shaman, “from that point its turtles all the way down.” Instead of it being turtles all the way down, it is continuously shifting investment portfolios all the way down. What you think is fifty shares of a thing, called by the name of a certain fund of a certain company is combined and recombined in different ways, with a part of your money being here one moment, there another, and for quantum gaps of time not being represented at by anything besides an empty space on a virtual spread sheet, only to popping back into existence as a Deutsche Mark, a barrel of crude, a pork belly, or a bottle of snake oil. Oh, yes, discontinuities are anathema to global market capitalism. I get it. Yeah, sure.

You may protest that this isn't the case. Yes, you have a mutual fund, but you were very clear that, even though you may get a more modest return, you were not going to have any part of pork bellies, or any commodities, let alone nuclear reactors, defense contractors, or third world sweat shops, so your portfolio is in socially responsible companies. Okay, that is good to try to grow your nest egg and have it grow with as much compassion and responsibility as possible. Perhaps such investing actually does make a difference in changing, ever so slightly, the direction of money producing money, ad infinitum. But we are told that in this brave new global market, ultimately (and not so ultimately) every concern invests in every other concern. Financial investment firms also sell stocks in themselves, and where do they invest their returns?

With so many degrees of separation, with so many levels of investment, each depending upon not merely growth but acceleration in the next level down on the feeding chain, where is reason and how does this ultimately redound to the individual who, after all, is at some level supposed to be producing and purchasing some sort of goods and services? In the last few years we have seen the aggregate value of the stock market skyrocket, and more recently we are seeing it plummet and then gyrate, like some gored animal thrashing around even as it bleeds. It isn't discontinuities this beast finds life threatening, and it isn't even basic speculation; it is a speculation on the relative certainty of acceleration, and more strangely it is speculation on the relative certainty that the future will be relatively certain of its speculation of future acceleration.

I recently heard, before the Dow Jones began its fall from grace in July, 1998, a commentator on a radio market show try to give some basic rule of thumb as to what was reasonable and unreasonable speculation in the stock market, and thereby how to tell when it was overvalued, and his advice, for once, actually sounded wonderfully common sense and homespun, and real, at least when one is considering short term projections. He said (and I'm paraphrasing), "Look, when people ask me things like this, I try to give an example that they can get their minds around. Say you were going to buy a company, like a shoe factory, from its owner. The owner said, 'well, I'll sell you this factory for \$500,000. We're in the black, we have a good customer base, and I get a total net profit of \$10,000 a year from it.' Would you buy it? Of course not! At that rate it would take you fifty years just to get your investment back. What you have been

offered is the ownership of a company where the price-earnings ratio is 50! And if you wouldn't buy that company with that kind of price-earnings ratio, then why on earth would you even buy a PART of it?"

Point well taken, because that is what you are doing when you buy some stock. And yet, during the last few years of stock run-ups, there were stocks selling at speculative ratios even higher than that. The most extreme example was the Internet industry, and the now famous example of the start-up on-line bookseller, *amazon.com*. Recently that company was selling for \$124 per share, with NO net earnings at all! Anyone who got through fractions in the fifth grade knows that this is a ratio with zero in the denominator, which you may call either infinity or indefinable, take your pick. There is only one reason why anyone would buy a stock in which, if you acted as a true owner, you couldn't get your original investment back as long as the company turned out a good product in say, fifteen years. And that is if you are betting that long before fifteen years are up the company will not just have grown. It will not just have grown in profits. It will not just have grown in its rate of increasing profits. Instead, it will have tucked so many economic jerks into its bottom-line that in a few years someone else will be willing to not just pay a simple higher per share value, but will multiply that by paying at the rate of an even steeper price-earnings ratio than you did.

It is absolutely fascinating that, in buying and selling stocks, you are NOT acting as though you owned the company. You are acting much more like a fly-by-night operator, hoping to get out of town before the person who bought your thoroughbred race horse at dusk won't be able to check the papers by morning. And yet it is in precisely this atmosphere where we find companies shutting down and moving their operations somewhere else even though they are making a profit. Why? People like "Chainsaw" Al Dunlop, the infamous corporate downsizer, really had it right, so far as the system goes. When these and other CEO hired guns were asked why they did what they did, they had an unassailable backstop "Look, buster, in case you missed the point in economics 101, shareholders, not communities OR workers OR governments are the owners of a corporation! I have been hired to do a job, by the shareholders who are my bottom-line employers. That job is to do whatever is called for so that

they can get a return on their investment.” Well, I guess that is why I have been so stupid all these years. I never DID take economics 101. And if they are right in the first place, that shareholders own the company, then it is pretty hard to debate the second half of the argument. Then why don't the shareholders ACT as though they own the company, and have some responsibility for its longevity, rather than just taking a ride on some well-timed explosions, and for the welfare of the people they employ?

You may be weary by this point, but buck up, there isn't much further to go. But before I close out this section of this very long chapter, and this chapter is supposed to have something to do with living by and for surrogates, you may recall that I still hadn't answered the question that had confounded me for nearly thirty years now, and that was “why jump out of a window?” Well, I can't interview anyone who did jump, so give me the license to make up a character, because even with a made-up character I couldn't make sense of that 1929 scenario, like I could with George Bailey of *It's A Wonderful Life*.

Let us say you were a middle-aged investor of the time, not a well-known local manager of a small savings and loan. And yes, you have been gambling with other people's money, lots of people, most of whom you don't know. You have had lots of company in this, lots of other people doing the same thing you were doing, at that has been a large reason why you were convinced that what you were doing was not just okay, but it was manifest destiny. This is a huge version of Jean Genet's *The Balcony*, (discussed in the notes to chapter one).

You even had facts on the ground--skyscrapers had gone up--magnificent testimony that what you were doing was an ordained good. What could match the majesty of a skyscraper? Surely not a cathedral. In general, skyscrapers are not centers of production. That is an architecture grossly unsuited to making anything. This is a control tower of culture. They are filled with offices, of other people like you, or their underlings, and the investments that support these huge icons are not just cement and stone, girders and reinforcement bars. It is the force of acceleration itself. It is like a person standing on a railroad and leaning forward. The only way that person can avoid falling on his face is if that flatcar accelerates, and keeps on accelerating. Mere forward motion is not enough. You are speculating on the future of speculation, and you have to go many layers

down before you find a turtle. Everything is legal, properly speaking, and even when you lean out at a more acute angle over the accelerating flatcar by leveraging and buying speculations on margins. But you are not alone, remember, there are lots of other people on the flatcar leaning forward as well, with, they hope, nothing but straight track ahead.

All it takes is for some version of a turtle (your ultimate prime-mover locomotive) to just slow down a bit and everyone falls over. In fact, just the rumor that a turtle might slow down is enough for everyone to fall over because the real acceleration of the flatcar is that you think it will keep accelerating. It is literally all in your head and everyone else's. But the actual person who jumped out of the window is not imaginary, not on a flatcar, and there are no turtles. However, you, as this investor, have worked very hard constructing this growing superstructure, as have the others doing the same thing. Very suddenly, what you see around you is not your office, your building, not even a house of cards. It is vapor, and that vapor is your life.

It is what you have spent all those countless hours and days doing over the years. To add insult to mortal injury, there will also be a lot of people who are not investors who will suffer greatly because you and many others will fall over, knocking them down underneath you. But truth be told, you are probably not thinking at all about them right now. You are in an existential panic, facing a black hole of non-meaning for all your efforts, having spent far too much time leveraging imaginary money, and far too little time doing anything that might be impervious to mere material misfortune, to anything that is nothing like vapor because it can't be vaporized. Yes, you are in an existential freefall, but maybe it won't be quite so terrifying if you just could get your vision, your own vision, that one you desperately need. The only trouble with a nice ending in this case, is, if you could imagine such a scenario, what would Clarence the angel be able to show you, in his review of your life and how the world might have been without you, that would give you the vision you need? No, there isn't a fire in your office; there is something much more terrifying than that. It is nothing. I still wish this fellow on the ledge wouldn't jump. He can start life again, and I know that. I wish he wouldn't. But finally, I could understand why he might want to.^{1xi}

Notes for Chapter 5

^{iv} The explanations and examples of the physical and mathematical concepts I use to illuminate socio-economics in this chapter are strictly my own. I have just used examples the way I have often done in both humanities and science classroom experiences, although they never come out the same since I usually just come up with different mental pictures at the time to fit the particular context. For readers who would like a handy reference book for basic concepts in the natural sciences, I know of none better than the highly readable and short *Science Matters: achieving scientific literacy*, by Robert M. Hazen and James Trefil, Doubleday, 1991. For a wonderfully engaging history of chaos theory, I recommend the celebrated book by James Gleick, *Chaos: making a new science*, Viking, 1987.

I had a personal epiphany, of sorts, when I first read Gleick's book. When he was describing the attempts of Edward Lorenz to do early computational predictions of climate, and his surprise at how the computer itself would, while grinding away at iterative equations, fly off to unexpected values when left alone, I immediately recalled an experience I had had years before as a physics student. I can't recall what the particular problem was, but I well remember that the solution was embodied in the equation: $\tan(x) = 3x$. This is a transcendental equation, and the values of "x" which solve this equation are the points of intersection between two graphs, namely $y = \tan(x)$ and $y = 3x$. The second equation's graph is a straight line, the first one is a series of repeating curves.

It is all well and good to draw the graphs as accurately as possible and then try to actually read the values off your picture, but that, of course, isn't very elegant. To calculate the values directly, you can't just solve this transcendental equation like a simple algebraic equation. Instead, you have to use find numerical solutions using a tool of successive approximations, in this case the Newton-Raphson method of numerical analysis. So, I wrote a little program to make this calculation, and what happened completely baffled me. If I gave the program a "starting guess" that was reasonably close to one of the actual intersections (which I could guess by looking at my graph), the program would roll around a bunch of times and finally "converge" on the actual numerical answer. It would know when to stop because I gave it instructions to stop if the answer in one iteration deviated by some set small amount from the approximation it saw in the previous calculation.

However, if I didn't start the program working within a small enough numerical region of one of the solutions, the calculations just went wild. They didn't just go off to infinity, and what I had expected was that the program would just converge on whatever solution it was closest too. But neither of these things happened. Instead, the calculations just went on and on forever,

and when I would interrupt the program to see what was going on, the numbers I might get back (the crunching that was going on at the instant I stopped it) I was completely shocked to find every sort of weird number popping up, with seemingly no relationship to the numerical solution underway. I had no idea what was happening, and wondered if what I was looking at was just some bizarre artifact of the electronics involved. As soon as I read of similar things happening (in Gleick's book), I was immediately time-transported back to my little episode many years earlier, and had a great A-HA! Moment. My little program had been running chaotically, mathematically speaking, looking in vain for a strange attractor to converge on, and it couldn't find one!

^{lvi} The example of the mill facilities used is a simplified version of the fascinating account of the struggle among the millworks of Bazacle, Chateau-Naronnais, and La Daurse, in *The Medieval Machine: the industrial revolution of the middle ages*, by Jean Gimpel, Penguin, 1977, ch.1.

^{lvii} I am completely indebted for my first hope that I ever might understand some basic tenets of economics to the marvelous classic text by Robert L. Heilbroner, *The Worldly Philosophers: the lives, times and ideas of the great economic thinkers*, Touchstone/Simon and Schuster, 1986 (6th ed.)

^{lviii} Years later my father had told me that he had actually been in close proximity to a minor episode, like that perpetrated by the loan shark goons on The Untouchables. In the early years of my parents' marriage, my father was constrained to work all sorts of jobs to make ends meet, especially when he was putting himself through college (the only one in his family to do that). Even after he became a full-time public school teacher he worked summers painting houses, and for a few years working an assembly-line job at a brewery. He used to teach private music lessons every hour he could wedge in. At one time he taught these lessons in a back room at a musical instrument store. He told me that it was late in the day, and he had finished his last lesson when he heard a discussion in the showroom and a cry of pain. When my father came out to see what had happened, the proprietor was obviously in great pain, and several men had just left. The proprietor, not the most perspicacious of businessmen, had fallen into debt with loan sharks, and the men who had just left had broken one of his fingers to make a point about repayment. That was one of several times that my father, years after the fact and when he thought I was old enough, told me things that amazed me, and left me wondering what stories he had never told me!

^{lix} I had never read of Frank Capra's film used in any writing about any subject besides the film itself although there probably have been such references in writings, and I have been oblivious to them. So, it came as great surprise to me to see a recent article about mortgage rates in the *Los Angeles Times*, which did

just that. As everyone is now well aware, the summer of 1998 saw the arrival in full force of the global-financial results of the "Asian Contagion," as the domino-topping economies of Japan, Thailand, South Korea, Indonesia rocked the world's financial markets like no other crisis in the last half-century (the literal words of world bankers, finance ministers, President Clinton, Federal Reserve Chairman Alan Greenspan, and Treasury Secretary Robert Rubin), which were only further pushed to the precipice when Moscow defaulted on its bonds, and several Latin American economies are now quite threatened. Whatever the fallout of the turmoil, only time will tell.

Nonetheless, huge amounts of capital were being moved into the bond market from stocks, and futures of all sorts, which represent, mathematically, even higher-derivative exposure risks. And to help re-liquify capital investments Chairman Greenspan was in the hot seat to lower the Federal Reserve interest rate. Such reductions, of course, are soon reflected in such things as home mortgage interest rates, and so in the early fall of 1998 all sorts of pundits were giving advice on when the big wave of re-financing of home loans would wash in, and how this would spur the new home building market.

It came as quite a surprise, therefore, when DESPITE the Federal Reserve lowering its rates, in early October, 1998, suddenly home mortgage rates began to RISE. Why? The following is an explanation for what one mortgage investor described as the greatest increase in three days he had ever seen, and a climate of "havoc...and a tremendous amount of tension." The explanation went as follows:

"The leap in mortgage rates is one of the first tangible ways that the turmoil in international financial markets has crossed over into the 'real' economy....The volatility has fed a climate of fear among investors, which has caused them to shrink back from all kinds of investments, including--significantly for consumers--mortgage-backed securities. Unlike in the past when mortgage rates were set locally by small-town lenders such as the one portrayed by Jimmy Stewart in *It's a Wonderful Life*, today they are set on Wall Street, where traders bid on mortgage-backed securities. Those are investment vehicles created by 'bundling' groups of individual mortgages into parcels that can be bought and sold like stocks." (Thomas S. Mulligan and Stuart Silverstein in *Los Angeles Times*, Oct. 10, 1998; capitals mine). I had already written the section of this book where I use the example from the movie and, although it is just a coincidence, I shook my head in amazement when I saw this very example trotted out in a national newspaper.

^{lx} Today we are saturated with the assumptions that innovation is the name of the game in the next century. If you want a good overview of the mainstream variations on this theme projected out for the next century see a recent special double edition of *Business Week*, August 24-31, 1998, with the cover reading,

“The 21st Century Economy: volatility is here to stay, but technology and globalization will spur robust growth.” This ambitious edition devotes about 100 pages to very well-written analyses and prognostications on every kind of innovation (molecular-level fabrication; genetic engineering; global supercontracting; and global “hot spots” for creativity; to name a few). This collection of articles is better than any single book of which I am aware of expressing the whole doctrine of the religion of globalisation at the present moment, and from well within the mainstream. A listing of books from, say, the last ten years preaching the essential outlines of the same dogma would be a meaningless exercise in multiplying sources.

However, what is now taken as both responsible and forward-thinking analysis did not originate with Lee Iacocca at Chrysler, or with Andy Grove at Intel, or Bill Gates. Perhaps the first, and last, serious attempt to understand the nature of innovation/entrepreneurship, and not simply as the engine for providing material wealth, but what its future might be in terms of a sociological arc was the economist Joseph Schumpeter. I refer the reader to the chapter devoted to him in Heilbroner’s *The Worldly Philosophers* (op. cit.).

^{lx1} Since you have doubtless been unable to avoid all the news of global financial turmoil in 1998, are you also saturated with all the nostrums of what should be done? I know that I am. What have we been told must be done? I’ve culled a random sampling of articles from a few of the large-circulation magazines from the last few months (e.g., *Time*, *Newsweek*, *Business Week*) just to get some feel for the prescriptions to the implications of the global economic crisis that might be reasonable to expect that the normally-informed American adult would have been subjected to.

First, I must admit that this is a very facile exercise. You might be tempted to say that any sampling of articles or essays says nothing more about some social reality than, say, a sampling of articles about different views on something like the events leading up to the impeachment hearings of President Clinton. What one would wind up with is completely divergent opinions, from outrage of moral failure on the part of the President, to outrage at the public for even worrying about this supposed “crisis,” to outrage at the press for fueling the fire. And what does that tell you? That there are as many opinions about the confluence of morality and politics (or public versus private issues) as there are people to think about them. Fair enough. That is still interesting for a culture-watcher to be aware of.

However, I would also say that the themes of economic analysis are of a fundamentally different nature. Rather than representing thinkers and pundits whose opinions are completely incommensurate right out of the gate (as, for example, with the Monica Lewinski episode), in the case of the global economic crisis, its diagnosis, and its prescriptions for correction, there is almost NO

difference from the accepted experts who like to think that they represent some vast intellectual spectrum of opinion. Every one of them takes a great many postulates as given, including: 1) the only healthy economy is a growing economy (measured by GDP with any variety of special coefficients attached); 2) no single country's economy can be blithely left to tank, not for humanitarian reasons, but for our own security, and so; 3) there is an implicit order of attention that we need to pay to other country's economies which hierarchies are not always easy to quantify in the same dollar reckoning as we would like. Still, in this reckoning Japan is generally at the top of the list of economies that need fixing right now because it has so much leverage in terms of import/export flow, and it is key to repairing the rest of the Pacific rim. Russia probably comes in next in importance, not because of huge capital flow (and certainly not for humanitarian reasons), but essentially because they have nuclear weapons which, if they find their way into the arms market would completely destabilize geopolitical economic policy. Then comes Latin America and Mexico, because of their rising potential as producers and consumers for us. Another universal postulate is that; 4) global investment capital, not just as multinational manufacturing companies investing in foreign plants, but for all higher-derivative financial instruments for global investors, is a good and necessary reality. The only differences between the so-called extremes of policy are the degree of liquidity and rapidity that might be allowed, as well as some possible increased oversight into risk-assessment accounting by bodies like the Securities and Exchange Commission and others, national or (heaven forbid!) international oversight (which, of course, is the very beating heart of the apocalyptic New World Order).

In April, 1998, we were told that new data revealed that free trade will not hurt employment and the new projections for the interest paid on the federal deficit for the next ten years indicated a downward trend, the opposite of the forecast of one year prior (*Business Week*, April 6, 1998, p. 30). Furthermore, disposable income was taking off like a rocket, as were prices, consumers were spending more than ever before, even while household debt had levelled off (*Business Week*, April 20, 1998, pp. 42-43). By May the fundamentals of the U.S. economy were so strong in employment, state and local revenues, and a tight job market extending well into the ranks of the unskilled made the economists almost giddy, and they would like to be wary of a looming inflation (since these other indicators historically provoke inflation), except there wasn't much sign of it, so the next best bogey-man to occupy ourselves was the potential competitive threat of the new pan-European currency, the Euro (*Business Week*, May 4, 1998, pp. 30, 34).

The next week there appeared a review of a new book maintaining that

America, due to technology, globalization, and education, would remain surfing the leading edge of the prosperity wave for at least the next twenty years ("Why the Party Won't Be Over Soon," by Kathleen Madigan, reviewing *Prosperity: the coming 20-year boom and what it means to you*, by Bab Davis and David Wessel, *Business Week*, May 11, 1998, p. 15). But the same issue included an essay by economist Robert Kuttner, revealing that the new Internet-commerce craze was based on a radically wrong assumption, namely it ignored the wisdom of economist Joseph Schumpeter who, half a century ago, told us where profits REALLY come from, and that is from discontinuities in the marketplace (e.g., imperfect information about pricing available to customers), and that the Web was too perfect an informational mechanism to sustain such discontinuities (hence, profits must evaporate). (See, "The Net: a market too perfect for profits," *Business Week*, May 11, 1998, p. 20.) But who would guess Kuttner could possibly be correct, when the same week *Time* ran an article titled "China Gets Wired: the Middle Kingdom has embraced the Net as the fastest path to the 21st century," by Joshua Cooper Ramo, pp. 52-53.

By late May, 1998, everything was looking better than great, by everyone's standards, and all economics was definitely global, but within that global economy which would, like John Kennedy's rising tide that raises all boats, there was still concern about something called the welfare of one's own nation, and of course you are expected (to be taken at all seriously) to bend your diagnoses to all ways in which the world might do okay, but at the end of the day we (the U.S.) had to remain at the top. How do we manage to do that? Should we have a national program to encourage and fertilize the maturation of strategic new technologies? That was the consensus of the National Academy of Sciences, but economist Gary Becker begged to differ in no uncertain terms: "Public support of R&D should concentrate on basic research without commercial value, while the private sector should finance and develop profitable technologies." ("The Myth of Industrial Policy," *Business Week*, May 25, 1998, p. 18).

Even with the persistence of good news about most of the American economic fundamentals, many economists remained very concerned about global capitalism, and the failure, in particular, of Asian economies to "fix" their economies. Regardless of how strong our production base and employment numbers were here at home, there was an inexorable point beyond which the collapse of Asian economies would pull us into a black hole as well, and here the major concern was Japan, the engine of the post WWII Pacific rim boom, and until very recently the envy of everyone else, especially the United States. In fact, the 1980's publications in business and economics persistently examined how we might be able to duplicate the Japanese miracle (education, total-quality management, dedicated workers), since we seemed to be tottering on our last decadent legs. So, might I say, that I was a bit bemused when a well-

respected periodical ran a major article that found out just what the current problems with the Japanese economy were! ("The Social Contradictions of Japanese Capitalism," by Murray Sayle, *Atlantic Monthly*, June, 1998, pp. 84-94) It turns out that everything about traditional Japanese culture is inherently unfit to compete in the global world economy! Imagine that! Social coherence and worker dedication were simply the flip side of cronyism. All that great education they were hammering into their youngsters was NOT superior to American education after all, since they were training people to be good students, not creative individuals!

In July, *Newsweek* was still touting the economic year as the "Year of the Employee," ["workers hold the cards in this booming economy. Is it time for you to demand a big, fat raise, too?"], (*Newsweek*, July 20, 1998, pp. 38-41.) And another new book (*The Productive Edge: how U.S. Economies are pointing the way to a new era of economic growth*, by Richard Lester, Norton; reviewed by Lewis Branscomb in *Scientific American*, August, 1998, pp. 98-99) reported that we had regained the global lead, thanks in part to Japan's bursting of its economic bubble and in part to difficult reorganizations in corporations, layoffs, new respect for customer service in high-tech, and some long awaited technology-induced productivity increases. But the moral is, as Harrison Ford said in *Star Wars*, "Good. Don't get cocky, kid." Our continued good fortune rested on our entire culture joining the church of ever-increasing commercial excellence.

Of course, by August, 1998, the global economic crisis had sunk in as a reality, maybe a full-fledged depression in Asia, and maybe a recession for us. In the course of a few weeks, every pundit was pointing his or her finger in every direction possible, and in the process assuring the robust health of only one industry, that of economic punditry. I have a stack here on my writing table of over twenty articles, beyond the ones already cited, which were splash-page fare covering the sudden vulnerability and fickleness of domestic consumerism seeing their paper wealth evaporate; why Japan was unravelling and why we should redouble our commitment to the free market; price-rigging; a world meltdown in confidence of global market capitalism with the advent of the Russia crisis; why you can't have free markets in cultures lacking in our values; which investment firms will weather the tsunami; a precipitous drop in earnings growth forecasts (talk about a derivative-based concept for worry!) for the Standard and Poor's 500; all those lethally pesky, non-reformist Asian politicians; the \$3.5 billion dollar bailout of Long-Term Capital Management for buying (on a margin approaching a multiplier of 120!) Russian bonds that defaulted; a major exposé on the slippery accounting techniques used to jack up share prices; and a report that the Joint Chiefs of Staff smell blood in the water in the Presidential scandal and are using that weakness to go on a Pentagon shopping spree, despite

the end of the Cold War.

What is a conscientious, informed citizen to do? What, indeed! This is just one example of why I do not wish to write on policy. The arguments are endless, and even to engage in them (for which I know I do not have the stamina) one simply must accept a whole boatload of postulates about what individuals and societies and economies are about and should be about, and I don't accept them in the first place.

But I haven't answered my own question of what a citizen is to do. I do have an answer: do something else. And that something else is ultimately what this entire book (the primary text, and as you are seeing, its companion text, the Notes section of the book) is about. And that is why I see my primary audience as the individual who is ready for some introspection about the meaning of life and what is worth doing. It is truly an "Upward, not Northward," proposition, not at all amenable to policy statements. It is a message of gratitude and invitation to opportunity, despite the tremendous human loss of life going on all around us: not just the actual passing away of individuals, but the willing bloodletting so many of us subject ourselves to in devoting huge portions of our lives doing things that we don't value in and of themselves, and that sometimes we don't even comprehend.

Even Robert Heilbroner, writing in 1986 (*Worldly Philosophers*, op. cit., pp. 311-325) despaired that the age of the very worldly philosophers he had so affectionately written about was over. These had been thinkers who toiled not just tinkering with the mechanism of the economic machine, but who had thought passionately about what humans do and why, whether it is good, lasting, or evanescent and destructive. Heilbroner thought, some dozen years ago at least, that he saw none of that sort of thinking in the present or on the horizon. This was an age for technicians, not artists of the mind. And there is a lot of evidence to bear him out. Lest we forget, two members of the elite braintrust that bankrupted Long Term Capital Management, by betting huge sums of other peoples money against an unknown future, to simply make derivative money on the timing of buying and selling of other financial instruments were... Nobel Prize winning economists! Good work, fellas. And I would like to add my personal thanks that you have devoted your huge cerebellums to making the world a better place.

Perhaps there will be, once again, a place at the table for the deep-structure worldly philosophers again. I certainly don't have the credentials of Robert Heilbroner in this assessment, just the advantage of ruminating on its possibility twelve years later. This year's economics Nobel laureate, Amartya Sen, was awarded the prize for his studies of poverty and famine, and that was made a personal quest for him by first hand experience of the famine in India in 1943. I do not know anything about his work so far, besides what I have read in the

newspaper following his award, so I cannot say more about him or what this recognition might portend. In any event, I am not an economist. But I am a teacher. Maybe even a writer.

Chapter 6: *The Great Divergence*

I don't know about you, but I could stand another amusing story about now. Sorry. You'll have to wait for the next chapter for that because we still have some strands to tie up with this whole issue of surrogates. As we'll see in a few pages, one of the words in current vogue among economic analysts, captains of industry, and policy wonks is called "convergence." This can mean almost anything, and it is one of those slippery terms that, when someone uttering it is pressed, might very well fracture along any number of particular beliefs, depending upon the complete agenda of self-interest of that person. We find the same thing when trying to identify "Democratic" or "Republican" political beliefs, liberal or conservative, etc.

In essence, however, it rests on the premise that we are in a new, fundamentally better, era of economic history. Capitalism has vanquished communism, except for a few outposts, so in the broadest terms the entire globe is very nearly on the same page. At least we are converging on the same doctrine and have to work out the kinks. In strictly material terms, this means that the entire world is the market for the entire world. We will all be producers and consumers, importers and exporters. Better still, it is unthinkable that in an information age any country or province can effectively be part of the throughput of global material commerce without also being part of the throughput of information. And when that happens, it is assumed, it is a short hop to all societies being free speech democracies, maintaining universal standards of human rights. We are therefore converging on global market capitalism, which like every evocation of economic market mechanics since Adam Smith, will make us better people without our having to be better people. The laws of material commerce will reward good social behavior and punish bad social behavior.

As I have maintained, the point of this section, as with the book as a whole, is not, to urge some new global or national policy to "fix what is wrong." I don't have one, and for all I know some version of global market capitalism may be the best way to manage our material affairs at this stage of human evolution. My focus remains to try to afford a vision of what we *seem* to be about, to illuminate

some visions of what we, individually and communally *may wish* to be about, and stimulate reflection and conversation. I can't think of anything more rewarding than such a response at any level. It is in support of these modest desires that I would like to conclude this section with a side-by-side examination of this postulated global convergence, with what seems to me an equally profound *divergence*.

When we look at the demise of communism as an ideology, it is quite easy to celebrate. After all, most everything about the system that we saw seemed so contrary to so many values that we justly hold dear, and noble. Even in its theoretical evocation (before the examples were established on the ground after the October Revolution, and the atrocities of Stalinism, for example) it runs contrary to so much that was so electrifying in the visions of the Enlightenment philosophers. We in the West had already been taught that the individual should have the right to pursue happiness, to exercise all sorts of freedoms. The state, however defined, ought not be the only locus of progressive ambitions. Quite literally, we caught the vision that we had the right to strive for our most excellent visions, and there was no telling just how exquisite those visions might be until we were free to act. In contrast, the very idea that the value of an individual life was not in its individuality at all, but as simply a member of a soviet of workers, was intrinsically repugnant to those who had hope of something more. Of course, if you were buried in a coal mine, dying young of black lung disease, forced to pay back all your wages for survival commodities at controlled prices, and shot by company goons if you tried to organize, then the idea of a soviet of equals on the march would feel like emerging into pure sunlight by contrast.

However, the premise of a pure, unencumbered, global marketplace itself rests on a new singular ideology. In this ideology, it is assumed that everyone will place a premium on the continuing acceleration of consuming and producing what is new, and put their backs into that as a good. Even in a so called "knowledge economy," we still wind up with a soviet of workers marching to the same anthem. If, in Marx's view, the otherworldly visions of religion are the opiate of the masses, in the global market place what is our vision, and how is it different from an opiate? And, to preview where we are going here, the

simultaneous great divergence that I see occurs first for the individual, the purported focus of excellence in a free society.

That is, in order to keep up with the accelerating locomotive of the competitive global market place, we are not simply asked to be flexible and fleet-of-foot to survive. We are increasingly asked to divorce ourselves from everything that, in past generations, supplied meaningful patterns to our individual and communal lives. How far can we diverge from our sense of place, of personal history, and of meaningful human connection? Undoubtedly we all have different thresholds for straddling that widening divergence, but there may even be absolute limits beyond which no individual can sustain a sense of a meaningful, worthwhile mortality.^{lxii}

i) *When skating on thin ice, just skate faster . . .*

Somewhere along the way the discipline of economics took on the appellation of the “dismal science.” As one of the little people looking out on the world I would respectfully disagree with that. I think the phrase does a disservice to both words. It is difficult for me to call it a science, by any of the examples I know, whether physics, biology, or paleontology, or anything else which purports to observe, gather evidence, form hypotheses, and test those projective hypotheses into past or present and see if some theory comports with realities, which themselves still show some larger predictive capacity that converges or diverges from the overall accretion of knowledge of convergent or divergent observations. Cosmology, for instance, is filled with all sorts of historical discontinuities of evidence. Except for the astronomer whose *raison d'être* for study is to only march up the ladder of professional promotion and be the final arbiter of reality (and I don't know of any personally, but I suppose there may be some), such discontinuities are often met with a sort of glee. Wow! The mysteries just keep on multiplying, and the universe never runs out of surprises. Let's see if we can match wits with the ineffable wonder of it all this time.

I also think that dismal doesn't fit very well. At least for the individual who is embedded in a system of market capitalism, the very acceleration of it all, combined with completely temperamental and infinitely variable inputs, which

keep shifting not just the amount, but the direction, of those accelerations is not exactly dismal. If I found myself suddenly in an automobile, with the accelerator pedal stuck to the floor, only to discover that my steering wheel had either fallen off or would only intermittently connect to the front wheels, and the brakes didn't seem to work, and I couldn't find the ignition key to shut it off, and I was on an unfamiliar road, at night, and the headlights would turn off and on at random, and, if somehow the car ran out of gas before I went over a cliff and I managed to make it home and tell my family about the experience, the very last word that would come to mind would be dismal.^{lxiii}

There is only one way in which economics can possibly be called dismal, and that is if you are not in the car and it is your job (as a putative scientist) to predict what will happen. Let us make it even more abstract because if I were simply to be an outside observer watching a real passenger in such a predicament, I would (as an empathetic co-human) be filled with dread at the likely outcome. So, instead, you are part of an electronic game, as a psychological test subject, and so you are simply given the task of watching such a process, as it unfolds, with nothing more than a virtual Pac-Man at stake, but your actual task is to infer the results of this video game. In fact, you are told, that the experiment being run is to see whether regular people can process information scientifically given a system with visual feedbacks in real time, and that there was, in fact, some underlying, projectable principles at play. If you figured these patterns out, then you would succeed in this psychological test of observation, synthesis, and hypothesis. Success in your task could very well include the prediction, before it happens, that Pac-Man will die at a specified time as the game progresses.

Okay, this is a bloodless test of some kind of predictive skill—it's a game, and it requires (according to my psychological research handlers) that I be able to apprehend logic under a time constraint. If that is all there is, you can cast aside any real world worries that you would be responsible for real harm to a real creature, and you steel yourself up for the challenge, and there is an excitement about it. Your handlers go to another room so as not to distract you and you start the game. Now supposed that the actual computer program that drives this Pac-Man car throws in variables at random. You would almost certainly fail miserably, but there is a slim chance you might succeed and be

elated. You may even be certain that you had, though your incredible wit, figured out the underlying patterns to this visual input.

When your handlers come back in the room, they would interview you, ask you how you felt during the experiment and just what was the pattern you discovered. They might be amused at some incredible logic you applied to figure out when the Pac-Man car would go off the road. Then they do the experiment again, and the computer changes the variables (and it doesn't take much tinkering when the variable changes something like acceleration, or how much you can steer and when) and this time, even if you succeeded the first time against all odds, you would certainly fail miserably this time. In fact, you would fail even more certainly and more miserably if you thought that you had figured out the algorithm driving the game the first time.

If they ran the experiment a few more times, you would continue to fail, and your anxiety level would increase because you had first thought that you had the patterns figured out, so why do you now keep getting it wrong? And, if you were willing to take part in this experiment in the first place and thought that you actually were an exceptionally clever person (bolstered in that estimation by the fact that you succeeded the first time), you would have several paths to get out of that room with your sense of self intact. One is to backtrack and admit that the first time you succeeded was merely luck, so that the successive failures tell you, now somewhat humbled, that you never did figure out the pattern and so you weren't as clever as you thought. After four tries or so, you would probably ask your handlers to stop the game, as it was just making you frustrated.

But now suppose your handlers came in when you had had enough frustration, and told you that they had actually lied about the experiment. They were sorry, but it was necessary so that you would actually play the game. They were actually after a higher-level insight, and that is to test human subjects operating under what seems to be a rule-bound set of conditions when the conditions were not, in fact, discernible by any application of intellect operating with those preconditions, and they were trying to measure the rate of changes from elation, to a redoubling of mental effort, to frustration, to the deterioration of perception of one's own intellect, to outright resignation and acceptance of failure. So what they really wanted from you now, was a narrative, as best you

can reconstruct it, of your inner states, of how you felt each time the game was restarted.

If these researchers have any compassion at all for real people (their test subjects) they won't let the experiment go on for too long because it can so quickly lead to disappointment in one's self, to a sense of resignation, apathy, and depression. So, before you get into too much trouble, they stop the experiment, everybody has a good laugh, and you fill out their narrative questionnaire. If they have misjudged when to stop the experiment, they might risk having the subject first completely disillusioned and then angry at the deception. Rather than saying, thanks for letting me participate in such an interesting research project, he might instead choose to punch one of the "lab coats" in the nose on the way out.

In other words, an experiment meant to gather real data on, say, the psychological arc of expectation and disappointment (which the researchers in the other room are excitedly recording), the subject of the experiment is left not thinking he has actually uncovered some underlying truth, but rather that he, personally, is not that smart and gets depressed. Economists, expected to figure out the patterns and then demonstrate those patterns are, in this example, not the research psychologists. They are the undergraduate volunteer playing the game. And even if it is only a Pac-Man whose future is at stake, not real people or real societies, you can only convince yourself that you are clever for a few iterations of the game. Okay, I take it back; I can see how economics, as a discipline, can be dismal.

So, if you ARE an economist, how do you, in your day-to-day occupation keep from just being in a dismal state of mind? Well, there are several real distinctions between the above psychological experiment and the real-life work of an analytic economist. First of all you are, to a certain extent, in on the game from the outset. No professional economist expects that he or she is actually in the position of the test subject in the above experiment, where they will be allowed to play this game for a while, but at the end of the day the door will open to their office and a couple of lab-coated folks come in and tell him that they were deliberately changing the algorithm each time the game was played. To be a professional or academic economist cannot include in that worldview such an eventuality.

Secondly, there is the implicit belief that there is, in fact, SOME kind of world economic algorithm, and they can figure it out. The way they go about figuring this out is actually very respectable in the model of a laboratory science. They collect data about the past, and develop mathematical models, which, with the benefit of hindsight, actually give you back the historical events when you put your data into your formula. In the physical sciences and applied mathematics, this is called “curve fitting.” Here is a simple example. Take a beaker of cold water and put it on a Bunsen burner with a thermometer in it. You notice that the temperature goes up at some smooth rate, so you think that maybe you could model this increase in temperature and even make a predictive law of nature from it. That would be neat, and intellectually satisfying, and might tell you something about the material world.

Having made that observation, you decide you need more than just an impressionistic observation, but actual data. So you start over with a new beaker of cold water, and are careful that the intensity of the flame stays the same. Now you watch the thermometer, and note down the temperature at the end of each second. When you plot this on a piece of paper, you will get a nice set of points that do indeed suggest a smooth curve. So you shut off the burner to see what this visual-mathematical representation of heating water tells you. You start by connecting the dots, but you realize that the process was continuous, not just jumps in temperature when your watch ticked off successive seconds. It is only reasonable to smooth out your graph and assume that what happened between your observations was similar to what happened even when you weren't taking down thermometer readings. You come up with a pretty simple algebraic formula that represents your curve, and you say that this represents the predictive curve of heating in a controlled situation. Not bad. And others can do the same experiment, taking measurements every half second, to see if you didn't miss something in the details that would actually change your formulations and understanding of the gross phenomenon.

Now, if you didn't stop your experiment when the water simply got hot, but started to boil, even you would have noticed that your simple graph is not sufficient to account for things getting hotter. You would notice a very interesting phenomenon once the water started to boil. As soon as the water boils, your thermometer stops reading higher temperatures. In fact, it will stay

at exactly the same temperature for a very long time, even though the Bunsen burner keeps supplying heat at the same rate! Not only that, but this just keeps being what you see until ALL the water has boiled away, turned to steam.

This is only a surprise if you happen to be the first person to do it, or if you don't know anyone else has done it before. What has happened is called a change of state (from liquid water to steam), and as you might imagine when you continue your graph of temperature versus time, the shape of your graph changes radically (and discontinuously—it is not well-behaved) once the water begins boiling. Your original graph was fine to hand out to your colleagues as long as everybody was only interested in how the temperature of water changes as you supply heat within the range of beyond freezing and short of boiling. Beyond that, your graphs make a transition that isn't curvy (predictable or extrapolatable) anymore, and your new theory has to be radically different now to be able to be useful for anything at any temperature.

A phase change is a complicated phenomenon in nature, and it doesn't seem to make sense at the large scale level or say, a whole beaker of water. So you have to come up with a different level of explaining reality (what is water, what is heat, what is temperature, and what is going on) to even be able to make useful real-world predictions anymore. And so far as phase changes go of normal things in terrestrial environments, this has long since been removed from the realm of the unexplainable in physical science. The principles behind phase changes remain complex, and there are certainly realms of science, like cosmology at one extreme, or neuroscience at another, where the actual principles of analogies of phase changes continue to be ever more fantastic and imagination-bending.

I am constrained to believe that economic theorists must be exceptional intellects in many regards. I know that I am not nearly clever enough to earn a living that way. But the more I try to understand the world of economic theory, the more I keep getting slapped by cognitive discontinuities that I can't reconcile. I am fairly certain, for example, that there must be any number of economic theories out there, especially since academic economics finally started incorporating in their analyses some basic mathematical tools beyond addition and subtraction, multiplication and division, and compound interest (sometime in the early twentieth century) so they could see more complex dynamics in the

motions of economies, which have incorporated some analogues to “phase change” in their models. However, not being a trained economist (can I ever forgive myself for not having taken Econ 101?), I’m afraid that the vocabulary that they use in between their curve-fitting formulas is like a foreign language meant for initiates only, and, frankly, I don’t have the desire to learn that language. Yet even if there are equivalents to a change of phase, we at the lay level don’t hear much about it.

I would suppose that the much-hyped “information age” is accounted by economists as something like a phase change, a mathematical discontinuity of quantity and quality, but, again to repair to my basic interpretation, we somehow are told that even if it is discontinuous, the changes it incurs should still be, in the mathematical definition, well-behaved. I am sorry to report from the forefront of three hundred year old mathematics, but if a function is discontinuous, there is no way it can at the same time be well-behaved. It just ain’t so, Joe. We still expect things to move ahead at every level. Motion is not enough; it must accelerate or, literally, die in a free global market. And one stopgap model to give us more space and time to accelerate is to introduce a discontinuity in the market machinery, but to also keep it mathematically well behaved! How could this ever be done?^{2lxiv}

Well, there turn out to be a few handy instruments you can inject into these formulations to paper over the incongruities and convince yourself that things in the material world will keep getting better. There is still enough company among those who believe in these projections and repeat these nostrums to each other so that a lot of people are not jumping out of windows. At least not yet.

Even within a closed, parochial economic system there are mechanisms that allow one to be leaning forward, to use the accelerating platform analogy, and imagine it is possible to not run out of track and keep going. One way is to change direction, and hopefully you can manage to do this gradually enough to adjust to it. In fact, repairing to tabletop physics, if you continually change direction, this is a kind of acceleration without having to change speed. It always takes beginning physics students a bit of getting used to when you tell them that, according to Newton, the moon is constantly falling toward to earth. Then why doesn’t it crash into the earth? Because the nature of its actual falling is compared to what it would be doing if it were not going around the earth: it

would be going off in a straight line. So, merely by continuously changing direction, the moon is, in fact, in a continual state of falling in toward the earth in comparison to its trajectory without the mutual attraction of gravity, namely going off on a tangent and receding from the earth.

There are several ways an economy can change its direction, and not just add market amounts by adding people. One has already been discussed, and that is the appearance of an innovation, like television in a world that had only known radio; or the personal computer and the Internet in a world that had only communicated either one-to-one (letter, telephone) or one-to-many (print, broadcast). These sorts of innovations radically change the previous rules of commerce, and until people can come to some sort of consensus about what this new dimension is worth to them, the potentials are truly unknown. If this development turns out to provide something that people either intrinsically value, or so many other facets of society adopt it that one must also integrate it or be left out of that society's commerce altogether, than the innovation grows in use and market forces *at that point* do the things that all economists say is what they are really after, like smooth but increasing rates of growth and competitive pricing, and variations on the theme of original innovation to gain market share, etc.

However, the original innovation, if it truly is an innovation, provides a discontinuous, not smooth, change of direction followed by some kind of straight-line acceleration. True innovations are hard to come by, and they are not predictable. You can't dictate that an innovation will happen. But there are other changes in direction that are much more predictable in the short run. One is the variations-on-a-theme process. Put more chrome on the car and give it a bigger engine, for an example from the 1950s and 60s. Give the personal computer color, then graphics and sound, etc. The half-life value of such variations is much shorter than a real revolutionary innovation.

But there are still other options, tried and functional. This includes producing the same goods or services, essentially, but changing the meaning of its surrogacy. It isn't this anymore; it's that. This process is called marketing, and Alfred Sloan of General Motors was one of the first to master it. In this, the customer is not merely supposed to buy more of something because they can and

two are better than one. You don't simply replace something because it is worn out and, perhaps when your original widget is worn out, a better-engineered widget has been developed so you get that instead. The logic goes beyond all this, and it derives from the fact that simply having something is supposed to MEAN something beyond any utilitarian value of the thing itself. This is the heart of brand-name recognition.

But is there a limit to the imaginal value-added magic of marketing? No one actually knows, but there are signs that there may be such limits. There are signs of these limits even if you are able to establish, hypothetically (like the physicist's "spherical cow"), that a society will never actually awaken to the most fundamental illusion of all, and that is that they are actually spending their mortalities pursuing surrogates in the first place. Even working within the most myopic kind of flatland culture imaginable, with no intimations of gratitude, depth, spirit, of anything worth pursuing that ultimately cannot be fixed in the coin of the realm of surrogacy, there are still hints of limits.

Just, exactly, what are you willing to pay for that running shoe? Last year they were \$80 a pair, and this year they are \$120, but you have changed the color of the logo (so everyone will know that I bought the more advanced one) and added some new Velcro and air bladders. Doesn't there ever come a time when even the most brand-conscious human-as-consumer stops for a minute and says, "you know, actually, this is still the same old foot I'm putting in this shoe, it isn't like I'm the Bionic Man or something and was fitted with a new body"? I need a car to make some errands and commute, so what exactly am I getting from this sixty thousand dollar handcrafted sport utility vehicle with a built in sauna and full-screen movie theatre?

These are the easy criticisms, and they go further back than Thorstein Veblen's idea of conspicuous consumption. Furthermore, these criticisms can easily be dismissed by saying, "well, of course, we should all live within our means, and some of us simply have more means." Or, they can be dismissed as the typical carping of a college teacher against the "philistines" among the rich (who remain in that class, by the way, until they give us some money by making a big donation to our campus). But I maintain that I am not carping against the rich or anyone else. I am not even carping against global market capitalism. The only object I am after is better vision, regardless of who we are, what class we

happen to be in, or what stage of cultural and spiritual evolution we happen to find ourselves. And in this section of the book, I am after the vision that remains once we look beyond the “forest for the trees,” or, once we look behind the surrogates to see what we might really be after.

So in this pursuit, I retain the right to do such silly things as look for meaning in clichés. Who would seriously do that? You would be better off looking for spiritual depth in a greeting card. However, clichés and bumper stickers usually need to have at least some basis in some perceived reality. If they did not, they wouldn’t even be funny as others with a different view laugh at how “obviously” boneheaded they are from their own more enlightened point of view. As Wolfgang Pauli might have said, “they aren’t even wrong.” I remember seeing one bumper sticker, and for a short while it seemed as though I saw it a lot. It read, “You can never be too RICH or too THIN.” This definitely did not fit Pauli’s category of “not even wrong,” but even at a superficial, flatland level it was *at least* wrong. Of course you can be too thin! You could be so thin that you die, and it’s hard to be rich and dead at the same time. Secondly, you can be so rich that all you have time for is thinking about keeping what you have, in which case you are pretty much dead in any other sense of the word excepting, perhaps, respiration, metabolism, and cell division. Just how long can people find meaning in the marketing of lifestyles, before the lack of substance becomes so apparent that no one will play the game anymore? The presumed returns of difference (status, influence, class, work-ethic virtue, cleverness) diminish because others are already bored by the unending succession of marketed emblems of successful living?

A few years back I had a young student in one of my classes who said a surprising thing. He said something like, “You know what’s really sick? It seems like in my generation, no matter what we do or come up with, it gets turned into somebody’s product. I mean, whatever we do, like grunge music, or rap, or being a slacker or a loser or a gangsta, or anything, we can’t do it for more than a month before you see it popping up on a Pepsi add or something, and then everybody does it, and now you have to pay, like, a zillion dollars for a pair of shoes that look like they’re beat up!” Now, it so happened that I enjoyed this student quite a bit. On more than one occasion his commentaries would make me

laugh out loud. And, after all, he was only nineteen. But this time he wasn't kidding, this was something that had meaning for him, and he was annoyed. My first inclination (which I did not act on) was to say, "Are you serious? This is a real world problem as you see it? Get a life!"

So, I didn't slam my student down for that. In fact, as I recall I didn't say anything, and a few other students probably said something by way of support, but in a short time the discussion returned to the subject of our readings for that day. Furthermore, I happened to know that he was a fairly serious student (he was always prepared with the readings, wrote his response papers thoughtfully), and he wasn't rich. He worked part time to support himself, and he sometimes acted as chauffeur for a wad of other students driving his impossibly beat up old station wagon. But that episode stayed with me, nonetheless.

Our academic topics might be about some grand themes like the history of conflict resolutions, or the social responses to Darwin, but at the end of the day these teenagers also had to make sense of their everyday lives and the mundane contradictions inherent in them. And what they saw was that the culture they were immersed in was telling them that the real reason why they were in college in the first place was to get a good job, and the reason to get a good job was so that you wouldn't always be left behind while earning a living, and that the nature of these livings they were supposed to earn hinged primarily on everyone agreeing that stuff, and the images stuff represents, was what we were all supposed to work for. If the majority didn't agree on this basic premise, then the whole superstructure would collapse into itself and everybody, especially in an advanced economy, might be left hunting and gathering.

Perhaps there was something more than simply the indulgence of the treasured cynicism of late adolescence in this critique. I think that one of the indicators that there is, in fact, more to it predates the marketing of expensive basketball shoes and wearing baseball caps backwards. I see one of the most explicit detachments from anything with lasting value, and a full-bore race toward surrogates coming hard on the heels of the end of the Second World War in this country. That indicator was and is the absolute supremacy among the middle classes of "career" as a thing in itself, as opposed to either the worth of what it is you do, or why you need the salary you get from it.

As national corporations flourished in the post-war period, with their production and sales still taking place almost entirely within the geographic boundaries of the country, there was an explosion in the broad category known as the professional class. These might be engineers, accountants, middle managers, and technical analysts of any sort. Increasingly, the ticket into this expanding population was a college degree, but not always, and the price of admission was fueled by powerful strategies like the G.I. Bill.

ii) *Pay no attention to the man behind the screen!* (The Wizard of Oz)

Imagine yourself as one of those young people, and yes, that would be disproportionately white and male. Perhaps you had grown up in a fairly stable neighborhood around Schenectady, N.Y., just to take an example. You return from the war, and enter college, locally, and decide that you want to become a corporate manager, a quantum leap from your father's work experience, and filled with the excitement of being part of a world on the move, even accelerating, with no end in sight (unless, of course, somebody did something really foolish and unthinkable like start another war after the advent of nuclear weapons). You graduate, and, low and behold, you get a job with a bold *new* army, this time at General Electric, and the really neat thing is that you can still live in your old neighborhood. If that weren't upscale enough to show off who you and your family had become, maybe you would move to a better neighborhood, where things were a little more pricey. You could still make a short drive and see your old friends, and have the children see their grandparents. Life is good, and getting better! Revenues are increasing, and in some small way, you felt, you were a part of that enterprise that helped it along, so why shouldn't you have a rising standard of living?

General Electric is doing well, and they are impressed with your skills, so one day they tell you that they are opening up a branch office in San Antonio. They want you to be in on the ground floor of this next step, and so they want you to move to Texas and help open up the branch. Of course, that also means a bigger salary, and a change in job title further up the hierarchy. You would like to think about it, but you are excited that you would be so anointed. You talk it over with your family. Nobody knows what to expect in Texas, and it would

mean really leaving all his or her friends and family. But we would make more money! We could have even a nicer house. We'll make new friends. And as soon as we get there, we'll splurge a little on long-distance phone calls to all our old friends and family. If things turn out as planned, we might even be able to come back for the holidays in a few months!

I recently heard a little essay on the radio, by an African American woman I presumed was about my age, maybe a little younger. She said that her father, while she was growing up, was a middle manager for IBM, and that in those days the families of people who worked for IBM had their own version of those initials, namely: "I've Been Moved." In truth, her essay wasn't actually about the travails of moving and never having a community as a social factor in and of itself. She talked instead of the even greater discontinuity of identity that she experienced every time they sold one house and moved into another in a different state, being an African-American family negotiating the social waters that were presumed to be the preserve of white Americans, which must have been acutely painful for a teenager to live through. But I was still fascinated by the image of the moving family, whose community identity was a corporation. This was not the first time I had pondered the absolute incongruity of corporation-as-community, and of the American addiction to motion as we dissolve our geographic sense of place.

When the communist bloc began to disintegrate about a decade ago, I remember hearing all sorts of new world predictions coming from the pundits of economics, politics, and sociology. We, in the United States, were already in the "information age." Phrases like that, as well as post-modern, post-industrial, and post-everything were already well worn. But I remember sitting alone in my apartment asking myself what this might really portend. Among the reasons for the absolute flush of optimism by everyone was, first of all, because the threat of thermonuclear war seemed to not just ease, but to drop precipitously. This was another example of a mathematical discontinuity, not a smooth curve, and it was certain to have its unwanted disorientations as well. But at the time, that didn't matter so much. Who cares if we go into a temporary recession or worse, by the gyrations? We have bought a big chunk of time, all at once. We can all bank on the fact that we really ARE going to be alive next year, and we had been

suppressing that terror, that we might all get vaporized, in our collective psyches for forty years now!

Then, there was the optimism generated by the new economic “call to arms,” made possible by the fact that we could really do something for and with the other half of the world now. We could get up in the morning and feel that we could exert ourselves toward global progress, and that was something that could not only pay off very handsomely, but was the kind of work (no matter what your part) you could really put your back into. Not only this, but there were all sorts of other windfalls that would make this a truly golden age like no other. The first windfall to seize the popular imagination was our own defense budget, the so-called post Cold War “defense dividend.”

Amazingly, their closest accounting for how much this country actually spent for the Cold War, is in the five and a half trillions of current dollars, a truly unimaginable amount.^{15v} This fortress industry, what Eisenhower himself warned against as the “military-industrial complex,” consumed not just material resources and technologies with the single purpose of detection, deterrence, or (fingers crossed) destruction, but consumed the entire lives of millions through careers dedicated toward NOT letting something happen. Now, not only would these tremendous resources be freed up, but also we could convert whole layers of society toward something else, literally beating swords into plowshares.

The next windfall businesses and politicians trotted out was the very countries (our former feared enemies) whose populations would be enlisted as the next ranks of soldiers for a richer future. These countries comprised a rather curious mix of “second world” economies that had been prevented from joining the international community of markets through the ideological imperative of communism. They were filled with educated people, especially in the applied sciences and technology, which is the sort of expertise we expected would keep the economic engine accelerating. We, the public, had already been harangued for years about how bad our schools were, how dumb the kids were when compared, especially in math and science, to nearly every other country. “Fine,” you could almost hear the CEOs say, “you wouldn’t listen up, and smarten up your schools and your kids. We told you that the future is high-tech, but you just sat there consuming our products but not sending us anybody whom we could employ to make the next generation of stuff. Well, in Eastern Europe they

educated their kids, and they know from hard experience the value of a dollar! We'll build some plants over there and show you the discipline of the market place!" Of course, one part of this thinking was patently wrong in the first place. The former Soviet states were filled with people who actually DIDN'T know the value of a dollar, and that would be another grand discontinuity to cash in on.

But I remember, almost at the same time that the Berlin Wall was torn down, asking myself what this actually meant. That is, not the pronouncements of an economist or politician, but what it might feel like, right there on the ground, for someone living in one of these former Soviet states. It was so discontinuous that I couldn't actually make the picture come into focus, of what it might feel like to be there, of what sense one might make of one's life. I guess I supposed that there would have to be something like a huge Marshall Plan just to see these people through to their next meal until the spores of capital investment took hold to provide them with work and salaries. So, not knowing or imagining exactly how they would make it from where they were to where we imagined they would go (becoming, essentially, like us), I decided to move my imaginal landscape up a few years and see if that made sense. The image that finally did come into focus was frightening.

What I imagined was a small town, which had been spared the economic and social dislocation of the west by being insulated in seventy years of state control. The lifestyle, at least in its most fundamental aspects of the pace of change, the built landscape, and the relationships of families across generations, had not changed all that much from the nineteenth century. People didn't move around much because there was no need to do so and not much surrogate reward waiting if one did. Materially, this might be just subsistence living, and we in the west had no doubt that, once given the taste of something better, and especially of the thrill of acceleration, they wouldn't opt instead for that.

So I imagined taking some new branch of a high-tech company, and plopping it down in that landscape. Not just fabrication industry, although these would certainly be a good investment for a while, because these were educated people who wouldn't have to just be "benders of metal" for a foreign company. That kind of work could be largely automated through robotics, where you don't need many workers at all, or it could be moved further down the global economic line, where having workers produce even inefficiently is still cheaper

than even automation. Let's be real about this. Maybe open up a new research and development branch for IBM, for instance.

And the question that immediately followed that hypothetical scene was what would happen to the landscape? Is it possible to put down something like an IBM, and not have that fact, of necessity, bring everything else with it? Wouldn't people who didn't have cars or much in improved roadways suddenly need them as well? Wouldn't they become transients, strangers to their physical communities? Wouldn't it necessarily mean that, for any extended time and space, they couldn't have representatives of several generations living under the same roof? Wouldn't it necessarily foster the same kind of individualism that we keep calling brave and noble in this country, but which has had the effect of hollowing out home, community, and leaving grandparents terrified to get any older or sicker because it is so dishonorable to be a burden on your own children? And once these ties were dissolved, wouldn't that leave not a culture, but a population who, just like us, measured their lives through surrogates, hoping, all the while, that the horizon of those surrogates and their successors would keep accelerating ahead of us so that we never faced the emptiness that might make us want to jump out of a window?

We in the world's advanced economies seem partial toward imagining that the convergence of global markets will help keep us accelerating. In fact, if you didn't know already, "convergence" is the hot phrase of the day among economists. After all, once we are all speaking the same language of commerce, won't that tend to bind us together socially as well? And once every country is fully invested in our way of life, and getting rich by it, then certainly the imperative of wealth will also overwhelm all the other nastiness that keeps popping up in human history, like wars and ethnic hatred, and the charisma of weird dictators. After all, money talks with more force and logic than things like ideologies or ignorance, and commerce will provide such evident abundance that we will all be speaking the same language. We'll finally understand each other because global commerce will strip away all illogical beliefs that have always gotten cultures so riled up and destructive. Commerce will strip away the dangerous delusions that there is any reality beyond what can be assigned a commercial value.

Even if it becomes hard to imagine the increasingly short cycles of innovation and, much more often, brand marketing as sustaining that acceleration, if we can just get everyone else on board those developing economies will act like successive layers of locomotives underneath our own. There is so much to be done in advancing these countries, we tell ourselves, that we have at very least another century of acceleration before everybody catches up (as producers and consumers) to where we are right now! According to this line of thinking, we all know there will have to be some leapfrogging, just to prevent things like environmental collapse, so we'll work that in. We had a few centuries of bending metal and burning coal in our Industrial Revolution, and China, with one-fourth the world's population, is still running steam locomotives. Well, that won't do, so we'll trade some advanced techniques to help them jump over that phase of our own history. But there is still a double-catch in even these seemingly socially aware solutions.

Certainly, we don't want to ride a wave of acceleration that depends upon the developing world going sequentially through all the phases that we have, or at the same rate. In fact, no one expects that. But the actual acceleration of advancement of developing nations, assuming that they all fall into line and want to do that, can be not just quick, but nearly instantaneous. If we expect that an individual child growing up in an advanced society today, should, by the time he or she is twenty-two years old, be able to have mastered enough technical knowledge of whatever sort to be able to enter into the productive workforce of that high-tech society (starting at birth no different from any other child), then doesn't it stand to reason that an entire society could do the same thing? Sure, there are infrastructure issues, like a robust educational system, so perhaps a generation and a half, or even two might pass before everyone can do the same level of skilled work, given a truly level playing field.

There is yet another problem with this model, and that is the relative value of novelty. When I was very young my family got its first television set, a huge monster Zenith black and white, which we kept for about thirteen years when we replaced it with a small black and white television. My parents didn't buy a color television until after I had left home. Although I had seen other color televisions by that time, when I would visit and see color right there in my parent's living room it seemed pretty neat. Children today are born into a world

of entertainment that can do pretty much anything imaginable with the sense of sight and sound, and, so far as I can tell, they don't find it amazing. I wouldn't even say that they find it all that amusing, but more just something to do. This is not an indictment of children's lack of wonder or imagination; it is simply a normal response to an environment one is immersed in. Remember our discussion of how the human senses are most responsive to change, not stasis, and especially to rate of change. Again, extrapolating from the individual to a society, why should we expect the collective response to be any different?

The very novelty of films, talkies, radio, television, etc., drove their popularity, and more important for commerce, their rates of increasing popularity until the market became saturated. There is no dependable half-life of the commercial popularity of past innovations in an unrestricted global market place. No one, or group, will willingly suspend disbelief and find last year's innovations novel and attractive knowing that something else is already available. There is a direct challenge presented by the evaporation of the market-value of past innovation/novelty to any vision we in developed economies have of continuing to ride the leading-edge of market capitalism. Even more important, we can't neglect the fact that even more fundamentally the entire economic model is completely dependent upon a global buy-in of living out one's life in pursuit of material surrogates. These observations are not just technical difficulties to fiddle with as we attend to the global market "mechanism." These are themselves forces of acceleration. They are rooted in aspects of human desire, and occurring within a system of reference, for which we have no historical data from which to extrapolate. In this most fundamental way I believe we have come to a profound discontinuity in history.

Stodgy historians and philosophers of generations past would sometimes intone, with the wisdom of white hair, that, at the bottom, there really was nothing new under the sun. We can learn everything that is truly fundamental to the human condition if we would just read our Homer, Plato, and Aristotle. While there is a resurgent movement to reinstate a reading of the classics, which I think is a wonderful thing, I doubt that many would say that it would be sufficient to tell you everything about the human condition (...except for those tedious details of the intervening history of the last two thousand years). In fact, there are all sorts of insights not possible to imagine until societies take on new

forms and inhabit new landscapes, and our current forms and landscapes ought to be giving us all kinds of new insights.

And one of the forms that is peculiar to the second half of the twentieth century is the rate of change of forms. For most people in most societies whose livelihoods were accomplished after the Agricultural Revolution, for example, their modes of living were not only fixed, but those forms of activity extended as many generations into the past as they could imagine with no expectation that things would be much different extending that generational line into the future. And without formal histories or general literacy, the imaginal landscape of what one does in life was stable. For the most part what one needed to know was literally handed down by example. Even in the Middle Ages, once an individual was ensconced in a form of social activity and production the patterns of expected replicability remained fairly stable. One might experience a certain dislocation in that mode over several generations, but there was little to cause profound dislocation, outside of the occasional marauding party or getting trampled by your horse, to force a reformulation of what the patterns of your own life were and useful knowledge to be passed on to the next generation.

We look for big changes from five hundred years ago, and we find things that seem eminently manageable from our perspective. The historian Lynn White, for example, has made an eloquent case for three inventions which played the crucial role in bringing about the entire social structure we call feudalism: the iron-clad plow, the improved horse harness, and the stirrup. The first two allowed for a much more effective use of draft animals in agriculture, and the third enabled the development of an effective, professional military protectorate. The use of iron had already been established for many centuries, and even these new techniques were not mass-producible. Several generations would have time enough to incorporate these new forms of society and productive work without throwing everything out at once, and having children's lives handed to them as an alien exploration with no more than a "good luck" from the parents. Even the technical crafts such as masonry, millwright, and other artisans, had a well-defined right of passage through the guild system, and the nature of the arts were also expected to remain fairly constant, certainly over the period of a single lifetime, but most likely for many generations.^{lxvi}

However, in this century, and particularly since the Second World War, the rate of change in our modes of living and working has accelerated to such an extent that it is completely discontinuous with the past. Even the Industrial Revolution does not come remotely close to present experience. This is the first time when, not only are there changes in every expectation of what patterns will define one's life, but these changes are occurring not over several generations, or even within one generation, but continuously within the expected lifespan of a single generation.

Our latest projections for the information economy is that anyone who hopes to continue to prosper and is now beginning college or work should expect to make radical career and skill changes perhaps a half dozen times before retirement! When change happens this rapidly, not due to war or famine, but due to what we are told is the proper working condition of the economic machine, those who live in that world don't even have to imagine fuzzy, ill-informed histories about past societies to ask questions of meaning about their own life efforts. Even after they have reached adulthood, their lives become a succession of lives by any previous historical reckoning, and they need only question their previous five years of life to see if the trend line conforms to anything that makes sense or provides a satisfying sense of meaning and purpose.

As I said in the introduction to this book, I do not believe that the rising generation is afflicted with some genetic mutation that leaves them cynical or in malaise. They are the forward shock troops seeing, for the first time, these rates of change in what we do and how we do it, and discerning that they are expected to find satisfaction from mere motion. And if what they see in the activities of their parents and mentors looks like a transparent addiction to mere motion, they have every right to ask their elders if they are missing something or not. What do we tell them? What is our vision besides "I guess we'll never know the meaning of life, but do you have a real question?" This is as real as it gets. They aren't looking for dogma, though in their thirst for something substantial many will latch on to dogma. They are looking for their vision, and they are asking us if we, being further along in mortality, see anything at all instead of just the wind in our eyes. Is this the best we can do: on the one hand tell them to repent, or on the other just say "good luck"? If the vision they are given is not

meaningful, how can we consider anger, apathy, and antisocial behavior unreasonable?

Why do we do what we do, really? And that means accounting for where we spend most of our time and energy? *We work and we buy.* What do we buy, individually and collectively? What gets the most attention in the political campaign? *We need more money for education!* Great! But what is the most pressing reason for that support for education? *Well, that's a stupid question. Obviously, if our kids don't get educated they'll get left behind in the global economy and they won't get a good paying job in the information age.*

Okay, what else is important? *Health care, you idiot. Why? Because the cost of health care is skyrocketing, of course, and if we don't do something nobody will be able to afford it, and if you don't see what's wrong with that, you really are hopeless.* Why is the cost of health care skyrocketing? *Another stupid question! First of all, there are all those layers of bureaucracy, then doctors get paid too much, and then there are all those new drugs and treatments that cost an absolute fortune, and we have to have them all. Why? Arrrgh! So that we're not a burden on our children when we get sick, for one thing, and so we don't die!* Oh.

Anything else important that we should be taking care of, that is so obvious that I should understand that it is a fundamental quantity of being human (just asking)? *Of course! Public safety, that's a big and obvious one. I mean, a person could get killed out there! Oh, I've also heard we need a missile defense system so some nut with a missile doesn't nuke us, and I'd have to agree that's a pretty good idea. I'm sure there are other ones, but those are the big one's that come to mind, and what planet are you from anyway that you'd ask such unbelievably dumb questions?*

In this information age, what are the really robust growth industries? What are the places, if you are a young adult getting ready for the world of increasing returns, which you should think about? There are any number of them. Let's see, the entertainment industry has really grown, but it is only, globally, in the many billions of dollars in revenues right now. But with this new global marketplace there will soon be billions more people who would like nothing better than to be whisked away from reality, so that is not even a mature industry yet. And they will need lots of dealmakers, tons of programmers, a couple of actors, and boatloads of infrastructure people, so that's a definite winner. You also might

look at anything in health care, and that industry includes every kind of skill on the planet. Then there is home and business security, a real growth industry. Is there a pattern here?

Hmm. Almost forgot, anything having to do with communications. You know a consortium has just launched sixty-six geosynchronous satellites so that, no matter where you are on earth at any time, you can instantaneously talk on the phone anywhere else (with no operators!), and simultaneously get your e-mail and a picture of your kids!^{18vii} And that's just the beginning; there is virtually no end to it. Not to be obtuse again, but exactly why would I need to be able to do that, I mean download a hundred messages, talk on the phone to anyone, stuff like that? Why? Because you're in business, that's why! And with the new global marketplace the potential number of people you might have to talk to will be six billion and rising! And imagine the possibilities if all six billion have to talk to everybody else, I mean, it boggles the imagination. You've got to get the jump on the next possible partnership. Business, as we like to say in the information age, moves at the speed of light—it's, like, way faster than a bullet.

If somebody told me that, if I went to college, it would allow me to play my own small part in that grand vision I just might think twice about it.

iii) *Can we ever go home again?*

In fact we can't go home again, if by home we mean our individual childhoods or some earlier epoch of human history. I do not bemoan that obvious truth. If it were true at any level, I would have no idea where we might turn to find meaning and purpose in existence. For teachers who insist that their students do not understand any of the humanistic disciplines unless they comprehend the steady march of the grim and the tragic in human affairs are setting their students up for the inevitable detachment and disgust that must result. This does not inspire anyone to find the educational opportunity fascinating or worthwhile. It allows for only the most pathetic afterthought to encourage engagement: we have continued to fail miserably throughout history, and now things are many times worse, so it's your job to go out and fix things, even though other generations have failed when facing even more tractable problems.

When I tell my students that I actually sense more hope that we, individuals, community, and societies, are much more likely to make radical improvements in our quality of life, at deep levels, I am not offering them a bit of intellectual candy to make them feel better. I firmly believe this is possible, maybe even *probable*, though not inevitable. This vision of hope is based upon many people beginning to see through the illusions of living for and through surrogates, and discussing what makes life worthwhile and acting on it. And what heartens me most is the fact that I am seeing more and more people and communities doing just that: being involved in many versions of this reflection and inspired action.

Perhaps globalism and its attendant crises (from human rights, to environmental emergencies, to conflict) are catalysts in effecting the growing number of philosopher-citizens in societies, and in their acting according to their best insights. If that is the case, this is just the latest and most profound example of the essential heuristics in human social and spiritual evolution: there are certain visions we must acquire *in their own time*, or in other words, as we change our various landscapes we are able to gain new insights about those landscapes and our lives. This is a wonderful time to be alive, so long as one is truly alive, seeking wisdom and insight and acting according to one's best visions.

Most of what I would like to consider as explorations in envisioning are in the third section of this book. However, it seemed only fitting to share a few observations and hints that have seemed helpful in maintaining a sense of gratitude, and an eager engagement in activities that are deeply satisfying. I am not a big fan of "pop psychology," and the overflowing self-help sections of bookstores. Still, some of the brief observations to follow might well be found in such books, I don't know. These suggestions are not in a hierarchical order. I don't have a twelve-step plan. And of course, these are elements that have been helpful to me and I don't presume to assure their universal appeal.

One suggestion for "better living" I do know can be found in the self-help section. Andrew Weil is a Harvard-trained physician and one of the darlings of the proponents of alternative medicine. In his book, *Eight Weeks to Optimum Health*,¹⁰⁰ he suggests that stressed adults make a point to regularly take a "news fast." By this he means not watching the evening news or reading the daily

newspaper for a while. I think he is really on to something. A number of years ago I lived in the Washington, D.C. area, actually “within the beltway,” as the phrase goes. During those years I became increasingly hungry for news. I read the *Washington Post*, newsmagazines, watch the news and political commentary shows. For want of a better word, I became addicted to news. Yes, I did find it annoying when the pundits and politicians would not just analyze policy and events, but spout off on their interpretations of what “the American public” feels and expects. [Columnist Calvin Trillin has dubbed these political talk-show regulars the “Sabbath Gasbags.”] Even with those affronts to my intelligence, I found the gathering of news and opinion to be an insatiable quest.

Of course, along with interesting discussions of world and national events and trends, one was also confronted with every sort of random disaster, whether that be a flood or a drive-by shooting. And all these things were simply downloaded without context, and all absolutely out of my control. First the latest scandal, including allegations and counter-allegations. Then the economic forecast for unemployment. Then the biggest apartment building fire in three years claiming the lives of so many people. Then the spread of AIDS in Thailand. Then a series of unsolved murders. Then a ten car pile-up on the beltway. After the break we'll have sports and the weather. No context, no meaning, nothing but disaster, and NOTHING I could do about any of them.

Disasters have always happened. However, before electronic broadcast, there was a time delay between the simple happening of an event, and learning of it. The graphic visuals were absent. To see a traffic accident or a tornado minutes after the event makes you feel like every disaster had just happened right next door. I am not denigrating the average citizen for watching the evening news—I watched it too. However, I noticed that I was beginning to feel anxious and vigilant a good deal of the time, even if there were no apparent reason to be so, which was most of the time. This mode of being informed of one's world, the anarchic pastiche of unmitigated disaster, is absolutely antithetical to any creative, considered, or compassionate state of mind. I still read the news, but I try to do it once a week, not hour-by-hour, and I must say I feel better for it.

I also try to find as much time to participate in the things I always feel better for having done. Among my absolute favorite activities is engaging and lively conversation, preferably with lots of laughter along the way, even if the overall theme is serious. As a teacher I get paid, in part, to have great conversations! But I look for it everywhere, and almost without fail everyone feels energized, hopeful, and more fully alive and human for our taking time for conversation. Even observing others engaged in real conversation brings me joy. And some of the conversations would not normally be termed such. Among my personal favorite things to do is see live jazz. When a jazz group is really in a groove, it is a conversation beyond words. It is exciting, sublime, exhilarating—the best example I know of democracy as art.

Then there are some more individual directions. Some people hate to be alone, and they need something going on all the time to feel secure. I find that if I can't have some time, every day, to reflect on my own thoughts that I tend to lose my way. My ability to envision disappears, and I am solely preoccupied with the next appointment, the next deadline, and I start to feel less secure and less substantial. There are many ways individuals use to introspect and reflect. The rise in our culture of the practice of various strains of Buddhism (or at least an awareness of them) has led many to conflate Buddhist concepts of meditation, mindfulness, and awareness with something like a comatose state, confusing simplicity with simplemindedness. The terminology used is sometimes unhelpful for those who only hear popular summations of such things as Zen practice, and one of the more abstract terms for Western minds is the attainment of "emptiness." Who could ever want that?

The Buddhist scholar and teacher, Thich Nhat Hahn, describes this concept eloquently, and in a way more rich and satisfying, than anyone else.^{ix} "Empty" doesn't mean anything unless you know empty of what. My cup is empty of water, but it is not empty of air." He goes on to describe that a true understanding of reality, is to understand how every existence, all things as well as all beings, "inter-are." That is, nothing exists as a completely separate entity. Rather, everything receives its existence and its meaning in relationship to everything else. He continues, saying: "But, empty of a separate self means full of everything." Regular and deep reflection, unless hopelessly confused with anxiety, ultimately has the effect of putting one's own existence and concerns

into perspective. Your mind is no longer filled with the unreal fullness of just you, your schedule, your problems, and your imagined upcoming crises. When you empty your mind of just you, you begin the process that allows all that is flow through you.

Finally, I have found it invaluable for well over twenty years now to keep a personal journal. It is one thing to give yourself over to reflection. It is another process to record those reflections. I have found that the very process of writing to myself has the effect of giving those thoughts a different voice. This voice speaks back to me from the page, often telling me new insights in the process, as though I were having a conversation. In fact, I am having conversation. After many years of teaching, and coming up with all sorts of suggestions for what to learn and how, these are the sorts of wisdoms I have come to feel I can leave with my students as practices I believe in.

Notes for Chapter 6

^{bxi} If at this point the reader remains uncertain that there is a singular theme of the inevitability of convergence to global market capitalism among captains of industry, finance ministers, and planners, in the developed and developing nations, see William Greider's *One World, Ready or Not: the manic logic of global capitalism*, Touchstone, 1997. Or, to use a few quotes: "For years, socialists used to argue among themselves about what kind of socialism we wanted," said Denis MacShane, British Labor MP and an official of the International Metalworkers Federation based in Geneva. "The choice of the left is no longer what kind of socialism it wants, but what kind of capitalism it can support." (Greider, p. 36). "'Things are going to get tougher,' [predicted General Electric CEO Jack Welch in 1994]. 'The shakeouts will be more brutal. The pace of change more rapid.' What lies ahead, Welsch said, is 'a hurricane.'" (Greider, p. 21) In point of fact, Greider makes his argument with such blistering force, detailing the palpable sense of a system out of control among the industrial elites, as well as the bewildering and pernicious disarray of individual lives in far-flung cultures, that I myself had, finally, to put the book down, so anxious and exhausted did his analysis leave me.

^{bxii} I had long felt that there was a real cognitive dissonance between the measured pronouncements of, say, Alan Greenspan or Robert Rubin, and the critical instability that seemed to be the motive force of global economics. In fact, their ability to keep their composure really made me think I was missing some underlying principle. (Then again, as I was growing up, I thought the same way about nuclear weapons. The entire prospect seemed so preposterously near to detonation that I couldn't fathom how people actually went about daily life. And so, seeing that people actually DID just get on with their daily life, I simply told myself that if the adults could carry on, and certainly they must know more about this than I do, than so can I—I will only get really nervous when I see the adults around me acting nervous. And it is only now, 36 years after the Cuban Missile Crisis, that it is proper, in intelligent and cultured conversation, to admit to how terrifying the whole thing was!)

^{bxiv} Before one can even hope to arrive at some mathematical algorithm describing the dynamics of global market capitalism, one must realize that the globalization process, while well under way, is far from complete. Therefore, what obtains at present is a swirling hodge-podge of different national and regional schemas, and these are not comprehended even by those in the middle of them, for they reflect the radically changing reactions to the changes themselves felt by the populations of a locality, nation, or global region. This would seem to be an invitation for the intervention of thinkers whom Robert Heilbroner might call worthy worldly philosophers. There have been a few attempts. Two that come to mind are 1) Robert Reich, former Secretary of Labor during Clinton's first administration, and his book: *The Work of Nations: preparing ourselves for 21st century capitalism*, Alfred A. Knopf, 1991, and 2) Robert Kuttner and his book *The End of Laissez-Faire: national purpose and the global economy after the Cold War*, Alfred A. Knopf, 1991. And in fact, I gave a fairly glowing review to Reich's book a number of years ago (see book reviews in *Technology and Culture*, University of Chicago Press, v. 34, no. 2,

1993, pp. 469-471).

I still think that Reich was doing the very best he could to find some means to apply humanitarian policy within global capitalism, without just throwing up his hands and saying the whole thing is bankrupt. I find problems with his prescriptions today, but I still think he performed a very valuable service by being early off the block in illuminating some real incongruities in our "stated purposes" that were causing real pain and dislocation for people. First of all he exploded the great myth of American multi-nationals being national assets, and thereby worthy of twisting our national political policies to accommodate them. For example, when Charles Wilson, former president of General Motors and newly installed Secretary of Defense was asked during confirmation hearings whether his former position might cause any conflict of interest in becoming Secretary of Defense, he could answer with candor, "I cannot conceive of one because for years I thought what was good for our country was good for General Motors, and vice versa. The difference did not exist. Our company is too big. It goes with the welfare of the country." (Reich, p. 48). Such a statement today where any product or portion thereof, from any company, no matter what country their headquarters may be located in, could be produced in any other country, could no longer be made (especially in the presence of recently downsized workers) without an armed guard surrounding the speaker.

Reich goes on to make that case for a growing number of industries, with no apparent limit in this age of globalization. And yet, we are still stuck with anachronistic policies, not to mention anachronistic if not just downright dishonest politicians, who continue to make policy and pronouncements as though American multi-nationals gave a hoot about American workers. This new situation needs to be recognized, and since it appears irreversible, we cannot allow "American" multi-nationals to pull any kind of "good for America" rank, and we must wise up to our politicians and not let them use this obviously dissembling rhetoric. In addition, American corporations are often not particularly good citizens even on home soil. Instead, rather than helping their communities of location, they continue to hold cities and states hostage to threats to move to another state unless given all sorts of privileges, new infrastructure (at taxpayer cost) and reduced taxes, just for the "gift" of being there with jobs.

Reich goes on to elaborate this point, which honesty I found by itself a powerful breath of fresh air all by itself and one long needed to be made bluntly. Then, what's a nation to do if not stump for its own corporations in the global economy? Reich has one answer that rises above anything else. Since we are also living in an information age, in a knowledge economy, the one thing that government can and should do to see to the interests of its own citizens is make sure that they are educated properly, and re-educated regularly, so that regardless of who does the employing (G.M., Siemens, or Sony), the citizens will be high-tech, and well-paid global employees. That is the only thing that will actually see to the increased economic welfare of the citizens of this country in the new globally competitive market economy. This is okay so far as it goes, but now, five years after I wrote that book review, I have major problems with this.

Within Reich's own formal logic, he was consistent. The problem he was

addressing was the future economic welfare of Americans in this new regime. He had let in daylight on the actual working principles of multi-nationals. And he had a solution that could be argued WAS the proper province of governments, local, state, and federal, to keep us ahead of the wage-curve. Fine. However, even as I read this I could see its boundaries. This was national policy. Both Reich and Kuttner are well aware of, and have written about capitalism's "dirty little secret." That secret is that the real money, true profits to manufacturers, shareholders, and investment managers, does NOT, in fact, arise from a perfectly lubricated market system. In this, they were both reiterating what Joseph Schumpeter had already figured out a half century before.

If a market system is perfectly lubricated (perfectly efficient, perfectly fair, completely unfettered) you simply get paid a fair (determined by the complete market of production and consumption) compensation for your service. The real money is made in the DISCONTINUITIES: wage-differences between countries; inefficiencies in getting similar goods to actually compete side-by-side in the same market; and time lags in things like setting currency exchange rates.

Simply following this logic, it was obvious that these new market debunkers were correctly understanding the new market global economic picture, but still holding a moral right to leverage discontinuities for the benefit of one nation over another. That was the real job that economists and governments should be about in representing their home turf globally.

I suppose I'm just a bleeding heart humanitarian, but I don't see anything particularly moral about this either. And there is another issue that I think is not simply fobbing off the moral economic question by one more layer of remove, but is positively corrosive to what I believe to be the very best that a culture, any culture, has to offer, and that is an environment where we don't have to simply be tunneling moles trying to earn a living (and then we die), but we can actually lift up our heads, see daylight, and be about other things as well with our lives that make life truly grand and worth living, and not just passing off the hope of enlightenment to some future generation. In a society, the segment of life represented by that may be called education, in many dimensions and incarnations. This includes public schooling (so you can experience the marvels of delight awaiting those who can read!), higher education, spiritual education, reading clubs, craft guilds and interest clubs--and of course not all of these need to be paid for by the public at large, but I am just trying to open up that entire horizon of joyful learning for its own sake.

The problem that I felt in my heart (and in my gut) was that these new world pictures were not getting us beyond a new strategy to grind our lives away in competitive production and consumption at an accelerating pace. And for me the worst part of the whole thing, the ugliest emblem that these world-views were still marching to the drumbeat of a new soviet of global workers and consumers, was that it had every tendency to define education as TRAINING: training in just the next layer of high-tech skill that would be saleable, and do THAT better and faster than other countries.

^{bv} The figure on the cost of the Cold War was the conclusion of a recently released Brookings Institution publication titled, "Atomic Audit." I read a notice of its release in

Popular Mechanics, October, 1998, p.18.

For further background information on the cannibalistic dynamics of global market capitalism, see *America: What Went Wrong?*, By Donald Barlett and James Steele, Andrews and McMeel, 1992. For a pre-global economy history of America's governmental corporate policy, see Louis Galambos and Joseph Pratt, *The Rise of the Corporate Commonwealth: United States business and public policy in the 20th century*, Basic Books, 1988.

An Observation: Is there an algorithm? [*Once more, with feeling*]

You may recall that in Chapter 5, by way of introducing the qualities of the underlying dynamics of economic growth, I began by introducing the concepts of chaos and Newtonian mechanics using "table top physics" experiments. I deliberately avoided trying to push these examples any further in the text, so as not to detract from the flow of the theme. However, I have given some thought to the dynamics of global market capitalism, as described by William Greider (*One World, Ready or Not*, ibid.), and I played around with some other table-top physics examples that might be rough analogies to that world as experienced by commerce and trade thinkers and planners, and I did come up with some ideas. This is mostly for fun, so feel free to skip over it if, for you, it obscures rather than illuminates:

I spoke in Chapter 5 of rulers, rolling marbles, and bowls. The example of trying to keep an economic system continually growing, but well-behaved concerned putting a marble on a grooved ruler, inclining that ruler ever-so-slightly so that the marble would have a tendency to roll down, and then sliding the inclined ruler with the marble on it along your kitchen table. The point was to push the ruler so that it accelerated just enough to keep the marble from moving up the ruler (inflation), or from rolling down (stagnation or worse). This is the simplest mechanical analogy, and it doesn't even take into consideration compound growth (which is what we're really after in the standard economic model), or any social dimensions ranging from self-informing and accelerating changes in capital investment, or national and regional governments encountering the myriad social discontinuities that attend accelerating change in the lives of people. So, even though the marble-ruler experiment requires some dexterity on your part, and you very quickly run out of table-length to push the ruler along, it is not nearly so touchy to input conditions as a global economy actually is. Is there another kitchen experiment that more closely reflects the conditions of a dynamic global market economy, and how economic leaders hope to control it? Let's try one.

This time, we will still use a marble and a tabletop, but instead of a ruler, let's use a bowl. And before you get comfortable with the idea of putting the marble inside a salad bowl and sliding it around (which, in physics terms, would be roughly compliant with the idea called a "stable equilibrium") I want you to turn the bowl upside down. If it is a smooth stainless steel bowl, of the variety we have around our house for mixing salads and such, you will find that it takes some dexterity and luck to just balance the marble on the top of the bowl without it running down the surface. If you are able to do this, and obviously, we are not yet moving the bowl, you have achieved what a physicist would call an "astable equilibrium." Any jiggling of the bowl or table, and the marble will roll with

increasing speed and increasing acceleration down one of the sides. If you are able to attain this balance, you have achieved the equivalent of a “static economy,” which is no economist’s idea of how the system must run.

Now, take the marble (and you may need an extra set of hands to help here) and hold it against the side of the bowl somewhere—anywhere—it doesn’t matter as long as it is not at the top of the bowl, or at the bottom resting between the edge of the bowl and the table top. Okay. Your job, is to have your partner release holding the marble when you say to, and then you have to immediately slide the inverted bowl along the table, pushing at varying rates of acceleration, so that the marble stays relatively in place on the side of the inverted bowl, not moving up or down too much along this smooth concave outer surface. If you think balancing a pencil on the tip of your nose is difficult, try the marble on the bowl!

But we are not done yet! If you miraculously can achieve this, even over a short distance (and now you will appreciate just how short your kitchen table is, and how difficult it is to keep pushing the bowl faster), you still haven’t accomplished what the global economists are trying to achieve. You have the benefit of devoting all your attention to one single effect—you are watching the marble only, and you are getting continuous feedback by watching it. Economists cannot do this, even with supercomputers. They cannot get this immediate feedback on all parameters on a continuous basis, and act on them continuously and instantaneously. To get a little closer to the economic reality, then, what you need to do is the same experiment in the dark (all lights out), with your only feedback about where the marble is provided by an intermittently flashing strobe light (like the kind they used in discoteques).

Is there anyway to succeed at this? I’ll leave it up to you to try, but I don’t see any way to do this. Unless, you add one more element to the table top experiment. Get some really viscous liquid, like molasses that you left in the refrigerator, and slop some of it over the outside of the bowl. The liquid can’t be so viscous that it acts like glue, and just cements the marble to the side of the bowl, it has to permit the marble to still roll down the side of the bowl. Nonetheless, the marble will roll a lot slower, and you will have greater time for your eyes to collect the information on the relative motion of the marble, and for you to react by pushing the bowl along the table appropriately. What we have introduced might roughly be called a kind of frictional force, a motion retardant. In global economics this is represented by things like national regulations on imports and exports, controls on the rate of flow (in and out) of hot investment capital, and the like. This is the very thing the purist free marketeers insist must be done away with. As far as I can see, this messiness is the only element that keeps the system from flying apart in a big hurry.

^{lxvii} The global telecommunications satellite project I’m referring to is called Iridium and is spearheaded by Motorola. By the time you read this, it will be up and running. See “Getting Iridium Off the Ground.” *Business Week*, October 5, 1998, pp. 76-80.

^{lxviii} Andrew Weil, *Eight Weeks to Optimum Health*, Alfred A. Knopf, 1997, passim.

^{bix} Thich Nhat Hanh, *The Understanding Heart: commentaries on the Prajnaparamita Heart Sutra*, Parallax Press, 1988, pp. 7-10.

Part Three — Deep Practice, Synthesis, and Envisioning (Thoughts on conversation, community, education, and what is worth doing)

Chapter 7: *When Questions Come of Age*

i) *A river runs through it (the stages of life)*

I recently read a touching little reflection by a middle-aged father who took his fourteen-year-old son on a camping trip. At the end of a week of backpacking in Rocky Mountain National Park, the father and son found themselves sitting one evening on a ledge overlooking a freshet of snow melt coursing through the rocks below, and after a bit of silence immersed in this elemental landscape, the son commented quietly, “This is a good place.” The father replied simply, “It is.”

As they packed their things and began their trip homeward, the father noticed his son becoming somewhat disconsolate and self-possessed (as teenagers do!), and he noticed his own level of anxious preoccupation rising as well, as he began anticipating the business and duties that awaited him back home. Once home, the father continued thinking about how his life was revving up again, about messages, manuscripts, and e-mails, and when some neighbors called to ask him and his wife over to watch a glorious night sky, he told his wife to convey his regrets, there was just too much to attend to. His wife, being wiser, told the neighbors they would be right over, and in the beauty of quiet friends letting themselves become absorbed in the grand mystery of infinite space, he again found his place, his center. The great contrasts between two very different states of mind led him to some reflections, nothing we haven’t heard before, but his words carry the ring of primary experience:

If our addition to growth is rooted in evolutionary history, we can’t just decide to feel good about living with less. We can, however, shift the focus

of our expansive desires. We can change the standard by which we measure prosperity. We can choose to lead a materially simpler life not as a sacrifice but as a path toward fulfillment. In ancient terms, we can learn to seek spiritual rather than material growth.

Meditation, pilgrimage, and other forms of religious inquiry are only part of what I mean by spiritual. I also mean the nourishment that comes through art, literature, science, through conversation, through skillful, useful work, through sharing bread and stories, through encounters with beauty and wildness. I mean slowing down and focusing on the present moment, with its inexhaustible depths, rather than dashing through life toward some ever-retreating goal. . . .

Less burdened by possessions, less frenzied by activities, we might play more with our children, look after our elders, plant flowers, read books, make music, come to know the local birds and trees. We might take better care of the land. We might lie down at night and rise up in the morning without feeling the cramp of anxiety. Instead of leaping around like grasshoppers from notion to notion, we might sit still and think in a connected way about our families, our communities, and the meaning of life.^{1xx}

I thought this little reflection to be lyrical and familiar. It also left me pondering some patterns beneath the story as told. Sanders' essay is personal, reflective, and it rings of truth. It has been evoked for centuries in wisdom traditions, and I come away from reading the *Tao Te Ching* with similar reflections on what is important, what is delusional, and with a gratitude to be alive. We hear the same insights from the transcendentalists of the nineteenth century such as Thoreau, Emerson, and Whitman. In the last twenty years more and more Americans have searched for simplicity, reverence, sense of place and community, and many have also searched for transcendence and direct experience of the spiritual through a host of movements that slide and merge in and out of vogue, and in and out of alliance with each other. The acolytes of transcendence have mostly come from the educated middle class, and not infrequently their suddenly need to come to grips with their lives, through considered and patient reflection and change on the one hand, or through every

sort of snake-oil mysticism on the other, occurs when they themselves are approaching middle age.

If we posit middle age in contemporary America to be somewhere between age 40 and 65 (I want to give plenty of latitude here), we can see that this is not an historical constant. Go back a century or two, and what we consider to be middle age would be already accounted to be a full lifespan. Go back to very early civilizations and our anthropologists and paleontologists tell us that age thirty is about what one might expect. One is old by that time, and the rigors of providing for the necessities of life would have weakened the body and made it mortally susceptible to physical insult of many varieties. In late twentieth-century America, a young adult is often just realizing his or her professional aspirations by age thirty, if they have a mind to raise a family they are often still looking toward that as a future phase of life. They may be changing professions five or six more times during their careers. The peak earning years are, statistically, reckoned to occur at around the age of 50, and we are increasingly hearing debated that the notion of expected retirement from employment at age 60 or 65 to be outdated (by actuarial data) and unworkable (by Social Security and pension plan projections) and not even desirable. After all, if one is alive and healthy at age 70, it is assumed that work is intellectually stimulating, socially connecting, and economically beneficial for the individual and society alike.^{lxvi}

Long ago the writings of Hinduism posited at least four primary stages of life. The first was that of the “student” of life, which would commence between age 8 and 12, acquiring the necessary skills to function in adult society, and this would continue perhaps to age 20. The next stage is that of the householder, during which the individual raises a family, is gainfully employed, and active in acquiring status, wealth, and is engaged in matters of running the community. The next stage is contemplative, and may be demarked by the birth of a grandchild. In this third stage one is free to seek philosophical wisdom, husband and wife together or separately, and solitude and retreat may be necessary. For the properly evolving individual, the last years of life are of a different nature altogether. Before death, one would be fortunate to have realized the dissolution of the self (that is, of the ego in Freudian terms) and have no attachment to anything, anyone, or any place. One apprehends the “all in all,” that all is transient, all is flow, and one is therefore content and serene in any place, in any

condition, no longer the lone introspective seeker, but a joyful observer of all that is, including all the stages of life and activity of the younger generations.

What, then, of passing on wisdom to the next generation? One simple answer is that if all humans, in the ideal case (that is, they do not die young and are open to wisdom at each stage of life), go through a similar set of stages or patterns of life, then the wisdom of what comes next is always modeled in that culture by individuals in that subsequent stage, for those in the previous stage. In the Hindu tradition, one is not expected to be an ascended master of consciousness as a child, or even as a young adult. They recognized that that is not how life proceeds. In fact, society would fall apart were it not for acting well in one's successive stages of life. And so one is given cultural permission to be a child, a student of practical living, an adult who seeks to amplify one's station and responsibilities, etc. But there is always a model available of the next stage, so one is not lost floundering around out of one's age without purpose or direction.^{lxxii}

Yet we creatures of the impending millennium live in a very different landscape. With rare exceptions, we have no rites of passage to indicate when one has become an adult. We have substituted the search for wisdom with the search for technical expertise (in any field). We disregard our elders as "out of the loop," not able to master the new techniques of the workplace (and by implication, of living). When we do turn to them, it is to bring them out of early retirement to teach the professional skills they have (providing they are recent enough) to our youngsters to augment the public education mission of preparing youngsters to work in the global marketplace. Middle age has now been pressed into service to coincide with maximal technical skills, maximal earnings, and time to leave the foolish questions of youth (e.g. What is the meaning of life, and what is the good life) behind and get on with life's imperatives, like saving for retirement and making sure one is self-sufficient in every way after retirement. This sounds like a good prescription for fear of death, and even fear of life itself. It sounds like a breeding ground for anxiety and psychosis.

And so I thought about the little story, related above, of the father and his fourteen year old son. I do not know this family, but I think that this adolescent boy is very fortunate. It is perfectly alright for a fourteen year old to be ignorant of the meaning of life, and to be thinking instead of what he will wear to school,

what new CDs he will buy, and if he can get a date. What does matter, and this is crucial, is that he has someone in the generation ahead of him who actually does ask these questions and is trying to act by the best wisdom that comes from asking these questions. Hopefully these individuals are his parents, perhaps even some admired teachers, and some relatives. As long as that child can intuit that someone is asking those questions, and is still able to lead a hopeful, grateful, and creative life of purpose, then all is well. He has the freedom to be a child. Without that confidence that the older generation has some wisdom, he is likely to deduce that life is already as good as it gets, and for anyone who has gone through adolescence, that is an awful thing to wish on anyone.

Between the ages of twelve and fifteen I went on some camping trips with my father and my older brother, Brian, whom I've mentioned before. My father loved the outdoors. He even loved our own little outdoors, outside our house in New Jersey, and he was most grateful at the number of birds that made homes in our trees. He had a book on birds so he could identify them, but he wasn't an expert. The only birds I remember by name that he pointed out to me while standing in our yard were the pileated woodpecker and the tufted titmouse. I remember the former because it was fairly large (I thought), and it would peck away at our trees with great energy, and I was impressed when my father explained the physiology of the woodpecker's beak, how it was mounted on a kind of shock absorber that allowed it to produce great impact on the wood with minimal impact back at the bird's cranium.

I thought that was an excellent bit of engineering, but it still hurt for me to watch it bang away at a tree without imagining it must result in some sort of disorienting pain. I knew how much that could hurt, having sustained a few major impacts to my own brainpan when just playing around, and, in one instance, by being profoundly unaware of anything but my own daydreams. That happened one sunny Saturday. We lived in an old house at that time, and it still had a stone cellar, a coal furnace that was later converted to heating oil, and a wonderful musty smell. My father did his carpentry work in that basement, and I had a little bench next to his where I would do my all-important tinkering. It was a magical place, especially on Saturdays in autumn. There was a set of hurricane doors that opened to the outside, and stone steps going down, with a

modest doorframe of broad boards set into the stone foundation that constituted the entry-proper into the inner sanctum.

I remember my father was working in the cellar on a plywood boat that my brother, father, and I would soon take on a float trip down the Susquehanna River, and I had no responsibilities that day except to enjoy myself. I was just running around the yard, hopping on my huge old Schwinn which weighed more than I did (with a big spring shock absorber on the front), and generally feeling so much exuberance that I didn't know what to do with myself. At one point I dropped my bike to the ground and went over to the cellar doors to see what my father was up to with his green-painted float-boat. Not knowing what else to do, I decided to go down and stand next to him, and see what was up.

In my unbridled enthusiasm, I just jumped down the stone stairs in two hops. The last hop would land me in the cellar, and I decided to make a big entrance. What I hadn't counted on was the fact that the doorway was only about five and a half feet high. I was looking at the place on the cellar floor where I would make my dramatic dismount from the steps. My exhilaration of flying through the air lasted perhaps a half second, until my trajectory, still on the ascent, was rudely interrupted by the top of the doorframe, square in the middle of the top of my head.

I bounced off the doorframe, and landed with great force on the cement floor, legs spread out in front of me. I was in the process of meeting my maker in two ways. First, I had never hit my head so forcefully against anything in my life (not even when Billy Wrin's little brother hit me in the head with a full swing of the baseball bat while I was playing catcher). There was intense pain mixed with a most unpleasant swirl of colors and patterns. It felt like my brain had been extruded to my feet.

Secondly, I hit the floor so hard, right on my tailbone, that all air was immediately expelled from my body. With the little sense I had left, I thought that I would die of suffocation before the brain trauma did me in. I was completely immobilized. My father looked at me, surprised, but I wasn't unconscious and I didn't do anything. I stared straight ahead, unable to breathe, move, call for help, or even cry. I don't completely remember what happened next, but there was considerable rolling around, holding parts of my body, and

gasping for air. Perhaps that is why I was so viscerally impressed, several years later, when my father explained to me the mechanics of the pileated woodpecker.

In any event, the three of us did take that trip down the Susquehanna River in Pennsylvania. Perhaps three years later the three of us drove up to the Rideau Lake in southeastern Canada, and camped out and fished for a week or two. We made that trip once more while I was still a teenager. I remember my father's enthusiasm and reveries on those trips. He loved everything about it. He loved camping, the wilderness, the ever mystical promise of bass or lake trout, etc., etc. I did enjoy going out on the boat, and I took some pleasure in fishing, but more in the act of casting than in waiting for a bite. I also remember a lot of mosquitoes, of how much I disliked the smell and feel of the bug repellent we wiped on our faces and necks. And while I did appreciate some of the wonderful scenery, mostly what I thought about was all the things I wanted to do once we got home, projects I wanted to work on and getting together with my small circle of close friends. I was an adolescent; what was I supposed to think about? But I'm sure that somewhere, even at the time, a part of me was reassured that my father seemed to be in another world, a world he cherished.

Those trips became more rich for me as I grew older. It was the memories of those times and landscapes that I could recall and experience a part of what my father experienced. They also provided us with some funny stories that never seemed to lose their humor. My father, as I have probably mentioned, was very Victorian in many respects, especially about anything having to do with nudity or sex. Nonetheless, he considered it his God-given right, when we were out in the wilderness and no one else was around, to go skinny-dipping.

One time we were out on a lake, fishing, and we had rented a little twelve-foot boat with a small outboard engine. It was a hot afternoon; we were in a little alcove, and my father decided it was time for a swim since the fish were apparently all taking a siesta. So he stripped down and jumped in, and invited us to do the same, but Brian and I stayed in the boat. We watched as my father swam around, trying out different strokes, and generally refreshing himself, all the while telling us we should do likewise. Finally, my dad was pretty tired and swam back. My brother waited until my dad was within ten feet of the boat, and then started the engine and zipped off about twenty yards. My dad laughed at this trick, and, spitting water, said something like, "hey, come on you guys!" He

swam up to the boat, and this time, just as my father was about ready to hoist himself up, Brian took off again. We kept this up about four times, until my father started looking desperate and we let him in. Really juvenile humor, admittedly, but Brian and I (and my Dad, once he got his breath back) thought that had to be about the funniest thing ever.

About ten years before my father passed away at age 75, he started trying to work up some enthusiasm for us going on another camping trip. By that time, of course, we all had adult lives of our own, and were always busy. I would see the eagerness in my father's eyes for the idea, now that we were all men, and I would humor him along that, yeah, I would tell him when I got a week free. But we never did. I am sorry that we didn't. But this is not meant to be some wrenching admission of life-opportunity lost.

No, we didn't go on a camping trip again, but my father and I became very close friends, especially in those last ten years. I spent a lot of time with him, and we had great conversations and did other things together; it's just that camping wasn't one of them. I probably could have appreciated the reverie of the wilderness much more at that stage of life, and in that he would have still been my mentor. However, another thing happened which was in part why our relationship deepened so much. I was exploring new ideas, and new worlds that my father never had, and in some respects I became his mentor. I still sought his advice, but he depended upon me to be his emissary to the world of new challenges and insights that had not been a part of his experience. I would explain these new landscapes to him, and he would inhabit them with me, and then we would converse and advise each other, as two men who loved and respected each other. When my father passed away from cancer, as had his father before him, I was profoundly sad, beyond words. It was the sadness that I simply loved him and missed him immensely, but thankfully it was not a sorrow shot-through with remorse or regret. He knew how much I loved him, and I knew how much he loved me, and we had said our goodbyes. He had had a good and passionate life. He left me with that passion and the knowledge that such was the order of life, and I knew that part of him went with me as I continued my journey along other rivers, rivers he had not navigated.^{lxxiii}

ii) *When are we available for wisdom?*

I think it must be part of the human condition to feel misunderstood: by your parents when growing up; by teachers in school; by friends who change in ways different from you; by acquaintances who have stayed in the same neighborhood while you went elsewhere; by a spouse or partner; by one's own children. It isn't until we have some significant life experiences to call our own that we begin to realize that some of the most poignant episodes of feeling misunderstood had relatively little to do with the other party from whom we felt estranged. Instead, we were the strangers to understanding our own evolving natures. We may have felt the first intimations of change or doubt in previously held truths, but hadn't the courage or insight to see ourselves as creatures in process. In struggling to suppress the contradictions that must necessarily accompany every metamorphosis, we strike poses of who we think we ought to be. We confuse ourselves, and consequently it is no mystery that others can't keep up with those changes that even we can't give voice to.

Yet even this worldview misses the truth somewhat. For in truth we are all in metamorphosis all the time, and it is the rare individual, indeed, who can appreciate those changes as they occur as good and evidence of life itself. The process is continuous, and not just step-wise, and in any relationship between two individuals, it is occurring simultaneously and distinctly for both persons. Those individuals to whom we often look for wisdom because they live creatively, well, with compassion and engagement, and are not easily beset by discord around them, are not (as we may assume) static creatures, having attained a final state of holy grace. Rather they are fully aware of their own spiritual and intellectual evolution, and are joyful in that emblem of their humanity. They are receptive to introspection and envisioning, and as such they are both co-creators of their lives, and grateful spectators of their lives. We seek their company because a part of us senses that they celebrate the evolving creatures that we are, and would be the last people to express harsh criticism that we are not the same person they once thought they knew.

To live in celebration of change is a practiced art. I don't mean the kind of change that occurs willy-nilly, or the sort of "whatever . . ." attitude that reveals mere fickleness, fascination with superficial novelty, or lack of a sense of

personal commitment and integrity. The change I am speaking of is considered, not taken lightly but neither looked on with dread or morbidity. It is the kind of change that comes from honest reflection with one's self, and can then explain such changes to another of integrity, without deception or dissembling. We *are* capable of embracing such change at most stages of our lives, with varying degrees of insight and appreciation, but for me to say as much (which may sound very sensible as you read it) flies in the face of our age-old characterizations of the stages of life. When you look at the phrases we blithely throw around to "identify" who someone "is," we do so because it is easier to see them as static individuals, with set characteristics that we can then use to make quick assessments of whether she or he is someone we like or dislike, or the limits of association we wish to set in our dealings with the other. We are not reflexively disposed to approach others (or even ourselves) as though they were, as Aristotle would have said, in the process (continually) of "becoming."

You would get nothing but nods of assent, in casual conversation, if you were to make the standard descriptions of childhood, youth, young adulthood, middle age, and those advanced in age. "Infants are completely open to anything; they're just fascinated by anything they haven't seen before." "Young children are 1) fearless; 2) shy; 3) not like their siblings; 4) just like her mother, etc." In fact, you can hear parents of youngsters trot out anything at all that merely describes a child, and then append any reason to that observation that validates the characteristic with the assurance that they have just uttered an eternal truth. "Teenagers are rebellious, just because they are trying to be 1) rebellious; 2) find their own identity; 3) moody. . . etc." Unless, of course, they aren't rebellious, in which case they are "on the right track." And on and on. Young adults are "lost because they are coming to grips with adulthood and finding their own way, or meeting a completely different circle of friends at college." Middle aged folks like to see themselves as "bearing the weight of the world, taking on real professional or work responsibility, trying to make a support system for those for whom they are responsible, with precious little time for diversion, let alone navel-gazing." "Senior citizens are, you know, out of touch with the pressures of contemporary life, and they are set in their ways." Unless, of course, they aren't.

We don't all talk this way about everybody all the time. But such utterances are common currency enough in casual conversation that when actually looked at critically, they seem to be a hopeless tangle of contradictions, or perhaps just conversational space-fillers. And yet when we are not talking about somebody, especially someone not present, but talking with someone, a different picture emerges. A real conversation involves intense listening, and a high degree of empathy on the part of the speaker to be understood (not just to be heard or victorious); as well as a longing empathy on the part of the listener to help the other be understood, to understand what she is saying, and (as in the examples given several times in this book of storytelling) to make those utterances more true than they would be in the absence of an empathetic listener.

If one is privileged to be in such a conversation, one is in a sacred space. ^{lxiv}Conversants come away from such encounters changed, regardless of the subject matter. For far too many people, such encounters are so rare in their daily lives that the experience can even be disorienting. Heading back to a meeting or a spreadsheet after such an encounter can leave one reeling in possibility, elevated by the communion, and trying to figure out how to make it happen again. What happened was not a mere transfer of information, or a debate won or lost. What happened was an encounter with wisdom, called up by awareness, generosity, and empathy. Best yet, and contrary to popular belief, anyone can do it. How can we do that? How can we make such real, meaningful, and vibrant conversation a part of ordinary life, something we should expect from life, not something we see as an aberration? In a functional way, it is like learning to appreciate music: the more you are involved in it, the more natural AND the more rewarding it becomes, for all involved.

I have given some thought to the art of meaningful conversations, and the lives of those with whom I have had fine conversation to see if there are any indicators for when (in terms of stages of life) individuals are most susceptible to have depth and awareness and the other keys for generating wisdom. Those indicators are sketchy at best. Many of my insights come from the program in which I have been teaching, so I need to include a little background about that experience to give context to my remarks on when and how individuals become interested and conversant in deep, open-ended conversation that produces wisdom-insights.

The program in which I have been teaching for over seven years now is an undergraduate, interdisciplinary, liberal arts degree granting school within a state university, known as the Hutchins School of Liberal Studies at Sonoma State University. A philosophy professor in the late 1960s, Warren Olsen, first conceived the model.^{xxxv} He was inspired in his vision of interdisciplinarity and inquiry-based learning by his first encounter with the late Robert Maynard Hutchins, a major educational reformer and president of the University of Chicago, when Olsen was a high school student growing up in Chicago. Together with a few like-minded souls Olsen came up with a proposal for an experimental humanities program at a time when there was some freedom to try experiments at the college level, some of which blossomed, but most of which did not, sometimes for very good reasons (fluffy, ill-conceived, no content, etc.). Olsen was not certain what the creation of this program would entail at the outset, and probably expected that it would rapidly evolve as he recruited faculty for this new program.

The Hutchins School enrolled its first students in 1969, and what followed was “interesting,” to say the least. The debates over essential courses, curriculum, and methods were hotly debated in weekly faculty meetings even after the teaching program had already started. It should be mentioned that one of the essential ingredients that would set off the Hutchins School from all other academic departments was that the primary teaching venue would be (and still is) composed of seminar discussions. In the ideal seminar setting, a group of twelve to fourteen students meet around an oval table with their faculty facilitator and course teacher. The role of the professor is to act as a catalyst and facilitator for in-depth discussions of the topic at hand, and when necessary be the academic specialist who could move the students out of stalled or unproductive discussion based upon missing elements of essential background.

One of the first faculty members thought that in order to be truly open-ended, there shouldn't even be a curriculum, and the contents and reading lists for any class should be left up to the students who showed up. Luckily for the future of the program, Warren Olsen was a bit more of a formalist than that. For my part, when I had heard from Warren and other faculty who were around from those early days, I immediately thought of all the worst aspects of progressive parenting and education that found a brief popularity during the

1960s. The cry of “freedom” on these fronts among what was, even then, the radical fringe that saw fascism or imperialism or some other great “ism” at every turn, and they violently objected to anything resembling a hierarchy of knowledge being foisted upon the true innocents of society, the impressionable young. According to the most extreme leading edge, there was something poisonous to the young in imposing any received wisdom (I don’t think they actually used the word “wisdom” at all).

So, for example, if you thought your youngster might enjoy music, the best thing to do was simply expose them to ways to make it themselves without formal training. If you had a piano in your home, let the toddler bang around on it, but never subject them to the formalisms of scales, practice, or lessons. Whatever they bang out with their little fists, be sure to lavish praise on it and maybe even insist that their spontaneous banging was somehow more real and valuable than any Mozart concerto. Of course, most of us (I hope) know how these things end up. The child, rather than deriving any sense of joy at creating something themselves, is quickly bored by random plinkings and moves on to television, which at least has some entertaining visuals and sometimes even a story to it. Perhaps this mindset of a new golden age heralded by the immediate jettisoning of anything like effort, discipline, and patient mentorship is nowhere better parodied than in the outrageous novel, *The Serial: a year in the life of Marin County*, by Cyra McFadden.^{lxxvi}

To make a long story short, Warren Olsen’s vision, including the idea that there should indeed be a rigorous curriculum designed by well-educated faculty, held sway. A larger group of faculty were recruited out of graduate programs in a variety of disciplines beginning in 1970, and for the next few years, while they built and taught a coherent curriculum, the faculty debates continued hot and heavy about the overarching intellectual framework and the structure of the integration among disciplines and courses.^{lxxvii}

I won’t belabor this history further but to say that it has undergone many changes over the years. The nature of the courses required the teachers to be able to work together (often teaching sections of courses designed by an interdisciplinary team, that was called a course cadre). Those who came from the arts, social sciences, history, physical sciences, had to make sense to each other.

In lower division courses where they would co-design and co-teach multiple sections of an entire intensive course of study, they had to understand each other's disciplines and the compelling reasons for their suggestions for themes and readings within the overall course, and they all had to be able to understand and teach these different subjects (that is, lead seminars), at least at the level that we expected of our undergraduate students. I should note here that the particulars of the program I've just described is an intensive example of a wider educational mode called "Learning Communities," which is gaining a national audience and is springing up across the country in various incarnations.

When I first came to the Hutchins School in 1991, after completing a fellowship at the Smithsonian Institution, I did not really know what I was getting into. My doctoral dissertation advisor at Johns Hopkins had simply seen a position search notice, where the position description included a desire for someone with a Ph.D. in the history of science, with training and experience in one of the natural sciences, and for someone who had a proven teaching record and was interested in working with an interdisciplinary faculty. Having come to know me and my previous careers well, my advisor sent me a copy of the announcement with a post-it note saying: "This looks like exactly what you are looking for," suggesting I should check it out. It took some time for me to become accustomed to facilitating, rather than lecturing (after all, what would undergraduates actually be able to contribute in their callowness to things I had spent my life studying?). But after a semester I began to calm down from my need to simply download everything I knew already, and began to cultivate more of the empathetic listener and catalyst for their own learning. I realized that there were times when I certainly did need to step in and give them additional background beyond what I had put into the course readings, and this often took the form of the students actively petitioning me to share these things.

I came to realize, once I had become able to guide and really listen, that quite often these students not only understood some very deep concepts which they were encountering for the first time, but that they were synthesizing wisdom that was truly their own. They were learning to express these ideas with compassion and passion, and I knew that the sorts of learning that were occurring in these episodes (which were increasingly the norm and not the exception!) were truly life changing.

They were learning the difference between wisdom and factual knowledge, without dismissing the informing power that factual knowledge brings to wisdom. Their communicative skills, in seminar discussions and in writing, were uneven, but there was an undeniable upward trajectory. They were learning, by direct experience, both the truly wonderful potential of their own minds in meeting acknowledged great thinkers on their own terms, and, most significantly, they were learning the way that wisdom and insights are multiplied when a directed discussion is engaged by a group of active participants and active listeners. All of these things came as a revelation to me, but they also came as a revelation to the students themselves. They had not previously realized the joy of truly searching conversations about things that really mattered, among a group of peers whom they respected and with whom they felt a mutual responsibility to do their best. In relating these experiences to the reader, I recognize that more detail is in order. That will be done in the following chapter. At this juncture I only wish to emphasize that we regularly underestimate the potential for deep understanding and wisdom among our mainstream youth. It has been my personal experience that has awakened me to the fact that I had the very same assumptions, and they were wrong.

So, let me return to the question of when we are available for wisdom? Completely unexpected to me, I found out first hand that eighteen year olds are capable of this. Now, truth be told, even when I taught high school I had encountered exceptional individuals (not only the academic superstars) who seemed not just smart, but wise beyond their age, and I wondered where these kids came from. When I saw it at a state university, I was again shocked. These students were quite often, by the normal modes of testing and ranking in our society, quite ordinary. I found out that many of the entering students ended up in the Hutchins School almost by default. Most really had little or no idea of what they were getting into. They had never been in a seminar discussion before; they had never had any course that might even be called interdisciplinary, let alone transdisciplinary. They had never been required to formulate coherent analyses of things that mattered and had basically learned to manage by being passive and showing up for class. And here I was witnessing not just a few, but a majority of our students, after finding their feet (and their minds and passions) thriving in this environment.

Granted, there have always been a few students who, even when given the exposure to this environment and invited to rise to the occasion, were simply too immature to take on this kind of responsibility for their own education and for their commitment to their peers. There are always a few whom, after a semester or two, we counsel out of our program, and they usually agree that a standard curriculum of separate disciplines, of courses defined by a single textbook, and of lecture and test is more suited to their temperaments. However, I am always surprised at the number of otherwise ordinary students who are immeasurably inspired once they have seen the vision of what learning can be about, and the unparalleled experience of wisdom-generating conversation among peers and mentors. And I, for one, could not clearly see this vision either until my students helped me experience it.

It is nearly a daily occurrence for me to find myself awestruck by the insights of several students, and I try to let them know how marvelous these insights are in the moment. And I have told my students that I can do a pretty good job of recalling my own thoughts and concerns when I was their age, and they are far, far, beyond any insights I was entertaining at that age. Often they look at me with a kind of disbelief, thinking I am just being kind. I think it is a natural disposition for college students to think that their professors are of a different species, or some such thing, and they read this image back into whatever sort of person I might have been when I was their age. But I am not giving them empty compliments. I also tell them that had I even known that there was a program like this when I was an undergraduate, I would have tried to get into one. But at the same time I tell them that if I had, I am not at all sure that I would have been mature enough myself to really understand what was going on, and very likely would have done something else. And again, I'm not sure they believe me, but that is my own best estimation of such a time-travel experiment with my own growing up.

So, I know that given the right environment, the art of truly meaningful conversation and the joy of learning and growing in wisdom are within the grasp of most individuals, and not just a privileged elite. It may be of interest to note that the majority of students in the Hutchins program are women. There are more women than men in the student body as a whole at our university, but the ratio is even higher in Hutchins. I will not try to infer anything about gender

and the attributes of learning communities myself (I'll leave that to sociologists), but it is interesting to ponder, nonetheless.^{lxviii}

Another demographic group well represented in our program are so-called re-entry students. These are students who, for whatever reasons, left off formal education at some point in their lives for a number of years and are returning. Sometimes they began their post-secondary education at a junior college, took some general education courses, and are now seeking a bachelor's degree. Not infrequently, if they did take formal education after high school, they found themselves in all sorts of disparate life-situations for a long time. They have worked at a variety of jobs, blue collar and white, salaried or hourly, have raised families, and experienced parts of the entire spectrum of adult life. They come back to school for a variety of reasons as well. Some simply have a felt need to complete a degree, both for professional opportunities, and to express a measure of personal courage that they can take on something significant and see it through. A number of them have reached a point in their lives, in their 30s, 40s, and 50s, when they are eager to intellectually explore in a space and for a time set aside to do that. As you might expect, their levels of anxiety and apprehension that they can actually do this can be quite high.

From my first encounter with these students, these older re-entry students, I was moved by their courage and desire. They have been among the most interesting individuals I have worked with, and, having seen much of the world already, they can make astounding connections and find breathtaking insights in deep reading and conversation in a learning community. They are also more apt to be completely expressive of the joy of learning, of how the world has opened up for them, both because of the contrast between such a life and the years of slogging they had thought pretty much defined what it meant to be an adult. They also frequently experience an even greater shock in the recognition of their own abilities than do the traditional-age undergraduates.

Without recounting the many personal examples of individuals I've worked with as teacher and mentor who have told me of their fundamental life-changing experiences, let me just say that so far I have found no upper age limit on individuals who hunger for knowledge, wisdom, and can succeed magnificently during their tenure as students. Many ask me for suggestions of professional and educational pursuits they can follow after matriculation that will allow them to

continue both their explorations, and enable them to pursue work that will invite their insights and spiritual wisdom values, as well as for ideas for research projects and internship programs commensurate with their passions. I do my best to help.

For those who go on to do academic graduate work (sometimes because they really hope to be able to teach in a program like Hutchins), they often succeed quite well, but very often they return for visits with reports that what is considered a seminar discussion at these other, highly respected, institutions is quite different from their earlier experiences. They find a less-than-enthusiastic reception for their analyses and questions of the very postulates of a given academic field, and are generally told to master the catechisms of the professions as already defined, an apprenticeship that will take years, before they are allowed to add their own piece of layering to the prevailing dogma.

Many of our students also return for visits expressing a longing to find community where they can continue the “great conversations” that they found so life giving. In the last few years a number of our students have begun to form various associations, face-to-face, on-line, during their student years and after graduation, where they can continue their associations. I do my best to inspire my students with confidence, enthusiasm, and most of all with visions that the world is changing. There are places for agents of positive change and visionaries. When students seek me out for advisement about specific things they might do, perhaps continuing their studies, perhaps finding a niche in the workforce where they can find meaning and not just wages, I do my best to think this out with them and suggest resources, and sometimes personal connections in the outside world who would be receptive to their enthusiasms. However, there are always a few students who, when they come back to visit, have found gainful employment but not a conversational wisdom community. Indeed, I realize this vacuum is not often easy to endure.

We are living in a culture driven by its surrogates. There are visionaries scattered among us, but often they are not in sufficient numbers or proximity to foster conversational wisdom communities. I am not suggesting that everyone quit their jobs and join a commune outside the boundaries of mainstream society. In fact, I am hoping for the exact reverse. We might become a more grateful, reflective, conversational, and wisdom-seeking and wisdom-applying society. My

fondest vision is that we might embrace dispositions as a primary theme of what we consider to be the good life for the mainstream. It is possible. I know we can expand our visions of what we seek and why beyond the surrogates of flatland, because I have seen it happen personally, in microcosm.

The rest of this chapter, and indeed the book, are ideas and impressions to help this vision along. I am not alone. In fact, I am greatly encouraged by the number of individuals and groups who are already acting to realize societies and communities that will allow for greater and deeper satisfaction as we put our efforts into them, so that we will not be either overcome by ennui, or like so many anxiety-ridden grasshoppers, as Scott Russell Sanders put it, leaping “from notion to notion.”

iii) *Keeping track of your life and telling stories*

There isn't a specific order to creating a conversational community. As mentioned above, for many of the students I've worked with, they were simply immersed in it by virtue of having enrolled in the Hutchins Program. We have tried to improve the information disseminated about this program, but we still have quite a few students who enroll thinking they were about something very different from what they ended up doing, and quite surprised by the experience. In addition to the radically different experience students have in a learning community, there is also the very transformative experience provided by being able to set aside a time in life specifically for learning and personal change, and this is a disjuncture that is universal for all students leaving home for the first time. I try to emphasize that it is a positive disjuncture to be embraced and not just a disequilibrium to be endured until they are comfortable in their new setting.

I find this deliberate change in life patterning so powerful an opportunity that I wish to have it available not just right out of high school, but at regular intervals later throughout life. I see regularly, first hand, the transformative experience of older students who return to school and have given themselves time for contemplation, learning, good conversation, and re-evaluation. The positive effects are so profound that, if I were to make any pronouncement on social policy at all (which I am loathe to do), it would be for at least the

consideration that in the twenty-first century we think of mainstreaming ways for adults to re-enter the academy. (And I am thinking specifically of the Learning Community model here.) Not for technical upgrade courses for their current employer's immediate needs, but for a kind of workers' sabbatical to have the freedom to think grandly about life's ageless mysteries, in the presence of similarly engaged individuals from different backgrounds.

I think that if we were to consider at least making such opportunities an option for many working adults, without penalty (they can return to their jobs after a semester, for example) in much the way we have been evolving things like flex-time, daycare, and maternity leave, the benefits to society would be beyond imagining. Such worker's sabbaticals would be the sort of environment that would most profoundly invite envisioning, and on a very large scale. For all the think tanks, business consultants, and CEOs who keep saying that they really ARE looking for creative individuals who know how to work well with others, and have the ability to really "think outside the box" of what is, there is nothing currently being touted by any of these so-called agents for new thinking that would even remotely compare to the creative possibilities that would come from a society that embraced regular involvement in learning communities as a benefit.

Of course, the real changes that I can dimly envision are beyond the corporate bottom line. I see regular sabbaticals in deep, wisdom-seeking conversation as one of the best ways to help inform lives with meaning, of growing the connections of community, and of seeding further conversations, beyond the academy, with wisdom rather than mere technique. I see this not as some conforming of public opinion to a national religion, but rather as the most lovely way to express and embrace the maximal diversity of visions, ethics, and ways of living. And best of all, we would become known to each other, and to ourselves, and this knowing is the very heart of empathy and wisdom.

Let me return for a moment to the humble experience of the classroom, by way of introducing one curricular exercise that I feel I can recommend wholeheartedly, without any reservation, for anyone at all. It speaks directly to the topic of this section, namely keeping track of one's life and telling stories. A minimal amount of background is needed here. In the lower division (first two years for students entering at the freshman level) of the Hutchins Program we

have a four semester sequence, which when taken in its entirety can stand for most of the general education requirements of the university (with the exception of mathematics). These courses are very intensive in every respect, including extensive readings and writings, special projects, and a lot of time with the teacher. In 1998 I first taught the second course, which we call "In Search of Self."

This course, taken by second semester freshmen, investigates the history of conceptions of the self. It includes the ancients; the invention of the concept of the modern rational, autonomous and interior self (e.g., Descartes, Shakespeare); the Darwinian concept of self; the early twentieth century philosophers of the conscious and unconscious (e.g., Freud, Adler, Jung); a tour of contemporary neuroscientific theories of perception and thinking; and the postmodern constructions. Yes, it is a lot, but then again, these inquiries comprise nearly the entire workload during the semester for a student in this program. That is, this single course is twelve units. The final project requires the students to write their autobiography, with the intent that the insights they have gained throughout the semester will open their understandings of themselves to enrich that autobiography. This final project is not easy for the students. These autobiographies are typically about thirty pages in length. When I look back on my own state of mind, to the best of my recollection, at age eighteen, I don't think I would have had all that much to say about who I thought I was, and how that fits into some worldview. Nonetheless, these students were able to do it, which was just one more bit of evidence to me of the broad availability to wisdom *when properly nurtured and encouraged*.

The autobiography is a most profound project for these students, and they all report that it is like nothing they have experienced before. They complete these autobiographies as their final project, and so it also coincides with the end of the semester, with the end of their first year in college, and with a host of other changes they have experienced since leaving home. I told my students I hoped this attempt to understand their lives in a meaningful narrative would just be the beginning. They have viewed their lives as creative works in progress, and they have assessed just what that trajectory feels like right now, what they

think they have learned, how they have truly become different creatures at different stages in their lives.

And then I tell them that I, too, continually write my autobiography. I do not call it my autobiography; I call it my journals, but I have kept writing journals for the last twenty-five years, and have increased the amount of writing over time as my experiences have become both broader and deeper, as my insights have interleaved. I am sure that there are countless individuals who have led meaningful, authentic, and insight-filled lives who have not written journals. It is quite possible that there are individuals who are able to discern their meaningful life patterns, to comprehend the wisdoms they have gained within a dynamic and unfolding narrative without ever having committed those reflections to paper. Of course, we all know of people who are, for example, natural born athletes and seem able to do all sorts of things that the majority of us could only imagine approaching with insistent training, if at all, and the same holds true for a host of other gifts. When I encourage my students to make a life practice of writing down their experiences and insights, it is simply the best advice I can give for awakening them to their true desires and potentials, and to ensure they are never left in existential distress over what their lives add up to. One might account my passion for journal writing with an intellectual deficiency on my part to just keep everything in my head, without the additional experience of writing out my life as it presents itself.

However, I think that one of my gifts in life is that relatively few things, academic or otherwise, came with a natural leg-up, and so in doing almost anything that I have applied myself to, I have always had to give a lot of thought to what needs to happen in order to do it. This description of my learning process is not false modesty on my part, I really mean that, just as it is not false modesty when I confess to many of my students how much more mature and insightful they are than was I at their stage in life. I have been around many people in many disciplines for whom my situation was quite distinct from their own, so I know what I am talking about. This experience has caused some painful recognitions on my part. At this stage in life, I think that my shortcomings have actually been a profound blessing in what I do, though they did not seem to be anything of the sort for many years. I was raised to think that I could literally do anything, if I just applied myself to it. I know that my parents

meant well, but I am not so sure that mantra is always the best thing to tell a child.

After I began studying physics in earnest, for example, I was grittily determined that I would master that subject and its attendant disciplines. I did all right, but I was not the star of the department by any means. Still, I would work in my study carrel for hours on end, many times until dawn. Finally, there came a realization, near the end of my undergraduate years, that I had reached a level of sophistication where I could see that some of my peers, while still working hard, were also intuitively seeing their way through these problems in a way that I would never be able to. There is an area of mathematical analysis used by physicists called tensor analysis, and when I hit this conceptual tool, I was stunned by the divergence between my experience and some of my peers'. When solving a single problem, I would sometimes write out in very small print, complete descriptions of exactly what a particular line of mathematics meant, what was in it, and why I was using it. Three fourths of my worked out homework problems were prose, interspersed by equations. I would also write out all of the simplifying reductions of a series of equations, even the arithmetic ones, not leaving them out as "obvious" as everyone else did.

I was blessed at this time (and that truly is the only word I can use to describe the following encounter) with a friend by the name of Gordon Wright. And Gordon, wherever you are right now, I want to once again thank you for your friendship and humanity. At this level of study it was allowed and even encouraged, for us to get together and work jointly on our homework assignments (of course, we couldn't do the same on tests), and Gordon approached me one day and suggested that we get together regularly in my study carrel, which had a blackboard, to work on our homework. Gordon was warm, humble, soft spoken, and self-effacing. He didn't think there was anything special about himself. However, when we began meeting in the evening to work on our problems in tensor analysis and theoretical mechanics, we would both begin hunched over our textbooks and notebooks at my desk, but soon Gordon would take the problem to the blackboard.

Gordon didn't talk fast; he would always explain what he was doing, and he never, ever, lost patience with me. I would sit there amazed at how he could see, intuit where a mathematical line of reasoning should go next. When we were

done, I would always understand everything that we had done, (sort of reverse engineering), but I was astounded by his understated ability to know when and how to make a conceptual leap. More than once, after several hours of exhausting work (for me, trying to keep it all in my head and make sense of it) I would say to Gordon: "This is really wonderful, but I don't understand why you want to work with me. I mean, Gordon, I really don't think you need my help, and to me it seems I am always the one who learns from you, non-stop!" It was true, and it was Gordon who showed up at my door, like clockwork, asking when we could get together next to work on that week's problem set. To this day, I honestly feel that Gordon's presence and friendship was a pure gift, and a divinely inspired gift. I have no other way to describe or make any sense of it. In later years I have come to see that episode, and there have been many others where I needed help and suddenly, when I was out of options, a gift appeared. In many ways, Gordon was very much like Clarence, the angel who came to George Bailey in *It's A Wonderful Life*.

This episode provided some very deep insights to me, which have stayed with me to this day, and which also seemed to be completely outside of what Gordon thought he was doing (at least as far as I know, but then again . . .) During this time I was confronted with my own limitations. These were not socially imposed, or due to being raised by demeaning parents. Quite the opposite. Here I was, twenty-seven years old (I had left college several times, and changed majors), and I was still operating under the assumption that I was every bit as capable as anyone, as long as I applied myself rigorously, and that whatever field I would become master of was simply a matter of my personal preference. I don't think that any psychologist would say that someone with such a view of himself was suffering from low self-esteem! I had been able to keep this view of my abilities and myself reasonably intact up to that time, and that even included all sorts of justifications for why others sometimes did just seem to be able to understand certain concepts better and quicker than I did. I had maintained this precious, and flawed, view of myself. But finally, the dam broke, and I was confronted with a brutal fact: I cannot do absolutely anything just as well as anyone else.

It took some time to absorb this new observation, but its after-effects were absolutely invaluable. I had already been keeping a journal by that time, but I began writing wildly, with flashes of new insight. On the formal level, I wanted to understand how Gordon, and others like him, understood things that I couldn't. What was he thinking and how? I believe I actually asked him this question directly on several occasions ("how did you think to take THAT step, at this point?"), but that approach didn't help much. Gordon would look at me, a bit puzzled, and explain again what he had actually done on the blackboard. He was not being coy or condescending (both were completely out of his nature, and he couldn't be condescending if his life depended upon it).

And so I realized that there was something different going on in Gordon's mental landscape than was going on for me. I decided that at some level, and maybe subconsciously, people like Gordon were able to work with mathematical abstractions almost as images, and that arriving at a certain juncture they could somehow perceive, actually see, a spectrum of possible branches of logic all at once, weight them, and intuitively be drawn in a certain direction. I even came up with a term for this mode of thinking. I called it "spatial reasoning," by which I did not mean the literal spatial imagination that psychologists refer to as one of the "intelligences." I meant the ability to hold a number of ideas simultaneously, and in abeyance, until they were pulled out of this manifold of below-conscious possibilities in a certain direction.

I also realized that, at least in the disciplines of physics and mathematics, I was not one of those individuals whose deep structure of problem solving worked this way, and I had to come to terms with that realization.^{LXXIX} I did get through that course, and others, and I think that to have studied for so many years and not finish my degree would have been psychically destructive rather than instructive. But I now had a very different appreciation of lived experience, and developed an openness to being instructed beyond what my own predetermined goals drove me toward. I did a lot of journal writing. I came to better understand my strengths in teaching, which were in no small part due to my limitations.

Having concepts not arrive easily or intuitively and out of the blue in my chosen discipline, I was extremely sensitive to all the ways a person could misunderstand. I found that I did have very strong intuitions, but these

intuitions were of an empathetic sort. I found that I could anticipate what it was that a student could not understand in developing some concept, and that I could vocalize this difficulty even when the student him- or herself could not quite understand what it was about that concept which they didn't understand. I found that I could also visualize analogues and examples that might help a particular student at a particular juncture. I came to have a much more profound appreciation for the variety of gifts with which individuals are endowed. These insights, much of which I set down with great energy in my journals, set the tone for the next two decades of my life.

But what do these personal reflections of my own education have to do with my freshman students who had just written their autobiographies? I was urging them to use this major writing effort as a grand beginning, not as a project to be tendered for credit. The bright recollection of major transformations I had experienced at their age was most powerful, and the fact that I had written intensively as those transformations worked themselves out, and that this writing had both enabled me to understand my struggles and to find my way toward new, rich visions as a result made me most desirous that they might find joy and wisdom in a similar attention to writing their experiences as a life practice.

There is something of extraordinary power, in my experience, in writing down one's experiences, insights, goals, life changes, decisions and their reasons. There is something very powerful in respecting one's life as a creative work-in-progress. When I write down my best insights, my profoundest hopes and dreams, my current wisdoms, whatever they may concern, the page seems to speak directly back to me as though it were another self. My journal is a spiritual wisdom companion. It has never left me bereft in life, so long as I uphold my part of the sacred relationship with this friend, and that is that I will attend to it, learn from it, and always be as honest as I possibly can about any difficulty, crisis, plan, or insight. There is also something about having accumulated these thoughts on paper, in binders, which gives me a sense of motion, meaning, and the ownership over what I create and do with my life.

Sometimes I go back and read sections of my journals from years past. It helps to restore that meaningful life narrative that is so important to me. Often I don't need to go back and read them because the effort and attention of having

written these meditations, and their physical presence in notebooks on my bookshelf bring them back to life just by see their binders. The very writing process brings such clarity, such wonderful new insights, that I am constrained to believe that the very act of keeping track of our lives is a sacred practice which makes us available to wisdom that we might otherwise discount, or never see in the first place. It enchants life itself. It deeply inspires gratitude.

In years past I have often tried to leave my students with some bits of wisdom, sometime in a semester, of things I think are important.¹³³³ At times these pieces of advice from the older generation began to get a little too numerous. Keep learning. Look for ways to improve your world. Be grateful. Don't hang around with jerks that revel in their "heroic" despondencies and pathologies: it is an easy air to affect; it doesn't inspire visions, and their cynicism can infect you. Remember, true empathy is the art of true understanding; do not reject people, epochs, or groups out of hand because in some way their worldviews made some sort of sense. If you want wisdom, you must be able to understand in this way, across distances of time and culture. Always seek out worthy mentors and try to understand their wisdom without becoming a disciple; and as you go through life always look for opportunities where you can be a mentor to others, and their questions will help you maintain your own integrity. Conversation, about things that matter, engaged with empathy and understanding, produce wisdom and lift everyone involved: seek to make such conversation a part of your life. Cultivate an irreverent sense of humor, and indulge in it frequently: few medications are as powerful as aerobic laughter.

I have now come to a place where I must trust that these bits of advice have already been spoken, by me and others, even during a particular semester, and if they didn't hear or notice all of them now, they will encounter them time and again, so long as they live with intention and awareness. The students will hear (or not, depending on what they are able to find a place for at their individual stages of maturity). As the saying goes, "when the student is ready, the teacher will appear." I do not, however, need to feel some frantic urge to pack my students off with a laundry list of everything I hope they will embrace. They are capable of insight; they will have their own experiences, and being in my classroom has been just one of many experiences.

So, I have pared down my parting advice to just one thing: keep a journal. I even promise them, as I do the reader, that if they write their lives, regularly, with honesty, and cherish the gift of the processes of living, they will be safe. Not safe from an accident, or an illness of any sort, or even from sadness. They will be safe from the worst of all fates, of having lived many years and having the dam break one day, leaving them with no answer as to what, of worth, they have been doing all this time. They will never, no matter how difficult things may become, find that their lives are meaningless. In short, they won't be tempted to jump from a window. In looking honestly at the desires and insights of one's life, and incorporating that wisdom into decisions of what to do next it is never too late to start (that is, regardless of the ages of the students, from 18 to 80), but it is always too late to knowingly put it off. Again, I do not say as some sort of threat that if they do not do this thing that they will have a miserable or crisis-filled life. I am only saying, that from my experience, it is the single best piece of advice I have in building a foundation of a meaningful life.^{lxxxii}

iv) *A note on mortality*

There was another activity we engaged in, in that freshman course I mentioned above, "In Search of Self." At the beginning of the semester, before they had gotten into all the readings, I asked them each to do a little overnight exercise, and to bring it to the next class. That exercise was to write their own obituary. I did not originate this idea. I got it from some colleagues, who in turn got it from a book by Deena Metzger. Before we go any further, let me ask you to consider your own reactions to this exercise. How did you feel when you read it? Did you imagine yourself being given such an assignment, and if so, what were the first emotional responses you experienced? What can you infer from your reactions, whatever they were?

When I told my students of the exercise, there were a variety of responses from the classroom. There were some puzzled looks, and at first there was silence while they took the words in. Then, there were some of the functional questions students ask, sometimes because they want clarification and sometimes because it is just something to do when they don't know what else to say. "What's supposed to be in it?" "How long does it have to be?" Then there were a

few who looked slightly ill, with comments such as, "I don't like this; it sounds so morbid. It's depressing. I don't want to think about dying!" There were also a few who seemed engaged by such an open-ended think piece, and their approval showed in their faces.

I believe it was the late biologist and essayist Lewis Thomas who first got me thinking about mortality, and the very odd places we have sequestered it in our modern consciousness, and the very unnatural and tortured way we respond to it, and I recommend that essay to the reader.^{lxxxii} Deaths, along with births, are the most natural of events in the human experience. How can we possibly hope to make sense of our lives if we are afraid to think about death? If the thought of one day dying is some black hole, is an existential void which produces anxiety or even terror to consider, then how is it at all possible to think about life creatively, serenely, and with gratitude?

I am not about to tell the reader what happens after death. The reason is simple: I don't know. I have entertained all sorts of thoughts over the years, and some have more resonance than others, but over the long haul I think those very meditations, and certain readings on the subject, have given me joy and gratitude. I must periodically consider it in the context of the life I am living, record my thoughts, and seek accommodations and resolutions where I do detect anxiety. When I have reached some insights, which have changed over the years, that seem to be my best wisdom on mortality at that time, I write about it in my journal and see how it informs other thoughts and reflections I have been writing about. However, I think we are making a critical mistake if we maintain that we are seeking insight into how to live our lives well, if at the same time we draw a rigid line at some life-phase approaching the end of our mortality and say, "this far, and no farther."

Mortality is not some mistake of nature, and our failure to be able to come to peace with it will invariably lead to all sorts of distortions in our life. It is a most expected result, when acting in denial of any big eventualities, to be anxious, confused, continually wondering what to do next. Without considering and embracing both life and its end, how will we become meaningfully engaged in the art of living? It has been said that when Plato was asked what all his philosophizing was good for, he replied that it was preparation for a good death.^{lxxxiii} I have thought that collectively we played with a culture-wide psychosis

during all the years of the Cold War, going on as if everything was fine, so long as one was able to keep from thinking that our national purpose, and the future of humanity, rested on the knife-edge of mutually-assured destruction, the official name of the policy of nuclear deterrence, also known by its most appropriate acronym, M.A.D.

And so the little exercise of having my students write their own obituaries was not at all some gruesome experiment to terrorize my students, and in fact it was precisely the opposite. It was an invitation to think lyrically about their lives while they still had almost all of it yet to come. What I was hoping for was that the students would take this opportunity to think not so much about what was going to come next, in the immediate future, but to imagine what *qualities* they would like to think they would have *expressed* in a life well-lived. And this is exactly what the students ended up doing! I was not so much interested in their laying out in fine detail what all their career moves would be, or positions they would hold. Rather, this assignment was an opportunity to envision. We all know that we have some amount of time for our mortalities. How much, we don't know, but we can assume it is something less than a century. What would we wish to have expressed most during that mortality? Some of the students fleshed out their obituaries with some homely details, such as being a grandmother, or having helped some group or other, and even these details revealed some wonderful virtues for community, devotion, creativity, and integrity. But they also put down wonderful qualities that they hoped would be apparent to those who knew them.

If you have never tried anything like this, I urge you to. It is a wonderful meditation for one's journal. What sort of person would express what you would consider a life well lived? Do you feel a sense of purpose and composure as you write this out? Are these things that you would really hope to embody also the sorts of things you are giving time and energy to? Whatever you decide in your heart of hearts, to actually write it down, to reconsider it from time to time, and to act according to your best wisdom whatever your current circumstances, *these are the sorts of practices that constitute a life well-lived at that moment, and for every moment*, regardless of when our mortality calls us home. If you want to sleep well at night, please try this practice.

The fact is that no matter who we are, we all have a life narrative, and so far as we know the ability to construct a life narrative is one of the great qualities that makes us human, as opposed to some other species. And, as psychologist Dan P. McAdams has so elegantly and persuasively shown through his extensive research, we are always in the process of telling ourselves what our current version of our life-story is.^{lxxxiv} If we are telling our narratives at some level, why not actively author them as well? The little imaginary obituary exercise is one way to open up our creative authorship, making our lives more than persistence in the face of random events, but instead a considered work of art, a work which we can see coming into focus as a daily process.

We may wish to create more than one work of art with our lives, and it is wonderful opportunity to seize if we are able. Our visions mature with experience, and in the process so does the composition of our lives. But if we are aware of our authorship, and acting upon the best wisdom we can muster at a given time to create our life stories, then we need never fear that the end of our mortality is creeping up on us. There is no, "if I can just make it to here" sense of when you will be fulfilled when you will have packed away the contents of a good life. It is happening all the time. There is no finer sense of eager creativity, joy, gratitude, and serenity, all at the same time, than through realizing that you are aware and acting according to your best lights, no one else's. To seek awareness and the courage to act is all anyone could ever expect of themselves. It has nothing to do with social station, with competition, or with any other surrogates that would have our devotion.

Notes for Chapter 7

^{lxxv} “The Stuff of Life: do you own it, or does it own you?” by Scott Russell Saunders, *Utne Magazine*, Nov.-Dec., 1998, pp. 47-51, reprinted from *Audubon Magazine*, July-Aug., 1998.

^{lxxvi} My choice of what I am calling “middle age,” as well as other age references are extremely fluid, and serve more of a literary and aesthetic choice than anything else. The point of reference is not statistical, but from how an individual living today might reasonably construct their life phases. The use of average life spans for different cultures and demographic groups is only vaguely related to how an individual envisions their own life, and rightly so. For example, recent reporting by the World Health Organization indicate that the prevalence of AIDS in Africa is much higher than any previous estimates, extending to one-quarter of the adult population in some countries. As a result, new calculations of average life spans on the continent have been radically revised downward for the next twenty years, falling to a level not see there since 1900. Infant mortalities and other radical disjunctures in statistical pictures for all countries further distort meanings for an individual life. More meaningful data are found in histograms, which show predictions for percentages of populations reaching certain age brackets. In the United States the percentage of the population that exceeded the age of 65 was minuscule, whereas in 2050, one fourth of the population will be in that category, and we might expect that for those in that category at that time, a significant number will live into their nineties, and perhaps see their centennial! See: “Family Album: a future portrait,” *Newsweek*, Nov. 2, 1998, pp. 62-63.

^{lxxvii} See *The World's Religions*, by Huston Smith, Harper, 1991, esp. pp. 50-59.

^{lxxviii} Again, for stylistic reasons I chose to relate this example of both the ordinariness and otherness of my adolescence, by way of illustrating the simple reality that we are all ready for different kinds of wisdom at different stages of life, and while these may often be located in some general age categories for many people, they are not, in my opinion, very predictable. In my experience, comparing the insights I have observed in many students I have taught with my best recollection of my own maturation, I am not struck at how advanced I was. On the contrary, much of my development seems to me, in retrospect, to have occurred at a glacial pace. Nothing seems to characterize my first eighteen years of life so much as “dreamlike,” and even after that I am now struck by how amazingly naive I remained, for years, in the ways, patterns, and tempos of the adult world. I have a particular example of this naiveté, which I had considered putting in the chapter, rather than the notes, and of which I should be quite embarrassed, but which I am now able to see as humorous and ridiculous (being sufficiently removed in time).

We can often delude ourselves as to the true effect of even the most poignant of our own experiential lessons. I recall such an experience from long ago, when I was VERY young (I must emphasize this to salvage any sense of self-respect). I had just moved to a new town to take a job, one of my first real jobs with a title. Everything I owned in the world was stuffed into my poor, disintegrating Plymouth Valiant. I didn't have any credit cards, or a checkbook, just a wallet with the cash that contained my gas money for the

trip and the cash that would keep body and soul together until my first paycheck.

I arrived in this town (which will remain nameless) full of wonder and excitement. Everything seemed magical, and I imagined that I must have landed on an exotic and alien planet, where everything was beautiful and harmonious, including the lives of everyone there. All the houses looked like they came straight from a Tolkien landscape, little Hobbitt houses in pastels and half-hidden in elegant flora. I left my sorry prairie schooner of a car parked at the town square and just went walking around to soak in all this place had to offer. It was early afternoon, and I decided to go to a cafe for a sandwich.

The cafe was crowded, and I waited my turn to order, thumbing through my remaining cash and making mental notes of how I would ration this out for a week or two. Apparently, I wasn't the only one who noticed my little pack of hard cash. What followed is still inexplicable to me. There was something about the air, the sunlight, experiencing decompression after many hours on the road. I have already said I was young, didn't I? I was far from worldly. Still, everything seems insufficient that I might say in my defense. Maybe I should just borrow from Camus' *The Stranger*, and say that the sun got in my eyes.

No sooner had I sat down at a table to eat my sandwich than I was joined by three young men, perhaps a little older than myself. What happened in the next few minutes (almost surely less than ten), I have a hard time reconstructing. To make a long story short, within minutes they had me parted from my survival cash with one of the oldest con-games in the world, three-card monte. Again, to help me maintain some semblance of self-respect, I wish to give these fellows their due. What they accomplished was a flawless piece of applied psychology. Everything from detection of an ingenuer, to the role playing of good-cop/bad-cop/operative, to the blistering pace of execution that was so fluid and effortless that time seemed to warp and I was floating somewhere not completely connected to the ground, until, to my horror, I realized that my money was gone, I was destitute in a foreign place, and these three literally dematerialized from the landscape.

The thing was, I don't gamble, and, in point of fact, I didn't even know that that was what I was doing. I know this is hard to believe, but I maintain it is true. When the consequence of what had happened indeed sunk in, some seconds after the trio disappeared, I ran out into the crowded street to see if I could spot them, but no luck. Not that I could have done anything in any case. I thought of reporting the incident to the local police, but the fact remained I hadn't been physically mugged. I was the one who, at their importuning, took out my cash.

I had to do something. Luckily, I did have one acquaintance in this area and I contacted her as soon as I could that day and told her what had happened. This was actually someone I had hoped to impress, romantically. I couldn't imagine being in a more pathetic situation, and the whole situation was humiliating. As I related the situation to her, writhing in anguish, she was both incredulous (exactly why did you take out you money??), and she had a hard time stifling her laughter. Finally, she wrote me a personal check for fifty dollars to see me through groceries until I got paid. She also

reported the matter to her father, whose reponse was, "But you don't actually feel sorry for this guy, do you?" Her check bounced.

That certainly was an object lesson! Maybe. An object lesson of what, exactly? To be aware? To realize that there are con-artists (whom I had never encountered in real life before)? I was certain, for years afterward, that I had received a very valuable lesson that day. But as I now look back on it, what actually followed was just a heightened sense of anxiety about my wallet! I just started to become suspicious about everything that involved money, and I went through that year not being particularly wise about money, but just refusing to spend more than a few dollars at any one time. I didn't buy many clothes. I would go shopping for something I really wanted (a nice stereo) but couldn't bring myself to purchase anything. My car needed to retire, and I bugged lots of car dealers with test drives, but didn't buy anything. And when I finally did put my Valiant to pasture in my next job, replacing it with a newer used car in a different part of the country, it turned out I got hoodwinked again, and felt nearly as dumb as I had with the card-trick affair!

I now have a much better, more satisfying, lesson to construct from that episode. That is, I don't want to play three-card monte anymore. And being trapped in cycle of pursuing ever receding surrogates, instead of living authentically the life I choose and understand, seems more and more to me like three-card monte. Of course, that is how I wish to understand that little misadventure now, years later. I most definitely did not have that sense at the time, and it is also important for me to remember that.

^{boov} I refer the reader again to the excerpt in the preface, from Laura Simms' essay on the power of stories.

^{boov} When I first came to Hutchins, Warren Olsen was still on the faculty, and I had many opportunities to speak with him and others about those early years. Warren also wrote an unpublished manuscript of about ten pages or so, detailing the founding of the program.

^{boovi} *The Serial: a year in the life of Marin County*, by Cyra McFadden, Signet, 1978.

^{boovii} For information on Learning Communities, you may wish to contact the Washington Center of Evergreen State College, Olympia, WA 98505, whose current director is Barbara Leigh Smith. Over the years I have been indebted in particular to Jean MacGregor, the previous director of the Washington Center, who is still there and also a professor of environmental studies at Evergreen. <washcntr@evergreen.edu> We, at the Hutchins School, have also begun work on a Learning Communities outreach network over the last few years, which goes by the name of California Learning Communities Consortium (CLCC), whose director is my colleague, Professor Les Adler.

^{booviii} See, for example, *Women's Ways of Knowing: the development of self, voice, and mind*, by Mary Belenky, Blythe Clinchy, Nancy Goldberger, and Jill Tarule, Basic Books, 1986.

^{boovx} I am reminded of an interview I read, and the reference for which I no longer have. It may well have been with Rodney Brooks, robotics and artificial intelligence researcher at MIT (and if not, I beg his forgiveness). The gist of what stuck in my mind was as follows: Concerning the ability of the human brain to actually do mathematics, whether arithmetic or abstract logic, it isn't something that we as a species do particularly well.

“It is kind of like watching a dog walk on its hind legs; they don’t do it very well, but it is surprising that they can do it at all.”

The point of this is actually very profound, as I see it. Evolutionarily, the human mind is wired up to do some truly extraordinary things, and these are very greatly appreciated by anyone trying to create machine intelligence. Even desktop computers can execute mathematical operations infinitely better than the human brain. However, things like facial recognition, emotional inference, and especially language, conversation, and the attention weighting of simultaneous perceptions, are things that nearly every human can do extraordinarily well. It has proved exceptionally difficult to get even supercomputers to succeed minimally in any of these areas. We take them for granted! And so (and this is the important part) the extraordinary genius of all of us regular humans is socially and culturally discounted! Instead, we look for the differences from what we are truly gifted in, as a species, to anoint the exception as the hallmark of intelligence. We enshrine the dog able to walk on its hind legs, neglecting everything else. I don’t know about you, but I find that strange.

^{boox} “The experts all agree: any effort to help the next generation—especially children at risk—must include mentoring. ‘Of all the social ideas of the last 30 years, it’s the only one that we know works,’ says *Newsweek* senior editor Jonathan Alter, who has done a lot of reporting on this subject. ‘No one succeeds in America without some kind of mentor—parent, teacher, coach, older friend—to offer guidance along the way.’” (*Newsweek*, Nov. 2, 1998, p. 20)

^{bood} See *Writing for Your Life: a guide and companion to the inner worlds*, by Deena Metzger, Harper, 1992.

^{booi} “The Long Habit” in *The Lives of a Cell*, by Lewis Thomas, Penguin Books, 1974, pp. 47–52.

^{booiiii} A most wonderful book for contemplating mortality, and there are many, is *Intimate Death: how the dying teach us how to live*, by Marie de Hennezel, Vintage, 1998.

^{boooiv} I strongly encourage the reader to see *The Stories We Live By: personal myths and the making of the self*, by Dan P. McAdams, Guilford Press, 1993.

Chapter 8: *Holography, Deep Practice, and Synthesis*
(Thoughts on education)

i) *Information, Knowledge, and Wisdom*

I remember hearing from about the time I was in junior high school that the amount of information in the world was doubling at ever increasing rates. It had the same kind of feel to it at the time (and I believed it in the same way) as the typical urban or suburban legend, another being that “scientists had figured out, for sure, that we only use ten percent of our brains, on average, and even Einstein used maybe only fifteen percent of his!” This second one has something very attractive about it; so far as popular aphorisms go, it almost had the same kind of appeal as UFOs and secret government labs holding onto unimaginable secrets from otherworldly aliens. Except this one indicated that each and every one of us harbored some kind of super ENIAC computer in our heads (because that was the sort of thing we equated with brainpower when I was a kid, being able to instantaneously divide strings of twenty-five digit numbers in our heads, and the like), but for some reason (probably another government secret) we just couldn’t figure out how to let this genie out of the bottle. And if someone DID figure it out, just any ordinary person could suddenly become a freakish intellectual equivalent of a nuclear warhead, could do anything by sheer application of concentration, and she or he could hold the rest of the world hostage! I even had little passing thoughts myself when I was doing my homework, like “where IS that other ninety percent?”

We had lots of those sorts of stories as kids, and I suppose that is part of childhood, and each generation has its own legends that take on the weight of fact which arise from whatever cultural forms and symbols are available at the time. Nonetheless, I had not heard that ten-percent/ninety-percent one for quite some time but was quite surprised when I heard it about a year ago, offhandedly mentioned by one of my freshman students! I guess some of these are more durable than others, and can successfully be passed down from one generation to

the next. In fact, I think I first heard it from my own father, but it also seemed to be common wisdom among my friends.

Although I didn't have the critical capacity to distinguish between the legend about Einstein's brain and the doubling rate of the world's information (or the desire to critique them), there is some basis for the latter legend. The only problem with it was that no one ever seemed to worry very much about the meaning of the word "information," and when this legend was invoked it was usually coupled with things like how long humanity had lived with fire as its only technology, and then suddenly we had the steam engine and telegraph, the cars and planes, and now we had rockets and transistor radios, and if you just looked at the rate of inventions, well, there you had it! Without a critical examination of terms like information, knowledge, and wisdom, it was very easy to simply be overwhelmed by all sorts of very different signatures of our progress, whether inventions or the physical holdings of libraries and lump everything together as evidence that the twentieth century was the apotheosis of human culture.

In this section I would like to make some distinctions among the three terms: information, knowledge, and wisdom. These distinctions are expressly to inform the discussions to follow in this chapter, and so I reserve the right to define them as I wish, Lewis Carroll style, rather than multiply dictionary definitions. In any way one wishes to define it, the information that circulates in society has been multiplying sharply during the twentieth century.

I recall looking at some old parts catalogues from manufacturers of electrical equipment at the Smithsonian, from around 1920, and they were slim little booklets with full drawings and prices.^{lxv} Today, the catalogues for a single kind of electronic device are the size of large telephone books, in fine print, and there are many kinds of devices. One could fill a modest library with such parts catalogues, and not just for electronic devices, but safety codes for transportation, trade data, or known carcinogens. No one is expected to know all these things anymore although it was this sort of information that formed a large quotient of what experts were supposed to supply fifty years ago. Knowing information by rote, and being able to report to others based on such familiarity, a few generations ago, was a large part of what separated the expert from the layperson. It was the core of their expertise. If an electrical engineer were to go

about memorizing parts catalogues today, she or he would be looked at as very strange by other engineers, and for very good reasons. A lot of information that crowds our world is most useless, that is least available to others who can make practical use of it, when stored in someone's brain instead of in a database.

With the exception of the rare statistical savant, most of the information that circulates today, calculated as bits of information, can only be useful to us when it is massaged and interpreted by a computer. Satellites and monitoring equipment supply meteorologists and oceanologists with huge quantities of numbers that are, as individual data bits, absolutely incomprehensible to the human brain, even to Einstein if he were alive and got off his behind and used all that idle wetware! As it turns out, we have evolved to understand concepts better in some ways than others.

A graph, being a picture, is easier for us to make sense of quickly than a string of numbers that make up a graph. In fact, we are now finding out that the more sensory-rich we can make data, within certain bounds of sensibility, the more we can infer. Molecular biologists and chemists today are using not only graphics to explore new compounds, but even so-called force-feedback mechanisms, where they can move molecular structures around their computer screens in 3-D, and they can feel, literally, by tactile "force-feedback," whether or not one functional group, (be it a new compound, a neurotransmitter, or an antibody) will "fit" or bond with another. Let the computer do the physics calculations that lie underneath these effects, and you get to play with Legos! And why not? Computers compute! We can sense, feel, intuit, and when operating at these levels, we can make creative leaps that would otherwise be unavailable to a brain dealing with numbers instead of images and tactile responses.

However, there is also a great temptation that comes with these tools, as marvelous as they are. When data are available electronically, it is very easy to produce meta-data. Say you are a marketing analyst. You have all the raw data automatically provided, whether the product is automobiles, soft drinks, or cosmetics. Two or three keystrokes will give you a bar graph, in color, arranged by age, income, gender, whatever. Another few keystrokes will give you a map of the U.S., or Europe, or the world, color-coded for sales hotspots, or growth areas. And for all we hear about the exponential rise of computing power in the

world (measured in teraflops) or the amount of data storage memory, and with all that electronic horsepower doing our impossibly huge calculations for us (so aren't we becoming one huge global brain?) most of that precious calculating and memory power is being used for the most mundane of purposes. We couldn't have done these calculations without the computers, absolutely. And so, if we did not have those computers, this information would not be collected, manipulated, and reformatted.

Computational science can manipulate raw data to allow us to do what we do best, and we can arrive at completely new insights. I am always amazed with every new discovery announced by astronomers and planetary scientists, and many of these discoveries are not only the results of looking harder, although the Hubble Space Telescope certainly can do that, but many of the really fundamental new concepts are hidden in data that do not become apparent without these extraordinary computational tools. Unfortunately, NASA, the National Institutes for Health, and other laboratories, as well as library information searches in the humanities, all these combined are utilizing but a small fraction of the total global capacity for data collection, storage, and analysis. Perhaps here the old legend about us only using ten-percent of our brains really does have a correlation in the electronic realm of networked computers! Most computational resource is devoted to figuring out who drinks Coke and who drinks Pepsi, storing unfathomable iterations of redundant spreadsheets, and giving us pages on the world-wide web that can not only show everyone in Belgium a picture of our cat, but they can hear it meow as well.

In short, our very capacity to move and manipulate data is itself a surrogate activity. If almost any of the truly numbing tasks of data accumulation had to be done by hand, we wouldn't do it, and we would find most of it no more dear for its absence. If one counts information in bits, we are probably doubling it every few weeks, at the rate the majority of information workers back up another disc or copy an entire hard drive. And the vast majority of it is junk which we think is necessary simply because it is there. It accumulates like so much worthless genetic code, much of which was never really useful to begin with. It doesn't even amount to the sort of information that one might use as an archeologist or paleontologist, to trace the evolution of something interesting in human

thought. It is more like a genetic sequence that accidentally coded for something like antlers on mice, never useful and long since deactivated.

If the information just stood alone, with no one attending to it, this multiplication of data wouldn't matter very much. We haven't yet reached the state where information requires no space or material at all, so one might bemoan the fact that we are wasting plastic and silicon in making so many data storage devices, but that isn't really all that important. What is important is the extent to which we give our lives over to it, to worrying about it. And what is also really important, from a quality of life perspective, is our inability to tell the difference between information and knowledge, and between knowledge and wisdom. It isn't so much "good" information versus "bad" information. "Bad" information, one might imagine as erroneous, and with a few computational checks and balances we might hope to be able to tell one from the other. In fact bad data can be very informative. It is more the difference between good information and just so much noise.

Good information ought to give rise to knowledge, not just more data. That is, we can discern patterns, arrive at understandings, truly think something that we didn't think before because its intimations were hidden from us. Still, knowledge alone is no guarantor of value when compared to information. A big batch of data may indicate to one person all the best markets for fast-food franchises, or for liquor stores. That is knowledge beyond data. One person may use those results to invest in those markets, or to advise advertisers to put up billboards strategically. The very same knowledge might lead a different person to investigate further, and see if there are other collaborative reasons why such markets exist, and then see if there is some social pathology at work that might be ameliorated. Same data, same base-line knowledge, very different trajectories.

My own definition of wisdom is "empathetic knowledge." It is the quality of empathy, I think, which allows one to perceive not merely patterns, but meaning, and hopefully, when possible, to act on that meaning appropriately. Empathy applies not only to the personal and humanistic realms although it certainly applies there. Empathy, or the ability to literally transpose oneself into a different circumstance, applies even to the sciences. This is the sort of intelligence evinced by the late Nobel laureate Barbara McClintock. Her insights into gene-hopping, or the ability for genetic information to actually move to

different chromosomal sites, required not just information through experiment, and not just knowledge of being able to discern informational patterns, but it required her to actually transpose her consciousness to existence at that microscopic level and make sense of options, possibilities, and strategies.

In my experience the expression of empathy has often taken place in the classroom, as I discussed in the previous chapter. Due in part to my own difficulties in mastering certain ideas, I can sense not only when students are having difficulties, but also what they might be. Often, however, these intuitions are not even specific examples of my own stumbling blocks. I cannot describe exactly how this occurs, and I have no idea how to codify what it is that I experience when I experience this intuitive transposition into the thought patterns of my students. The best word I have for this is empathy (not sympathy), and it is more than a history or catalogue of my previous experiences brought to bear at the time of student's intellectual tension and subsequent release into new understanding. What I seem to experience in such encounters is not amenable to a flatland description, it is dynamical and more than the sum of its parts (e.g., what students are actually able to verbalize, or watching their body language, etc.).

It is most fascinating to me that the current lines of research into the presence and nature of intelligence, whether human or other species, are all including in their definitions of intelligence both qualities I've described above. That is, these researchers are looking for signs of inference and pattern making (as opposed to a simple stimulus-response mechanism to repeated data), and empathy (the ability to first have a sense of self, and then to build on that to infer the inner states of another organism).^{lxxxvi}

This kind of transposition, out of the realm of the given, the obvious, the particulars of one's own immediate experience, is imaginal and empathetic. It is wisdom when applied intentionally and with integrity and gratitude. It allows us to be the authors of meaningful lives. It is essential to acquire if we wish to be truly awake to our potential, to our full humanness, to continually create one's life rather than just living one out. It is also through this acute awareness that allows us to truly transpose ourselves to the other, that also allows us to see what is really happening all around us, and not just notice the abrupt changes, or the dog walking on its hind legs. Or, as Ludwig Wittgenstein put it: "The

aspects of things that are most important for us are hidden because of their simplicity and familiarity. (One is unable to notice something because it is always before one's eyes.) The real foundations of his enquiry do not strike a man at all." Sometimes, when I wish students to understand what I feel Wittgenstein is reaching for here, I might pose a deliberately wild question or two which don't have an answer, as such, but which get at how profoundly affected we are by the most pervasive aspects of living. "What might Beethoven have written if gravity, instead of being what it is on earth, were only half its strength; or twice that; or the sky normally green instead of blue?" What, indeed?

ii) *On holography: a possible framework for envisioning*

Ultimately, this chapter is intended to propose some ideas on education. The previous pages preface that discussion by examining qualities of understanding, and in particular the essential differences between information, knowledge, and wisdom. It is my hope that, already at this stage, the reader is disposed to value wisdom as I've described it, and that above all we wish to achieve some measures of wisdom, and we would wish the same for our children and for others' children. And there is a hierarchy here. Perhaps it is not requisite in absolutely everything, but in many realms one must have a certain amount of information (otherwise one is not in possession of anything but someone else's opinion); then it is necessary to acquire some knowledge based on information (especially for experimentation, which requires fashioning knowledge from information). When one is in possession of many different kinds of knowledge, one can synthesize that understanding and, by reaching beyond flatland to find empathy and gratitude, refine knowledge into wisdom. It is not a linear process. There is much back and forth, and life experiences, great and small, keep returning, heuristically, informing both what we know and what we mean.

How do we teach wisdom? Certainly, the most important aspects for anyone are exemplars of wisdom. But when speaking of wisdom, as nice as that sounds, isn't there the danger that one person's wisdom doesn't necessarily comport with another person's wisdom, even on the same topic of consideration? I would agree that there is that possibility, and we must take care not to conflate wisdom with

dogma. Dogma can be codified, memorized, and tested, just like any information can. Wisdom requires the active searching and seeking of each individual. Guidelines can be told, whereas wisdom emerges. Analogies come to mind when contemplating wisdom. It unfolds, it distills, it resonates, it reinforces with serenity and gratitude, it is excited by challenge and change, even to its previous conceptions. What, then, do we teach while our students are ultimately about getting wisdom? What kinds of information and knowledge are not only worthwhile, but tend to foster wisdom and a vision beyond flatland? I have come to believe that there is actually great latitude in what we might consider essential knowledge, and this intuition comes from experience, and from an intuition that knowledge is holographic. But first a bit of explanation is in order.

A decade or so ago, holography was not much part of the public parlance, primarily because there wasn't much commercial use for it. Now, however, holographic images are found all over the place, on credit cards and toy store items. These are basically three-dimensional images, and when you change your viewing angle, you can actually see around the imaged object, as though you had the item itself in front of you and were to look at it from different angles. The principles of holography were first elucidated by the late British physicist and Nobel laureate Dennis Gabor in the 1940's, but the techniques for actually making them was not available until the 1960s since holograms required a special kind of light produced by lasers.

When I was an undergraduate, I recall one friend of mine saying that the laser "is a solution in search of a problem." This was largely true at the time since the basic uses of lasers then included things like drilling holes in steel, making wonderfully straight lines for construction projects, and bouncing timed pulses off the moon (the Apollo astronauts had placed a corner-cube reflector array on the moon which will reflect light back to its source, irrespective of alignment). None of these applications were very interesting for a physicist or even a student of physics because we all knew what was so spectacularly significant about laser light, and these aforementioned applications were not making use of that property at all. As far as we were concerned, the uses to which lasers were being put were sort of the equivalent of using a computer for a hammer. If all you see about a computer is that it has a certain weight to it, and a

hard case, you can use it as a hammer to bang things with, as a paperweight, doorstop, or even in place of a cinder block. And what was truly remarkable about a laser is that it produced *coherent* light! This was absolutely amazing, as I will explain below, and nothing else could do that.

The analogy to the computer-as-hammer was especially apt and annoying to us, because the uses to which lasers were being put did not even include properties that the laser was particularly good at. Lasers, in the 1970s, typically operated at an efficiency of between one and ten percent. That means that if you wanted a laser to generate a beam with a total intensity of 100 watts (the output of the reading lamp you may be reading with now), you had to put anywhere from one thousand to ten thousand watts of power into the device. And yet when lasers were mentioned in the popular press, they were always given the same sort of treatment as nuclear weapons. A horrible potential had been loosed, a potential death ray. If used properly it might be used in microsurgery (good lasers), but otherwise it was going to be War of the Worlds, with the United States and the USSR shooting beams of death at each other. All the applications that journalism and the public talked about were things like welding, the ability to make straight surveying lines, or Star Wars weapons.

It was all seemed so unimaginative to us who knew what laser light was in actuality. As for welding or burning steel plates, why not just use a drill or a cutting torch? You could get a lot more done, for a lot less money, and infinitely greater efficiency. We also had a joke that if you wanted to get funding for a research project, just put the word “laser” in the proposal, since that word seemed to have the same futuristic fascination with government grant reviewers as it did with the public at large, even if you were just going to use the laser’s power supply as a space heater in your laboratory.

The laser is actually an acronym that stands for light amplification through the stimulated emission of radiation. When atoms are stimulated with energy from the outside (usually through an electrical current or another light source), those atoms have a choice of what they do with that energy. They can ignore it, they can heat up (vibrate in random motion), or if the energy is of the right level they can absorb the energy in their electron configuration. If this happens, at some point in time, which is only a statistical probability, they can release that

energy in the form of a photon, or particle of light. The color, or frequency, of the light is determined by how much energy is released by that atom. This of itself was nothing new. This is exactly how neon signs produce their light, as well as fluorescent lighting. This principle was already beginning to be understood in the nineteenth century.

It wasn't until the advent of the physics of quantum mechanics early in this century that our perceptions of matter and energy got truly strange, and it was one of the forecasts of quantum mechanics that led to the laser. This was first implied by Einstein, who didn't even like, or believe, the implications of quantum mechanics. In this case, the idea was that although for an excited atom in isolation there is no way to tell when it might choose to release a photon of light, if that same atom were in the presence of an energy field which matched the energy it was storing at the time, that atom would be "coerced" to release its own photon of energy at that time, and the photon it released would be "in phase" with the photon that stimulated it.

Think of ripples on the surface of a pond. If you drop a pebble at the water's edge, it will produce a rippling in the water that will propagate across the surface. If you and a friend both drop pebbles, each point of impact will be a source of ripples, each spreading out, and ultimately the two rippling patterns will meet. If they happen to meet such that the crests and troughs of the two wave patterns are in the same place at the same time, they are in phase with each other. This is called constructive interference, and they actually add to each other's strength. In music, sound waves are produced by each instrument, which meet and interfere with each other producing all sorts of secondary patterns. Some results of sound interference produce very pleasing results to the human ear, and some produce a difficult tension for the listener. The pleasing interferences are called "consonant," and the unpleasing ones "dissonant."

So, a laser was an instrument that could produce highly monochromatic light (all photons of essentially the same frequency), and that was neat, but remember neon signs do the same thing. The really stunning quality was that all the photons (or wavefronts) emerging from the end of the laser were also completely in synch with each other in time and space! Except for variations on this principle in different regions of the spectrum (e.g. microwave "masers") there wasn't anything else that could DO this incredible feat of seemingly

reaching into a beam of light and getting all the photons to produce their energy variations in lockstep with each other. This laser property was something completely new in the physical world. We weren't emulating something already occurring in the natural world in a laboratory, we were manipulating one of the most fundamental expressions of the cosmos (light) in a way that had never been done, and that, as far as we knew, nature had not done herself.

Can you see now why some of us were so dismayed when people spoke of lasers as welders, surveyors, or ray guns? It was this disjunction between knowing how remarkable were the principles by which a laser organized the very nature and patterns of light, and the uses to which the instrument was being put that provoked what my friend meant when he said that a laser is a solution in search of a problem. Here was this absolutely stunning instrument, causing light to be, in every sense of the word, coherent. Certainly producing coherence in light is the most breathtaking thing of all. What can we do with such an instrument? How can we make use of readily producible coherent light, what is it about coherence that begs for us to see what to do with it? The essential quality here was order, a property of information, how can we use THAT? If all you want to do is make something hot, get yourself a magnifying glass and save your money. In fact, in recent years we have begun applying these qualities of laser light in the transmission of information through fiber-optic networks, as well as in remarkable experiments into the basic nature of matter itself (e.g., laser trapping and cooling experiments of atomic-scale particles, done at the National Institute for Science and Technology and elsewhere).

As it turns out the only actual application of this most singular property in the early days of lasers (1960s) was to make holographic, or 3-D, images. The first holograms were made using a single color only (often red, since that was the frequency produced by the most common low-cost laser, the helium-neon laser), and it used the very coherence of the light to make meaningful interference patterns of light when bounced off an object. It compared the light waves from a single laser that is split into two parts or beams, one part being the reference beam and the other being reflected off the object. These two beams are then recombined, and the resulting interference pattern is used to expose a piece of photographic film. Where the light is most intense at the film, you get the most exposure, which shows up on standard film (not print paper; this is the

negative) as a dark spot. If the two beams arrive completely out of phase, the produce no illumination, or a clear spot. The early holograms, then, were exposed transparencies, and if you were to look at it with the naked eye under ordinary light, you wouldn't see anything sensible at all, just a sort of fuzzy wash. However, if that transparency were then illuminated by laser light, the same sort of coherent light used to imprint the information, you would see the image of whatever it was from which you made the hologram. You needed the information encoded by coherent light to imprint a hologram, and you needed the same coherent light to get that information back out again.

I remember we had a hologram (transparency) of a steam locomotive in a display case, and as you walked back and forth you would see the locomotive from different aspects, just like it was in front of you. Furthermore, it looked really ghostly. The image didn't seem to be so much on the surface of the transparency; it just seemed to be floating in space like an apparition of a toy train.

That was nifty, all right, but the best was yet to come. It turns out that if you took one of these first holograms made on transparencies and, with ordinary scissors, cut it up into pieces, say into four pieces, and then illuminated these pieces with a laser light source, you didn't get one-fourth of the 3-D object in the original. You got the entire holographic image, just smaller! So, if you took that hologram of the toy locomotive and cut it into four pieces, each piece showed the entire locomotive in 3-D, just like the original, only smaller. And you could keep cutting it up into smaller and smaller pieces and you would keep getting the entire image. In other words, all the information to reconstruct the entire object, was encoded EVERYWHERE on the film.

This is obviously very different from normal photography. If you take a snapshot of you and cut it in half, you get half of the original picture, not a smaller version of the whole thing, and it doesn't matter whether you use the positive print, or the negative (the actual developed film). In standard photography (or video), what your camera and lens do is capture a certain part of the image in the field of view (what you see in the viewfinder when you take the picture), and the camera maps that information (how light or dark, and with other technology we won't bother with here, what color) onto a corresponding part of your film or electronic sensor. The smallest detail you can get recorded is

known as a pixel (from the two words, “picture element”), and each pixel has its own unique exposure on it corresponding to what you are photographing.

There is a natural limit to this fine structure of how much detail you can get. In standard photography, an emulsion is made at the factory where they make the film, using a compound of silver which, when exposed to light, turns dark. (This is essentially the same process that makes your silverware turn black over time, if you have real silverware). This emulsion is then dried and crushed up into fine little bits, which is then impregnated into film or photographic paper. Since these bits are actual microscopic chunks of material, your detail is limited by the size of these chunks, which is called the “grain.” But again, to reiterate, in normal photography, when you cut up the end result, you don’t get a smaller version of the entire photo, but just that portion of the field of view that matches what you cut off, and this is not the case with holography!

As long as one is using actual photographic film in making a hologram, one is also limited in how finely one can cut up the resulting hologram the physical dimensions of grain, but that is not a product of the principles of holography; it is an artifact of the physicality of the medium you are using to record the hologram. It may seem a natural evolution that the very latest research in data storage is an attempt to record information not as little patches of magnetized material on a disc, but holographically in an optical medium, like a crystal.

I would like to pursue the possible implications (beyond practical applications in industry or medicine) of holography for a bit because they speak most eloquently to the notions I would like to explore about information, knowledge, and wisdom, and ultimately to a different conception to the processes and content of formal education. However, I must say at the outset that, as compelling and exciting as I find these ideas of holography, I am not going to try to prove to the reader some absolute theoretical framework of matter, thought, the universe, and everything. Ultimately, I am skeptical that, even if such a model were ultimately true, that it would be possible to “know” these things in the way the sciences, mathematics and logic, and indeed all intellectual disciplines variously comprehend provable knowing. At a very fundamental level it may not be possible fully to know these concepts (even assuming that they were the case) because we are completely embedded in the systems and contexts we are discussing. What appears vibrantly true at one

level of connection may be seen as simply a mapping translation when viewed from a different context. (Think of Sphere passing through flatland, and Mr. A. Square's very reasonable, though grasping, interpretations of what he beheld.) It is with all of these admissions that I continue—using certain observations, which I am not the first to do—more as highly attractive catalysts of vision and possibility.^{lxxxvii}

One of the first individuals to become extremely attracted to the implications of holography for other areas of inquiry was a Stanford neuroscientist named Karl Pribram. As a very young man, in 1946, Pribram had the opportunity to work with Karl Lashley at the Yerkes Laboratory of Primate Biology, and became acquainted with the many years of research experiments through which Lashley had tried to determine the physical location of memories.^{lxxxviii} It is a reasonable enough supposition that Langely had, even in the age of computers. After all, when I type characters on my keyboard, the letters are converted into a series of logical one's and zero's (the ASCII binary coding scheme), and these are converted from electrical on/off states in the memory chips of my computer into small magnetized or unmagnetized regions on my disc. It is actually possible to locate these, and in fact that is exactly what the moveable read/write head on the disc drive does, when you load a disc into your computer, and you hear it sort of chattering away while it looks for files you have asked for.

The period ending this last sentence is magnetically coded into the disc on which I am storing this chapter, and if one wanted to bother, it would be possible to actually find, with a ruler and marking pen, the very small place on the floppy disc where it is. After all the possible places on the surface of the 3.5 inch disc are either magnetized, unmagnetized (including the essential spacing between informational spots), my computer tells me that I can't fit any more on it, and if I want to continue writing I will have to put in another disc. Exactly how my computer allocates the physical area of the magnetic surface for data and decides on the organization of this magnetic real estate is a bit more complicated, but in principle, you can think of it very much the same as an old vinyl LP record album.

The grooves of LP records carry indentations that the record player needle reads as a mechanical vibration (the needle actually does wiggle around). The

needle is connected to a tiny magnet that converts that movement to an electrical variation in a tiny coil of wire. The amplifier strengthens that variation, sending it to a loudspeaker, which (acting rather like the pickup needle in reverse) then vibrates according to the varying flow of electric current and giving you sound back again. In reality, the LP record does not have hundreds or thousands of grooves. It is really just one, very long groove spiraled around and around at smaller and smaller radiuses, until the radius is too small to produce useful fidelity. That determines how long an old style record can play: about thirty minutes maximum on a side. If you could unwind that groove on one side of an old LP and lay it out straight, it would be about three thousand feet long. It fits nicer on a twelve-inch disc of vinyl.

So, no matter what storage medium one is thinking of, whether printed matter in a book, a book in a library, a musical passage on an LP, or some binary code on a computer disc, these all take up some actual space, and they all actually reside at some location. Why shouldn't the brain operate the same way? ("Aha, here is the place in my brain where my fifth birthday party is stored in my brain—when Aunt Sally came over with the red wagon!") If you were to remove that spot where that memory is, the logic goes, I would have a blank there, and no memory of Aunt Sally at my fifth birthday.

Working within that very linear paradigm of the brain as a sort of "computer made of meat," operating on making or dissolving electrical connections mediated by chemical transmitters, and the mechanistic assumption that information takes up some space, no matter how small, and resides statically in a location, Lashley performed a series of experiments. He trained rats to be able to run (that is, learn) a maze. Then he operated on them and excised various parts of their brains, to see if they could still run the maze. (Ah, those behaviorists!) The results left Lashley disappointed, as he wasn't able to get any reliable results that would indicate, at last, something like "here is what the rats learned when they ran the maze, that information is located HERE. I have removed it and now they can do everything else, but they have no recognition of the maze." There was no simple correlation, as one might expect when deleting a file from a computer memory.

Instead, the rats could still run the maze! Of course, one might have disrupted things so much that the rats lost some coordination, listed to one side,

etc., or moved slower. But there didn't seem to be any positive correlation with brain location removed and some specific piece of information. Instead, it seemed more like memory was diffused somehow, or distributed throughout the brain. Years later Pribram read an article describing laser holography and had a flash of insight that perhaps the mental functioning of those rats, and perhaps of all brains, had more in common with the way information is encoded everywhere in a hologram. Pribram was fascinated by this, and over the next two decades further elaborated this idea.

In truth, I don't know what status these ideas have at the current leading edge of neuroscience. We have some amazing tools at our disposal now, especially things like functional MRI scans and PET scans that can watch our brains dynamically, that is, in the process of thinking. One primary measurement is to examine the energy uptake by different areas of the brain as it does different things. I am not trained as a neuroscientist, and I would have no suggestions for how one might transform the mathematics of physicist Dennis Gabor into something one might meaningful look for with our current tools of brains-in-process. On the other hand, as I have already said, this discussion of holography is not in service of a proof of ultimate reality.

Some individuals have extrapolated this model of reality very far indeed, and you can find references to some of them in the notes section. I find the idea of a holographic reality to both the physical and mental realms highly intriguing, and the very variety of ways something like holography is expressed in our world I find provocative. I would hope the reader is also intrigued, and will accept the subsequent ideas we shall discuss as at least worthy of consideration, and inspired by the considerations of holography, not proved by those considerations.

Are there, in fact, other examples in the natural world that might be termed holographic? In fact, the world is full of them. Take yourself, your physical body, as an example. You began your mortal existence by the meeting of two gametes, an egg and a sperm. In a wonderful dance these two cells joined and combined information, and once they had done this joining and combining they got on with the business of spreading the news. One fertilized cell became two identical cells, neither one of which WAS the cell from which it came, just perfect physical representations of their parent cell. They were different entities, their physical

structures actually made up from all the nutrients in the mother's bloodstream. The two then became four, then eight, and kept doubling, forming a spherical blastocyst of cells, all identical, but comprising far more mass than the original egg and the infinitesimal sperm.

Where was the parent cell? Nowhere to be found, if you are looking for the original atoms and molecules as so many marbles to be localized, tagged, and kept. The information is all there, but what is that? The DNA chains are the artifacts of information, much as we use zeros as placeholders in a number, and the non-zero digits not as things, but as ideas representing something else. The sliding beads on an abacus are not numbers, or the results of calculations, any more than they are bushels of wheat at the marketplace. The beads are just beads, keeping track of something very different. As physical beings, we are constrained to use physical objects to help us keep track of things, ideas or wheat, and we now prefer to use electrons instead of beads to keep track of wheat.

As the cells of the blastocyst continue to multiply, they are sharing information. There may be knowledge embedded and immanent in this patterning activity, but it is not yet apparent macroscopically. The growing blastocyst doesn't look like much of anything but a replicated pattern, which is interesting to see, but it doesn't manifest anything recognizable except a blob that grows by adding more blobs. That is, without foreknowledge of what is actually going on (and leaving out for the time being that we can pry into the process microscopically and see the vibrating activities of mitosis in complete cells and meiosis in gametes) the growing blob is no more surprising to the naked eye than putting detergent into your sink and stirring it vigorously (with beaters) and seeing an increasing layer of foam appear. If you get down close to the foam you discover that it consists of thousands of tiny little bubbles that are all pretty much the same.

Now, if you kept the eggbeaters going, you expect that more and more of the stuff that was once water becomes foam. Better yet, put a cup of water in a blender with a tablespoon or two of detergent and turn it on high. What was originally clear liquid that reached up two inches in your blender has become an opaque foam that fills the whole container. The liquid you could easily have poured down the drain, but the foam you now have seems to be of a completely

different nature. In fact, you can even sculpt it, crudely, into a vertically standing shape. And again, no matter how you sculpt it, if you look closely, it is just a bunch of bubbles, each bubble looking pretty much like the others. Now, you are not surprised that you can take a handful of this stuff and push it around into a sudsy pyramid shape, or anything else. However, if you were to turn on your blender and you not only got the expected foam, but after a minute or two the foam organized itself into a scale model of the Statue of Liberty, you would be mightily surprised. What if every time you tried it there emerged a statue? Maybe not the same statue. Perhaps the next time you turned on the blender you got Rodin's "The Thinker." Depending on your predisposition, if this were to occur in your kitchen you might immediately call the neighbors to confirm what you were seeing; or the newspapers; or your local exorcist.

Now, contrary to popular belief (and all experience, excepting the wonderful stories one finds on the large format tabloids at the supermarket) such an eventuality is not impossible, just extremely improbable. "Ah," the reader may claim, "but what of that thing called entropy which I've heard about? Are you not flying in the face of that?" Entropy is a measure of disorder in the physical universe, and the second law of thermodynamics states that it inevitably increases. Things tend to disorganize themselves, not organize. But there is an important caveat. Even if systems disorganize themselves when taken collectively and left alone, we can still have increasing organization and structure at a local level, but at a price. That price is energy. Plants are extremely organized systems, but in the process of organizing their constituent molecules to form a stem or leaves, they use a lot of relatively disorganized energy from the sun accomplishing it. As long as you put energy into a system, it is possible for order to arise, and in this case your blender is putting in a lot of energy. So, obviously, energy is required to create order out of disorder, but the mere application of energy is not enough to reliably create order. Or in the phraseology favored by physicists and mathematicians, energy is a "necessary but not sufficient condition" for producing order.

But let us return to our incipient human, which so far to the naked eye, or even with a magnifying glass, to the extent you see anything at all it might look no more surprising than a little ball of foam. At some point, something very much like the Statue of Liberty begins to emerge. The sphere begins to fold in

on itself, producing a tunnel down its middle that will ultimately become the morphologic structure of our alimentary canal, our entire digestive tract. But is each of the individual cells lining this crude tunnel going to be precisely mapped into a cell in the lining of your stomach? Don't count on it. What is beginning to occur is one of the most awe-inspiring creative acts in the cosmos: the process of differentiation in developing organisms. There is some sort of communication going on among these replicating cells, and the process is still not well understood. Somehow, these cells are not merely multiplying and dividing (early-on making exact copies of themselves) and taking in not only molecules from the mother but energy as well. They are also sharing a kind of collective wisdom, telling each other what is going on throughout the entire colony of cells, and telling each other when it is time for some of them to mature and go off to accomplish a specific mission for an unfolding process. As differentiation unfolds, some cells begin producing offspring that are not mere replications of what they were. Rather, some begin producing progenitors which start taking on the physicality of what will become liver cells, or retinal cells, or brain cells.

And remember, every cell sacrifices its own individual continuation when it divides and produces the next generation. If we indulge ourselves in anthropomorphizing the life of a single cell, we might shed a tear for its death, but celebrate its offspring. In the early stages, the children are just copies of their parent cells; but later on cells begin telling their children to become, for all intents and purposes, wholly different creatures from what they were. A trained physician or biologist has no trouble in telling a dendrite from a liver cell from a muscle cell, biopsied from a child or adult, under a microscope. Yet they all began the same. The *coup de grace* of this stunning process, is that as distinct as each of these differentiated cells have ultimately become, they all possess the same information of their common ancestry, and who all of them have become! There may not be a single molecule (again, if we could tag and keep track of them like marbles) in the fully formed human that actually existed in either the original egg or sperm. But the information persists. Every single cell in the human body (excepting the gametes which are the egg or sperm) contains ALL the information that was used to organize EVERY PART of this complex

organism. All information is distributed EVERYWHERE. We, each of us, and every other living thing, we are all holograms.

In fact, we are much more interesting and mysterious than photographic holograms as I've described them above, even on the purely physical level. If you think back to the photographic film hologram of a toy locomotive, all the information about the entire object (the toy) is encoded everywhere on the film, down to the level of the film grain, that is. So, you could snip off a little piece of the film, illuminate it, and get all the information you need to either see the full object, or to make another full sized hologram of the full object. It is a fascinating property of information, but no one would say that the hologram was alive in any meaningful way. It doesn't reproduce itself without a human agent. And when it does reproduce itself (that is, we make a copy), that is all we get, a copy. You never get anything else but the toy train back. If you had a hologram of a toy locomotive and made copies, you would never expect one of them to turn out to be a caboose, much less a whole train, or a network of trains, switches, and tracks.

We are not finished with our extended analogy quite yet. We, living organisms, are even more amazing than a hologram of a toy train that, through replication, began producing more information than we imagined and suddenly began articulating an entire system of railroads. We are holograms in process, continually, which continue to change the patterns of what may be represented as we go along, and we are *still talking only of the physical body*. Our bodies continue to have subtle and profound conversations within themselves, adjusting and readjusting every cellular activity, and even our morphologies, as new information comes in through our senses and we consume material (e.g., food) outside ourselves.

And, for the last few decades we knew that we could (first in theory and now in practice) read out the original information, or at least the instruction manual for the information, from every cell in the body. Until very recently, though, we didn't know if we could reconstitute the results of that information once cells were differentiated, especially in such a complex organism as a mammal. There seemed to be a unidirectional arrow of time associated with our holograms-in-process, that went one way only, not back again. When we read out strands of

DNA from mature cells, we are only seeing the fossils of the instruction manual. However, with recent successes in cloning, it now appears that we can not only recover the standing instruction manual, but it is possible to reawaken whatever creative impulse it is that actively makes the physical process manifest.

iii) *The romance of insight and the grand adventure of being human*

I need to pause here and make an observation, and this springs directly from my classroom experiences with students. In truth, most of my students have delighted, as do I, with ideational excursions such as those in the previous section. However, there have been students I remember who seemed to become disheartened, at least temporarily, when discussing the insights that scientific research has brought to bear on big topics, whether cosmology or biology. To the best of my recollection the source of their disconsolation was that, in their opinion, scientific research provided answers and removed romance and mystery from life and the cosmos. It has been several years now since I last recall such a response from a student, so perhaps I have gotten better in the ways I can encourage such considerations. It is also possible that I have become more taken by the emotional thrill of possibility as I have grown older, not less so. In any event, I need to make that case explicitly since I can't quite see you, the reader, in my mind's eye, and I wish to take care lest you may feel similarly: that these scientific findings and musings are somehow diminishing rather than expansive.

I would not say that I couldn't fathom the response of those students, or that I had never experienced it myself. But it is no longer the experience I have when learning of new advances in the sciences. What I have encountered, however, are practicing scientists and the writings of practicing scientists (not many, but some) who do seem to inhabit the landscape of misunderstood misanthropes, people who are getting the catechism right while living amongst a population of the benighted who continue to get it wrong. I don't want to dwell on this tendency among a few scientists at this juncture, but I will take it up for a bit in the next section because understanding why we teach what we teach, and what we think is important to know are topics of critical importance, and should be examined with care. What I wish to say here is simply that the scientific disciplines are fascinating and wonderful for the insights they bring, and they

should be encouraged in students by way of invitation into wonderful realms of understanding.

Knowing that a sheep has been cloned does not in the least diminish my awe at the miracle of life, and I can't imagine feeling that ignorance of some new insight, anything, constricts the wonder of all that is, rather than multiplies it. The human experience, both the life of the individual and the coursing of human history, is an adventure of unfolding consciousness magnificent beyond words. As intriguing and exciting as I find the implications of holography, I can not say whether or not it represents any sort of ultimate description of the world, mental or physical, but the creative departures I find in considering these implications thrill me right now. It is the best I can do, at this time, and all I wish to do in writing about it is to convey what is exciting and compelling about that vision, and see what else comes of it.

We should give ourselves the license to imagine, to use suggestive insights and analogies as tools to help lift us out of flatland. If we let the insights of many fields of study and many minds, past and present, inform our thinking, and catalyze our creative imagination, we can contemplate new patterns which transform what we do and why. This is the path of knowledge becoming wisdom, through conceptual stretching, contemplation, vision, and the manifestations of the heart's resolve. It naturally connects and permeates our separateness, and it naturally produces empathy and wonder. This process is constantly revisited for new vision and new wisdom. I suppose that it could also lead to a "grand theory of everything," to use the term that is the holy grail of theoretical physicists and cosmologists. I only say that it could happen, simply because I am ignorant of any law of nature that absolutely rules out a grand theory, or the possibility of human consciousness comprehending it, not because I feel that one is immanent in human understanding. In any case, it is the journey toward wisdoms (deliberately plural) that seems to me so powerfully significant and desirable. It is a spiritual trajectory, out of flatland. Following that trajectory is to give heed to spiritual passion, and it excites and satisfies at every moment, whether that moment feels like puzzlement or plateau.

Giving myself this license, I would add some other perceptions of holography. I have heard of many astronauts, once afforded a view of earth from space, being profoundly struck by its beauty and fragility. One astronaut

commented that one thing one immediately notices is that there are no boundaries, no lines separating countries that we become so inured to looking at maps or globes. It is just a contiguous whole teeming with life. If we take a similar perspective, but on this floating globe trace out any of the major systems, natural or man-made, we might find other patterns as well. If we could highlight the systems of water flow through land, rivers, streams, tributaries, underground flows, it would resemble nothing so much as the circulatory system of an organism. If we were to illuminate all the channels of electronic communications, or power grids, they would likely suggest a nervous system. Such visions of implicate patterns suggest themselves as we gain access to different perspectives, whether viewing the earth from space, peering into a microscope or telescope, from reading penetrating historical analyses, or from insights into archeology and paleontology. We should welcome all these perspectives and insights, and not be disappointed, but rather excited, when our best insights show the shortcomings of a previous grand theory.

Let me provide a brief biography of an idea as an example of new insights, which, as they change our grand intellectual models, should be celebrated and not mourned. At the turn of the century it was a standard mental model in science to depict the atom as a sort of solar system in miniature. In the late nineteenth century physicist Joseph Thomson, in trying to ascertain what an atom might actually look like but knowing that it was constituted of positive and negative charges proposed the "plum pudding" model. It visualized the electrons (negative charges) as immersed in a sort of atomic scale pudding of positive charge. That was soon shown to be inadequate when Ernest Rutherford shot alpha particles (helium nuclei) through a sheet of gold. To the normal person, and indeed to Rutherford as well, a sheet of gold, or anything smooth and solid, appears to be a uniform extension of solidity.

Yet when he aimed his beam of alpha particles at the gold and detected what happened (using a detector that works on the same principles as the coating on the inside of a television or computer screen, which produces an image when a charged particle causes a small portion that coating to give off light) what he found was that nearly all the alpha particles passed straight through the gold foil and struck the opposite side of his detector as though they hadn't encountered anything at all along the way except empty space. A few of the particles,

however, didn't just bend in their trajectories a little or slow down (as though they were passing through Thomson's pudding), but instead these few ricocheted radically, some bouncing right back like a golf ball bounced off a brick wall!

This led to a surprising and radical revisioning of what matter was actually like at the level of the atom. This new picture implied that what we see as solid matter is largely an illusion. The word illusion here is literally so, since there are very good reasons why matter, like a penny, feels solid to the touch, and why most solid things are not optically transparent. But the new mental picture of the world on the scale of the atom was now one of almost entirely empty space (hence, the result of the alpha particles that passed through unimpeded), where nearly all of the mass of the entire structure is concentrated in one location, the nucleus, which also happens to be where the positive electrical charges are concentrated. So, in an uncharged atom there are equal amounts of positive and negative electrical charge, but far from being a gooey amalgam, like a pudding, most of the structure we call an atom appear to the observer at that scale to be empty of mass, but somehow the location of the negative charge. Researchers couldn't see this structure with the naked eye, or even with an amplifying of the senses through something like an optical microscope. Instead, we had to send in informational emissaries in for us, existing at the same scale, to tell us what they encountered there in that realm, and those emissaries were helium nuclei, also known as alpha particles.

This still left unanswered what sort of mental picture we might form about that mostly empty space where the negative charge resided. This investigation proved to be much more elusive than Rutherford's discovery of the nucleus and his little alpha emissaries. I won't detail the experimental history here, since that is not the theme we are after, and there are any numbers of intelligently written books for the layperson which in fact do detail that intellectual journey. Instead, I'll just mention some highlights to get at our larger theme here, which is both the traces of holography in the world, and their implications.

The Danish physicist Niels Bohr was one of the first out of the gate in proposing a model for the entire atom. It posited that the electrons were circulating this massive nucleus, and that they occupied shells of orbits, where these shells represented the different levels of energy (not electrical charge, but

something very like kinetic energy, or the energy of motion). As it turned out, this first shot across the bow of modeling the infinitesimal was very useful, but short-lived. Physicists were, in working toward a model of a whole atom, not trying to just pin down a fixed structure that they liked. Instead, they were trying to understand how and why atoms can emit light when excited, which they did in very peculiar ways of specific colors depending upon the element that was excited. (Recall our brief discussion of lasers earlier, and in particular the discussion of neon signs and the like).

The problem with the simplified version of the Bohr atom was that, according to the well-understood laws of classical electrodynamics (the work of the nineteenth century scientist James Clerk Maxwell), if these charged particles are orbiting something, that very circular motion is the equivalent of acceleration. And Maxwell had already demonstrated that accelerating charges should be radiating energy, and radio communications gave hard evidence of Maxwell's theory. Therefore, such a simple model would mean that all matter should glow, and do that for a very short amount of time before all electrons radiated away all their energy and collapsed into the nucleus. In short, the very atoms that do exist couldn't exist, with this conception.

It was this very problem that was solved, over the course of about twenty years, by the formulation of the quantum theory of matter. Seldom has the world witnessed such intellectual fervor within a single intellectual community, bent on the solution of a single problem. Along the way all sorts of explanations and visualizations were tried from such luminaries as Niels Bohr, Werner Heisenberg, Albert Einstein, Erwin Schrödinger, Max Born, Paul Dirac, and Wolfgang Pauli (the "not even wrong" character mentioned earlier). And what emerged was a theory that turned out to be among the most revolutionary and powerful yet in the history of human thought. In the first place, the new theory provided a mathematical description (I am very cautious to avoid the word mechanism here) that actually accounted for what the experimentalists had seen in their spectroscopic analyses of gas discharge tubes (of which neon signs are one type). Secondly, it gave birth to a host of other mathematical implications, which, incredibly, have actually been born out over the decades as experimentalists have struggled to come up with laboratory translations of the implications of quantum theory that might actually be put to the test.

The aftershocks of the quantum formulation continue to be explored. Just as Einstein's theories of special and general relativity have fundamentally changed our notions of the topography of space and time on the cosmic scale, the quantum formulation once again revolutionized the topography of what the nature of the physical world is, of what seems to us as the normal world of matter in motion, and cause and effect, by examining the world of the invisibly small. Among the implications of the quantum formulations are included: the idea that what in gross form seems to be solid object at the level of the very small appears like a dance of the strangest kind, with the dancers expressing themselves sometimes as particles (events) and other times possibilities (waves); that two emergent properties (which we may due to the limitations of language call particles), when separated at birth, indelibly carry with them a knowledge (information) of the other, no matter how separated they become in space and time, and that their fates over time are somehow linked with some kind of communication (again, this is just a word for convenience) keeps them apprised of each other in a way that doesn't respect the light-speed limitation of communications as we know it; and that there is no such thing as an objective observer. By this last idea, I mean that we have learned that, at least when dealing in the realm of the subatomic, the very ACT of observation changes the reality of what one is presumably, and in very profound ways. Exactly what you set out to find about, say, an electron, DETERMINES whether that little entity will manifest itself as a wave or a particle.

Even further, when these little bits (as it is so easy to refer to such things as electrons as though they were just unimaginably small BBs) are exhibiting their waviness, that waviness knows no bounds. Far from being a tiny localized ripple instead of a marble, its waviness actually extends without bound. This leads us to ask just what we mean by waviness. Should we think of an electron as a little BB, but one that can also move around in curvy lines, tracing out something like a carousel horse as it goes around a nucleus like a planet around the sun, but going up and down as well? If image came to your mind, you are in good company because a visualization much like this was actually attempted by Schrödinger and Sommerfeld in the early days of quantum theorizing, even if only as a mental construct to help along the evolution of theorizing by what were, after all, only human minds.

If only this highly visual model were so, we might still somehow imagine a resurrected Aristotle or Galileo quickly getting our new world views in an afternoon's discussion where we simply described the evolution of laboratory test instruments and the wonders they revealed to the senses. But such is not the case. What is doing the "waving" you ask, when we talk of matter waves? The answer of what is wavelike, or doing the waving for all we know, is probability. When we actually draw a picture, on a blackboard, for instance, of the wave nature of matter the picture is, to be sure, nice and wave-like. But the axes of that chalkboard picture that produces the nice wave are like none I've mentioned before, such as when we discussed the sloping of a graph of acceleration, like how a bowling ball picks up speed when dropped from a roof. In those cases (thinking of a two dimensional graph), the horizontal axis is the ticking off of time, and the vertical axis represents how many feet the bowling ball has fallen by any particular time. Even these examples are not quite as straightforward as a bar graph depicting how much wheat or corn is in several grain silos, where each bar is a silo and even looks like one, but a graph of motion as I have described is one which anyone, with a little practice, can get used to.^{lxxxix}

In a graph of a matter wave, the horizontal axis is not time, but place. The vertical axis is not distance, but statistical probability! What is waving around in a matter wave is the probability that the entity you are talking about (say, an electron) would be found if you were to impose your observational interference and try to detect it. Try to get your mind around that kind of graphical visualization! So, you may say, the universe is probabilistic, and your showing me a graph of probabilities, so what? The "so what" is nothing less than everything that is. It turns out that the abstract mathematics actually turn right around in their tracks and start acting like "stuff" again, and at this part of the intellectual journey almost anyone who keeps waiting for a final answer, like "this may look like a castle, but I can see it is made up of little identical Lego blocks," is given full permission to weep and throw up her hands.

We have known the properties of waves of things we can see in real life for a few centuries now. Like the ripples in the pond, the waviness is visible to us, it moves and that is visible to us, we can run along with it, measure its speed, and maybe even hold out a ruler and estimate the distance between successive ripple crests. In the case of water ripples, the thing that is waving is the relative "up-

ness or down-ness” of the surface of the water. And, we have known, at least since the time of Newton, that things that exhibit wave structure can be expected to do certain things: when more than one is present in the same region they can interfere (constructively or destructively); they reflect from surfaces; and they refract, which means that they change the speed at which they propagate when they pass from one kind of medium (the stuff that waves) to another. Since acoustical sound does all of these things, we have been able to long infer that sound is a wave even though we couldn't see them and it took some explaining to say what was waving and how.

So, in the case of matter waves we have a waving of a statistical probability, which seems to be so abstract that any analogy to the waving of a slinky doesn't get there. Okay, so you have just drawn a mathematical conception of a piece of paper, and that picture of a conception is wavy. Yes, but the things (like electrons) being abstractly described by drawing a picture of an abstract concept, wind up doing REAL things that can only be inferred, from our experience, as resulting from REAL waviness! Matter waves interfere with one another, and when we freeze that process by detecting it, lo and behold, we get a real, visible pattern of wave interference. And there are examples even weirder than that, such as the single electron shot through ONE slit of a two slit grid, which comes out the other side with an interference pattern, as though its very own statistical waviness interfered with itself, and then manifest itself as a thing when we stopped the experiment.

We don't teach much about the quantum formulation of physical reality, except to future physicists. We consider the underlying mathematics to be far beyond anything that could be expected of our students to be part of, say, a general education program at a university, and there is some truth to that. It does make its way into some general publications about science for the educated lay reader, some of which are honest attempts to express in words these mind-boggling concepts. These concepts fell out of a collision between laboratory measurement and a riot of conceptual thinking, where the results, as with relativity theory, have held heady implications, indeed, of very deep mysteries that have then predicted other ideas, unthinkable without these constructs, that have turned into reality.

I can only imagine the raw excitement among those early quantum theorists, the sense that they were actually beginning to part the veil on the ineffable. You may think that theoretical physics is an area so intellectually abstract, and so buried in the arcana of the scientific cathedrals, such as those who run experiments at the handful of the world's huge particle accelerator laboratories, that it is one of those areas of human intellectual endeavor that you will never experience first hand, in the same way that you would be surprised to receive a personal invitation to participate in the excavation of the earliest human remains. And in either case, without the proper training, you would not likely be able to appreciate what the trained expert would see at either site. Furthermore, neither one would have much to do with the duties and challenges of everyday life, and whatever was learned from either elementary particle physics or an archeological dig, it probably wouldn't change the way we live our lives, individually, communally, socially, politically, or culturally.

In fact, you live with the consequences of quantum mechanics continually. At the most obvious level, if this is really how matter and energy behave, then of course your very physical being is intimately connected with these insights—but, of course, billions of people have lived out their lives without knowing these things, so it is not so much an issue of practical necessity. However, the very device I am composing my thoughts on right now is a product of quantum mechanical theory applied to the material world. The entire complex of electronics that has pervaded our world like nothing so much as an organism is based upon an understanding of the ghostly world of matter waves and wave-particle duality. In point of fact, most scientists and engineers who use this sophisticated equipment (and not just the rest of us who may have a personal computer, or a television, or even a telephone) don't know the underlying principles that allow semiconductors to work, and they aren't required to for their work. But we use them all the time and they are harnessing the most counterintuitive, even mystical properties imaginable.

In the world of quantum mechanics, for example, one can perform an experiment in which an electron, with a known energy, exists in a space from which it cannot escape (called a potential well). Suppose, for example, that you were a groundskeeper at a major league baseball stadium, and on an off day you and a friend had the whole park to yourselves, so you decided to play a little

game of catch. You only had one baseball with you, and this was a very special baseball. It doesn't have to be Mark McGuire's seventieth home run ball, just a ball you have had for a long time that had sentimental value. You enjoyed using it; you just didn't want to lose this ball, so you had written your name and address on it, just in case you ever lost it—one of a kind.

So you and your friend are tossing the ball back and forth, and enjoying the strange feeling of being the only two in this enormous enclosure. Suddenly, on one of the tosses, the ball seems to disappear. Your friend is running around trying to see where the ball is. Maybe he lost it in the sunlight, but he doesn't have it and neither do you. So the two of you go around the infield looking for it. It just doesn't make sense not being able to find it, but it is nowhere to be found, and you didn't even throw it that hard. It has to be somewhere, but it isn't. And there certainly isn't even a theoretical possibility that you threw it out of the park. You don't possess a throwing arm that could get the ball out of the park. You would be just about as able to be able to throw a baseball out of the Grand Canyon. Your friend is sorry, and you are too, at having lost your favorite baseball, so the game is over. You go out to the parking lot to drive home, and you find your baseball lying there on the pavement. How could the ball have gotten here? No doubt, you would rehearse all possible scenarios to try to make sense of the ball in the parking lot, and in fact you would be desperate to make sense of it because otherwise the world doesn't make sense. Could it have rolled out here? No, all the doors were shut. Could someone have played a joke and placed it out here? But there wasn't anyone else inside. Maybe, even though we didn't notice it, there was some sort of a whirlwind that carried it out here.

Now suppose you are back in there playing catch, when suddenly when you throw it, the ball just seems to disappear. Several weeks go by, and you get a package in the mail from Australia, and it has your baseball inside, with a note. The note is from someone you have never met, who explains that he was just out on the beach, by himself, watching the stars, and suddenly a baseball appeared in his lap. It had your address, so he sent it back. He might add, "I don't know how it got here. Nobody threw it to me; I was alone. It didn't wash up from the shore. It didn't even slowly materialize like those things you see on old Star Trek shows. It was just there. I can't explain what it was like because it wasn't like anything I have words for. If you have time, write back and tell me whatever you

can because I am afraid I might be losing my mind." He also gives you the date and time when this manifestation occurred, and it corresponds exactly to when your ball disappeared.

In the realm of the quantum mechanical world, every one of these outcomes is possible, and they actually HAPPEN, and if they didn't happen with some statistical REGULARITY, your computer wouldn't work. Max Born, one of the original contributors to the quantum hypothesis once said that anyone who thinks they understand quantum mechanics doesn't. And what he meant, I think, was that this realm of understanding is not amenable to any comparisons with ordinary life experience at the scale we live it. Going back to the Enlightenment natural philosophers, it was part of the worldview to think that everything might just be matter in motion, that is, the clockwork universe. For many systems such thinking works reasonably well. You actually can imagine the air in a balloon as trillions of little BBs all bouncing around in random motion, resulting in the large-scale effect of air pressure. But there is no analogue of mundane objects, like billiard balls, which will give you any handle on the ghostly manifestations of the quantum world.

Now here is the thing that is even more amazing than all that. For some reason, after millennia of pondering and telling stories and building things, we, human beings, were let in on this secret! No one invented the principles of the strange world of the quanta, of which we are all composed (along with everything else). No one sat down and said, "I want to build up a physical universe that will operate on these really bizarre principles because it would just be so cool." It just is, and the nature of what is lies far beyond the realm of anything we were able to invent as we played with ideas of mystical powers. How could we ever become dulled to the magic, the wonderful strangeness of insights that keep enticing us to further explorations, and even transforming our very daily lives in the process?

Yet now we sit here with our remote controls and computer keyboards, like so many Greek deities who know they can play around in human affairs or split mountains but are becoming a little bored and restless with your everyday miracles of creation and destruction, and perhaps yawning a bit as we ask for someone to surprise us again. Bring me the next miracle; this stuff here surely can't be miraculous because it is in front of me, show me something new! Rather

than seeing the underlying mysteries of the natural world and what we have been able to create, we get overcrowded with consumer stuff, which blocks out by its surrogacy and ubiquity both the natural wonders all around us, as well as the awe-inspiring processes that make possible what we do create. We are trained, by and large, to be consumers of nature's end-effects, custom-packaged, where the only magicians whose inventions interest us are the marketing experts.

I don't mean to give the impression that professional scientists, or even the leading lights in every case, are more enlightened in the most fundamental sense, and less prone than we, the consumers and bystanders, are always more dull to nature's mysteries and majesties. Not at all. It is a human propensity, and one we should guard against just as much as we should guard against our inclinations to be greedy or hateful or shortsighted in any way. In 1896, America's most prominent physicist, Albert Michelson, who was our first Nobel laureate in physics and was at the time the chair of the physics department at the University of Chicago, actually had entered into the school's course catalogue a brief description of what he thought physics and the training of young physicists was about. He said that it was most likely that the basic laws governing the physical universe were already in hand and understood, and that primarily, the work of physicists of the next generation would be in refining that framework. Or, as he put it, working out to precision the physical constants "to the sixth decimal place."

Instead, that next generation of physicists would witness and participate in a revolution of insights unlike the world had ever seen, including quantum mechanics, relativity, and the mind-boggling intimation that the entire cosmos was expanding. And this pronouncement was made by a man whose most seminal experiment actually formed the foundation from which Einstein envisioned his special theory of relativity! Here was someone right in the thick of it, and right at that intellectual cusp his vision proceeded no further than to produce an army of worker ants who would polish the intellectual artifacts of his generation!

In fact, the mysteries just keep coming and teasing us with glimpses of mysteries within mysteries. When I was an undergraduate we learned that the old model of the atom, viewing it as a solar system in miniature, was, of course,

wrong. It doesn't quite fit Wolfgang Pauli's criterion for being "not even wrong," but it was just another example of how we naturally search for mental pictures we can understand, and, after all, it didn't survive very long. All this is true. Yet it isn't *merely* a mistake, or a fossil of an idea that, in Darwinian fashion, was terribly misfit for its environment and quickly passed away. It has a lovely Platonic attraction to it, seeing patterns within patterns, and proceeding on the faith that there is some congruence between what we, as mortal humans, can imagine, and the nature of the universe in which we find ourselves. It can also be seen as wonderfully holographic, and being able to "see the universe in a grain of sand," as the poet William Blake so eloquently put it. It turns out that, so far as we know, if the universe is actually holographic, we are still too far embedded in it to know what patterns to look for.

Furthermore, the revelations from astronomy and cosmology just keep pouring in, and rather than closing off the universe to some neat package, we continue to be surprised at what we don't know. We are only able to begin to see what we don't know with each new set of questions that are only asked as the picture expands. Among our latest conceptual challenges in visualizing the truly immense, the physical cosmos as far as we are now privileged to view it, include the following: according to our best measurements of the movements of galaxies and clusters of galaxies, there seems to be a deficit in what we can detect. That is, things seem to have motions that indicate that there is a lot of stuff, gravity-producing stuff, that we can't see within the realms of what we can see. This "dark matter," as it is referred to is not a little tidying up and adding to the sixth decimal place. It is more on the order of at least ninety percent. The implication is that, just from what we can see, there is roughly ten times more stuff (in the same region) that is invisible!

Also, when speaking of really big structure, it has only become apparent in the last few years that the really huge super complexes of galaxies may be arranged not at all as we expected, as a uniform scattering of astronomical entities, but more as sheets or bubbles, where the galaxy complexes form the boundaries of those bubbles and the insides are relatively empty! Why? At this latest level of observation, the entire cosmos seems to be implying nothing like Thomson's "plum pudding" model of the atom, but more like foam. Again, I

wonder not only why this structure appears, but also why we as a species should have the privilege of understanding any of this. I see this very privilege as yet another intimation of transcendence, of our gift to rise out of flatland. And these intimations are the products, very often, of our noodling around, exploring, and being driven to push the boundaries of our perceptions from within flatland itself.

So we go to a lab in Scotland and find that, low and behold, someone has cloned a sheep. Then we interview the researcher and he says, well, yes, this is a major step, but it really resulted from a lot of painstaking trials, and let's see what comes of it. It really was, after all, the result of the application of exquisite technique, which required lots of other insights and techniques, which haven't been available until now. Meanwhile, we convene more panels of experts, some of whom tell us that this has great practical implications for genetic research and the possible cure of intractable diseases, and some of whom tell us that these explorations constitute truly dangerous territory and we need to slap controls on it. Some people warn of a Brave New World scenario, where we're breeding human organ factories or mindless robots, and surely this sort of research is not where we should be meddling. We draw the boundary at life itself. And some people just get depressed, concluding that these techniques mean that, once again, science has taken mystery from the world and we really are just a bunch of fancy matter-in-motion conglomerations.^{5c}

But just as Werner Heisenberg, Niels Bohr and some others didn't create the world of quantum bizarreness, neither did we create life. What continues to amaze me is why we, as a species, should have the privilege to even peer into the next level of the hologram, whether that is cell division, the quantum, or the cosmos. I don't find any of this depressing. As I said before, the mysteries keep coming, and to me the greatest and most inspiring mystery is the consideration of why we should be able to make these leaps of vision. And in contemplation of this human privilege, the vision that keeps calling to me says that there is both heritage and destiny at work. We are both immersed in and intimately interwoven into the very things we seek to understand, and we are called to feel our way towards that expression of the grandeur of creation in miniature. It is time for us to see the human experience, and our individual lives within that, as expressions of these mysteries, which may have no end of embeddedness.

There are plenty of people, including ones I know, who would howl at my persistence in asking why we should be able to understand anything. "It's simple," some of them would say (and I have a reflex that causes me to squint and take on the facial expression of a migraine when ever someone says those two words in response to a grand mystery). You have committed the fatal error of logic, which we have all learned so well at least since the Enlightenment. Your question of "why" requires teleology: purpose, intent, meaning. There isn't any. A pattern is just a pattern.

As for things like language, abstract reasoning, aesthetics, and all the other stuff, they are just artifacts of our evolution, which, for survival reasons only, favored social structure, which required language. And (if I only had a brain!) I would realize that in the cosmic scale of things, the reason "why" life evolved on this planet is a question without an answer, and asking it reveals a pitifully anthropocentric need for meaning on my part. The cosmos has had untold trillions of worlds to try with. This one just happened to succeed, and we are here as a result, and it is only because of that impossibly large number of trials versus the paucity of successes that romantics like you can even hang around to think it is amazing that we can ask why! As to why the physical properties arose just so finely tuned to allow this particular cosmos to exist at all, that's just another probability. For all we know, an infinite number of tries at something like a big bang occurred before one of them got it right, and that's why the universe is here, just the old tyranny of numbers game, and that's "why" you are here, if you must ask.

Ah, I get it. Thank you. I'm glad that there are at least a few folks who can set me straight, and I am properly embarrassed. We do have the right model in hand now, and it really is just mechanism and probability. So, I guess all there is left for us to do now, before we turn off the light, is set about figuring out that sixth decimal place for all the parts of this fine, desiccated explanation. Oh, and don't forget to collect your Nobel Prize on the way out. It's a special edition, you know, the very last we will be awarding.

I am an unrepentant cheerleader for the pursuit of knowledge of any kind and in any field, and I find the revelations of all the experimental and theoretical sciences astonishing, expansive, and thrilling. I am not, however, equally thrilled

with what a few scientists, actually in the stream of this unfolding journey, feel we are constrained to conclude from these visions.

iv) *Why should we seek wisdom?*

Is the holographic model a real representation of the physical universe, and perhaps by implication, the mental universe of consciousness as well? Of course, I don't know. Even if it winds up having some sort of persistence in our conceptual models, I don't think it would wind up being anything so literal as an extrapolation of the literal description we considered above of a holographic film exposure, and perhaps not even an extrapolation of the biological version, which is dynamic at multiple levels, and not static like the exposure pattern on the film.

Sure, the organization of our very local neighborhood, the solar system, is not like the bizarre mental picture we ascertain for the atom. Okay, so one of our Platonic intimations turned out, at least for the time being, to be a dead-end. And it may very well turn out that the patterns of holography we've been considering here are not universal. But the utility of considering holographic structures of mind and matter at the present may be that it hints at another imaginative leap that is, at present, beyond the dimensionality of our consciousness, despite our yearning efforts to get out of flatland altogether. Perhaps the holographic map is something like the elders of flatland getting together and witnessing the image of Sphere (instead of A. Square being the only witness), as it passes through our domain. But at least we are looking, and trying to understand the apparition.

What I continue to find exciting and sublime to contemplate is that we, humanity, should be able to comprehend any patterns at all. Why should there be any congruence between our thinking and the realm of things that have nothing to do with our simple physical survival? There is no Darwinian imperative for being able to find the intellectual resonances (and whatever other ingredients that enter into creative leaps of imagination in any field) that expand our consciousness into realms over which we need not have any input to survive, whether at the level of the electron or the entire cosmos. Why are we privileged to see mystery when it doesn't put food on the table or allow us to escape predators?

These thoughts provoke in me a strong sense, first of all, that there is indeed meaning and purpose in the human experience. Secondly, is the impression that we, individually and collectively, seen locally and globally, comprehended at a frozen snapshot in time or embraced as unfolding stories through time and generations, are, in fact, on our way somewhere. We are only given glimpses of the next level of the holograph one at a time, and even those glimpses require an active will of gratitude and envisioning. Without gratitude and envisioning we continually run the risk of conflating our various piecemeal views and descriptions, with creation itself.

Rather than reveling in the wonder of it all, of the fact that we exist, that we can imagine and envision, and that we are able to construct marvelous narratives of meaning which begs us to realize that we are part of the very fabric of that meaning, we can instead dismiss the wonder of existence by misunderstanding the spiritual significance of our own explanations. Instead of embracing the wonder of all that is, including the untold questions we can't even formulate, which awareness naturally generates profound gratitude, we often stuff everything we think we can explain into an expanding archival box that we label "not so special stuff," simply because we have explained it at some level. The conflation of human explanation with a semblance of deadness is not just toxic to the imagination (especially for the younger generations) but it is a deliberate denial of the grand spiritual gift of being human.

However, it makes all the difference whether or not we choose to seek visions, or to see the human experience as just so much complication of crossed purposes and parochial interests, with each interest birthed and competing for its own survival in an ecology of being that is without any purpose beyond its immediate experienced context. And what I would like to urge at this point is that, it is not just physical manifestations of the world (taken at any level) that seem to imply some sort of holographic embeddedness, but that knowledge, ideas, creative jumps, and wisdom also imply something of a holographic nature. Again, I must take care to warn against the strict literalism of this analogy, for even if it is true and not just an intellectual conceit, like the planetary model of the atom, it would seem to have a depth to it that we must intentionally evolve toward to appreciate. Such conscious and intentional evolution, although

admittedly heuristic, is not the sort of evolution of mutations in morphology we associate with the Darwinian explanation for the rise and fall of species.

I mean to infer an evolution of consciousness, a word that I know is fraught with confusion in academic contexts. However, there are only so many words in my vocabulary to turn to in such conversational patterns, where the printed text might be held at a distance and judged, rather than trying to co-vision and comprehend along with the reader. I might instead invoke, as I have done earlier, the word spirituality to describe these larger expressions of what we are about, as we become creatures of wisdom, and not just knowledge or information. On the other hand, I might be tempted to say, with Max Born, that anyone who thinks he or she understands it (in the way of a simple physical model) doesn't. In truth, though, I do not think that observation applies here. I am speaking of an awareness of a sense of motion within patterns of human experience, and of the process of becoming, as a species, (instead of static descriptions of what we seem to be doing that is observable at a moment in time). I think that these visions can be awakened in each other because I think it gets to the core of who we actually are, even if that nature is often obscured from our view by the press of daily events and the contents of the nightly news. And the key word here is "awakened," which is one of the most recurrent themes in every one of the world's spiritual paths, or wisdom traditions.

We are also, I believe, at an important phase of (potentially) positive creative discontinuity in the evolution of our consciousness. The best analogy that comes to mind, and I stress that it is only an analogy with all of the limitations that analogies suffer when pressed into service beyond those limitations, is something like the biological process of differentiation that occurs in the development of multicellular organisms like the human body. There comes a time when, somehow, it is communicated to the next generation of cells, all originally identical and only coming into being from the death of the mother cell, that it is time to become something else. The daughter cells are impressed with the imperative that, although they will carry all the heritage of their mother, it is their destiny to start becoming new creatures in the unfolding of a pattern of exquisite grandeur not yet manifest. Once the fully realized creature appears, all the cells, not very different from each other, still carry the wisdom of the original fertilized egg, and all the differentiated cells making up the various

organs remain conversant with each other, but their conversation is on a much different level, exchanging all sorts of perceptions of this grand manifestation, the human being, and their (cells) activities are in service of the myriad things that fully realized humans do.

Of course this analogy is describing the physicality and functioning of the body only. I believe that we are much more than that, but my visions only persuade me this much and not the particulars of what the next stage of the developing wisdom-organism, speaking of humanity individually and collectively, actually will be, let alone subsequent stages. We can only incrementally perceive that differentiation and synthesis are occurring, but that insight alone is spectacular and, so far as we know, makes us fundamentally different organisms. We can not only make inferences and projections into the future, but, through awareness of that process as our purpose in mortality, we can consciously take part in creating our own spiritual evolution.

I think it is this very perception that might provide our rising generations, today and in the future, with the visions they need to be actively and creatively engaged in their own lives. We need to be able to inspire and then let go of our younger generations. They have great purpose and destinies, which will manifest themselves in their lives differently from our own lives, as the mother cells giving birth to differentiating daughters, and the process goes on and on, not merely mechanistically, but with the spiritual calling of our own dreams and visions at that stage, to actively participate in and modulate what is, to envision even more wondrous possibilities not visible to earlier generations. These later generations will still bear the imprint of the wisdoms and life stories of their ancestors, but their mission is not to simply hold the current world together in some rearguard, defensive, vigilance.

Certainly, we must also see to those things, much as the body must constantly re-evaluate its current insults and send out its specially designated members to address that. In this light it is right and necessary that we apply some of our creative energy toward repairing things we detect are askew or injured, whether that be our environment, our systems of justice and human rights, and other parts of the human-world complex that are suffering. Were we not to see to these things, the body of humanity might become mortally ill. However, to imply that simply stopping the problems that continually arise is

the only visionary purpose to life is akin to saying that the only things humans are good at, and what they should be completely about, is the distribution of nutrients throughout the body and the killing of harmful germs when they appear. A body in a comatose state can do these things without help from the conscious mind.

I do not object to admitting to our younger generation that we have severe difficulties that will require imagination and compassion, and that some of them may find their profound calling in being primarily about solving particulars among these problem sets. What I adamantly feel is wrong is handing over the world to the rising generation with the imparted wisdom that running around putting out fires is the only visionary thing to be done. "We screwed up the world, sorry about that. We have left you with nuclear weapons, environmental crises, ethnic hatreds and a politics of confrontation, and we have addicted you to the pursuit of surrogates. Really, we are sorry. So it is your job to fix all those things, and from our statistical projections you have but a slim window of opportunity. Anyway, for what it's worth, good luck."

It is not that these problems do exist that is so toxic to our next generations. It is the preaching to those generations, that this is the *whole* picture, putting out these fires is the very most important visions you could possibly have about the meaning of life, and these are the pronouncements of people who often consider themselves to be the vehicles of the best far-reaching wisdom. Furthermore, we are preaching this morbid vision of the best possible things we could be about to those who have to go through all the stages of individual human development, from infancy to childhood to adolescence to adulthood. They indeed look to their elders for hope, vision, and the transcendent. We may not be able to particularize the visions of them becoming different creatures as a wonderful gift of mortality, but if our only responses range from "I guess we'll never know, now get to work;" to "get a good education so you can get a good job;" to "we are on the verge of extinction and that terror should push you to frantically run around and stop the madness" we are not giving them much to go on. And it is these very children who do not yet have the personal maturity or intellectual structures to challenge us on these pronouncements. This is what is truly spiritually debilitating, and we need to

stop promoting that impossibly pinched spectrum as defining the only possibilities for what their lives are about, or, on the other hand, giving them only end-time religious dogma that, rather than being an invitation to the generous blessing of co-creation of as yet unimagined futures, has its own sort of fatalism about the meaning of life.

There is yet another quality of the envisioning mind, and that is expansiveness that has the power to wonderfully evaporate many of the seemingly intractable problems we face as individual and societies when we operate only within the artificial perspective of flatland. So much squabbling, and the truly horrific consequences of such squabbling, necessarily reveals their own false conceptions, pettinesses, banalities, contradictions and ugliness, when our imaginations are caught up with visions beyond flatland. And again, I am not urging some singular "answer," as though an envisioning society would all subscribe to the same religion. That, too, diminishes the glory that we are not just observers of reality, and we are more than even participants. To draw a tepid analogy from quantum mechanics, we cannot even just observe without becoming part of the experiment. We actively co-create the realities that distill into the next level of visions. And to whatever extent the patterns in the evolution of consciousness may bear some resemblance to holography, we are all privileged to observe and comprehend these grand structures at every stage. But we also have as many privileged visions of those emerging structures as there are individual human beings. Our visions of possibilities become immeasurably multiplied by our conversations, through our sharing of our visions.

And so, before reconsidering what sorts of education might be most appropriate for wisdom and envisioning, we might briefly reconsider that knowledge is not just an accumulation of information. Rather, knowledge arises from the apprehension of useful patterns among appropriate information, but such knowledge is still at the level of being value-neutral. Knowledge and technique can be used for good or ill, or for mere diversion with no consequences at all. The self-same scientific insights can be applied to add either wonders or weapons to the world. An understanding of the psyche can be used to heal or manipulate. A knowledge of history can be used by one teacher to illuminate and by another to intimidate his students. Further, the mere presence of a pattern may or may not provide knowledge and a key to understanding. The Dewey-

decimal system is most definitely a pattern, but it is just one possible way of arranging books. I am not convinced that by deep contemplation of the Dewey-decimal system one would arrive at anything more compelling, even about Mr. Dewey himself.

If we can agree that information alone does not constitute knowledge (either positive, negative, or neutral), and that knowledge is a necessary-but-not-sufficient condition for wisdom, we may at least infer that there are more fruitful ways of knowing and learning than occur through teaching our rising generations ever increasing amounts of facts and techniques, with the blind hope that, in Darwinian fashion, if there are important themes that can give rise to wisdom they will simply pop out because they produce intellectual offspring.

v) *What ARE we doing? The evolution of the university, and the atrophy of synthesis*

If we look at the historical development of the western canon, for example, there are many periods whose overarching conceptions were based upon a faith that knowledge systems are, ultimately, interrelated and indicative of some perception of the transcendent. Certainly that was the central insight of Plato's philosophy, which saw human reason as a privileged resonance with ultimate truths in every area of conscious contemplation and their worldly applications. In this system of knowing, the study of mathematics and music are of peculiar importance, not because such study allows one to become socially "cultured," or because one will perfect a utilitarian technique. Instead, these represented spiritual practices in realms where we are in closest communion with transcendent insight.

Such study of particular fields deemed to be of a kind with insight beyond the mere detail of the earthly and mundane remained the focus of education well past the Middle Ages and the establishment of the first formal universities. The Renaissance Naturalists held to these beliefs as well, and were working within a broad Platonic-Aristotelian world-view in their arcane pursuit of the "philosopher's stone," and their alchemical recipes, where the integrity of the experimenter was inextricably fused with the material experiments he was performing. The entire physical world was alive with sympathies and antipathies according to the Naturalists, so it was obvious to them that the physical world

would respond not just to the techniques of the alchemist, but to his intent as well. To see the philosophers who ushered in rationalism, objectivity, and the Scientific Revolution as a group of immediately distinct intellects from their Naturalist predecessors and contemporaries, is to retrofit history with a prejudice toward the results of several centuries of Enlightenment thinking that were not nearly so distinct at the time.

One of the leading lights of the Scientific Revolution, Gottfried Wilhelm von Leibniz, who is credited with independently conceiving of the calculus at the same time as Newton, considered intelligence to be a property of the entire universe. He imagined this intelligence in a nearly physical but still mystical way, positing in 1714 that the cosmos was permeated with monads, or particles of intelligence that were microscopic expressions of universal intelligence. Or, to use the wonderful economy of explanation of writer George Dyson, “[t]hese entelechies (the local actualization of a universal mind) reflect in their own inner state the state of the universe as a whole.³⁶¹ According to Leibniz, relation gave rise to substance, not, as Newton had it, the other way around.”

Nonetheless, by the time Leibniz was considering a universal mind, the rise of specialties in intellectual investigation and the multiplication of information that resulted were already underway. By the time the French philosopher Denis Diderot, along with mathematician Jean d’Alembert managed to publish their magnificent Encyclopedia project in 1765, they relied on other acknowledged masters of fields of knowledge to help organize, on one bookshelf, all the knowledge that was. Still, Diderot and d’Alembert included an intricate taxonomy of knowledge, trying to weave so much learning together in linkages of derivation and genealogy rather than leave them as so much separate observations in art, literature, botany, or physiology. Within a century of the publication of Diderot’s encyclopedia, however, the German university had evolved into something quite different from either the center of spiritual inquiry, or even the inculcation of “Kulture,” as the Germans had considered their peculiar national mission.

It was on German soil where the first research universities were established, considering that term very much in the way we think of it today, and the United States was soon to follow the German model. The first and most notable example was at Johns Hopkins University, founded in 1876 directly on the

German research university model. That model, however, was soon emulated at the rest of America's premier institutions, including Harvard, Princeton and soon included the new land-grant universities springing up such as Cornell and Wisconsin. This model was not simply a matter of cultural envy and aping. It paid off handsomely, both in deepening knowledge specialties and in producing commercial spin offs. The most notable early example was the specialized research in organic chemistry in Germany, which produced a world-dominating industry for that country in the nineteenth century.^{xviii}

The rise of academic specialties paralleled the rise of professions, and we have already discussed the social landscape that resulted in this country in this century. The academic landscape, not surprisingly, produced a lot of specialists who, as their disciplines continued to amass data and produce sub-specialty offspring, found it increasingly difficult to talk to one another. It was not so much a product of animosity of one discipline toward another (although that exists as well); rather, it was that disciplinary and subdisciplinary specialists were paid, rewarded, and promoted for tunneling deeper, not for engaging in great conversations with faculty in other fields. In short, there were too many incentives to further bifurcate the accumulation of facts like so many arteries becoming millions of capillaries, rather than synthesizing.

In the natural sciences, of every kind, academic specialties had immediate payoff in the commercial world as well. The social sciences came into being as academic specialties after the research model of the natural sciences had been established as was producing such stunning results, and it is very difficult to look at the history of the academic social sciences and not see them being driven to pattern themselves after the natural sciences, and thereby obtain the same respect and support. The specialization within the humanities followed the lead of the social sciences, reluctantly but inevitably, insofar as they were housed on campuses where research specialization was everything, and if they did not also model themselves in this fashion, there was danger that they would be suspect as fit members of an academic community at all.

Yet, for all this specialization, the outstanding thinkers were always prone to be inspired by larger possibilities, by patterns that suggest themselves to the mind by synthesis and not dissection. In the process of doing this, they were often misunderstood and even ridiculed by their professional peers. We are not

just referring to a paranoid perception of the lone outsider, which seems to have particular attraction for conspiracy theories. Rather, it is a very natural human response toward truly original thought, and it is very naturally amplified by the development of specialties of expertise.

At this point I would like to pose what might seem to be an obvious question to some, with an obvious answer. However, I pose it not for the easy answers to which we are prone, but as an opening to a very different insight of possibilities. The question is this: where were the women (half the population of any society) and the wide variety of ethnicities and cultures during most of the history of the institutionalized university? The answer to the superficial question is, of course, that they were largely excluded. The more interesting question is why, and the really interesting question I would say is “the history of why” because it is not a static answer but has its own evolution. And if it is all right with the reader, I am going to go right past some of the first-order explanations, such as the power of patriarchy or that white males are prone to be racist evildoers, which again only works at the level of description, not cause. Still, if one even pursues even that line of analysis with patience, it does move our understanding of “why,” further to the level of something like “fear of the other,” and its attendant corollary, which is the consolidation of power and privilege. Fear of the other, I think, is beginning to penetrate to the realm of actual cause to the extent it taps into elements of the human psyche, individually and culturally, but I would like to follow a somewhat different direction of examination.

Since the establishment, in the middle ages, of the first formal universities in the western context, these institutions were not only a preserve for the privileged, but they had a social structure very much like fiefdoms. This was perfectly consonant with the outside social structures in which they were given shape, and one is hard-pressed to find anything like an embrace of diversity of any kind in that larger cultural context. The concept of the university being, beyond an inculcation of a wisdom canon, a prerequisite for entry into professional opportunities is quite modern. For most of their seven-century history the only professions that a university was expected to serve (beyond its calling for what we may loosely call general education) were medicine, the law, and theology (producing clerics).

Let us move abruptly from the Middle Ages up to a mere hundred years or so ago, and the emergence and wide proliferation of the research university and the finer subdivision of specialties within disciplines. And what we find is that, remarkably, many of the original characteristics of the original universities are still present. But these original structures and statements of purpose and governance are uneasily mapped onto a new agenda of what professors and their students thought they were about. Perhaps even the words “mapped onto” are insufficient, because these words imply at least the ability to locate a natural convergence. A better analogy might be that these assumptions were glued onto a new operational agenda, producing a very odd and unnatural beast.

The old assumptions, then, were roughly based upon a canon of wisdom. Before the arrival of modern specialized disciplines the university was the place where the universal (and hence the term university) wisdom contained in the sacred texts were to be passed down, with commentary. These wisdoms were considered eternal and beyond social context, even though, as viewed from the present, we know that it is impossible for learning to be free of its cultural contexts. In Germany, before the advent of the research-based institution, the universities became the focus for passing down values and interpretations that placed the Germanic culture at the zenith of enlightenment. The importance of this assumption of a timeless canon was that it also comported with the organization of the university, which placed it beyond criticism of bodies beyond the gates, except by the church, in disseminating and organizing this wisdom.

Rapid communication and critique through peer review, or larger social pressures for relevance to commercial productivity were not part of this knowledge universe. The “ivory tower” preserve was not an inaccurate description of the original university model. Like the cathedral building that also occurred during this period, where the result was not intended to serve a utilitarian function but as a representation of connection with the heavenly realm, this is what cultures wanted their universities to be. Previously I compared the university with a fiefdom, which implies a sort of sovereignty to the professoriate, who ultimately had only to answer to the regional prelates or the Pope himself. However, another system was already in place during the organization of the early university, and this was the guild system for the applied arts and crafts, in which those formally considered masters could hold

absolute power of entry into their craft, and this model must be also incorporated to understand the peculiarity rights and functions that the university held as its own.

With the advent of the research university what is most remarkable is that very little of the functional assumptions changed, even to this day. Yet it was obvious to everyone, and especially the research faculty themselves, that what they were doing bore no resemblance to what the universities between the thirteenth and eighteenth centuries were about. The results have no coherence, but lots of power, and they do all sorts of things, operationally, that are incongruous, at crossed purposes, and done by default. Our most prestigious institutions, taken by measure of their budgets, publications, number of Nobel laureates on their staffs, or their admissions policies continue to churn out all sorts of information and yet no one can come close to producing a mission statement that anyone on the faculty would recognize as "their job," except the most fluffy generalizations that would get shot down in any freshman writing course as not even worthy of a sentimental greeting card message.

You find things like "preparing our students for the challenges of the twenty-first century," "providing the skills necessary for the leaders of tomorrow," "gearing our rising generation to not just survive, but thrive in the Information Age," or "our prestigious institution is a recognized world leader in producing cutting-edge research in every area of the sciences and humanities."^{xciii} I have no idea what any of these things means. I can't even concatenate them or permute them, like so much refrigerator magnet poetry, and cobble together anything that has meaning, or put them into a blender and hope that meaning will just emerge. Meaning will not emerge: there isn't any meaning in the constituent parts. No holographic pattern will emerge when illuminated with coherent light, because the fuzzy smear on the film REALLY IS just a fuzzy smear with no embedded pattern. And without any emergent meaning upon which to stand, even momentarily, there is no way to use that vantage point (since there isn't one) from which one might produce visions of further meaning and wisdoms.

What is the purpose of a university education in contemporary society, and why do institutions continue to put out such meaningless blandishments as supposed mission statements? The answers to both questions are tightly linked,

and depressing. A university education has become the equivalent of a union card, and the blather over what the institution is about, as if it were about any purpose, is no more than advertising—speak to the “customers” (students and parents), assuring them that they will get what they are really after. They, the customers, are buying something very like an automobile, not one that they assembled or need to understand, but one they can just get in and drive. In purchasing a name brand (of either an education or a car) we also purchase the right to announce to everyone else who believes in the same surrogate language that we have purchased a lifestyle, even a state of grace.

If a significant number of people no longer believe in the truth of any system of linked surrogates, the system falls apart and loses a value, like so many Russian rubles. Keeping the value of this system of surrogates propped up lies not in its common utility. Instead, it requires that there always be a “leading edge” which is rare, like precious metals, and its very rarity allows it to be traded as something of inherent worth. Gold, by any utilitarian analysis, is not particularly useful. Silver is infinitely more useful, for example in photographic film, but the comparative value of gold to silver is determined solely by their relative proportions in the earth’s crust. You can’t drive away a gold ingot, or eat it, or ponder it for insight, or have it tell you wonderful stories. Even as elements go, it is fairly boring stuff, more known for its inertness (it doesn’t tarnish) than anything it can do or reveal.

Since we have all collectively agreed to assign it worth just because there isn’t much of it, you can use that gold ingot to buy lots of cars, lots of expensive food, and maybe even get yourself a live-in storyteller for a few years. But the gold itself can’t do any of the things that it can buy. There is nothing in the bar of metal that you could ever pull out, holographically, and ascertain, for example, the crafts used to build a house (which it may have bought), or the vision that inspired a great painting (which it may have bought). It just sits there, and we revere it.

To the extent, then, that we might hold up the institutions we presently call universities as generators and disseminators of wisdom, and that those who attend them will leave with anything like wisdom, we are simply applying a romantic and meaningless descriptor that bears, in nearly every case, no relation to what a university, or system of universities, does, and even less so to the

experience of someone passing through it. The very term, "wisdom," in fact, seems to be too heavy a burden to bear, even for institutions with billion-dollar endowments, so they don't use it.

What was once the very reason for establishing a university is now a quality we fear to mention, and so we ratchet down our expectations for universities, to be purveyors of knowledge, perhaps, but at very least producers of information. However, we continue to insist that we expect our university graduates to emerge with some glancing acquaintance of a vast array of disciplines, as well as some specialty information and techniques in a particular discipline. We do this (again, there are a few exceptions) by providing a matrix of courses and alternate options that represent the big block areas (mathematics, the natural sciences, the social sciences, and the humanities) that roughly resemble the next level of organization down from the entire university, which are the various schools.

And of course we don't want our students to sample these areas of knowledge by some fuzzyheaded generalist who doesn't really know anything cutting-edge, first hand. So, in some cases, we have them taught by graduate students who themselves are already fully differentiated into specialties to give the grad students some teaching experience and to help dilute the cost of staffing the research university with specialists at the full professor level. Some prestigious universities have begun to hear back from their customers that these methods are disingenuous from their point of view of the sales contract. They want their Mary and Johnny to be in touch with these famous people directly. After all, how would you feel if you had paid to see Elvis himself, and instead got to see a bunch of Elvis-impersonators? It doesn't even matter if the impersonator perhaps was a better singer than Elvis; you want to touch celebrity, which is valuable simply because it is rare, not because it is better, and that is what gives you bragging rights to your friends. And therefore we see, at more and more expensive universities, the full professors are being asked to go down into the pit and teach, perhaps, one general education area course a year, beyond their research and the graduate research seminars.

The results should not surprise us. We are asking our youngsters to get something like a broad education, by sitting in a large lecture hall listening to some noted specialist droning on who thinks, all the while, that his very presence here is wasted and a sure signal of the decline of civilization, and who is

just doing his or her job. Who knows, maybe something will rub off on some of them just by association. Meanwhile, that professor lecturing on principles of first year chemistry or the plays of Aeschylus, is not expected to know anything about any one of the other general education classes those very students are also taking. After all, they only have a name in their fields (and are therefore celebrities we want our children to see and hear) because they have been rewarded for tunneling, not for aerial views. The lecturer on Renaissance art probably doesn't give a fig about neurophysiology and vice versa, and isn't expected to care, except on his or her own private time as some sort of eccentric hobby. To the extent that these fields may inform each other in some fascinating possibilities of meta-languages or intimations of cross-disciplinary knowledge, let alone any visions of wisdoms, we expect our eighteen year olds to do this for themselves.

Of course this expectation is ridiculous, when at the same time they are being presented with celebrity mentors who haven't done that, don't pursue it, and for the most part consider such pursuits to be folly. In fact we in academia have even developed a perfectly bulletproof defense for the folly of producing wisdom through real questions that matter being eagerly engaged by disparate research specialists. This defense has the wonder of both celebrating a revulsion toward ecumenicalism (and the emergence of possible new wisdoms) and allowing us to plant our feet on the "firm ground" of our subdisciplines whose very firmness is reified by the existence of journals and associations of subdisciplines. The defense takes on different names depending on the subspecialty invoking it. Sometimes it is called "postmodernism," sometimes "post-structuralism," and sometimes "deconstructionism," but whatever the label we are to believe that the pursuit of wisdom is anachronistic because it implies meaning and purpose and valuation, and that sounds too much like religion. It also allows a bunch of people who might utterly disdain each other's particular assumptions to exist on the same acreage, separated by campus regions, buildings, mailing lists, and, best of all, by their disciplines.

Once again, I must take care not to be misunderstood, and in doing so what I wish to say might be seen to be in direct contradiction to what has come before. I think that the research made possible by the establishment and maturation of disciplines is wonderful and extraordinarily valuable. To discard

the value of disciplinary investigation is to simply reject history wholesale. This development of disciplinary research has been a marvelous step in the evolution of human understanding, and I certainly don't see us simply walking away from the study of disciplines any time soon, and I think it would be a mistake if we did. From an historical standpoint it is also quite natural that the depth of insight pursued by making these disciplines should have started at universities originally conceived under a very different worldview. What I am suggesting, however, is that if the university is to have any "meaning" (a word all by itself more shunned in academia than religious dogma) more than simply a localization of lots of different stuff (staffs, faculties, offices, laboratories, collections), we should be looking toward its value as an institution of education.

I am not talking here about anything remotely like "dumbing down" of curriculum. What I am talking about, however, is the pursuit of synthesis as a worthy, if constantly moving, goal. To the extent that specialist research insists that its current investigations are simply too complex to be understood by anyone not devoting their entire career to it, that the research results can't even regularly be translated into some ideational shape that can and must be entered into wisdom-seeking conversations, then maybe it should be occurring somewhere else. I am speaking of conversations, in the most inclusive and disparate senses of that word. And these conversations should be regularly entered among, not simply scholars of other research disciplines, but also as emerging conversations among students who, even at their young age, can be held to participating in such discussions as an integral part of their education.

If the specialist and subspecialist investigators insist that there is no meaningful translation, either because their investigations haven't matured enough for them to understand patterns that can be conveyed, or because they simply don't have the time for it, it does not follow that such research should not be pursued. There are lots of places to do that, and they are called research institutes, not universities, and they can be public or private, attached to a museum or a company, a branch of government or the gift of a philanthropist. To think that every one of these outposts of either esoteric or commercial research must also find a place on the university campus, whose presence ramifies out into the solidification of minutely cordoned-off disciplines as the point of the institution, is an exercise of sleight-of-hand composition of fluffy

mission statements to potential consumers at best, and is a deliberate act of deceptive surrogacy-marketing at worst.

If we are to succeed in seeking wisdom, one of the first things we must do, culturally, is come clean about what we mean by education, and get on with doing that. It doesn't matter how much we open up admissions to include the all of those who have been excluded historically when we have tacitly redefined what education is for. If education is not about seeking to produce new wisdoms, then it is just so much technical training for a particular job, and we should call it that. Would anyone seriously contend that one needs a degree from a prestigious research university so that one can "survive and thrive" in the "information economy," and that the reason for this is because there is some profoundly superior wisdom in the curriculum of a Harvard but not a state university? And yet it is true that with an Ivy degree in hand you are much more likely to get recruited for a position in a law firm, international business, or at the Department of State. Why? It is like gold. It is simply, by definition rare and therefore it has caché and social privilege.

Every literate person has heard the statistics of how few college graduates know that the earth goes around the sun and not the other way round, how many people think that dinosaurs and cavemen were walking around at the same time, and so on. If you want to scare a bunch of students tell them you are going to give them a verbal science literacy test, where they have to answer things that "everybody should know" one at a time, in front of everyone else. One could equally scare a lot of competent scientists if you put them in a room and told them that you were going to ask them questions out of their disciplines that everyone should know—in fact, I think they would be abjectly terrified by the prospect of showing their ignorance. The fact is that most science and mathematics is not easy to master (like the dog standing on its hind legs), and not everyone will be equally adept at it, and, yes, there are a few who seem "hard-wired" for it and pick it up right away, and that's wonderful. I honestly wish them every insight their peculiar talents might reveal, and I hope they will return with them to the larger conversations of society and the academy so that I can learn of them as well.

However, trotting out rationales for an educated public, and specifically for scientific literacy, so that our children will survive in the "Information Age" is

ludicrous. The reason to learn science at any age is because it is intensely fascinating, so engaging that it is absolutely worth the effort: not so you get a good grade, get into a good college, and (the ultimate bottom line) get a good job to compete in a global economy. For every legislator who rants about how we're falling behind, trying to scare parents that their kids are falling behind, I want to ask them (the legislators) to do a long division problem by hand or add two fractions, things we expect of our third graders. A lot of people do very well in the "knowledge economy," without knowing a *lot* of things that simply make life more interesting. How many lawyers or surgeons or economists or investment bankers (just picking from a sampling of knowledge economy winner professions) could give a coherent explanation for why we have different seasons, or why the Reformation was important? This is fairly fundamental stuff, here; we are not talking about jargon or arcana. And if we have now decided that a university education is for the training of youngsters in techniques they need to earn a living, then why don't we send them to very efficient professional training schools, for a fraction of the cost and time?

When I think of the roughly seven hundred years that we have had formal universities in western culture, and I think of the small sliver of the populations who had the privilege to enter those institutions, I do find that social exclusivity profoundly lamentable, and at several levels. At the first level is the individual herself or himself. It is lamentable to think of the vast numbers of individuals who existed in societies in which great ideas existed, but not for them. And in this perception, of course, it is not just the cloistered institutions that were not open to the wider public, but literacy itself was rare, along with the sorts of conversations in which one can engage when literate. To the extent that university diplomas became conflated with realms of association and much later with entry into professions, of course it is also lamentable that many individuals were effectively blocked from seeking to occupy those careers when they could perceive the injustice of it all up close on the cultural landscape.

However, I also think that this trajectory of education, to the extent that it ever was concerned with seeking wisdom through great conversation, as it has been at times, was greatly impoverished by the monocultural voices that were permitted in the conversation. To the extent that such areas as gender studies

and multicultural studies have become part of the conversation, and not just another discipline, they certainly have the potential, and in some instances have even succeeded, in bringing a richer conversation and different lines of sight toward wisdoms to the table. What I *don't* find particularly sad, however, lies at the level of discipline advancement, as though particular narrow disciplines were some sort of sacred trust. I don't, for example, wring my hands over just how much further along surgical techniques, or chemical engineering might be if only we had not been so unjustly biased in whom we educated for so many years. At that level, once one has defined the parameters and boundaries of a particular line of inquiry, I don't know that anyone by their heritage, ethnicity or gender, is any more likely than anyone else to find the next set of data or define the next technique.

To think in this way follows the same logic and view of professions and disciplines that actually occurs within disciplines and subdisciplines in the academy. The general arc of disciplines during the last century has been not to differentiate its emerging specialists from their mentors through larger conversations among the whole university. Instead the prescribed path is to tunnel deeper, and to support the identity and significance of the original disciplinary boundaries by multiplying capillaries in support of the discipline. This patterning is seen in every field of inquiry, whether the end point of training in that field falls under the category of the "professional" (business, medicine, law, and management being the new counterparts to the original professions), or whether the category falls under the heading of the academic. This latter broad category includes the arts, sciences, and humanities, where the recipient of advanced training is expected to continue deepening the paths of inquiry, and where the most traditional expectation for employment was that the student would himself or herself become a professor of that discipline.

Again, what one sees at ground level and across time bears the imprint of some very unsurprising human tendencies. If someone sees his or her life primarily in terms of devotion to a discipline, which defines and justifies itself through limited-membership association and the publication of intensive journals whose titles capture in physical form what life in that discipline is about, it is not surprising that the established generation would desire to see their work

continued. The continuing existence of their discipline, through a rising generation of specialist scholars and their subsequent publications, serves to satisfy a deeply-felt psychic desire that what they have been about is larger than themselves, but that their life's work will be preserved within that canon, nonetheless. At the level of the individual, it is an attempt to secure immortality, if only just a bit of it, and, considering the amount of time and effort many academics pour into their work, sometimes to the exclusion of nearly everything else, it is understandable.

However, when these psychic draws play out they tend to impress a very definite set of expectations on the life of an academic. Graduate students become not just apprentices, but almost surrogate children. Even with this implicit relationship, which is odd considering that the age of graduate students, in the main, does not place them in the role of children in any other aspect of life, there are better and worse ways to conduct a parent-child relationship. Some parents don't care what their kids do, as long as they don't bother them too much. Some parents are so intent on seeing their offspring as an extension (and thereby justification) of their own lives that they become overlords of their children's development, training, and choices, and nothing will get in the way of that child becoming exactly the preconceived vision that the parent has foreordained. Examples of this crop up in all walks of life, but we tend to hear about them in arenas of popularly understood celebrity, such as professional tennis or Olympic gymnastics.

There is an important distinction in the world of academics from that of the traditional parent-child relationship. The mentors in academics maintain the authority to choose their pool of potential acolytes, and they maintain the right to refusal throughout the duration of apprenticeship. And so, once again, it has been quite natural throughout most of the history of academic research, that if all this psychic weight of association and continuation were part of the process of mentoring the rising generation, that professors would be much more likely to select out their acolytes if they simply felt more affinity toward them, if these students actually could confer something of the sense of progeny. Academics were, of course, much more likely to gravitate toward students in whom they could see themselves at an earlier stage of life.^{xv}

vi) *The future of education: formal and informal*

There are some very definite implications for what we might expect of our educational process that proceed from both historical precedent, and from the nature of systems of knowledge and wisdom traditions. Our expectations must also be informed by the needs of contemporary society, which were not apparent to earlier generations. In discussing these implications I must also relate a debt of gratitude to many others. In fact, no one, and least of all myself, can stand apart from their associations and claim ownership to insight. Many of the topics I will be taking up are already on the landscape as operating exemplars, often without much fanfare, within certain universities and colleges, as well as in K-12 levels, and within communities. I cannot provide a comprehensive listing of these programs, and I am sure there are far more examples in operation than those of which I know. But I am always surprised to find how many times, when I think I have hit upon a truly novel idea, that someone else has not only thought of it but has even organized a functioning program.

I should like to begin with ideas about post-secondary education, and especially the notion of a college or university education considered broadly; and then move both forward and backward to explore implications for older adults and pre-college age students. In doing so I shall draw upon themes already discussed. In this process I wish to bring into more concentrated focus the purposes of education, as a public trust and cultural value, and at any level. In order to do this most concisely and sensibly, I need, once again, to make several more short illuminating excursions.

In 1950 the famous mathematician and computer scientist Alan Turing proposed his test for identifying a computer capable of Artificial Intelligence (AI), if one should ever claim to have been constructed. The test would involve a human tester holding conversation with two other conversants whom he could not see (presumably through a keyboard and screen). One of the conversants would be an adult human and the other conversant would be the presumptively intelligent machine. There should be no restrictions on subjects to be discussed, and one might easily imagine a topic that a human would know nothing of and concede that just as easily as the computer might not be informed on a subject. Turing's test is a statistical one. If in any number of random conversations, the

human tester could average no better than mere chance in determining which conversant was human and which machine, then the machine might justifiably be called intelligent.

For years, AI researchers took Turing's lead in trying to create machine intelligence. However, as researchers Kenneth Ford and Patrick Hayes have pointed out, this quest has proved not just illusive, but it strongly indicates that the goal itself is missing the point of machine cognition. They liken the power of the idea of replicating human behavior for AI investigators to a similarly powerful model during the nineteenth century with attempts to create mechanical, heavier-than-air flight. The desire for humans to break their bonds with earth and fly, bird-like, has ancient roots. But in the last century design after design was drawn and built trying to accomplish that by emulating birds. The imagery of the flying bird was so much with us, and so compelling, that a succession of inventors could only imagine artificial flight with the flapping of wings.^{xv}

Only when the Wright brothers abandoned that model did mechanical flight become possible. Once the new paradigm became the basic formulation, inventors and engineers no longer tried to make something like a giant artificial pigeon, which is both unworkable and unimaginably complex. But then again, as Ford and Hayes put it so well, "no bird can fly at 45,000 feet or faster than sound." In their work in computer cognition, Ford and Hayes are urging that rather than trying to emulate processes which humans do extraordinarily well and quite naturally, researchers should rightly be looking for avenues where machine qualities are vastly superior to human, and for interfaces where machines can extend our fundamentally human qualities to enable us to exploit our humanness more fully.

In deciding what kind of education is *worthy* for humanity, we should fully appreciate what we find remarkable about our species, and what we would like to understand, experience, and accomplish as a fitting response to the gift of being alive. This does not mean that because computers can do mathematical operations much more effectively than humans, and even in some cases construct mathematical proofs, that mathematics is an area we can write off as non-essential. The point is not for us to beat the machines in this case, but there is a

very singular *human experience* to be had in studying mathematics. Machines can also compose and perform music, but that does not in any way diminish what a human being *experiences* by studying and performing music.

Some of the things that seems to make us, as a species, unique include our abilities to synthesize information into systems of knowledge, and even to synthesize those systems of knowledge into larger and distinct insights. We are also able to empathize, as I have previously used that term, namely to transpose our individual experience and translate our wisdom to understand episodes and individuals whose experience is very distinct from our own. And this latter ability includes both laterally across contemporary cultures, but also through time. Most singular of all to the human condition is the ability to take these syntheses and empathies to project futures, both immanent and remote, including not just the details of trend-line extrapolations, but to imagine the qualities of possible futures we may *desire*. This is the process of envisioning, as opposed to simply the technical skills of prediction. The suggestions to come are those that would foster envisioning, but I think we can do much better than simply hope that envisioning will arise as a mental version of natural selection.

In seeking to ask ourselves to envision, the insights of specialized disciplines are essential resources to which we should all be privileged. There are even examples where the deep pursuit of a discipline has led the individual investigator to wonderful new visions with far-ranging implications. The example sited above of the neuroscientist Karl Pribram is one. Lewis Thomas, the late, celebrated cell biologist and essayist is another. After decades of peering through a microscope and adding specialized knowledge to his discipline, he found himself one day essentially “falling through his microscope,” very much like Alice falling through the looking glass. And what he envisioned as a result was that the life and organization of a single cell was emblematic of nothing so much as the world, taken as a whole.

Of course, we are all social creatures as well, and no one can declare absolutely the boundaries of the influences that their own insights. Or, in other words, we can never be sure what kinds of conversation with other individuals or with our entire encounter of life and the world give rise to insights. Still, these truly expansive insights can arise and take shape within individual

humans, and this ability, so far as we can tell, belongs exclusively to our species, and has no counterpart in artificial intelligence. Profound insights, syntheses, and wisdoms are available to individuals in conversation with a larger world. Wisdom can also be localized, in many individuals (perhaps holographically), and not only reside as separate pieces of information held by billions of individuals, only becoming something larger when taken in aggregate by some meta-human intelligence.

Let me explain by analogy to other systems of intelligence, living and artificial, why the ability of individual humans to synthesize understandings of large patterns of human culture is so significant. First, I do not believe that human thought and wisdom are “merely emergent” qualities. By that I mean that they are merely artifacts of something else, or that they can be accounted for by simply saying that the trillions of neurons in our brains are firing as a huge mass of (in computing terms) parallel processors, which when allowing for non-linear variables of positive and negative reinforcement produces any of the most profound sorts of projections (for example, deep empathy and imagined futures) which characterize humans. Even if strict material-reductionist interpreters of intelligence do, in fact, believe that this is how the human faculties work, the fact remains that we have nothing in the realm of scientific investigations that support this theory. That is, we have not produced any examples of networked cognition that resemble empathy or projection, not just in an entire network of simple organisms, but where each member of the network can be petitioned to express awareness of the whole.

Some would disagree, of course, and if my presumption turns out to be wrong, fine. I welcome any new insights, and prefer to embrace them, rather than base my intentions and actions on ignorance. In the field of artificial intelligence, for example, there have been some stunning advances, which have already challenged our notions of intelligence.^{xxvi} We can already build electromechanical robots that, singly, can seem to behave very much like single insects, say a cockroach or a termite. Of course, some insects such as ants, bees, and termites are by their nature highly social. Put a single bee or termite in a Plexiglas container and observe it, and in fact it doesn't do anything all that interesting. It may be attracted to light, repelled by certain other stimulants, and outside of that just kind of buzz around randomly looking for a way out.

Put thousands of bees together, or termites, and suddenly a very different overall behavior takes place, which one cannot get at by looking at the behavior of the isolated insect. Bees and ants differentiate in their behaviors, producing very elaborate patterns in their activities and in the physical structures that result from their activities. Yet it is very difficult to imagine how one (human investigator) might petition the information from any individual of the colony, which gives rise to such a complex hive and social activity. One possible insight from social insects is that, to a considerable extent, intelligence might simply be emergent. That is, with only a very few rules of operation, large numbers of such organisms will collectively produce what looks to the human observer as intelligence. When operating with pure information, that is snippets of recursive computer code, we can also induce a kind of patterning emergent order that might appear as, for example, a colony of insects. Perhaps we can get colonies of little autonomous robots to form such patterns of association as well. It is an interesting proposition, and one can only imagine what further insights could be pursued. The human observer sees patterns and dynamics that are highly suggestive, but we still don't know if it would be possible in these aggregations of stimulus-response organisms (whether live insects, robots, or evolving computer subroutines) to petition any of the elemental parts and get that pattern, holographically, to make itself manifest.

One test that the patterning of real insects is merely emergent (as some consider the activities of the human brain) and open-ended (that is, there might be some indication that we *could* extrapolate the theory of aggregations of simple rule-bound organisms to explain even higher-level behaviors that look even more like human consciousness when viewed aerially) might be to put a lot of social insects, say termites, in an artificial and "supercharged" environment. Colonies of certain termites in their natural environment produce physical structures that to the casual observer (not knowing what he is looking at) seem to be a fairly large sculpture, and likely the result of human fashioning. Suppose one were to place these termites in a large but enclosed area, with a very rich and continuous food supply, and being careful to remove waste products so they don't poison themselves or suffocate, and let them multiply. What might happen?

Would they, by the principle of emergence but amplified artificially by an order of magnitude, build even more complicated structures than they had ever been observed to do in the wild? Would they simply seek to isolate themselves into the same rough numerical groupings that they would in the wild, and build a lot of the same stuff? Would we observe, even with the problems of nourishment and waste seen to, that their social informational structure simply can't adapt to their being a significantly higher concentration of population, and they would switch into a previously unseen default mode and all kill each other? Among all the other things I am not, is an entomologist. I don't know what would happen in such an experiment, or whether, perhaps, such experiments have already been done.

Yes, there are those who would maintain that the human mind is merely emergent. Perhaps, but I don't feel that we are. I cannot prove that we are not although I see plenty of indications that seem to suggest that to me. At its base I can only say that I am impelled to believe it at a level one might call spiritual, and that to the very best of my ability to distinguish the difference among sources of insight, that this belief of mine is not simply a romantic desire to preserve the dignity of the self, or even more to the point, of myself. However, even if one is determined to reduce the human mind (and I don't mean by this only the physical organ we call the brain) to a manifestation of merely emergent interactions within some variation on the theme of a massively-parallel computer, we are still left with qualities that are not just remarkable, but so magnificent that we should be actively seeking to encourage them. These I have already mentioned, but may now be more clear in their interpretation.

While we may not know how, or if it is possible, to petition knowledge from an individual insect that would reveal the social operation of an entire colony, or, for that matter, whether such might be possible to evince from a colony of robots or lines of evolving computer code, we do know that individual humans have the ability to comprehend global concepts of structure and development. Furthermore, we know that as global concepts and structures change, the individual human can perceive and understand change. Beyond that, we know that individuals can imagine all sorts of things not simply before them, either as immediate landscape or transferred remote information, such as from a book,

although these sorts of informational patterns have the potential to help catalyze the imagination of the mind.

And as I have been urging, we also have the capacity for empathies, meaningful envisionings, and wisdoms. I think it is essential, at this point in the evolution of human consciousness, that we realize these qualities, that we seek to encourage them in everyone, and that we make the cultivation and expansion of these qualities explicit in what and why we teach our students, of any age. Of course, it is difficult to encourage our students to seek wisdom, and to generate new wisdoms, if we (as teachers, mentors, parents, and brothers and sisters in the human family) do not believe ourselves that this is really what our children and we are uniquely called to do. If we do not believe in this transcendent life work, then the only encouragement for a meaningful future we can offer our students is to try to pack into them as much as we currently know, and wish them good luck.

As we proceed to consider some particulars for educational patterns of content and learning structures that would proceed from the pull of encouraging new syntheses and wisdoms, several ingredients are, and will always be, significant. The first is the idea that collective insights are of a different nature from individual insights although once elaborated these insights can be comprehended and taken further by individuals. The learning structure that produces collective insights is, taken most broadly, conversational and multi-modal, rather than unidirectional, from a single source to a passive receiver, whether the receiver is an individual or a group. However, in constructing environments for such conversational learning we must be aware of certain responsive tendencies that seem to be part of our natures.

To begin, as we all know, if we have taken part in various aspects of the culture of information, especially computer-mediated communications, there are thresholds of both individual mental attention and the number of sources and amount of information presented that must be respected, and to a considerable degree we can find cues to these thresholds in face-to-face conversation. If you are in the company of many people, say, at a meeting for a purely social party or for a meeting with an agenda, in the time before everyone settles down (to dinner, or a series of presentations), the aerial view would be somewhat very chaotic and certainly noisy. If you were to hang a microphone from the ceiling

and listen, without being able to visually look at individuals, it might be impossible to discern anything but an ebbing and swelling of overall noise that sounds kind of like people, but, outside of the occasional booming laughter or shout, you might not be able to discern any separate words at all. And in fact, actors and sound technicians can do a fairly good job of producing this large scale effect by generating a whole bunch of meaningless words, syllables, or phonemes (hubbub, hubbub, homina, homina, etc.).

If we are actually in this group of people, or if the aerial sampling is supplemented by video, one finds that people tend to group into either dyads, triads, or perhaps groups of no more than six for conversational success, and they face each other to pick up on full body expression and vocal tonalities, which allows them, mentally, to focus and filter the huge amount of stimuli into a small subset with which they can engage. In my own experience from teaching in conversational seminars, I have found that even in the most idealized setting, where extraneous noise is absent, where the pursuit of a single topic is expected and encouraged by all participants, and with a skilled facilitator who can help both to catalyze discussion directions and provide a respectful participation of active listening, and where all participants are able to fully see each other and read inflections and emotional tones of consonance, dissonance, and urgency, the number who can fully participate simultaneously roughly doubles from the number who can participate in a random, or audibly challenging context. That is, it seems that even for a well-modulated conversation with focus built in, the number of active participants can be very effective with numbers of a dozen to, perhaps, fifteen. Larger groups seem to fall into a necessary division into more appropriate sizes of critical or sub-critical mass.

Even given these structural elements of a "learning community," which I alluded to earlier, transcendent syntheses and wisdoms that are life changing for the participants are likely, but not always assured. It also helps if the teacher involved is herself sensitive to the directions most catalytic to these syntheses and wisdoms, and can help all the participants recognize their emergence and draw attention to it. This awareness of a gifted facilitator is a sensitivity much like that of an artist, who can frame even the mundane and present them as wondrous, things we normally are predisposed to not notice because, as Wittgenstein said, they may seem simple, familiar, or just always with us.

Powerful insights and rich conversation become the order of the day if the teacher does not simply notice these things from time to time, but actually projects very real expectations that epiphanies of wisdom will occur, with regularity, and that the students should likewise cultivate an expectation of them from among themselves. In short, it helps immensely if the teacher cultivates a heightened awareness of envisioning among students. Rather than try to elaborate on all of the various events and episodes that might be signatures of this kind of learning, I would do much better by referring the reader to someone who has already written about them from personal experience, and in ways more eloquent than I could write them. I would hope that everyone who is passionate about education might avail themselves of the words of Parker Palmer, in his recent book, *The Courage to Teach: exploring the inner landscape of a teacher's life*.^{xvii} This monograph is by far the most significant and inspiring book I have read about education as a transcendent path, written by an educator. In the main I don't make a point of reading books about education, as they are nearly always devoid of vision and are mere technical surveys or policy studies written in service of flatland presumptions and goals (especially, national competitiveness in the global market economy), and are produced by individuals who seem never to have experienced transcendence in teaching themselves.

Where might these observations lead us when considering the landscape of education as a whole? It is time to elaborate some particulars, but I wish to mention, again, that these particulars, in many instances, have found expression in various institutions and locales, and that further, this elaboration is intended to simply help in the process of a cultural envisioning, rather than providing a concrete and immutable model. And for almost any wonderful example, there are wonderful exceptions that seem to be very nearly opposites, and so any particulars given are, at the very least, encouraging of variations and modulations many of which are beyond our current imagining.

I would hope that everyone has had at least one teacher in his or her life who was truly inspiring. If you were so fortunate, sometimes that teacher was one who expressed the very sorts of qualities of larger syntheses, vision, and encouraging as creative agents, working as a learning community. But I know that these are not the only model teachers who have positively affected students'

lives, when I have asked them who their best teachers had been. Some memorable teachers focused in on certain students with individual mentorship, and some had been so fascinated with the implications of the insights of a particular discipline that they almost seemed to forget the students, but somehow pulled the students into their enchantments.

What these responses tell me is that there should always be room for exemplars of different stripes able to express their own particular passions and personalities, and not every effective and inspiring teacher can be shoehorned into a singular model or structure. After all, such variety is part of the grandeur of the human experience. Where we continue to err in our educational systems is only partially structural, but it is nothing so simple as merely a problem of no structure (leaving students adrift) or too much structure (killing the creative agency of the teacher), although both extremes have been attempted and have failed. We wish both teachers and students to be creatively engaged and enthralled by the experiences they share. We must take care to avoid imposing structures of education that are inimical to broader possibilities of encouraging experiences that inspire our students as creators of knowledge, wisdom, and visions. My suggestions, therefore, are of a kind that can serve as points of departure in structures and purposes that encourage the seeking and forming of deep insights and wisdoms among many students, rather than as the preserve of a few students who simply have a gift for envisioning and an awareness of that gift.

The sorts of structures that I think might encourage and catalyze more vision, a more transformational educational experience, and richer lives of engagement, then, are those which embody the art of conversation as a primary goal and recurring ingredient. Courses, especially at the level of general education, are designed around grand themes, as opposed to a checkerboard of catechisms of single disciplines. They engage large questions in which the individual students are invited to synthesize past knowledge with current information and realities, to find the limits of their understanding, the paths most richly inferred for future investigation and synthesis, and a constant reference back to the learning community itself as a source of wisdom. That means keeping track of the trajectories of individual and communal insights, a

biography of ideas as the course progresses, and using that biography and those trajectories as themselves worthy of further discussion and analysis.

In other words, the “text” of the course is not just the variety of books and other information used to inform conversation, but the learning community also generates, over the course of the semester, its own text of synthesis and understanding, every bit as worthy of penetrating inspection as the text of the published authors. Every course taught should have as a part of its implied purpose a deeper understanding of the experience of creating wisdom, and when students are working these themes out, intensively and in the company of each other, they are by that very dynamic structure immersed in the transformative experiences of empathy and transposition of the self.

Once again, if we as educators are true to our missions and statements of purpose, we cannot hope to be effective mentors if what we expect of our students is completely distinct from what we expect of ourselves. If we actually do embrace the idea of interdisciplinary learning communities for our students, but ourselves remain separate from other communities of learning, we are not providing anything like a working vision to our students. For example, at many institutions there are courses offered on occasion that are billed as interdisciplinary. In operation they are often coordinated by one professor at a time, offered to large lecture sections where all information flow is unidirectional, and where the spectrum of disciplines is presented as a series of specialty lecturers who appear in succession to give a lecture on their own deep-tunneling research that is supposed to fit into some bigger theme. These lecturers are themselves usually not invested in any significant way in the development of the course themes, they don’t attend each other’s lectures, and their appearances are like a series of pinch-hitters, brought in one at a time for a succession of “at bats.”

Calling these “sampler shows” an interdisciplinary course, as a student experience, is kind of like putting a red rock next to a white one and calling them both pink. If the succession of pinch hitters have no interest or time to discuss, as a learning community, what a transdisciplinary pursuit of meaning might lead to, why do we expect our eighteen-year-old freshman to see anything at all in the passing parade? Instead, they have been presented with (ostensibly as some kind of exemplars of wisdom and achievement) a serial exposure to

specialists who find it laughable that they themselves should be generalists, let alone conversationalists. Furthermore, there is no presumption that the students themselves might bring anything to the table of discussion that is worthy, original, and perhaps even catalytic in producing insight in any one of the succession of lecturers.

I do think that there will always be a valuable place for discipline-specific research. However, taking those disciplines and subdisciplines as the summit of education, and then reading them back on what we expect of students is not merely a mistake and unproductive, it is toxic to the imagination and spirits of our students. We may also want to continue to have research institutes for even deeply-tunneling disciplinary investigations on the campuses of our universities. Yet even these institutes, I believe, in order to constitute anything even vaguely representing the original meaning of university and contributing to the generation of general wisdoms (deliberately plural) and their transmissions should be able to engage, at some level, with learning communities, and not merely among their cohort specialists at other institutes.

At the level of faculty, I do not think it particularly useful to make a simple bifurcation between “teaching faculty” and “research faculty.” Nor is it particularly helpful in generating new wisdom to simply coerce those called research faculty into grudgingly teaching a few graduate seminars in their narrow specialty, or even more grudgingly to teach a general education level biology course (for example) once every two years. I don’t particularly care whether specialty researchers who are exceptionally good at what they do teach at all. I do think that in order to be a meaningful and functional part of a university, the mission of an institute should include a need to be engaged in conversational communities of some sort, and not only giving, but receiving suggestions on the meaning of what they are doing and how best to translate that for the enrichment of the educational mission of the university’s students at large.

However, the qualities of educators who can truly inspire students, collaborate in the evolution of learning communities that foster wisdom and seek ever new insights, are even more rarefied than those of the gifted researcher. These are individuals who are not teachers by default, instead of becoming something else. They are intensely curious about all sorts of things, and driven

by the joys of transcendent experiences among their students. They can inspire students to see visions in their own conversations, and stimulate resonances of recognition among their colleagues and students. As these mentors eagerly participate in and encourage such conversation they teach, by example, envisioning as a way of life and an exhilarating goal for education. Individuals need to see this process in action, to be part of active questing conversations that extend and overlap over the course of semesters and even years to catch the vision of its transcendent significance. To be in such company is life changing, and certainly a worthy cause around which to build a university, and a noble goal for the cultures that embrace them.

I would like to try even more specificity, by way of examples, to clarify ways to manifest such prospects for education as cultural and institutional goals. Once again, though, I feel constrained to emphasize that these are examples, only. Without highlighting that strongly felt aspect of specific teaching activities as revealing of qualities of learning communities (that they serve as catalysts for further visions), the very elaborations of examples can easily be seen as more constricting, more prescriptive, and less admitting of creative variety. We need specific examples from the classroom to make the vision sensible, without insisting that those examples are also the final word on curriculum or technique. The danger of confusing examples for final and universal imperatives is one reason why individuals writing this or that observation of cultural trends often prefer to remain at the level of critiquing that which is patently broken. And to the extent they offer suggestions of a positive nature, these analysts often remain at the level of generalization that admits of universal agreement but no ideas for implementation. And so, having tried to avoid being misunderstood, I will make some further observations that seem to be useful, from personal experience.

One of the more notable examples of programs begun at universities to generate some version of a larger vision among students was inaugurated well into the period of the paradigm of the research university in this country. These were called the "Great Books" programs. The most famous was the great books program inaugurated at the University of Chicago by one of America's preeminent thinkers and reformers in education, Robert Maynard Hutchins. Chicago was already renown as a world-class research university in both

established and emerging disciplines in the natural sciences, social sciences, and humanities when Hutchins assumed the presidency there in 1929, where he remained until 1945 when he became Chancellor until 1951. Hutchins was strongly disposed toward a program for undergraduate education that seems almost like an update of the original university philosophy of Scholasticism, which included a study of the great philosophical works through history, as well as logic, rhetoric and mathematics.

For all its merits, I do not think this curricular structure is the most appropriate one for our time. I do not make this judgment lightly, out of deference to winds of fashion, such as the increasing pressure to produce specialized research to serve a highly technical society, or to avoid the huge flap that emerges when anyone actually tries to list what the essential canon of wisdom ought to be that students should learn. Instead, I feel that that a fixed content, great books program is missing the mark because it does not sufficiently address other realities of our times. In avoiding these powerful and emerging intellectual, cultural, and social themes of our times, such a curriculum misses the most fecund approaches to inspire students, to involve them in great discussions of evolving wisdoms, and ultimately to encourage them to envision that which we, the larger culture, can only dimly perceive, if at all.

In the first place (and I will for ease of explanation consider the western canon here), whatever listing we might assemble of critical and seminal thinkers of the past, were not merely original, reaching however they might beyond the constructs of their own flatlands, but they were also fully immersed in their times and informed by it. A full appreciation of what made these thinkers rise above their peers must include a full appreciation of their contexts. To understand Aristotle in full, one must also ask what the world looked like when he (Aristotle) got up in the morning! What was the informing environment of “givens” and “obvious truths and patterns of living and conversing” that were so much with Aristotle that he doesn’t feel the need to even mention them? This deep contextualization is very much worth doing, but we have some very natural constraints on what we can do with any program of education with real human beings and their developing wisdoms as the purpose. Namely, there is not sufficient time in any college curriculum, even if extended to five years for the undergraduate program, to explore every cultural context of any pan-historical

and pan-cultural listing of great books. We must make choices about how much can be read and internalized, and how best to take deep investigations of a finite number of subjects with our students that will serve them as “wisdom examples,” as they become life-long learners, and not always at a formal educational institution.

Therefore, any successful model for education needs to include the realization that we do not have an infinite amount of time. Even if, as I will later suggest, we were to build into our cultural assumptions of the good society a regular revisiting to great discussions throughout life, we still must accomplish meaningful results for our educational endeavors AT EVERY STAGE, and not simply defer the possible realization of the romance of learning and creating conversational wisdoms for when we become octogenarians. This satisfaction of experiencing meaning and wisdom in a reasonable amount of time is especially crucial for our youngsters as they begin their journeys. Four years, as perceived by an eighteen-year old is a very much larger fraction of their lived experience to that point than it is for someone forty or sixty years old. And, it is at this very juncture when they are most able to be truly inspired with what they might contribute to the world, on the one hand, or convinced that the period of apprenticeship they must endure before their opinions count for anything are not worth the effort.

We should design our curricula in a manner that elevates the meaningful participation of the student while not diminishing the power or intent of the insights they encounter, and there are ways to succeed which have the most wondrous effects on students and faculty, especially if they are committed to the evolution of a learning community. The first key is to invite synthesis of knowledge by students as early and often as possible, even during the first semester of their first year, and not wait until their senior years when they have absorbed enough facts that we deem them worthy of trying to assemble big-picture views of history or literature or any of the arts and sciences. This means that we must consciously design what we teach to allow meaningful synthesis at regular intervals, based on limited information and knowledge that the students have learned. It also means that we must be kind, and not slap down the student who, in seeking bigger patterns of meaning, goes beyond his or her knowledge base at the time.

Why is it so crucial to develop the art of synthesis early in the educational process? And what kinds of contemporary curricula can take greatest advantage of opportunities for synthesis? We find such informing keys even within the very individuals who have endured for centuries as paragons of wisdom. All of them were themselves not mere specialists, but were marvelous synthesists of the variety of knowledge and experience available to them at the time. Unless one is going to fall into the trap of imagining some heroic age of intellectualism, broadly distributed, in some past golden era, we must realize that our own times are also producing masterful synthesists, and we are squandering one of the best resources of our own time if we ignore them.

In order to actualize these opportunities in our institutions of learning, we must carefully consider our roles as educators, and what it has come to mean, professionally, to be an academic specialist. Suppose that our culture, or even a given institution of learning, were to consider it valuable for undergraduates, whatever major they might choose to pursue, to also come away with some knowledge of the arts and sciences more broadly. We know that the majority of our current institutions fail miserably at this, whatever collection of required general education courses we throw at our students. Students forget nearly everything they are exposed to after having passed the requisite tests. These results seem to me to be expected, rather than a shocking result, considering how we present our discipline-specific courses. Suppose we also thought it to be useful to have some working sense of the history of cultures, not divided up by artificial time constraints. Now imagine simply throwing a bunch of specialized researchers in a big room and asking them what counts for literacy in their fields, and then locking the door until they could come up with a curriculum that satisfied each of them, and would provide a memorable and exciting overarching experience for youngsters between the ages of 18 and 20. If you are having a hard time visualizing such an exercise leading to a successful vision, and not wholesale bloodletting, or everyone retreating moodily to a corner and refusing to participate in such an inhuman activity, you are not alone. But to start with the aggregate of simply "what is," or in this case "what education has become," as the necessary point of departure may not be the most appropriate.

What if, instead of beginning with our current configurations of professionalism and specialization and institutional accretion, we start with

something much simpler. We need a concrete entity so distinct from the bureaucratic culture of academicians that we can escape the tar-pit assumptions that confound envisioning. Let's start with a single book. For this example I will suggest one of my personal favorites, realizing there are many others one could choose from among. My nomination for a book to catalyze thinking differently about the culture of education is a contemporary masterpiece of synthesis: *Coming of Age in the Milky Way*, by Timothy Ferris.^{xviii}

Ferris has had a number of career titles, including documentary filmmaker, science journalist, and professor of science writing. His lifelong passions, however, have been astronomy and cosmology, and he has written with extraordinary eloquence for the larger public, seeking to awaken them to the romance of this science. However, in *Coming of Age*, Ferris exceeded the scope and vision of this exploration throughout human history beyond anything I had previously seen. Yes, within this single text the reader will learn a lot about astronomy, physics, and cosmology, written in terms that the uninitiated can understand without in the least compromising the ideas themselves. That, in and of itself, is worth the price of admission.

But Ferris goes far beyond even these grand intellectual quests. He goes back to ancient civilizations and describes the art of map making, the sort of early exploration available by ship, from when they were largely coast-hugging journeys because there was no way to know where one was without landmarks, and of the peril even in that. He talks sweepingly of ancient cosmologies, and what the cosmologies inferred about the meaning of life, individual and cultural, among those who generated those cosmologies. Ferris includes so many of the telling details, biographical sketches of significant and often idiosyncratic personalities, the histories and episodes as best we can infer them as lived experience within those cultures, and all the wonderful scientific reaches. And what emerges is the greatest drama of all as the driving force behind this single book. That drama is the persistent, cross-cultural, and timeless drive for humankind to find its place in the great constellation of existence. The big story that pulls the reader into this compelling adventure is that we make *maps!* Whether those maps are local cartographies, cosmological maps, mythological maps, personal memoirs, great literature, the rise of wisdom paths and religions,

indeed, virtually anything and everything, *we*, as a *species*, are continually driven to find out the landscape of *where we are*, and *what it means to be there*.

Taken this lyrically and grandly, an exploration of a field of inquiry, like Lewis Thomas's single cells under a microscope, blossom through to a passionate vision and embrace of everything, of all we know. And such lyricism sets the mind in a state of wonder and excitement. Wouldn't such bold and open-ended intellectual journeys give place and meaning to everything one might experience or read from that point onward? Instead, our most familiar curricula and methods feel like being buried beneath subsets of information with no spiritual pull to it, information that speaks to nothing resembling an inquiry of what and who we are, and what we might become. One comes away from encounters with studies that use the best synthesists for their points of departure not just with a lot of knowledge, which is wonderful and memorable because the knowledge has place and meaning, but also with the very vibrant sense of a journey, of visions yet to unfold, and a celebration that one is privileged to be on that journey. Such encounters resonate and vibrate, and leave everyone aching to continue in great conversations of our pasts and our futures. These conversations are memorable, and they are ennobling.

If one were constrained to place such an educational experience under a name, perhaps it might be called "Maps and the Human Experience," where "maps" are considered as broadly as described above. And such a curriculum would not only invite specialists to see their own disciplines with an inviting and aerial view, but would encourage them to value their own best insights in wonderful collaboration, rather than competition, and being part of these discussions among disparate faculty could not help but inspire the participants. Now try to imagine if these same faculty did not stop at these conversations, and reigniting their joys in teaching, but saw it as a context to continue to pursue grand, meaningful, envisioning conversations, reinventing their syntheses and curricula every year.

What would such a learning community do for students who saw their mentors engaged in such continual excitement and envisioning conversations? What if the students were taught in such a way that they could participate in these great conversations as well, and indeed that this process of the dynamics of

ever-evolving syntheses was held out, explicitly, as why learning is so precious and transformative? Now imagine these students, millions of them, many choosing to further pursue discipline-defined professions, but having experienced the wonder of regular and inspiring conversation in learning communities, being inducted with open arms into other communities, into their society at large, where we value them for their visions and conversation, and not just their parochial technical skills.

Again, to return to the particular example of map-making and the human experience, Timothy Ferris' book is, for me, a wonderful example of scholarship, of superb writing, and of weaving a large transdisciplinary fabric that invites further syntheses and envisioning. This is a favorite book of mine, and I offer it only by way of example. It may not be one of the texts chosen by other faculty, even if they were to contemplate a curriculum whose overarching theme was the human drive to explain their place, across times and cultures. There are other works when arranged to illuminate large arcs of the human experience that could be chosen, and it is important that the faculty themselves be inspired by their choices. It is also true that students arrive at college at many different levels of preparedness for such studies and conversations, and these abilities must also be taken into account when designing curricula.

Perhaps a book such as *Coming of Age in the Milky Way* would require many students to spend their first year developing preparatory skills of engagement with such writings, as well as in critique and synthesis, and in the skills one must bring to learning communities, such as active listening, clear exposition, and empathy. However, in my experience, courses that are simply about acquiring information or a skill, and do not at the same time engage an exciting theme that is not simply collected information or the particular skill itself, more often fail than succeed and can leave the students dispirited. Students must feel, and not as a sophisticated ruse, that what they are about is worthy of itself, and not merely paying the dues of apprenticeship before they can do something interesting.

Another example comes to mind by way of the invitation to genuine adventure and original thinking. In the Ferris book I've been describing, one might generally capture its broad strokes in saying that it explores the ideas of

human individuals trying to comprehend where they stand and why. If one takes the trajectory of contemplation and moves it in the other direction, that is the human desire to understand the interior self, one is led inexorably to equally expansive and compelling histories. Even if a professor, or a group of faculty, were to take on this broad theme for a multi-semester, transdisciplinary educational experience, the typical way we approach such concepts is chronologically.

That is, one might examine the sense of the individual implicit in shamanic cultures, in Homer, in the great monotheisms, under imperial imperatives, etc. Later one might consider the writings of Descartes and Shakespeare together as the first clear evocations of the invention of the modern, western self, setting an important cultural climate for Enlightenment concepts of individual rights and so on. Then one might proceed to examine the intellectual landscapes of the consciousness theorists (Freud, Adler, Jung), and the rise of behavioralism, and on to postmodern considerations of the fractured selves in uneasy conversation with each other. What a journey, indeed!

But is such a curriculum structure most suited to the life experiences and intellectual and psychological contexts that 18, 19, or 20-year-old students are likely to have? By working strictly chronologically, one is beginning with a conception of the self that is perhaps the most difficult for a present-day student to understand. On the other hand to simply throw the students at any of the other grand theories and their shifts presupposes that students have an articulated model of the self that will be surprised by the contrast and therefore will be awake to its implications. How do you best begin a student on the path of discovery and synthesis, so that, right away, they are awakened to what they already know, to what they think they know, to what they have never considered before, and to a conversation of wisdom, and which will set their interests and drives to a high level of alertness and eagerness?

In this case another author comes to mind, which may or may not be a favorite of faculty designing their curriculum. But I immediately think of Oliver Sacks, and in particular his books *The Man Who Mistook His Wife for a Hat*, and *An Anthropologist on Mars*.^{xvix} I have used each of these books at different times and for different courses, and besides being so beautifully written, they are, to

me, examples of a very high order of the distinctions between information, knowledge, and wisdom. Sachs' essays are all thoroughly suffused with wisdom, not necessarily answers, but a stunning aerial view of personal episodes of patients he has known that certainly requires a lifetime of learning on Sachs' part. However, Sachs also expresses and evinces from his readers the very high art of empathy, and this is what distinguishes wisdom from even the most profound of intellectual theories.

If you are familiar with the works of Oliver Sachs, you know that one of the remarkable signatures of his essays involves individuals who, for various reasons, have lost some fundamental element of perception or cognition that the rest of us take for granted. As a result, many of these individuals have reinvented their core sense of self to accommodate these changes, and to retain a coherent narrative of their world, in ways that are breathtaking. Through the most stunning transpositions, Sachs attempts to enter and understand their mental landscapes. I have yet to introduce these books to students without their being deeply moved, and provoked to ask questions on the nature of being and consciousness which they eagerly admit they had never thought of before. Sachs writes for the lay reader, providing all background material (results of both his scientific training and his deeply ecumenical interests) necessary to understand how and why these episodes are so revealing and inviting to wonderment. Of course, the more one has read and pondered before coming to his work, the more one also appreciates the depth of insight and the artistic beauty of the prose, but they can be approached and engaged by first year students as well. And once they are drawn to this magnificent adventure in exploring the human enigma, they are much better prepared to find their own abilities to understand and transpose their own models of self across time and cultures.

It is essential for students to be explicitly informed that they are embarking on a grand, expansive adventure right from the start, from the first day they step on a campus. They must sense that the faculty and the institution are genuine in this exciting invitation to a grand adventure, and that wisdoms will emerge conjointly among faculty and students alike. These wisdoms will certainly have much in common from year to year if they are tapping into insights that are not just random quirks but are rooted in the human experience, from which we expect to find more themes that persist than those which appear without

patterns or signifiers. However, it should also be expected, if the curriculum is truly alive for faculty and students alike, that the class entering one year will not have exactly the same experiences, themes, and conclusions during their learning community conversations as will the class entering the next year. I must emphasize, such variations and unknowns as arise in learning communities (even between two seminars simultaneously following the same syllabus) are to be encouraged, not shunned. For in this vision of education, we are requiring the university to evolve once again. Once the university was the place where one was expected to master the "received wisdom," to allow those of privilege to be the "bearers of culture." In the vision I am describing, we are asking students to help us compose new wisdoms, and that creative act must be alive, meaningful, and polyvocal.

Again, to use the example of languages, living and dead, the surest signature that a language is no longer in use is that it can be defined comprehensively and finally in a dictionary, however large. It is only completely definable because it is a fossil, a fly in amber, no longer a living organism. Faculty can make similar inquiries of what is happening in their general education learning communities. If the curriculum begins to take on the appearance of a static catechism of insights, things which can be codified and simply handed down, rather than evolved among the current conversants, that is emblematic that the learning community has lost its essential vitality, and has become a training academy. A faculty involved in such an enterprise should be in regular conversation with itself about the vitality of what it is doing. The students should be encouraged to synthesize, to create, and to offer new wisdoms, not merely to emulate. And the students should also be part of the conversation, at different levels and with some regularity, about the work of that learning community.

As wonderful as the experience of such lively learning communities can be, there are yet other elements that I feel strongly should be included in the university experience. The first is experience outside of the classroom, and not only of a socializing nature. In this regard I am greatly heartened by the intentional growth of opportunities, at many institutions, which invite and encourage students to complement their formal studies with experiences in the community and beyond. I find it very encouraging to hear that volunteerism,

student-initiated projects of all sorts, and internships and fellowships with a wide spectrum of organizations are becoming less the exception in students' lives and more the pattern of the day. They provide manifold opportunities for students to receive spiritual fulfillment knowing that they are already contributing to efforts larger than themselves. It also allows them to become mentors, to seek out mentors of a different sort than may be on campus, and to bring real world experience back to their learning communities as they seek wisdom and envisioning.

Another element I encourage students to avail themselves of is something I call "deep practice." By deep practice, I mean to search for some particular passions, to follow them, and perhaps attempt pursuits wholly new to them. The particular pursuit does not need to be anything so structured as to be their declared major or minor on the way to a degree although the student may decide to do just that. Rather, I encourage them to immerse themselves in at least one pursuit very different from what they normally do. When students tell me, for example, that they are beginning to study painting or sculpture, theatre or dance, or music, but sheepishly admit that they don't know exactly how they will fashion those courses into a major or minor, I try to be quick to reassure them that it is simply a wonderful opportunity for its own sake. Of course, the passionate avocational activity does not need to be in the arts, but it is a particularly immediate example for what I mean by "deep practice." Perhaps most significantly, a deep practice should involve a way of knowing, doing, and understanding that illuminates the mind through different ways of knowing from one's usual studies.

Learning not just the history of music, or theory, but also devoting oneself to being able to create music is an experience I find difficult to describe in words. Music is a language, to be sure, but it is so different from any other form of discourse that the creation of music comes as a revelation to those who experience it. It does bear some resemblance, I think, to the nature of storytelling as described in the introduction, and also in the example of the Laguna woman trying to help her composition teacher understand the use and experience of story in the Native American tradition. The creation of music at its best, no matter what classification we give to the kind of music, calls every participant to a completely different plane of mutual awareness and

transcendence. I feel fortunate to be at a school that has, among other things, one of the best jazz programs in the country. The faculty are themselves accomplished artists of the highest order, and they bring in top names for concerts and symposia with the jazz students.

But I also love to go to the student concerts. True, they are talented and devoted, and, they have mastered the techniques of their instruments. Still, to see a combo of students, as a group, take off on the most supernal flights of musical fancy is a marvel to behold. Even with all their individual skills and ideas, when they are in their groove they become an organism, and this higher state of consciousness shows in every aspect of their physical being. When the voicing is handed over to the pianist, or the acoustic bassist, or a horn player, you can see the rest of them all light up in the beauty of what is coming to life, you can feel their collective imaginations, energy, and creative empathies feeding each other and they all soar. There are light and beauty and pure visions pouring forth, but no grandstanding. If anything, they seem genuinely reticent to seek the audience's recognition of the "one great solo ride," because as wonderful as those solos are, they don't want to detract from the even more transcendent experience that they are all having together. And I see the joy of co-creativity with students as young as freshmen!

What ought to be university experience? Can we envision one that could be transformative for the individual, and even more transformative for the culture that embraces it and encourages it? The culture that succeeds would be able to state, with excitement and compassion and hope for its rising generation, that there are wisdoms to be found. Such an institution, and its larger culture would be clear that we have only intimations of what those wisdoms may be, and we will do our best to help you in seeking and acting on these wisdoms. We, as adults and mentors, could say this, not apologetically, but by way of invitation to purpose and meaning, for that is truly each new generation's calling. By any measure this is a great adventure, and the entering class should be challenged to arrive at insights that we cannot yet perceive. We need them to do that. Not just to find a niche in the information economy, or even to be the equivalent of emergency room doctors who will somehow repair all of the injuries that we have incurred. You deserve to experience transcendent joy in whatever pursuits you choose. What we ask in return are your visions.

vii) *The Conversational Community: reading out from the university*

There are several patterns that come immediately to mind when considering the effects of learning communities, beginning from the arena of the university and a formal educational experience as they extend outward through society. These patterns suggest activities and formats that may be attempted to most effectively produce a coherent fabric for a society that values and seeks to promote wisdom-producing conversations and their applications. First of all, the concept of mentoring is central, but there is no singular model for a worthy mentor. In the ideal case, everyone ought to be both mentored and mentoring. Even within the formal educational context, there is a significant and enriching blurring between the lines of students and teachers in learning communities.

If there is a compelling underlying reason why mentoring is effective in a formal institution of learning, we ought to be able to translate this pattern into other social, professional, and cultural contexts as well. In doing so, however, we need always keep in mind that there are, in fact, different stages of psychological maturity during the life of individuals. The stages of widening understanding (of the self and the other, and of empathetic understanding of other cultures at a given time, and also across time) while not precisely age-specific, can still be used as general guidelines for what sorts of learning community activities are most appropriate for individuals and generations.

There are other considerations that arise from observations of the historical insights we have of the nature of human association. Here, I find myself harkening back to some of the qualities of the "pastoral ideal," which we have discussed in some detail. You will recall that in one example of an agrarian nineteenth century community, I posited a geographically located community of perhaps several square miles, and with a population of something on the order of 500. The rationale behind using these parameters was to make sensible the community understanding and empathies that, among other things, directly affected the sorts of communal policy decisions (politics) that would arise.

That is, there are certain presuppositions that all community members bring to their personal associations, as well as to deliberations of what projects the community might undertake. In the nineteenth century agrarian community,

these presuppositions included an implicit understanding that the patterns of anyone's productive activities were either identical to one's own work, or, in the case of those not engaged in farming, were fairly easily comprehended by the rest of the community. Furthermore, the very geographic proximity of the community as well as the high degree of interpersonal connection, gave a very concrete image to communal actions. What ever they decided to do as a community, they were going to have to live with as a community, and they would have to deal with its after effects as a community of individuals known to itself.

I am not suggesting that we turn back the clock, and remake the world as an aggregation of early nineteenth century agrarian communities. That is not possible, nor would it be desirable for a host of reasons. What I am suggesting is that we not automatically dismiss insights we might gain from this sort of community, with their failings and successes, as we contemplate how best to begin experimenting with the new wisdoms of learning communities. We may need to pay attention to some of the forms of social organization that formed, by default, before the full expression of the Industrial Revolution, as a starting point in envisioning the plurality of visions of the future of society.

The forms I am speaking of are those that most directly foster the quality of empathy, for the transposition of one's personal view (the universe emanates from my eyes outward) to other views of lived experience. One of the limitations of the pastoral ideal was that, while such transposition was necessary for cohesion and survival, it was often not very expansive. We tended to cluster into groups, ethnic or religious, with whom we already felt there was a very high degree of commonality. Swedish immigrant farmers tended to congregate into "little Scandinavias" of communities, where they could continue speaking Swedish, many families were already known to each other, and virtually everyone was Lutheran.

The fact that these cultural commonalities also were defined by geographic proximity produced more homogeneity, rather than challenging the new community to come to grips with the meaning of community in more diverse terms. In this country we have seen a steady appearance of ethnic, cultural, and linguistic subcommunities during the nineteenth and twentieth centuries. It has also become increasingly apparent since the middle of this century that many

other aspects of society impose centrifugal pulls on this type of community establishment, and many of them are simply the felt imperatives of economic life, including the placelessness that results from professionalism and careers.

What is the meaning of geographic place in community, and are there factors which not only translate into our current society, but which must be factored into our next visions of social structure? I would suggest that there are. However, these, again, are intimations and extrapolations that may constitute good places to start, but we may also find out that these factors are more fluid than I would suggest and, fifty years from now, we may be finding meaning and place in patterns that we cannot clearly see from the present.

In looking for these parallels in evolving conversational communities, let me repair once again to the educational learning community where I have some direct experience. So, while we are exploring reading qualities of learning communities out into the larger culture, I need to describe a bit more of the conversational community at the university for practical observations that may illuminate social behavior and structure outside of the formal campus. I would ask the reader to consider with me the following observations for indicators of what may or may not be fruitful dynamics for communities of many sorts: professional or collegial, informal and town-centered, within and between generations, school children to local mentors, etc.

As I've already described, when our students begin, they are placed within seminar units, of about a dozen students, who meet regularly for intensive seminar discussions with specific readings guiding their explorations for each meeting. As a single class, these students stay together for the entire semester; however, they also meet weekly with, perhaps, four other seminars that are proceeding through the same syllabus, for a total of about sixty students as a class cohort. They very quickly get to know the other students in their individual seminars, and many strong friendships are formed in this first semester that last throughout their college years and beyond. As they proceed to subsequent semesters, we, as faculty, make a deliberate attempt to mix up the memberships of subsequent seminars to increase the instigation of different lines of inquiry among the students and to decrease the chances that particular students might find themselves locked into a particular expectations of opinion or social tendencies, and instead are able to more freely allow both personality,

creative tendencies, and intellectual dispositions evolve. Furthermore, we try to have as few repeats of students getting the same professors from one semester to the next, although the combinatorics of a limited number of students and faculty does not allow for no repetition of student groupings in any semester.

So, what we have so far are groups of twelve to fourteen, usually of similar age, who quickly bond intellectually and socially, under the “hothouse” conditions of the intensive seminar, and the unique larger context of simply going away to college where young people find the opportunity to take on new ways of being and presenting themselves that can be dizzying, but also let them leave behind parts of themselves to which they were confined simply through the inertia of peer expectation. Furthermore, the larger group of about 60 students who are embarked on essentially similar learning community experiences quickly get to establish even larger patterns of friendship and intellectual association.

Finally, the enrollment at the entire Hutchins School of Liberal Studies, both lower and upper division, ranges somewhere between four hundred and five hundred students. For students who remain in this program beyond the two-year intensive sequence (which they can use as an alternative to the traditional course-matrix general education requirements and matriculate into any other major) for their undergraduate degree, many other associations, formal and informal, appear, which transcend age and class, especially since many of our upper division students are “re-entry” students, older than our entering freshmen, and with completely different life experiences. Students have in recent years initiated extracurricular discussion salons, publications, as well as participating in great numbers in both on-campus groups, and off-campus internships and fellowships.

As faculty, we have also inaugurated mentoring and tutoring options within the course structure of the program, where upper-division students can work on compositional skills, seminar-related skills, and on-line publication with upper division students. In short, what I have seen is a strong sense of community at many levels, sustained by many webs of direct contact and conversation, within the Hutchins program at large, but with the most intense sense of community, in general, directly proportionate to the amount of personal contact and work within subgroups.

We have also, particularly over the last five years, interwoven computer-mediated communications into many of our courses. I find it most effective as an articulated conversational space, where students can make further observations on topics from the seminar, thereby extending the face-to-face seminar with asynchronous written reflections, which serves to help students elaborate their ideas if they are a bit reticent in a high-energy seminar session, or who simply have insights that did not occur until later, or for some students who are exceptionally articulate as writers but less so orally. I have found it especially useful as an adjunct to the seminar precisely because the electronically-posted reflection is read and understood by others who know the individual doing the writing very well, as a member of their community, and they are very eager to highlight each other's on-line comments the next day in seminar.^c

I have also thought that it may be very useful to extend the on-line adjunct of a seminar discussion to student-driven communications with other campuses, in other parts of the country or the world. However, my sense of how such an arrangement would be most satisfying would not be to simply have an open chat room where thousands can log on simultaneously, but instead as an outgrowth of the seminar-level discussion, and of the same dimensionality. For example, if seminars were being conducted on two campuses, with the course co-designed by the teachers at these two distinct locations, it might be a wonderful way to enrich the possibilities of conversation and cultural transposition to have those two, small, classes in private electronic conversation with each other. There seems to be something about the way human beings converse and process meaningful insights (and not just disseminate data) that needs to be heeded here. Even in a focused discussion, with the participants known to each other and with good facilitation and all members acting as active listeners, it seems that if the number in the conversation rises much above twelve, that we begin to subdivide into groups that again comport with our ability to actively listen, contribute, and come away with meaningful synthesis.

The dynamics of on-line communication, admittedly, are different. In the first place, they can take place asynchronously. But when one looks at the vast networks that comprise computer-mediated communication, one is hard-pressed to find anything that resembles learning community conversations: intentional, active-listening (reading) groups, committed to each other and to evolving

wisdom, and patient with the process. It is not that such conversations cannot happen without finely tuned discussion spaces; it is just unlikely. To the extent that such groupings do evolve, it is frequently among people who already have a personal connection, a face-to-face connection, established in a different context. I have had plenty of people try to convince me otherwise, but I have also taught research seminars investigating the nature of community, and research seminars that have investigated (through tiered experiments) the relationship between face-to-face communications and computer-mediated communications (including e-mail, listserves, BBSs, and MOOs and MUDs). I have not been convinced from the evidence I have seen that those who have insisted that their on-line experiences are chock-full of deep and generative conversations understand what I am referring to by those same words.

One of the most telling episodes for me, and this goes back a number of years, was when a student assistant and I designed a MOO-space (multi-user, object-oriented domain) to be able to host, among other activities, a real-time, on-line equivalent of a seminar discussion. If any readers have experimented with on-line MOO-spaces you will recognize that what we were attempting was radically different from the typical on-line MOO. In a typical MOO-space (I had my students making visits to the granddaddy of them, Lambda-MOO (run through a computer at Xerox Palo Alto Research Center) the experience to the novice is mind-boggling. When you log on as a visitor, you are given a computer-generated alias character, like "PurpleGuest," which you can modify or, if you become a regular visitor you can gain extra rights to do things like build your own virtual living space. These spaces, when we were using them, were all text-only, meaning that even though there were virtual objects all over the place, they were described in words as you encountered them, like a Dungeons and Dragons game. These objects could range from rooms, to seashores, to hot tubs, to mirrors that you could "teleport" though to some remote location.

When users logged on, there could literally be thousands of other individuals throughout the world logged on at the same time. Not only did you have to negotiate any number of strange objects that could affect where you were, but conversation, to the extent that the messages flashing across the screen might be considered conversation, had no large-scale sense to them.

Individuals who recognized each other among the thousands present might page each other or teleport somewhere for some gossip. Unless you had such a friend-in-waiting, what happened on the screen made all the sense of listening to every voice simultaneously at a convention center, or at Grand Central Station. Some of my students found it mesmerizing, like watching a Mardi gras parade. Others tried to engage in conversation or follow conversations, and actually felt ill, sort of nauseated. It was amusing, from an anthropological standpoint, to see how inventive users were in creating alter-egos for themselves, in gender-swapping experiments, and all the other sorts of things that sociologist Sherry Turkel has described, but there was no place for genuine, inviting, and meaning-producing conversations of the sort we had come to revere in our seminars.

So, we had this idea that we might create our own, private MOO-space, running on a campus server, just to see if, when enjoining conversation among students who knew each other face-to-face, and were committed to intellectual and personal integrity, and satisfying conversation, we might be able to continue the process into a virtual space. My student assistant did the heavy lifting of translating our ideas into computer code, where we could build rooms and seminar spaces, and informal spaces. We came up with an idea for the seminar discussions that we thought would help us to transfer our seminar skills into a real-time, MOO-space, but to refine the computer code we needed more expertise, so we solicited help from two on-campus computer gurus, both of whom had a lot of experience in artificial spaces like MOOs. What we asked for was a “talking stick.”

The talking stick was to be a virtual object, of the sort one could program into a text-based MOO, and we thought it might be a very useful bridge from the random wildness of typical MOO experiences to a space compatible with our seminar. In essence, one would enter the seminar room and login for a discussion. We decided that the number of virtual chairs around a virtual table might be limited to twelve, and once these chairs were taken then the seminar was full for that evening. Others might still want to come in and observe the discussion, but active participation would be limited to twelve, taking our cue from our experience in face-to-face discussions. In order for one to “speak,” or post a comment, one had to first “pick up” the talking stick, which also meant that it had to be free for use. The talking stick was free, meaning you could pick

it up and have the floor for a conversational comment, when the previous speaker had “put down” the talking stick.

The attributes of the talking stick were all attempts to, however clumsily, map good protocol of active listening and respect for the individual that occurred in satisfying seminars, through all sorts of awareness of personality, body language and expression, and finally skillful moderation by a seminar leader. To avoid the time lag involved in typing in one’s commentaries to the topic or someone else’s comments, as opposed to verbal conversation, we also thought that the “handle” of the talking stick might be a kind of buffer, where conversants could type in comments as they thought of them, and the comments would be stored and queued up in order of entry, and released automatically once one had picked up the talking stick.

We never did code our talking stick, which I’m sure wouldn’t be too great a challenge to someone skilled in the art. We did run a few seminar-type discussions in our own little MOO (which we dubbed “Morphburg”) with varying degrees of success and satisfaction. What I do remember most vividly, however, was a discussion that my student assistant and I had with two computer programmers whom we hired for short-term assistance and consultation. When we described just what the object was that we wanted to construct, the talking stick, and why this virtual object would help us emulate a seminar discussion, one of the two (who had a lot of experience playing in MOOs) asked, “Why would you ever want to do such a thing? Everybody knows that when you are in a MOO-space, and the text is scrolling by really fast, you don’t worry about it. You just ignore everything, and you get good at spotting your name, or alias, when it scrolls up, and that’s what you pay attention to. That means somebody is trying to get your attention. The rest of it is junk, so why pay attention?”

Despite this unsatisfying introduction to the realm of computer-mediated communications, I am sure that there will be major changes in both the technology and our uses of it that will be *potentially* useful in enriching true community in the future. I have little doubt that as the “bandwidth” of our computer-mediated communications increases, as our modems give way to cable or satellite links and processor speeds increase, these interactive spaces will get increasingly more sophisticated, becoming navigated much more by the sort of

surrogate, multi-sensory avatars that Neil Stephenson forecast some years ago in his cyber-novel, *Snow Crash*. I am not a Luddite, and never have been. I enjoy technology simply because I have always had, as part of my personality, the affections of the gadgeteer. I find myself fascinated with every advance in technology, simply because it can be done. I also am interested in technology as a student of the human condition, because many technologies so profoundly alter the landscape of possibilities and “what is,” that I am intrigued by what we as humans will become, or think, by the mere presence of profound technologies.

I think that computer-mediated communications have great possible implications for the human condition, but I am not sure what they are yet. The problem to date is that we are using existing technology, and building next-generation technologies, to simply facilitate what we are already doing. The big dream of the titans of networking is to make us infinitely more efficient consumers of things and data. I find this depressing. This is not a case similar to the laser being “a solution in search of a problem,” nor of using a computer as a doorstop. This dream of electronic market consumerism actually *does* use all of the bells and whistles that microprocessors and fiber optics can deliver. A more appropriate metaphor for this commercial dream is that the technology has become a hypodermic needle, pumping us full of surrogates to authentic living.

The simple utopian hope that once we could all talk together, we would all somehow be even incrementally more enlightened is not something I see as inevitable and something I have seen precious little evidence for to date. Computers are exceptionally good at handling information. We have taken that entity, information, and at times done meaningful things with it, but most often we simply multiply it because we can. We can retrieve data, like the daily news, and send it on to the next person (or nearly everyone) whom we feel needs to see it next, whether for a business decision, or gossip masquerading as personal connection, or just so much entertaining imagery. The simple fact that each one of us can now become our own broadcast station to the world, does not imply that meaning, transformation, or wisdom, will somehow organize itself out of the noise.

Therefore, when I think of possible uses of such communications actually helping our species become different creatures, wiser and not merely with more

information to access, I am drawn, at least as a point of departure, toward the local. If we have nothing meaningful to say, or to solicit from others, why should we think that being able to do so anonymously and potentially with untold millions, will be some quantum leap forward in the evolution of the species? (I am thinking again of the termites in a super-saturated environment.) The fact is that we have built up a physical landscape, and modes of living, especially in the last century that have made the art of conversation increasingly more rare, more difficult to initiate and sustain.

What I am in favor of, and have done some work in for the last few years, is the development of community-based, conversational networks. Places in cyberspace where we can meet in book clubs, where students can share with students, where mentors might be available, where teachers and parents can meet. These are architectures dedicated, first of all, to enabling us to overcome our urban and suburban built landscapes of isolation and suspicion. They invite conversation and personal responsibility, and actively discourage anonymous and antisocial behavior. How? By serving geographically local populations, who might inaugurate their getting to know each other electronically and asynchronously (to accommodate our various work schedules and other obligations), but which draw such people to WANT to meet each other face-to-face.

If we can succeed in surmounting the barriers of our built landscapes and our constructed lives, we may very well be able to reincorporate into our futures the most essential components of true community that underpinned, through necessity of lifestyle at the time, the qualities inherent in the pastoral ideal. I am not saying that computer-mediated communications is the only way to penetrate our cubicle-like and conversation-inhibiting walls (physical and social); it is simply one of the truly beneficial applications of a technology that is largely squandered on much less meaningful tasks, and in the process that technology, through our willingness to settle for life's surrogates, has become our master, demanding that we do more and more to keep it fed.⁴¹

If we can succeed in bending our intentions toward the creation of conversational communities, all sorts of other things naturally flow out. I certainly think we will have the potential to become much more welcoming of other cultures and world-views, that we will be able to embrace and celebrate

the richness of the human experience since we are less fearful of holding on to our own fragile world views. I am not implying that we will arrive at the state where everyone is in intimate contact with everyone else on the globe. That is ultimately possible so far as technological infrastructure is concerned, but it doesn't comport well with the human psyche (without some radical alteration of the psychological and physiological operation of the human mind, that would not seem to be our destiny). We can only have meaningful communication that is deep conversation, with so many people at a time, and during a reasonable life span. However, if communities themselves become conversant among themselves, it is not too much to imagine that we will also develop meaningful modes of communication within layers, among more complex social structures: community to community, region to region, nation to nation.

If we can succeed in creating conversational communities, we might expect other developments as well. I had mentioned earlier that it would be wonderful if adults, at regular intervals in life and regardless of their occupation, were able to return to learning communities for deep explorations and soul-satisfying conversations. In a conversational community, where talking of ideas with depth becomes the norm and the reward for living, one might easily imagine that groups of adults might make use of universities, or any public campuses, to pursue these conversations. But one might easily imagine that it would be the participants themselves who would design the courses of study and help run them, rather than turning the whole matter over to a supposed higher authority, in the figure of a professor of this or that.

I envision a politics of empathy and learning emerging from a culture that embraces conversational communities, rather than the politics of competition and siege warfare among groups with immutable demands, which is the politics we currently endure, where the "communal wisdom" amounts to no more than a head count of ideologies or monied interests. A politics of empathy and learning is radical, I know, but so much more life giving. I also imagine school children being asked to participate in the process of helping the community find itself, and its meaning, beyond the fact that people just happen to be located in mutual proximity and tied together by taxes and real estate value. Do we really want our children to seek wisdom? Then they must see that we seek it as well, and we are inviting them into the process, not to be our economic equals, or our

placeholders once we have reached the end of mortality, but as new and different and wiser creatures than we could become because that is their destiny.

Do we want our children to understand anything about governments and societies and history? We say we do. Why not have school projects, or class projects, where children go out in teams and gather oral history interviews from the most senior members of the community? Why not send them to the local newspaper and find out the history of how their own community evolved? Maybe put it on a website, but have the community hold it up as something worthy and wonderful, and all about connecting generations and finding meaning. Do you want new ideas for developing downtown? Why not ask a group of local high school students to do the initial study. They will need plenty of mentors in city planning, in soliciting input through interviewing those living in the affected areas, and in the economics of infrastructure. Have these students know that they are being given a big responsibility, that what they come up with most certainly will be listened to by the rest of the city. And these students WILL rise to that occasion, for it calls out the best in them and establishes that they are already useful, not just after some indefinitely long apprenticeship.

The ideas just keep multiplying once we have embraced who we truly are, who we can be, once we attempt to reach out of flatland altogether. Humanity has always been blessed with visionaries from time to time, and their singular urging has always been to awaken ourselves to the vibrant glory that is our existence. To be truly awake is not so simple as a literal comparison to physical sleep versus being physically awake. How do you know when you are awake, as opposed to being asleep? Is it that you get up and walk around, and do other things until it is time to go to bed? Sleepwalkers do those things as well, and much of the twentieth century can be seen as so much frenetic sleepwalking. On the other hand, one cannot be certain that one is asleep if one is dreaming. There are dreamers, lucid dreamers, who are so intensely awake that it is nothing like the consciousness that we often utilize as we sleepwalk our ways through our duties.

We need to awaken from our sleepwalking. We need to awaken to our best dreams, our visions. This kind of dreaming is a gift of being human, and we must not let that gift slip through our benumbed fingers as they grasp instead for

surrogates. We can dream this way. We can envision beyond what is and out of flatland. We can do this. Together.

Where there is no vision, the people perish. . . .

Proverbs 29:18

Notes for Chapter 8

^{lxv} The catalogues mentioned are found in the Dibner Collection, at the National Museum of American History, Smithsonian Institution, Ronald Brashear, curator.

^{lxvii} There is an intriguing parallelism between the assertion I make for empathy, and contemporary intelligence research in other species. That is, researchers posit the appearance (or lack thereof) of evidence of empathy as a signature of intelligence beyond stimulus-response activity in animals. See, "Animal Self-Awareness: a debate," in *Scientific American Presents*, vol. 9, no. 4, (Winter, 1998) pp. 66-77. See, Evelyn Fox Keller, *A Feeling for the Organism: the life and work of Barbara McClintock*, W.H. Freeman, 1983.

^{lxviii} Ken Wilber is among those who have explored the explanatory possibilities of holons. I have not kept up with his work, except to read his two most recent books: *A Brief History of Everything*, Shambhala, 1996; and *The Marriage of Sense and Soul: integrating science and religion*, Random House, 1998. I found both of these books to be rewarding excursions in integrative world-views. I could not hope to recapitulate his views here, but I will just mention one aspect. Wilber posits, in both these recent books, a fundamental unit of organization, which he calls the "holon," giving due credit to the late Arthur Koestler for its coinage. A "holon" as an organizational entity which is complete in itself, but which is completely "enveloped and transcended" by the next level holon, in a particular category.

In physical matter, one might posit, for example, subatomic particles, atoms, molecules, large-scale accretions (like pebbles), planets, and so on. Each layer out completely encompasses the previous holon, but also transcends it in that domain (for physical matter this would be complex physical structure, but Wilber goes on to posit four quadrants of existence, which are the meeting places of the material and spiritual, the interior and exterior). This may seem complex expressed in words, especially when pared down to a few sentences, and so I would recommend the books in their entirety for an appreciation of what he is explaining, which is also aided by diagrams.

However, I just wish to mention that in the world-lines of holons delineated in these books, it is expressly stated many times that these lines are unidirectional, only. That is, each new level of holon "enfolds" all information, structure, wisdom, whatever, that was in the previous level, and then transcends that holon in every way. I find Wilber's ideas most provocative, but I am not convinced that they do, in fact, define the grand structure of the cosmos and consciousness, nor that the imperative of unidirectionality in holon structure is true.

For the best single, up-to-date volume that tells of the quest of cosmologists and physicists to arrive at a grand "theory of everything," so far as the material cosmos is concerned, see Timothy Ferris' *The Whole Shebang: a state of the universe(s) report*, Touchstone, 1997. His note about Wolfgang Pauli referring to certain ideas as "not even wrong," is on p. 84.

Another idea that I found fascinating from a holographic point of view is a theory proposed by theorist Gerard 't Hooft about the nature of black holes. A black hole is a concentration of matter so great that its gravitational field, within a radius known as the

“event horizon,” is so great that it devours all matter in its neighborhood, from interstellar dust to solar systems, without even light itself able to escape. In order to solve certain conceptual problems posed by the thermodynamics of a black hole, Gerard 't Hooft proposed that ALL of the information contained in the astronomically large structures that a black hole might swallow up could be actually preserved in a tiny area, the Planck-Wheeler area (unimaginably small at 10^{-66} square centimeters), and this particle of mass-energy-information is called a “boltzman,” in honor of the nineteenth century thermodynamicist, Ludwig Boltzmann! (ibid, p. 99)

^{lxxxviii} Two books that work the holographic idea into many arenas (that is, in attempts to approach global theories of matter and consciousness) are: 1) *The Holographic Paradigm, and other paradoxes*, Ken Wilber, editor, Shambala Press, 1985, and; 2) *The Holographic Universe*, by Michael Talbot, HarperCollins, 1991. My summary of Karl Pribram's training comes from Talbot's book, pp. 12-14.

^{lxxxix} The history of the Scientific Revolution can be understood in two very illuminating and complementary ways. One can look solely at the layering and branching of ideas, based upon the scientific method as well as intellectual leaps of creativity. One can also read it as a history of instruments, beginning with the very idea that one can introduce an artificial (constructed) instrument (microscope or telescope) to amplify one's natural senses and believe that what one sees is reality. Furthermore, most scientific instruments are not mere amplifiers of sense, but translate one physical phenomenon to a very different phenomenon that is sensible to the human investigator, and that we would believe these inferences as well. For an understanding of this historical leap, see the references listed in the notes for pages 79-81. For a most fascinating re-creation of what observers actually saw as they peered through the first microscopes, see “The Earliest Views,” by Brian J. Ford, *Scientific American*, April, 1998, pp. 50-53.

^{xc} It may be inferred that I think that references to Aldous Huxley's *Brave New World* (and his later essay *Brave New World Revisited*, both of which appear together, Harper and Row, 1965) are inaccurate. While I do think Huxley's novel is a masterpiece, and should be required reading, it is far too easy for students to look merely at the technologies employed in creating a manageable and orderly society. Rather than interpreting these interventions (such as baby farms where designer-fetuses are inoculated to make them fit for a predetermined social function) enforced by a secret cabal, the real message for today lies in our own uses of technology as surrogates for authentic living, choice, and the freedom to seek wisdom and act on it. I think a paired reading of *Brave New World* alongside, for example, Neil Postman's *Amusing Ourselves to Death: public discourse in the age of show business*, (Penguin, 1985), gives a better picture of the true prophetic power of *Brave New World*, namely, we are willingly doing these things (evacuating our lives of meaning and filling it with surrogacy) to ourselves.

^{xci} George B. Dyson, *Darwin Among the Machines: the evolution of global intelligence*, Perseus, 1997, p. 35.

^{xcii} For a brief introduction to the German culture which informed its educational structures, see, V. R. Berghahn's *Modern Germany: society, economy, and politics in the*

twentieth century, Cambridge University Press, 1987, esp. pp. 1- 37. The best standard reference source remains *The Emergence of the American University*, by Laurence R. Veysey, University of Chicago Press, 1965. For an interesting and germane case study, see *The Chicago School of Sociology: institutionalization, diversity, and the rise of sociological research*, by Martin Bulmer, University of Chicago Press, 1984.

^{xciii} In the generic mission statement phrases, it should be made clear that I am not quoting from any college catalogue, despite the fact that I put the phrases in quotes. I made them up. I would like to say that they are flights of imagination, but really they are just part of the flotsam and jetsam that accumulates by being in our culture, like so much advertising pitches. One doesn't have to be very inventive to throw together a bunch of advertising lines from sound bites one is subjected to. I would be interested to know how many of those phrases actually are to be found in university catalogues, but I am not nearly interested enough to find out by reading them.

^{xciv} I am happy to report that although I attended several of the research universities myself (Princeton, Johns Hopkins) I was, to a great degree, spared the kind of difficult guild-like apprenticeship relationships myself. However, through various networks of association, I know personally of many more students who suffered through some of the worst examples of what I describe.

^{xcv} See "On Computational Wings: rethinking the goals of artificial intelligence," Kenneth M. Ford and Patrick J. Hayes, *Scientific American Presents* (1998, op. cit.) pp. 78-83.

^{xcvi} George Dyson, in his book *Darwin Among the Machines* (op. cit.), does make the case, or at least the imaginative leap, that our worldwide network of telecommunications may indeed constitute some sort of thinking and self-conscious intelligence, while we humans who have built the system imagine that nothing of the sort is going on among the various satellite relays, ground transponders, personal computers and mainframes, and all the other embedded devices that shuttle around our bits and bytes, making it possible for us to get our e-mail and cell-phone calls. It is an intriguing idea that mere machines, besides doing our bidding, are also engaged in a sort of meta-conversation of which we are not aware, and which we could not decipher in any event. Dyson hints that if there were any way for human intelligence to interface with the global electronic nervous system, it may have to occur with an impressional (my word) language like music.

I find it a provocative idea, but, even if there were a global machine conversation going on not of our making, I am at a loss to imagine what to do with that idea. One is left with the problem of Karl Lashley trying to test rat's brains to see where the idea of the learned maze is. If none of the nodes (repeaters, modems, computers) is responsible for the conversation, if it merely emerges by millions upon millions of interconnections, where does one go, in the global telecommunications network, to petition for access to the conversation? The human mind, however, is not just trillions of interconnections, and I don't think that consciousness merely emerges from it. Somehow, with all its neural structure, there is also a consciousness that has access to the whole conversation. That consciousness can engage in conversation with itself (rumination, projection, construction of narrative), but also with other consciousnesses.

Nonetheless, I found George Dyson's book a delight to read. George has made a living building and designing sea-going kayaks. The entire Dyson family is quite remarkable. The mother was an accomplished mathematician; George's sister, Esther, has been a catalyst as a writer and consultant to the computer industry; and the father is none other than the noted theoretical physicist and marvelously eclectic essayist, Freeman Dyson. I would love to eavesdrop on a family conversation. And in Freeman Dyson's latest collection of essays (*Imagined Worlds*, Harvard University Press, 1997) he even conjectures that it might be entirely possible, at some time in the future, to construct little transeivers that could be implanted in one's brain, which could read out and transmit your thoughts, emotions, and impressions to others with similar devices! He admits that there may very well be people who would not want to either broadcast or receive such things, but that there may be colonies of people who do, who would live together. If nothing else, such ideas are certainly provocative!

George Dyson was also greatly impressed by a nineteenth century author, Samuel Butler, and his imaginal futuristic novel *Erewhon* (op. cit.). At one point Butler ponders the possibility that machinery might constitute a form of life, and in fact, even the future of life. He saw the possibility that humans would serve mainly to tend to machines, rather than the other way around. When I first read this book a number of years ago, I was also struck by that observation. After all, Butler was writing with little more than the steam locomotive as the catalyst for this idea! I could understand how someone might reach that conclusion in the age of the personal computer, but I was dumbfounded at this mind-bending projection of some evolutionary force where the locomotive was the only operant symbol. I thought, at the time, that whatever it was that so provoked Butler's imagination might be similar to the sort of informed anxiety attack that Henry Adams suffered when he saw an electric dynamo. The story of Butler was made all the more rich for me when I discovered the intellectual relationship and correspondence between Butler and Charles Darwin, which I had not known until I read of it in George Dyson's book.

^{xcvii} Parker Palmer, *The Courage to Teach: exploring the inner landscape of a teacher's life*, Jossey-Bass, 1998. For a synopsis on what is actually on the minds of college students, given the meaningless barrage of facts, threats, and demands our culture gives them, see *When Hope and Fear Collide: a portrait of today's college student*, Arthur Levine and Jeanette S. Cureton, Jossey-Bass, 1998.

^{xcviii} Timothy Ferris, *Coming of Age in the Milky Way*, William Morrow and Co., 1988.

^{xcix} Oliver Sachs, *The Man Who Mistook his Wife for a Hat and other clinical tales*, HarperPerennial, 1990; and *An Anthropologist on Mars (seven paradoxical tales)*, Alfred A. Knopf, 1995.

^c I recommend two books for a basic reconnaissance and analysis of the networked computer as a social habitat. Howard Reingold's *The Virtual Community: homesteading on the electronic frontier*, HarperPerennial, 1994, is a sympathetically written account of the original networked community, the San Francisco-based WELL (Whole Earth L'ctronic Link). This network began in the mid-1980s, partly the brainchild of Stewart Brand, who initiated the *Whole Earth Catalogue*. It describes a fluid meetingplace that, at times, really

did have communal virtues, but also had its shortcomings and tragedies. In Sherry Turkle's *Life on the Screen: identity in the age of the internet*, Simon and Schuster, 1995, the sociologist-author explores the expanded abilities of individuals, when on-line in any number and kind of virtual spaces, to appropriate any number of personas, communicating with any number of other personas.

Once you find yourself uselessly jittery and anxious, either from reading these (above) books or because what you are reading too closely approximates your daily routine, then let me suggest a little essay I recently ran across. "Stealing Calm: an ode to radio," by David Shenk in *Technology Review*, July/August 1998, pp. 76-80. Then, perhaps, put on some good music (music, unlike listening to the news, is not to be taken in small doses), perhaps have a little wine, and put together a jigsaw puzzle with someone you like.

⁶¹ I have found *Creating Community Anywhere: finding support and connection in a fragmented world*, by Carolyn R. Shaffer and Kristin Anundsen, Jeremy P. Tarcher/Perigree, 1993, to be a very useful guidebook and sourcebook concerning face-to-face (physically proximate) community.

