SECOND NATURE

the Man-made World of
Idealism, Technology
and Power

D a n   B r u i g e r

Left Field Press

www.leftfieldpress.com

*'This is a bad time,' Earth Mother said. 'The people
have gone on a bad road. But until they come to the end of it,
they won't believe you when you tell them it leads nowhere good...
You must wait for them to reach the end of this road.
You must wait for a change of heart.'* — Starhawk 1

Contents
****

Prologue: AN IDEAL WORLD

Prologue : AN IDEAL WORLD

The road to hell is paved with good intention —proverb

In the worlds of science fiction, civilizations of the future consist of wall-to-wall technology. Whole planets are reconstructed literally as vast machines. Alien or future human environments are entirely artificial and nature is a shadowy nether land. Where life unfolds on board self-contained space ships roaming the galaxy, it is taken for granted that voice-activated nano-synthesizers will magically produce all that a living planet once provided. The glib faith behind such fantasies is that technology can, should, and inevitably *will* replace nature, and that people are destined to live in environments entirely defined and sustained by human will.

In truth, we live on a precarious ledge in evolutionary time. We are mere byproducts of a complex supporting biosphere. Should humankind ever succeed in creating an artificial biosphere, this would be no starship *Enterprise* but another Spaceship Earth. Its residents would be as dependent and vulnerable there as they are on this planet. Yet, however unscientific or out of touch with reality, such visions of life in completely man-made worlds *are* taken seriously because they are the ultimate fulfillment of an age-old fascination with the Ideal.

The modern incarnation of the Ideal is the machine, a Platonic Form that exists nowhere in nature. As a product of thought, imagination, definition, it is set apart from natural things by the same gulf that separates mind from matter, the concept from the thing conceptualized. Through technology, Man bridges this gulf to make the concept so: nature is remade in an idealized image. Progress means replacing an indifferent chance environment with a deliberately created one.[2]

If passé in academic circles, the philosophy of mechanism is still the paradigm of the world at large. Our view of nature itself is seen through the twin distorting lenses of modern technology and economics.[3] Mechanism is their common denominator. Based upon the mechanist philosophy, blind faith in technological advance and economic growth is destroying both nature and civil society. The very concept of economic globalism is mechanism writ large—a sophisticated worldwide engine of profit, to further empower an ever richer world elite, while other people everywhere become more impoverished and disenfranchised. It is a formula to reduce the world to an idealized

monoculture and all value to monetary gain.

The term *machinery* passed into English usage as a theatrical device: the ropes and levers and gears behind the scenery, used to produce marvelous illusions on the stage. This is exactly the function of this world machine today. With devices that are obvious, yet invisible through the willing suspension of disbelief, the overdeveloped consumer world maintains its fairy-tale lifestyle, extracted from a languishing biosphere and from the misery of neo-slaves. Mechanism masks intentions, in economics as in technology, reflecting a willful ignoreance and the fact that the mind has always believed itself independent of matter and above nature and other souls. No doubt the separation of subject and object is endemic to human consciousness. It underlies commonly the mission to separate from nature and "man's inhumanity to man." Mining human populations for profit, for instance, is little different from raping the earth of its resources. "Resources," after all, are simply those features of the world that some people presume are there for their taking. The whole of modern civilization and its fanciful projections into the future are founded on the simple assumption that nature belongs to Man, and not the other way around.[4]

A model and testing ground for Man's usurious attitude toward the external world has always been *men's* historical relationship to women. While the prospects of both globalism and the technological society are deeply political issues, we shall see that they are also *gender* issues. The exclusion of the feminine within men parallels the exclusion of women from the worlds men create. These issues, in turn, are infected by philosophical conundrums so far upstream in the Western psyche that we scarcely recognize their crucial importance as forces unconsciously driving culture and technology—perhaps over an abyss. Like many disciplines, philosophy tends to be specialized, parochialized, and denatured in such a way that it fails to examine the big picture or to call things by their obvious names. Nevertheless, the future of technology and that of the world may depend on the resolution of archaic tensions between the genders, as between the subject and the object. It may hinge on a primordial conflict between the human identity, as an organism driven *by* natural history, and our identity as the conscious symbolic creature driven *out* of natural history.

What, after all, makes us different from other creatures, on a separate track from nature? Is it the use of tools and grammatical language, an upright posture, the possession of an immortal soul? Of many proposed criteria of humanness, I shall argue that the crucial one is *self-*

consciousness. For, this is the "carrot" that leads people universally to strive, through culture and now technology, to create the human world and identity.

But there is also a "stick." We remain deeply marked by the suffering and ignominy of our animal past, especially as it continues to determine the present through the tyrannies of pain, physical vulnerability, disease, mortality, and genetic conditioning. The Darwinian vision articulates what people have always intuited: that Mother Nature, after all, cares not that we suffer, only that our genes carry forth. Because we are able to imagine and manifest possibilities beyond the limitations of found reality, humankind has always labored accordingly to create a kingdom of its own, superimposed upon the natural world. We have invented gods who *do* care and ideal worlds in which we are self-made and free from the humiliations of the flesh—free from the mortal prison of the body, the ravages of time, and the unpredictability of nature. Virtually everything we do is touched by the need to deny or defy the limitations of this animal heritage. What makes humans different from other creatures is that we *want* to be different.

Self-conscious appreciation of the original and ongoing fragility of the body in nature continues to inform all cultural expressions, including modern technology. I will argue that the very *intention* behind culture has always been to transcend and take the place of nature. What sets homo sapiens apart from other animals, more than any specific skill or trait, is flight from the natural condition. Though inescapably part and product of the natural world, we are the creature with a will to be separate. But this intention to remove from nature is tragically refuted every day by the facts of mortal life in the body, with its programming, frailties, cravings and sufferings. Human will continues to be confounded by the reality, complexity, and resistance of things that are not of human making or choice and are beyond human control. Even so, the rejection itself of nature appears to be naturally adaptive—that is, given the success, so far, of our species at overrunning the planet.

The obvious and laudable ideal of technology is rational effort to better the general human condition. Technology promises a modern path toward salvation and heaven on earth—a materialist route to ancient spiritual and social ideals of autonomy and perfection.[5] It is safe to say, however, that it has failed in this promise for all but the privileged few. While technology serves power, and promotes the welfare of the few at the expense of the many, the hubris of the technological enterprise is not fully accounted for by "rational" self-interest. A

deeper, darker, and more passionate motivation underlying technology, to put it bluntly, is the quest to play God. If new technologies fail to meet genuine human needs, it may be because that is not their real purpose. Avarice, power, and even altruism play their parts, of course, in driving invention. But what consistently, if unconsciously, directs much technological development is the ideology of transcendence. This is no contradiction, for capitalism and technology are but articles of faith in the modern consumer religion of the West. The philosophy of mechanism underlies both technology and economics, and inspires futurism on both fronts. We shall see that it has roots in the same idealism traditionally expressed in religion.

Transcendence is more distinctly a masculine than feminine preoccupation, however. Nature is not simply turned to advantage, but carefully imitated, reverse-engineered, and displaced literally by a *man*-made world. Through artifice, a second nature is fashioned in a masculine image.[6] We shall see that the male psyche, in particular, covets the creative powers of nature, which are represented primordially by woman and only subsequently by a divine father. But power does not distinguish among its objects nor its roots. While power over nature is deeply conflated in the male psyche with power over others, and over the feminine identified with nature, fundamentally all power comes down to *the power of mind to decree its independence of the body*. It is the power to rule its own proper kingdom. This is what marks the passion for technology as idealism in both the normative and descriptive senses, and gives it a religious, even fanatical, flavor. Men are virtually driven to become "as the gods," creating from scratch their own artificial world. And that is a timeless world in which they already rule, in thought long before its technological fruition. At its core, it bears the promise of eternity and omnipotence. This is far from hyperbole, though not so far from blasphemy. While dreams of ultimate power are the clichés of science fiction and horror, they are also the unconscious motor of male-dominated culture at large.

Even the face value of technology reflects masculine interest in its advantages for power. Technology has always facilitated domination and empire, largely expressing archaic male drives that have come apologetically to be accepted, under patriarchy, simply as "human nature."[7] There are now on the order of one hundred million land mines waiting in the earth's soils to blow apart unsuspecting limbs, many of which will belong to children who have no understanding of the conflicts or technology that will lead to their maiming or death. I shudder to imagine even a single pair of the hands that manufactured

or placed these mines as belonging to a woman, though I know that is increasingly likely. There is irony in the fact that the brute aspect of human being responsible for such inventions has been embellished through the very culture of idealism that is at heart a *flight* from animality. And: a further irony that modern women are conscripted into such male programs of destruction.

The schism in human nature extends to conflict over the relationship to nature itself. On the one hand lies nostalgia for lost vitality and paradise, and the motive to preserve what remains of the natural world. We long to be restored, in some sense, to a life of greater authenticity and harmony within it. The irony there, of course, is that our species probably never *did* live in harmony with nature. A life strictly within the natural order—that is, without culture—would be the vital but unreflective life of the brute, limited in the damage it could inflict upon the planet, to be sure, by small numbers and the restraining presence of other creatures. Having already been there and tried that, phylogenetically speaking, humans began early to search at the other extreme for security, superiority, and conquest of nature. The first step in this program, initiated many thousands of years ago, was the elimination of large menacing or competing predators. The final step would be complete control and transcendence of matter, energy, space and time —indeed, the conversion of all matter to conscious, if not human, intelligence.

In that extreme, nature is viewed merely as the expendable scaffolding for the construction of the human (or post-human) empire. But this scheme has always been, and remains, foolhardy. The notion that nature can somehow be discarded has its roots in the ancient delusion that the head can live without the body; that mind is the true payload, which must jettison its expendable physical vehicle in the journey "upward." Modern versions of this ascensionism, in which technology aims to liberate the self from gravity and even embodiment, reflect ancient beliefs that an immaterial soul is the essence of the person, free to wander from the body and able to survive its death. Whether or not such beliefs are true, they are misguided when motivated by rejection of the body—that is, rejection of the inevitable sufferings, limitations, and humiliations of mortal life.

The nature that early Man inherited has long vanished, while technological utopia remains a pipe dream full of contradictions. For the planet to return to a wild state would virtually require the absence of people. But, for the planet to be reconstructed as an artificial satellite

would entrain the end not only of wildness but of humanity too. For, despite delusions to the contrary, the human organism can only live as a link in "the great chain of being." A technological future that includes humanity will therefore necessarily exist in the context of living nature, and in balance with it. The future is thus constrained because, in origin and essence, *the head is but an elaboration of the body*. The human mind cannot exist other than by grace of the planet's biosphere. The real choice facing humanity is between the values of life, traditionally associated with the feminine, and the heady masculine idealism that, in the name of salvation, ironically drives the modern world toward destruction.

While we are inescapably embodied and part of nature, collectively we have always aspired to be disembodied spirits, angels, free of natural bounds. The possibility of post-human or artificial life is merely the latest version of an ancient dream. This dream is false, however, because even robots are physical creatures, causally connected to their environments. If there are to be truly intelligent machines, they will, in effect, be *organisms* with a life of their own and with their own connections to the environing world. Intelligence, natural or artificial, *derives* from the connections entailed by embodiment and can never completely divest itself from this reference, nor from material form.

The awareness of self gives rise to an inner, subjective category or world of "experience" apart from the external world and the life of the body. Self-consciousness is undeniably useful to a social creature in qualifying the absoluteness of perceived reality and the compulsiveness of response. This renders action more flexible, circumspect and cunning.[8] But the evolutionary import of subjective consciousness goes further. The inner realm of idea constitutes a distinct domain, a human world parallel to that of the physical world, generating the dualism recognized in the so-called Mind-Body Problem. This parallel inner world is the seed and blueprint for the cultural world of artifice that Man substitutes for nature.

While all sentient creatures evaluate stimuli, and are therefore capable of pain along with pleasure, only self-conscious beings can be said to *suffer*, which requires knowledge of one's condition. The natural state of any organism is perforce one of limitation, mortality, and participation in an evolutionary contest whose rules and playing field dictate the creature's perception, behavior, and very being. For a self-conscious organism, there is suffering in the awareness of these constraints, in the longing for possibilities it can conceive beyond these

(or any) limitations. The very fact of being able to see the natural context of one's life implies a ground on which to stand apart from it. This imaginative ground is the terrain of the inner subjective world, where the flag of the self is planted. Rebellion breeds in this soil against the constraints of embodiment, and here the plot is hatched to over-throw the humiliating yoke of nature.

Thus culture and the technological transformation of the world begin with consciousness itself. The possibility of alternative "realities" is already laid out in imagination, in the interior world of subjective consciousness. The thought already is the thing re-created on human turf. It is not such a big step to reverse the flow and translate the inner image once more into outer form, to reconstruct the idea as artifact. The concept, its codification (as verbal instruction, program, or blueprint, for instance), and the artifact constructed from it, all partake of the same essence. We shall see that this essence is by nature simplistic and ideal.

In the inner world of idea and imagination, the human spirit is free and illimitable, self-generating and in control. It is the author of its own being, rather than created and constrained by inscrutable and uncon-trollable forces impinging upon it from without. Accordingly, this is where the self-conscious creature finds itself more secure than in external reality. This inner realm is literally imaginal, ideal. Yet the self-conscious mind, a mere upstart on the evolutionary scene, is condi-tioned by its long genetic heritage to venerate only what it perceives as solid, real, and external. For this reason, idealism typically conceives the ideal, the image, the wishful thought, as already and actually existing independently of human mediacy. The inner or subjective content is projected outward as objective and real. In order to challenge the authority of nature, the realm of the Ideal must be conceived as superseding nature. It must be perceived not as mere wishful thinking but as substantial, independent, preceding mind both logically and temporally in the way that nature does. Hence the tendency of religions and mythologies to project the utopian condition backward in time as a golden age, and to project human aspirations as the attributes and dictates of the gods. How else to explain, in any given age, the discrep-ancy between what *ought* to be and what actually is the human condi-tion?

If the Ideal is held to exist already, though unmanifest, it must exist in the past or in another order outside or above nature and time. It must be a kingdom to which admission or return is possible in the future, if

barred in the present. Like a conspiracy taking hold in the reigning ranks of authority, ideality must bide its time, remaining nominally deferential to the power of reality it seeks to overthrow. When it stages its coup, it must appropriate the look and imprimatur of the real. Thus idealizations are reified, made substantial, projected outside the realm wherein they were conceived. And this conception must appear immaculate—which involves a willful, if unconscious, self-deception. For, everything suspected to be born of mind is tagged "subjective," a mere imagining rather than a potent reality.

But mind has another venue than the spiritual or mental one in which to venerate the Ideal. Besides imagination and the longing for freedom and perfection, we have industrious hands with which to make our idols manifest. And what better place to build the new kingdom than on the very foundation of the old? Opposable thumbs make it possible to render the concept in material form. An ideal world can be built of real matter; nature can be transformed by thought. Hence, the promise of heaven on earth through technology.

While the notion of an earthly paradise has persisted in every age, one must clearly discern the various actual motives behind technology —always mixed, but diverging widely in implication. These include: improving the human lot; extending the power and advantage of certain individuals and groups over others; and appropriating godlike (or feminine) creative powers.

To alleviate suffering seems a worthy enough cause. But human suffering might, in the last analysis, be boundless, its remedy without reasonable conclusion, and its cause as much self-inflicted as imposed in the natural condition. At the hand of nature, moreover, Man has suffered not only injury but insult. The damaged body can repair and be mollified; but the damaged ego grows vengeful and power-hungry. Man is not satisfied merely to improve the human lot in nature, but seeks to redesign and even displace nature altogether. The humiliated spirit seeks not redress but total vindication. The same wound that creates the drive for power over nature leads to war between peoples and the brutality of rulers against their own citizenry. When all the great beasts were hunted to extinction, the spear was turned against other men.

The adverse effects and perverse misuses of new technologies tend ironically to *increase* the human vulnerability that is one of the prime motives for technology in the first place. Furthermore, technological advancement *substitute*s for moral or social progress, so that business (quite literally) can proceed as usual, without the inconvenience of

social upheaval or economic redistribution. The more technology we have, the more technology we crave to protect ourselves from its abuses in the absence of real wisdom. And, the more we put ourselves at risk from the horrors of runaway development, the more we take flight in the distractions it provides. As Aldous Huxley foresaw, the pervasive culture of entertainment includes and combines TV, alcohol and drugs, computers, shopping, virtual reality, sex, and that classic opiate, religion.[9]

Religion and technology, far from being opposed, are commonly motivated by the search for relief from the harsh and disappointing life of the body in the real world. They both seek salvation from the animal condition. Having conceived ideals of perfection, the religious mind then projects these outside itself as "God." Such ideals are spiritualized in order to believe that they are "already so." The secret human project has always been the darkly religious motivation behind the hubris of technology: to *make* it so by stealing the fire or mantle of the Creator, to become as gods ourselves. Moreover, technology and monotheistic religion unite in arrogating to the male the right to do as *he* sees fit with the future of the planet, indeed the cosmos. They merge in the longing to emulate the ways of a masculine god.

Thoughts that were once the province of religion are now plausible as technology. It will therefore make an enormous difference in coming years just how effort is apportioned among the distinct goals behind technology: human well-being, divine creativity, and limitless power and wealth. While these are all aspects of the drive to master and separate from nature, even to become idealized beings, divergent motivations may take us down very different paths. The first road will modestly retain technology in the service of general human fulfillment in balance with nature. It will involve judicious restraint and circumspection in the use of technologies, always as *tools* subordinate to humane values and human will. It will be inseparable from social goals of equity, justice, and universal well-being.

Playing God, in contrast, will lead to outcomes decidedly hazardous to our health. They will *not* be under human control. If naively followed, the drive to impersonate the creative, life-bearing powers of nature will lead to intelligent entities and artificial forms of life that will threaten to displace nature itself, or at least that part of nature we are. Ironically, the ultimate fulfillment of the machine metaphor—which reduces living nature to dead raw material—is the dream of new, artificial forms of life that risk to become new competitors and preda-

tors of human beings rather than our obedient tools. (Such worthy opponents might well prefer mastery to slavery!) Laboratories are on the verge of bringing into being a whole new ecology of artificial forms of intentionality, potentially competing with the biosphere for the right to exist. Human life, in this scenario, might be phased out in the name of progress or evolution. At the very least, we might no longer find ourselves at the top of the food chain, but overshadowed by our more intelligent and powerful brain children. The species, under its masculine directive, would then have served as midwife to new forms of life and consciousness. While lauded by some, this seems a strange consolation for loss of hegemony on the planet!

All of this presupposes we do not simply destroy ourselves first through old fashioned cupidity and aggression, multiplied by the forces of technology, shortsightedness, and exploding numbers! The third inspiration behind technology has always been *power*, which, through mechanism, would reduce the world to an instrument of the powerful.

The drive to conquer nature amounts to a program to substitute ideality for animal reality, human intentionality for the causality of the found world, artifice for nature, will for instinct. The paradox and the danger is that this reaction is driven by the very instinctuality it flees as much as it is guided by the ideals toward which it reaches. Perhaps there simply has not been time to genetically adapt to the accelerating pace of change to which the human form has subjected itself in the past ten thousand years. Men were first hunters, then warriors, then merchants, then captains of industry, now entrepreneurs and CEO's... but always following essentially the same genetically-programmed imperatives through a changing landscape. Inadvertently recreating the structure of conflict that we have with and within the natural world is perhaps the very ethos of patriarchal civilization. As natural obstacles to human fulfillment were overcome, humanly created ones replaced them in the form of wars, crime, social injustice and strife, environmental degradation and the "side-effects" of technological innovation. The harshness and indifference of nature are replaced by the cruelty of people, the indifference of institutions, and the hardness of man-made environments. If we were not at peace within nature, then why would we expect to be at peace within the ersatz human world? In the power vacuum left by the conquest of nature, the enemy of Man is no longer nature but masculine obsession.

Evaluation of specific technologies today, like the motives behind them, is hindered by the blanket ideology of consumerism, progress, unlimited economic growth; by the romance of modernism, science

and sci-fi; and by the new face of "national security," in which the specter of communism has been replaced by "terrorism." To think clearly about technology, and choose wisely *which* technologies will serve us, will require great resources of lucidity, political will, and creative ingenuity combined with wisdom.[10] One wonders where these will come from.

The ideology of progress is part of the patriarchal aberration. Boundless technological advancement and boundless economic growth are myths invoked to mask the true problems of how to share the world's wealth and how to work collectively toward the planetary good. Achieving social justice and cohesion, in balance within nature, would be a far more significant accomplishment than is promised by proliferating technology (let alone supersedence by robots!) The wise use of technology cannot be a matter of blind faith in the future as held by the technological and economic optimists who have the ear of power. In fact, it cannot be left in the masculine hands of "power" as currently conceived. The needed transformation of human priorities might come about through engagement of the world's great untapped resource of feminine consciousness—supported, of course, by men who respect the values it represents.

Ecological and economic crises have dominated public attention, with good reason, for so long that they have come to be regarded as "natural" phenomena of modernity, somehow inevitable because of the burgeoning human presence on the planet. However, they are far more the result of deliberate policies enforced by particular interests for private gain. Statistics concerning the distribution of wealth, moreover, bring home the hollowness of the ideal of human unity. There simply is no "we" to form a collective will. The combined wealth of the world's richest two hundred and some *individuals* (overwhelmingly male, to be sure) exceeds the combined annual incomes of nearly *one-half* of the world's population! In 1960, the richest 20 percent of the world's population was *30 times* wealthier than the poorest 20 percent. By 1990, *that* ratio had nearly doubled![11]

The world's population, meanwhile, *quadrupled* during the twentieth century, with ecological effects yet to be fully felt as the world attempts to follow the Western consumer model. And while it may be true that the world's overall wealth has increased with population, and indeed *because* of it, the lion's share of this wealth has been concentrated in an ever smaller number of hands. The result is that the last thirty years have seen the injurious decline in the global living standard, as

well as the insult of an accelerated widening of the gap between the haves and have-nots. This is happening not only because the poor reproduce faster than the rich, but also, insidiously, because the rich have ever more sophisticated economic and political mechanisms for disenfranchising the poor and middle classes. I will argue that this is, in fact, the very purpose of the consumer monoculture!

How can one speak of collective efforts to heal the planet and the rifts in humanity when the ideal itself of community is under threat? How can the mass of humanity (expected to peak at over eight billion) find happiness when it is literally possible and seemingly inevitable for a few hundred men to control and hoard the world's assets, and for the rest of us to cooperate with them cheerfully in this doom?

Gender may be the sleeper, a trump card yet to be played in "post-his-story." Essentially, it is males who made and rule the world we know, with its contentiousness and lies, its political, economic, class and ethnic ruptures, its wars and power struggles, its old guards and youthful radicalism. The plan of this world is masculine, with its focus on money, power, sex, violence, hierarchy, technology, and disinformation. The unimaginative monotony and predictability of globalist society belies human diversity and vision, reflecting male obsessions with order, mechanism, method, uniformity, automation and control.

What is there specifically about the masculine mentality that seeks power, domination, and technological solutions, and which has always been willing to dismiss the visions and concerns of the other human moiety? And what is there specifically about the feminine mentality that has consistently allowed this to happen? How can there emerge a distinctly *human* voice of reason that is not the dominating masculine voice? These are some of the questions the following chapters will attempt to answer.

Technology and power express masculine intentions and attitudes. Idealization itself is essentially a masculine process. But *the* masculine is a *mentality* far more than a collection of sexually determined traits, let alone a collection of males. The attitudes and thought processes I call masculine may indeed have a gender basis, but there are many men who thoughtfully protest the global domination of patriarchal values and who actively work to realize a different vision. The number of women, on the other hand, who participate in or indirectly support corporate rapaciousness, warmongering, sexual materialism, and other values frequently associated with men, is accelerating. Even so, by and large it is fair to say that we are engaged in a struggle between two

value systems that happen to be associated with traditional gender differences, however genuine or apocryphal these may be. I believe that the only hope lies in a resolution of this struggle in favor of more "feminine" values, whether or not these are upheld in the persons of women.

At core, the masculine is a *third-person* stance toward the world. Men are typically preoccupied more by things and their interactions and uses than by reflection on their own relationship to those things or each other. The essence of the masculine stance I wish to underline is *control,* exercised from top down, from head to body, from subject to object (even conceptual objects in mental space). The subject unilaterally manipulates and uses the object—including the human object and the object of thought. This has been a very handy skill in the ascendancy of the species, and certainly in the ascendancy of male power. In any case, for better or for worse, without the masculine mind we would not be living in civilization as we know it.

But the fascination with objects, power, the external world, acquisitiveness, control, and goal-oriented *doing* has become far more than a male specialization with adaptive value; it has become the root metaphor and obsession dominating life, the motive and rationale of modern culture. It has eclipsed the more feminine values of relationship, openness, compassion, surrender, nurturance, contemplation and just *being*. In thought, if not yet in deed, the whole of nature has already become an *it*, a dead thing, a machine. Instead of promoting equitable distribution of the benefits of technology, economic institutions—enforced by war machines—have become mechanisms to divert wealth and power into even fewer hands. If technological and economic optimists have their way, the world will become an ever more inhospitable place to all but the extremely wealthy, whose resources will be used trying to shield themselves from the effects of war, crime, pollution and ecological catastrophe they themselves have promoted for gain. And even they cannot live on a dead planet!

Inquiry into nature, like history itself, has been predominantly a male enterprise. While women made babies and kept the home fires burning, men went out, for better and worse, to discover and make the world. But the same side of the male mind that leads to technology useful for the domination of nature and other men led concurrently to the use and domination of the male resource and support most important and closest to home: women. The rebellion against the body and nature is enacted against woman too, through her historical enslave-

ment and every subtle form of continuing misogyny. For, nature is the body of the world and the womb of culture, the matrix within which we make our human life. Woman is literally the first environment we know. On a profound level, the control of women mirrors the control of matter, as woman and nature are identified deeply in the human psyche. (Indeed, *matter*, *mother*, and *matrix* come from the same Latin root.) The technological stance reflects the reactive attitude of the male mind in defending itself against the feminine as the mysterious Other, a defensiveness reflected even in men's attitudes toward lovemaking. If women accepted historically to make the best of their situation, it was no doubt essentially for the sake of their children. Population growth, however, has brought us full cycle. The world no longer needs an expanding population, and women are potentially freed, from their defined role as breeders and homemakers, to become emissaries of feminine consciousness and to focus their energies on the wider world's problems. History may be calling for a more active role of women in political and economic affairs; far more importantly, it demands the feminine voice to define what politics and economics are to be.

Though it is a moot question whether the objectification of woman or of nature came first, the very fact that they are linked should compel curiosity concerning the implications for sexuality, power relations, and science and technology. For, in making love with woman we have the same choice as when inquiring of nature as the Unknown: to allow ourselves to be overcome and transformed by the experience, so that our very intentions and identities are unfixed; or to remain in protective custody of our rigid selves and purposes, off limits to transformation. The first is a stance of opening, softening, dissolving toward shared or emerging truth; the other, of hardening, closing, reasserting established boundaries and identity.

I am not advocating a strategy for men to improve their relationships with women. The timeless "battle of the sexes" is now entirely up for grabs, for the simple reason that the traditional and genetic foundation of gender relationships—raising children in the economic family unit—no longer applies in an epoch when the world is choking from the consequences of overproduction and over-reproduction. *The relationship between men and women must find a new basis*. What is at stake involves not only the persons of women and men; the unresolved dance between masculine and feminine holds a key to the very fate of life.

The physical intensity of the sexual act appears overwhelming,

forcing a kind of surrender, at least in orgasm (isn't this why we seek it?) But for men at least, the drive to *remain in control*, separate and intact, always stands against, and may subvert, the primal longing to *merge*. No doubt, in past times the option of masculine "surrender" was scarcely affordable. Surrender to other men was fatal, surrender to woman was regressive, and surrender to nature meant helplessness before natural disaster, which could only be met, like defeat in battle, with humiliation, fear, impotence. A large part of the appeal of religion is surrender to God, who retains the paradoxical irony of being a human construct controllable through supplication and magical practices. Now that we have long since "turned the tables" on nature and woman alike, it is necessary to reconsider the meaning of surrender, if we hope to master the obsession with mastery itself.

The universe as a *machine,* or a vast simulation, is the ultimate expression of the mechanist worldview, which presumes to see everything, in the rich fabric of real existence we call nature, as imitating human invention: life imitating artifice. The very success of technology is taken to signify the truth of mechanism as a worldview.

The projection of inner schemata upon sensation is, of course, how all cognition works—from sense perception to scientific thought. In fact, mind can only understand the world in terms of concepts, which are inherently simplistic compared to the complexity of the real things they codify. The ability to analyze complex reality as composed of idealized schematic parts is the very power of intellect and the source of the human triumph. But the belief that physical reality—nature—can be *exhaustively* analyzed, codified, controlled, and exploited implies that mind can eventually overtake matter in such a way that experience and knowledge would no longer be a joint venture between self and world, but a work of self alone. This is the idealist program taken to the extreme (and idealist beliefs typically hold that experience *already* is a product of self alone).

The social correlate of this solipsism is the willful isolationism of a rich developed world living at the expense of the rest of the planet and in scornful ignorance of its parasitic role. It is also the masculine ethos writ large. The irony is that—with such ultimate domination of matter, and of the many by the few—consciousness becomes no longer a response to the real world at all, but literally a self-contained illusion, a dream. The ultimate consumer choices, supposedly just around the corner, of plug-in bodies and designer "realities," expand the same bubble of delusion already brought to us by the nightly pabulum of

commercial television programming—a delusion that helps Western society dismiss its own complicity in the daily plight of millions.

The dreams of techno optimists—from space weapons to virtual reality; from downloading of minds into simulated worlds to surrogate bodies and remote robot interfaces; from space colonization to the expansion of posthuman intelligence throughout the universe—all these propose the ultimate triumph of idealism, of mind over matter, of individual over community. (At the same time, they imply the final triumph of materialism, of money over all other values, of the masculine obsession with power). But this victory for mind, if carried to its ultimate solipsistic conclusion, would bear the price of living entirely within a fiction, disconnected from the political and economic realities that make it possible: the celebrated 'brain in the vat' at last—this time as a *social arrangement!* The ultimate separation of mind and body through post-human technology would, uncoincidentally, parallel the utter separation of the haves and the have-nots in the postindustrial world. The overdeveloped West is already "mind" to the malnourished "body" of the Third World. In a totally automated world—as in one based on slavery—paid labor will be superfluous, and those who do not control the means of production will be literally expendable. This is the true significance of the growing chronic unemployment developed societies already experience despite the promises of globalism.[12]

Whether or not the futuristic dreams of techno optimists are feasible, they are symptoms of broader confusions and hypocrisies. It is fascinating in its own right that the (predominantly male) imagination is able to entertain these as serious goals, since they literally engender unbalanced thinking. But are they more insane than the ecological and humanitarian crises already precipitated by *economic* futurism? Both technologic and economic optimists presuppose a one-way interaction between subject and object, of unrestrained *use* of the world and of others. Feedback from technological manipulations is allowed to affect only the type of knowledge of the object that is useful to further control. The knower remains untouched. Expertise grows, sinisterly, while the expert does not. This is why technological progress outstrips wisdom, which is the sadly lacking ability to distinguish the merely possible from the genuinely worthwhile. Feedback from the policies of economic globalism similarly does not reach its hermetically sealed steel-and-glass-tower protagonists—or their shareholders—except through highly filtered statistics coming over the wire or in glossy annual reports.

Although devalued in the masculine ethos, another type of con-

sciousness *is* possible, which expresses a gentler relationship to others and to nature. Because it involves connectedness, even when passionately emotional it is far less adversarial than the detached third-person stance. The *felt* object is less alien, less other, in fact less "object." The world would be far saner if the opposition of subject and object were balanced by a *participatory* consciousness not only directed to other persons but also *to nature and the world at large*. One cannot count on such an ideal future as the next evolutionary step. It will not come simply as a proverbial happy ending; for, by definition, reality isn't a story. Nor is there time to rely on biological adaptation for such a profound change. It *could* come, however, through the concerted conscious intent of millions of men and women of good will. More than a change of those in power, it will require that power itself be dismantled and redefined. For a start, we must abandon consumerism and the investment economy and return to local economic and political autonomy. This is far more than a matter of recycling, ethical investment, or voting for "green" candidates and policies; for, we are controlled on every level through our appetites and our attachment to a privileged position that is collapsing in any case.

The gender imbalance, too, must be *deeply* rectified. This is far more than a matter of politically correct grammar or of "equal rights"—which is currently the right of women to pursue the male model! Ideally it will involve a balanced mentality within each individual, regardless of gender. It will also involve an active resistance to the current reign of masculine paradigms in governments, corporations, media, universities and other organizations. It will involve insisting that "feminine" values prevail in governance at all levels, public and private. And this will require that well-motivated people of both sexes join together to be more insistent than their rulers. Furthermore, women must claim their chance to run the world—as I heard one feminist call it: *she*volution! That is, women must do that for which they are genetically and traditionally better prepared than men, and for which they are now perhaps politically ready: to relate effectively to others in all levels of leadership in order to bring the world to harmony and balance. (Of course, I am aware that there is nothing more contemptible to women than men who inform them what they should be doing. As one woman wryly commented: "Isn't that just like a man—create a mess and expect a woman to clean it up!" I can only beg their indulgence in the urgency of the situation.)

Men could begin cleaning up their mess by supporting the leadership of women. They could certainly continue to fill the positive roles

they are good at: manipulating stuff and ideas, and getting things done. But the attitudes behind the organization and direction of society and its technological pursuits, the *vision* of human destiny and the recipe for an ideal world, must no longer rest in the hands of the power-hungry few, nor be dictated by the aberrations of archaic masculinity. They must instead be turned toward values that favor the continuance and enhancement of life rather than power, of body before mind.

The deepest problems we face are not technological or economic. They are profoundly ethical, political, and philosophical. The real historical questions concern the *seeds of intent* that have grown, like the Baobabs in *The Little Prince*, to overrun and strangle our world. And the real question for the present generation is how to expunge these or tame them, in hope of creating an equitable and renewable society at last. Perhaps the challenge, above all, is to solve the ancient conundrum of how the meek can prevail against the powerful and aggressive. In what we know as history, the masculine has always dominated the feminine; mind has dominated matter; the ruthless have dominated the weak, the mild, and the altruistic. In our age, technology promises to dominate life. If it is tragic that the utopias envisioned by Jesus and Gandhi, and so many others of good will, are not fact today, at least our world has allowed the legacy of those visions, however distorted. It has allowed the softness and beauty of women, however abused, and the laughter of children, however brief. Perhaps it is not too late to hope that one day it will allow perfection as more than the heady idealism of masculine ascendancy, expressing rather the whole human being.

Chapter One: WHAT IT IS LIKE TO BE A CONSCIOUS BODY

We are such stuff as dreams are made of —Shakespeare

1.1 The Bearable Unlikelihood of Being

Cosmologists inform us that the basic physical parameters of the universe are quite specific and highly improbable.[13] Not only living organisms appear to be the unlikely products of chance, but the whole enormously vast and complex universe necessary to support them. Just as a single individual or species could not arise by itself in isolation, but only in concert with a whole biosphere, so it appears that a life-bearing planet could only arise as part of a whole universe with unique characteristics.

Two centuries ago it was still feasible to believe that the cosmos was created by a personal God. From a Creationist perspective, the laws and constants of the universe, the difference between something and nothing, and why there is anything at all are matters of divine *intention*, rather than the inherent nature of the creation itself. Today, however, science favors naturalistic explanations of why the cosmos exists, with its particular laws, and why it exists rather than nothing. The emerging picture may include an infinity of possible or actual universes very different from this one, most of which might be too simple, too small, or too short-lived for life to develop. One thing is clear: only a universe of a certain size, complexity, and longevity could harbor intelligent observers who marvel at the improbability of their own existence. What is unique about this world is that *we* are able to live here; and what is unique about us is that we can conceive other worlds in which we *couldn't* live. In imagination, naked consciousness may go where it wills. But in the real universe consciousness is clothed in brains and bodies, and can only occupy worlds that foster these.

The sense of awe and sheer wonder at the world's being here, with us in it, is not diminished by natural philosophy, even if reductionism is, in a way, the intent. It *is*, I would contend, diminished in religious and metaphysical thought, even when awe is the professed intent. This is so for the simple reason that such speculation is self-contained and unilateral. No matter how clever, where thought is a unilateral product of mind it is essentially impoverished, closed, and one-sided. Natural philosophy, in contrast, connects with the external world through informational feedback loops. Science leads to an ever bigger picture,

more wonder, and further questions because it is, at its best, an open-ended *dialogue* with the natural world. As in any genuine conversation, it is proper to ask questions and listen to the response. Metaphysics and theology, however, tend to monologue; they are closed to new or outside information. Their purpose is to provide the intellectual security of a final theory, as well as the social utility of a fixed guide for appropriate behavior. Metaphysics may intend a true picture of the world, but it accords the world itself relatively little say in that portrayal. In contrast, science at its best is not a fixed sphere of knowledge, but open and provisional.

We shall see that the motives behind technology, as *applied* science, are mixed and that technology represents a different attitude toward nature than pure science. Many high-tech visions for the future are inspired more by metaphysical idealism than by a genuine desire to dialogue with nature. And while the standard of objective truth may still be independent of utility, in practice today much of basic research is funded with the aim of economic gain. The ethos of modern society is similarly unilateral: nature, the land, the earth are not listened to by corporate interests following the ubiquitous profit motive, just as citizens are no longer listened to by their governments. Consumer capitalism has triumphed as the ultimate dispensation of the age. Progress is its metaphysic; shopping and entertainment are its sacraments; mass media provide its catechism.

Religion is certainly not the only venue of closed thinking. The whole human world tends to closure simply because it is created by human intention. The self-conservative forces of culture have always fostered self-contained and closed systems of thought. Sacred texts do serve as ultimate references in what amount to quasi-axiomatic systems of thought, wherein the faithful may hold that everything one could hope to know can be deduced through interpretation of the scripture. But codified law is similarly a textual system, though it is constantly updated and is admittedly of human origin. The memes and mores in general of a society also define an informal and largely unwritten guiding "text" to consult. What a sacred scripture is to its cult or congregation, the traditions, ways, customs, forms, assumptions, and laws of a society are for it: a recipe or script for living. Postmodern culture has taken subjectivism a step further in deconstructionism, which insists that reality should be interpreted as though it were a text. The motivation may be the latitude we have in interpreting texts that we do not have in interpreting nature. But that is also the danger—unless it can be

proven that nature is indeed a creation, an artifact, a text.

While any text is finite and limited, in order to serve as a foundation its premises must either be unquestioned, and revered as absolute, or else be consciously agreed upon. One is led to suspect that the essential conservativeness of cultures everywhere motivates the closure of human institutions. Like all creatures, people seek stable environments with which to come to terms in dependable ways. The human creature has learned to consciously construct such environments, both within and without. A world defined by people is, after all, potentially more reliable and satisfying than the inscrutable and unpredictable ways of nature. A world *engineered* by people ought to be even easier to master. While nature is the Unknown, human codes and institutions—indeed, all thought and invention—consist reliably of what people have put into them. They are knowable *by definition* and therefore represent the only secure knowledge.

Because human worlds are thus intentional, they contain only what is already implied in their deliberately laid foundations. Animals, to be sure, also have their fixed ways and routines; the natural world is cyclical, the organism is homeostatic. Though animal life may appear boring and limited, it is full of uncertainties that are distasteful to the simple-mindedness of idealizing human thought. We are forced to confront the possibility that *any* natural reality is fundamentally more uncertain than *any* intentional construct. Ideas and ideals are simple and easily mastered *in principle*, whereas physical and even social systems are complex and inherently beyond control from without. The other side of the certainty and security of intentionally created systems is not only their tedium but a potentially dangerous mismatch with reality.

The routines people make for themselves do achieve a sense of stability and continuity. Like every creature, we can only live in a relatively narrow zone of comfort between unbearable or lethal extremes. And this is a truth of psychology as well as biology. To appreciate or even perceive the full majesty of the world would be too much; sensory input must be filtered, simplified, conducive to decisive actions. There must be neither too much nor too little stimulus. Meaning emerges between overwhelming chaos and stultifying regularity or tautology. Such a middle zone is ordered, while not overly determined; it has general structure, but leaves details to be worked out. The mind finds great satisfaction and engagement in this problem-solving type of activity, sometimes called 'convergent thinking' and also called 'normal science' in the context of scientific research.[14] It is basically the fascination evoked by games of all sorts—including their current

archetype, the arcade-style computer game. In any game, there is given a field of play (whether a board or a grassy playing area, or their electronic equivalents), a defined goal, some rules, and some playing-pieces (like chess pieces, a football, the "tokens" of Monopoly, or the protagonists of role-playing games). Students of mathematics may recognize these as the elements of a formal or axiomatic system, such as geometry. Indeed, games *are* embodiments of axiomatic systems and any game can be axiomatized.

So can any machine. Machines, in fact, embody formal systems too, just as cultural artifacts in general embody ideas. It is still current to think of brains, organisms, and even nature at large as mechanical—which means, implicitly, that they are seen as embodying an intentional design. The machine is the paradigm of artifacts and invented systems, and for millennia it made sense to believe that the world was designed and created by a master Craftsman. The materialist view, however, is that mind is a product of nature and not the other way around. Therefore, ironically, if materialism is true, then mechanism is not! We shall see that the mechanistic worldview that grew out of materialism involves a paradoxical and unwarranted projection of mind (in the guise of artifact) back upon the natural world.

Mechanism, progress, and linear time are related modern notions bearing a family resemblance to the concepts of problem solving, game playing, axiomatic systems, and textual interpretation. We shall see that it is no coincidence they all bear strong appeal to the masculine mind in particular. They have in common the provision of a comfortable, workable zone in which the self is empowered, a manageable mental space in which to achieve definable goals. The geared clock was the archetypal mechanism, the inspiration for the "clockwork universe" of the Enlightenment, and also the precursor of the motor. An algorithm is a motor for generating an output from an input, as are the rules of a game. Hence, the first computers were called calculating *engines*. The ultimate conclusion of linear time—the final output of the "initial conditions" of the cosmos—is the heat death of the mechanist universe, when all the moves have been played out, the mainspring unwound, the engine of the universe run out of steam, the program terminated.

Some individuals, and some societies, are more open and some more closed. Furthermore, there are cycles of opening and closing in societies, in individual lives, and in creative processes.[15] Most of any historical cycle will consist of working out the details of a new regime, scheme, paradigm, or theory. But the cycle will also necessarily include

an initial creative ferment and a final stagnation, sandwiching the more conventional middle. When change is too rapid or chaotic, there is nostalgia for the good ol' days, even if they were not in fact so good. Instability inspires conservative longing for structure, certainty and control—until an excess of *those* inspires revolt again! Generally, too much of anything breeds its opposite, as part of the homeostatic search for balance.

Contemporary disaffection for rapid change and the dubious fruits of technology fuels a return to religious and spiritual beliefs and conservative values. But religion and tradition cannot effectively re-enchant the world. They represent, rather, the same remove from nature that motivates technology. Theology may provide security in a fixed system of beliefs; but it will be an impoverished system because of its very fixity, offering only a precarious security. The wonder and awe for which people pine in the mechanized world derive from the vastness of the natural world and the open horizon of consciousness; they cannot be rekindled in claustrophobic systems of thought. While any religion is far more reductionist (and fatalist) than the 19th-century scientific determinism from which we are beginning to recover, the modern program of science still includes the idealist article of faith that physical reality is, in principle, exhaustible by human thought—or by superhuman computation. It is the faith that Man, or his spiritual descendants, will one day know and control everything, and that the shallow values of the modernist aberration will spread over this planet and beyond. This is the sound of idealist monologue, of no one listening because nature is deemed to have nothing further to say.

1.2 The Triune World

The very existence of the physical cosmos and biological life are miraculous, yet there is a further miracle in the strange fact of consciousness. We exist, we are alive, and we are *aware* of existing and being alive and aware. We are aware of our awareness, conscious of being sentient organisms moving through time toward mortality.

However, the default state of awareness is focus upon the world outside the skin, so that one does not usually dwell on the awareness itself, nor distinguish it from the world that is its natural object. We might plausibly imagine that animals are confined to this state of external orientation. But humans have another direction for attention as well. Besides sensation, we embrace feelings, thoughts, imagination,

dreams—the "inner" realm that is loosely called subjective. The existence of such an inner venue suggests that awareness—even of the external world—constitutes a distinct domain in contrast to the world itself. We shall see that Man needs this second domain, this inner space of humanly created meaning, as his home away from home and as the workshop for his tinkering.[16] Of course, it is not at first a place in any physical sense, although the mind's eye does seem to rove in something like space. Mental images, for example, seem to have extension, as external objects do. But this apparent space, visual and conceptual, is in no topological way inner; the external world may be exterior to the skin, but not literally to mental space. When we speak of the inner realm of thoughts and emotions, it is not the physical volume inside the body that is meant, although emotions do have their somatic referents. We mean rather a conceptual space whose characteristics and structure may be modeled on physical space, but whose objects are 'ideas' rather than things. This is the primary sense of ideality. The connotation and meaning of *perfection* derive from the fact that we prefer to live in such a humanly-defined, idealized, and mental world.

Mental images are, in essence and origin, representations of physical things, even though a given mental image may not correspond to any actual thing. Unicorns may not really exist, but no one would be entirely surprised to see one in the flesh since they are, more or less, familiar horses to which a familiar tusk has been added. They do not exist in nature, but they do in the world of imagination. Of course, such creatures of the mind's eye have also been re-created in the external world by human hands. Thus they appear in medieval paintings and tapestries, in children's illustrations, as carousel rides, in animated cartoons, etc., as well as in literary descriptions. Whether reconstituted graphically or typographically, a mental image can be stored in physical form, from where it can be retrieved again to mental space. The thing was first physical (actual horse and actual tusk), then mental (perception, memory, and imagination), then physical again (painting, sculpture, printed description), then mental once again (as perception of the artifact and the image it conveys).

The inner world is plastic in ways that the outer world is not. In your mind's eye you can move mountains, or grow horns on horses. The mental world is hardly subject to physical laws, even if modeled on the physical world. (If energy is spent in thinking, in mentally moving the mountain, it is physiological energy of the brain and accompanying tensions of the body. You are not obliged to *imagine* any energy required at all to move the mountain.) Imagination is a magical realm,

where new things, new actions, and new combinations are thinkable which extend the range of possibilities beyond those presented by the external world. Conversely, magic and magical thinking project the freedom and plasticity of this inner world. Fantasy and magic are the forerunners of technology, as the means to bend external reality to human will.

The symbolic representations of culture include everything that people use or create to store meaning, by means of which they can re-access and transform experiences. This includes memory itself, of course, and human culture must have consisted for a very long time mostly of lore and songs committed to memory. Language was the first, and remains the foremost, cultural tool. But meaning can be stored outside memory, in cultural artifacts, which have a dual status as material object and mental symbol, as physical energy and as information. Man-made objects and signs exist, so to speak, at the interface between mind and body. With reasonable justification, one could consider cultural expressions to occupy a third realm in its own right. Thus, philosopher Karl Popper speaks of the *three worlds*, respectively, of physical states and objects, states or objects of consciousness, and cultural expressions—to which he refers as the "objective contents of thought."[17] What makes them objective is that they are intersubjective or transpersonal, even when ephemeral—like a song, for instance, whether or not it is recorded or written down. Since many cultural expressions *are* embodied in artifacts, this "third world" is not only ideal but has a physical existence of its own. It is everything that expresses and codifies human thought and experience in a public way. That the image, the idea, can be altered experimentally before it leads to action allows action upon the environment to be far greater in range and sophistication. Just as importantly, it also allows the world to be used as an extra-somatic memory and workspace, an external display of thoughts. With imagination you can turn a forest into pencils; and you can use the pencil to do calculations that would send you to the moon. The full significance of the independent existence of this third realm was perhaps less apparent in Popper's time than now, when some of its objects might literally acquire a life of their own or become agents of thought themselves.

Technology is but the outward expression of the inner world. It is as novel and remarkable on this planet as the planet itself is surprising in the inert reaches of space. A pencil or a Ferrari is no less alien in the setting of nature than the black monolith of *2001*. Either is a good deal

more out of context than unicorns. After existence and consciousness, therefore, the third "miracle" is *artifice*. From a scientific point of view, what is miraculous in each case is the improbable degree of order. Artifice, technology, and machines in particular, may be viewed as the human contribution to the increase of order in the cosmos.

1.3 Mind-Body Problems

Following Popper, one might say that *being* has three domains: physical reality, or nature; idea, or thought and experience; and culture, which includes technology. Clearly culture and technology involve an interaction of the first two domains. How shall we characterize this interaction, the relationship between the physical and the mental realms? When one speaks of "reality," is it the external physical world that is meant or the inner realm of consciousness of it, which also includes nonphysical things like dreams and mental images? What *is* the display or "show," so to speak, of experience, if it is not physical; and how does it relate to the material world it depicts? What does the world *really* look like, if it is not what is literally portrayed in experience?

Questions of this sort are collectively known in philosophy as the Mind-Body Problem. They reflect, I believe, a deep and persistent confusion arising from the tail-chasing reflexivity of self-consciousness. The fact that we are aware, not only of the world but of our awareness of the world, seems to make awareness itself something separate from its natural objects in the external world. Metaphorically, this difference appears to be like the difference between a snapshot and the scene photographed. While much of the (same) information may be present, the photo of Mt Fuji is not Mt Fuji. Perhaps this does not seem particularly disturbing; after all, both the mountain and the snapshot are physical things, and we can readily see and explain the resemblance through optical and chemical analogues that are stages in causal processes. But suppose you take the picture with a digital camera and store it in your computer's memory. The information in that form is hidden, and without apparent resemblance to Mt. Fuji. To display the image in recognizable form, you need to activate a program, which is a complex series of manipulations that "process" the information. Nevertheless, the image exists in memory, stored physically as electronic micro-states rather than visible states of silver halide particles or pixels on a screen. The very fact that "information" can take different forms suggests that it is independent of *particular* physical processes. That, of course, does

not mean it can exist independently of *all* physical states.

The photo is a domain distinct from the thing it represents. Like a map, though physical, it is not the territory. In a similar way, our brains map and store the world outside (and inside) our skins, and something like a computer program seems to reconstitute electrochemical information in the brain as the "show" (home video?) of experience. But, even aside from the fact that the brain is not literally a computer, much less a camera, there is something troubling about this metaphor, however suggestive. For clearly there is no one inside your head to film or watch the inner show of experience, and no inner screen upon which it is projected, in the way that you look at a TV, movie, computer monitor, photo, or map.[18] Descartes had realized, in early 17th century, that the camera metaphor does not *explain* conscious experience but simply leads to an infinite regression of observers within observers. To understand *why* we see the world at all—or to explain the appearance of an inner display of experience—we are obliged to wonder what it means to *see*. More generally: to inquire what consciousness *is*, and how it works.

The question itself is relatively new. We are, after all, immersed in consciousness, which is so taken for granted, so transparent, that coming to think of it as requiring explanation is like the fish discovering "the problem of water." Before the Renaissance, if people thought about it at all, they probably imagined visual perception as a business of the soul peering out, literally, through the apertures of the eyes and simply registering the world as it is. Other sensory experience might have been similarly conceived through commonplace metaphors. For example, if the soul "wears" the body as a garment or glove, then contact with something hot or abrasive would be painfully transmitted to the soul through the skin, as through clothing; odors would waft in through the nostrils, as through an open window, etc. Aside from dubious anatomy, this sort of naiveté employs the "soul" as a version of the "little man in the head," with an infinite regression of observers. It fails to create a separate category of *experience*—Popper's second world of consciousness. Why a clear sense even of the problem—let alone its solution—only entered human understanding with thinkers like Leibniz and Descartes is an interesting question in its own right (Newton does not seem to have dwelt on it enough to have identified a problem within his purview—one reason, perhaps, why he is not classed as a philosopher). A rough answer would no doubt point to the general rise of subjectivism, individualism, relativism, and religious skepticism in the European Renaissance. It might point to literacy and

print, which separated the messenger from the message and concretized the abstract world of thought as a realm independent from the minds of particular individuals. Books elevated thought, accentuated subject-object dualism, and aggravated the adversarial stance toward the world "outside" the mind, including the body.[19]

Before we proceed further to analyze the Mind-Body Problem as a subtle and esoteric conundrum (with which many people may under-standably not be familiar), it is important to point out that it involves, for each and every one of us, highly personal issues as well. This personal dimension—and therefore the depth of the question itself—is masked by the very fact that it is universal and utterly foundational. The dualism of mind and body, stated simply, is the truism that each of us *is* a "self" who *has* a body. When we look out upon the world, however, we nowhere see selves having bodies. What we do see is bodies going about their business, whether these bodies are inanimate objects or living organisms. The fact of self-consciousness adds to this picture a sense of our own existence—of being some*one* as well as some*thing*. Indeed, we find ourselves *inside* the particular something that the body is (perhaps even inside the head). There is the impression that one's consciousness is the true inhabitant, the body a mere dwelling or vehicle: *you*, not your body, are who you *really* are. This arrogation of identity to the "self" aggravates the fundamental dualism involved in self-consciousness. It forever pits us against the world and especially that part of the world known intimately as one's body.

In particular, dualism establishes a relationship of use or manipulation in regard to the world, and to the body as part of the world. One may call this the 'I/it' relationship. Since the body is a part of the world, and my *experience* seems to be dependent on body functions, I find myself in the same adversarial relationship with my own body as with the world at large. This struggle may take obvious forms, as in the attempt to control experience through drugs or to tame the body through rigors and spiritual practices. It may take more subtle forms like biofeedback training, reprogramming physiological responses and associated conscious experience. Or it may take fanciful forms that would transcend dependence on the body altogether, such as "upload-ing" one's mind to cyberspace. All these strategies in the struggle with embodiment have in common a manipulative stance of the head toward the body, experience, and the world at large. It is this stance of control that broadly underwrites technology.

The human creature is part of a continuum of organisms, all of which seem to exhibit intention. Other creatures have goals and apparent motivations. To this we relate the self-conscious sense of our desires and feelings, so that we are willing sometimes to impute to other creatures the sentience and even selfhood which we so obviously possess. At the same time, however, we may wonder what this really adds to our picture or understanding of organisms. Are they really centers of consciousness like people, or are they perhaps just machines, going through the motions we associate with purpose and feeling? For that matter, nothing prevents us from wondering about each other's sentience or lack of it; hence, the concept of the *zombie* as a human body going through the motions associated with consciousness, yet completely blank inside. In fairness, though, ought we not also to ask the same question about ourselves? How is our consciousness and our selfhood *functional*; how does it help us go about our lives as organisms? From the external perspective of looking out upon the world as composed of bodies, we might suspect that *these* are the real entities, and the *persons* which we take ourselves to be are rather a fiction or myth of some sort. Could the self be something the self-conscious organism has dreamed up as a way of being in the world—a front, so to speak? Then, do *I* have my body or does *it* have me?

If these seem to be silly questions, the answers may have serious consequences. For, if my attitude is that *I* am the boss and owner, and the body is my servant (or robot), then I will certainly relate to it differently than if I consider myself the humble servant, the body master. "Self," moreover, consists of the panorama of one's *experience*, not of the real objects in the world, of which this body is merely one. I am the center of my experience, whereas my body is hardly the center of the universe. This alone is sufficient to dispose one to view experience as preeminent, the seeming objectivity of the world just a feature of the show designed to lend it authenticity and greater interest. Add to this the power of *control* over the production of this show, which one does not exercise over reality, and there you have an enduring appeal of idealism.

How I relate to my body is therefore of key importance, reflected in how I relate to the world of "body" at large. If my body is my personal attendant, sports vehicle, entertainment center, and pleasure dome, why would I not relate to other objects in the same way? For, the basic dualism lies between self and world; *this* body is just the first tier of outerness and otherness in relation to "I." Every form of egotism, subjectivism, self-indulgence, addiction, sexual and economic exploita-

tion, manipulative attitude, substance abuse, and obsession with power likely stems from this root opposition of self and world. And what a different world it would be if this self were seen as a usurper, a fiction, a dream, or perhaps merely a detail of language!

But the self, of course, is utterly convinced of its own existence. Descartes doubted the reality of the world, but never that of his self. While ego may be addicted to reality, the independent reality of the world is a basic threat to ego's hegemony. What a shock, then, to conclude that "self" is merely a conceptual afterthought, along for the ride, and totally at the mercy of the body, others, and the real world! Ego has to work very hard to assimilate or deny such an abhorrent possibility. And it is this shock, I believe, even more than mortality, that is the source of resentment at the natural condition and of the drive to flee nature for a world in which the human self actually is central and master. The whole of civilization might be viewed as an ongoing protest staged by the subjective self, to have its way against natural reality.

Much of what enters consciousness cannot be catalogued as experience of the external world. Dreams, hallucinations, thoughts, imagination, emotions, afterimages, and phantom pains are indeed experiences that may *refer* in one way or another to events or features in the world. But they are not directly experiences *of* the world. This fact suggests another category than experience of external things. It establishes the existence of 'the mental' as opposed to 'the physical,' 'mind' versus 'body,' 'subjective' versus 'objective.' It renders *to see* and *to experience* intransitive verbs. And this duality poses fundamental questions. If some experiences are not experiences of the world, then of what? Furthermore, what prevents the conclusion that not only such "anomalies" as dreams and hallucinations belong in the category of the subjective, but *all* experience? The very existence of the mental realm casts doubt on the reality of the physical one, for how can one be certain to which category a given experience belongs? If all experience takes place in the domain of "film," so to speak, then what reason is there to believe that this inner movie corresponds to what exists "out there" in the real world or that there even *is* a real world outside the theater of the mind? Perhaps one is *always* just watching an inner movie. What, then, is the relationship between experience, as a representation, and the reality it represents; between the film footage and scene filmed? And, if we admit the mental as a category of nonphysical being, how shall we imagine it interacting with the physical world? How do thoughts and

will animate the body, and how does the chemistry of the brain—a physical organ of the body—produce the inner show of experience? To paraphrase Leibniz, how is one to imagine that climbing about in the machinery of the brain would give any hint of what the color blue should be like as an experience, or why the desire to move one's finger leads to the finger moving?

Many answers to these questions have been proposed, but it can almost be said that the problem itself is more significant than any solution. It is one of those fateful issues in philosophy (and, we shall see, in life) that divide opinion roughly into two camps which perennially disagree. This is the symptom of irresolvable paradox, of a conundrum that is logically too basic for common ground or agreement. One of these philosophical camps believes that what is fundamentally real is the external world of physical matter, energy, space and time. This is the position of *materialism,* upon which scientific theories are founded. But many people do not agree that the physical world is the fundamental reality. They remind us, for example, that experience (as opposed to the world experienced) cannot easily be explained in physical terms. Moreover, many specific experiences resist physical explanation (for example, telepathy, out of body episodes, precognition). These point rather to consciousness itself—or its reifications as mind, soul, or spirit —as the fundamental reality. This is the position of *idealism*, which is the core of most religious thinking.

The challenge for materialism is to explain the miraculous *fact* of consciousness, the "show" of experience as I am calling it, and to explain how it relates to physical reality—in particular, how it can be produced by the physical brain. The challenge for idealism is to explain the appearance of a consistent, independent, and perhaps infinitely complex external world. If it is all but a dream, then it may as well be as irrational, inconsistent, sketchy and incomprehensible as dreams often are. But it is not. If it is a dream, it is a recurring, consistent, highly detailed, and largely communal one. Many spiritual doctrines do portray experience as illusory, dreamlike. Some are pessimistic about this life in the measure it appears to be a nightmare of transitory illusions from which it is advised to awaken. But there is a hopeful side to idealism as well. If "it is all in the mind," then at least it would appear that one has some direct say over experience—the power to avoid suffering through a change of perception, attitude, and behavior, for instance. This is the basis of "positive thinking" and many New Age doctrines, as well as perennial spiritual teachings.

There are educated modern people who believe they can influence

the weather with their thoughts, possibly because they consider the external world to *be* a thought. From a materialist perspective, this is nonsense—a regression to magical, wishful thinking. But materialism also has its pessimism and optimism, and perhaps its childish naiveté. If the material world alone is causally real, then consciousness is helplessly along for a deterministic ride. What hope of freedom is there, for example, if we are simply run by our genes—or those of our rulers? On the other hand, technology promises the power to change physical reality—the ability, for instance, to manipulate our genes and therefore our very being. Clearly, materialism looks at one side of the picture, idealism at the other. But can we see the picture as a whole?

Idealism focuses on the role of mind, or self, in determining experience, while materialism emphasizes the role of the external world. This suggests that experience is actually a co-product of self and world. Mind is one factor in determining experience, matter is the other. Using a mathematical analogy, one could say that experience is a function of these two "variables," or that it varies as the *product* of self and world. I call this the Equation of Experience. Of course, a single equation with two unknowns cannot be "solved." And in life there is no second equation with the missing information. The only way to solve the Equation of Experience is to treat one of the variables as a constant: to fix it arbitrarily, by convention. This is just what both idealism and materialism attempt to do. Each pretends that there is only *one* active and independent input to experience; the other "variable" is ignored as effectively dependent on the first. Thus, to the idealist, the appearance of an external world is merely another creation of the mind or self (or of God); while, to the materialist, mind and self (and the concept of God) arise in physical brains, through natural processes. The Equation, following common sense, states rather that experience always involves a contribution from *both* self and world and that both are real and important in determining our experience. However, there are actually several issues here entwined.

One is a variant of the nature-nurture debate: does information from the outside world, or one's mental processing of that information, determine one's experience? The clear answer of the Equation is: *always both*. Another question is whether idealism or materialism is the correct *perspective* in which to understand the nature of experience and the world. Is the essence of reality mind or matter? This question can never be answered to everyone's satisfaction; the best that can be hoped for, I believe, is a somewhat artificial compromise, that each has its

place. No one can prove to everyone's satisfaction that either perspective is exclusively valid; but we might agree that both are useful in some contexts, limiting in others. Like the wave and particle theories of optics, they may be considered complementary, at least pending a deeper understanding.

Furthermore, we might recognize that what distinguishes them is actually *point of view*: a first-person versus third-person narrative. Materialist description is always in the third-person (remembering, however, that *any* description is ultimately and inescapably first-person. Even scientific measurement and observation are, if not carried out, at least interpreted by conscious scientists). Idealist description is implicitly first-person (keeping in mind its tendency to reify the viewpoint of the self as a quasi-material entity, as in the soul or the eternal Forms of Plato). The question then becomes: which is truer, a first-person or a third-person account? Must we not conclude again that both have their place?

Why are many philosophers (and probably people in general) not content to let the issue rest there, with the uneasy truce of such informal dualism? To answer that question, we must first realize that self-consciousness really does create a unique and embarrassing dilemma from which there is no *definitive* way out. In either an idealist world (in which matter is just another idea) or in a materialist world (in which mind is dismissed as an "epiphenomenon"), there would *be* no Mind-Body Problem, no dualism. Were we not aware of being aware, there would be no separation of subject and object, no categories of 'subject' and 'object,' 'self' and 'world,' 'mental' and 'physical.' There would simply be *the world*, without categorizing experience of it *as* experience or as taking place in an inner domain belonging to a self. Nor, without a self, would one explicitly perceive the world as unfolding "outside" of oneself. Rather, it would simply *be*. For modern adults, this state of pre-subjective non-differentiation is hypothetical, since that is not normally how experience is organized for us. But we may imagine that newborn infants, and most animals, are in something like this state, since they do not appear to be self-conscious. We might speculate that there was a time in prehistory when our earliest ancestors were in transition toward increasing self-consciousness—which, indeed, appears to be still developing. In any case, self-consciousness has cast humans irreversibly into mixed terrain.

To accept the indissolubility of subject and object in a deeper than intellectual sense could be interpreted as enlightenment or as psychosis, depending on how the person handles the disorientation involved.[20]

The search for freedom and empowerment of the self may derail toward either side of the Equation—toward megalomania or toward a paranoid sense of the world's power over oneself.[21] The "idealism" of the individual psychotic may cause trouble when it exceeds the collectively defined bounds of common sense; whereas society as a whole can get away with its delusions until they become collectively lethal.

There is a natural inclination to favor one variable over the other. Thus, the dualism of mind and matter divides philosophical opinion about itself. While they cannot agree with each other, people are natural monists because unity seems to be an important principle of psychic organization. Even those ancient systems of thought expressly called dualistic—such as Christianity, Zoroastrianism before it, or Manichaeism after—in fact take sides, favoring the triumph of good, or God, over the other principle.

Why, then, *are* we self-conscious if it is so much trouble? Does self-consciousness serve some biological purpose? Perhaps it is inevitable in a brain that is complex enough to self-refer. Analogous difficulties are known to arise in mathematical systems complex enough to allow self-reference. Certainly, if self-consciousness were *dis*advantageous, brains of such complexity would have been selected out of existence. Quite the contrary, the construction of an inner subjective domain of thought seems to be the very key to Man's success as the rational, technological animal. In this, its proper domain, mind is able to create abstractions and simulations, models and idealizations, material as well as imaginative fabrications. This is how we extend our cognitive reach beyond immediate time and space and sensory limits. Because our minds can abstract and analyze regularities, to some extent we can anticipate the future. Because we can invent systems of thought and translate them into physical systems, we extend the senses' grasp, expand our environment, and transform the world into a place of our own making, in which to feel more secure and in control. The subjective domain turns itself inside out, giving rise to external aids to thought, such as writing, books, films, and computers. All of this has immediate survival value, but goes further to lay up stock in the future, the possible, the imaginable. The ability to play in this inner world yields a miraculous edge in the outer one. The growth of civilization reflects the growth of subjective consciousness, and of the ideal world that is not *of* nature, even while it is its evolutionary product. Consciousness itself is an ecological niche. If we are unique on the planet as conscious beings, it is not because we are spirits somehow marooned in a physical cosmos, but because our species long ago eliminated major competitors.

Awareness appears to serve as a means of registration, and tagging for later retrieval, of input into the memory system. Awareness constitutes knowledge *that* information has entered the system; for, the classification involved in processing a content for meaning also serves to file it appropriately for retrieval. *Self-consciousness*, in contrast, is *meta*-awareness. Only a self-conscious being can ascribe to itself a point of view that is distinct from what is viewed, and even claim the view it looks upon as its own production. As when watching the news, one is at once looking at the TV monitor here in the room and at the remote but real scene transmitted. Attention is naturally drawn to one or the other aspect; self-consciousness insures the ability to choose which, according to context.

To continue this metaphor, sometimes the monitor displays prerecorded files or fictional productions instead of a live remote source. In all cases, however, one can say that the *display* constitutes a distinct domain from the content displayed. Without self-consciousness there would be neither an explicitly interior domain nor an explicit point of view *upon* the world. There would only be the ever-changing unfolding of the display itself (or, of the world, if you prefer).

Self-consciousness implies awareness of one's positive but limited role in producing and choosing experience—that is, awareness of the 'self' variable in the equation. This awareness gives one, to some extent, the ability to change the experience, if not the world itself. The ability to consciously reprogram, so to speak, means greater flexibility and range of response, as well as a more objective perception of the world. Obviously, these abilities alone would favor survival. More than that, however, the inner domain is the research and development laboratory for the direct invention of new experience—new images, assembled and transformed, of elements borrowed from the external world. The recombination of these is the basis of our power to manipulate the world itself, and so to change experience indirectly as well as directly. In this way nature is redesigned by human consciousness, at least and at first in imagination, and often eventually in deed, through technology.

The evolutionary advantage of subjective consciousness is that it leads potentially (and paradoxically) to greater objectivity and control. But objectivity, we shall see, is a double-edged sword. An instinctual behavior is brought under conscious control by bracketing its perceived object as an element of an inner domain. In this way, one can stand outside the behavioral implications of perception to reconsider

the object from a more detached perspective.[22] The overweening certainty implied in perception of the object as external and *real* is tempered by recognizing one's own contribution to that perception. One is therefore in a better position to look before leaping, even literally. The implied emotional detachment may have facilitated cooperative behavior in a highly socialized species. The utility and significance of "objectivity" should be considered in this evolutionary context. The very function of self-consciousness is to qualify and relativize the mind's tendency to perceive in absolutes—in objective, external, certain terms. This function itself must be qualified as well; too much detachment or certainty is as dangerous as too little.

One can argue that because nature created Man, whatever Man does is natural—part of the self-organizing creativity of the universe. It must be admitted, however, that much human activity defies naturalistic analysis precisely because it does not seem to derive from instinct or directly serve survival. Man has staked out another territory than nature, in mental existence and in the world of artifacts. If consciousness itself is *defined* to be natural, then the human world may be considered a natural progression of animal life. But such a definition begs the question; and even then the disjunction implied in the Mind-Body Problem does not disappear. Consciousness could as well be regarded as an evolutionary cusp, precipitating life into a post-natural state.

Here, briefly, is the solution to the Mind-Body Problem I propose: subjective experience, and the objective behavior that is its correlate, share a common origin and meaning within the organism as an *intentional agent*. An organism is, of course, a passive physical system as well as such an agent; it is part of the causal universe. But unlike inanimate matter, physical connections within the organism are also *logical* connections, and the flow of behavior can be described either causally or logically. In this sense, the mental *is* the physical, for they are two descriptions of the same events, containing the same information. The fact that information must be carried on underlying causal processes is another way to state the identity of mental and physical. Information is then both the message and the medium. It is knowledge of events, meaning communicated symbolically through logical connections; *and* it is events themselves, communicated physically through causal chains of influence. Description formulated in terms of intentionality is able to bridge the gulf between first and third-person perspectives because every intentional agent (that exists physically) is also a

causal system. Otherwise put: every mind has (is) a body. The reverse, of course, is hardly true: not every physical system is an intentional agent.

Causal description of a creature's behavior, like that of inanimate matter, may be viewed as a sequence of physical events in space and time, connected by forces and processes which exist independently of human thought and which do not entail the creature's agency or intention. The creature's behavior then appears to proceed passively from sensory stimulus, through electrochemical connections within the organism, to motor response. All of this takes place implicitly from a third-person point of view, as events in a physical world external to the observer. But such a molecular description of a creature can hardly account for its behavior as an organism. Intentional description, in contrast, consists of a sequence of steps in a *logical* system, like the moves in a game of chess, or the instructions comprising a computer program, or the dialogue and stage directions of a play. It is a series of actions that are intended as well as observed (though in a sense not to be identified with human conscious intention). While intentional description may be explicitly third-person, it implicitly takes a first-person point of view, as an analysis of the purposes and point of view of an agent rather than the behavior of inanimate matter or the point of view of the human observer. Intentionality involves symbolic operations, following logically gratuitous principles.[23] Such operations within the organism can be understood as a formalizable cognitive system (like geometry or any language) that is "interpreted" as referring to the real world. As intentional connections, they are made not in physical space but in conceptual space. Intentional sequences take place not in time but in logical order: the if/then of syllogism rather than cause/effect in time.

Nevertheless, such connections may be embodied in a physical system. Indeed, they *must* be if they are to be real. Intentional connections or sequences are real, or embodied, when they also consist of physical events, which instantiate them and which may be described causally. Your thoughts, for instance, are embodied by neurological processes in your brain. The former take place in a symbolic realm, following their own rules of formation and meaning, while the latter take place in physical space and time, following physical and chemical laws. But they are one and the same. From a logical point of view, these are parallel rather than contradictory descriptions; the whole point is their correlation or coincidence, just as words are carried on corresponding physical sounds or signs.

How, then, does an object (even the sophisticated object that an organism is) *have* its own *experience*? How does it differ from inanimate objects that can be described in strictly causal terms? The short answer is: by *intention,* as distinguished from *cause*. To be sure, an organism may be viewed as a causal system; but it is also an intentional agent. Just as squiggles on a page can come alive as a story, or mathematical symbols can represent actual relations between things in the world, experience *is* the semantic sense that an organism's brain makes of its own representations, its communication with itself as an intentional agent. *A physical system comes to have experience, and a point of view of its own, through the long evolutionary history that obliges it to become an intentional agent*. It thereby makes sense of its relations to the world, registered in internal representations that *matter to itself*. Motivation is the source of all meaning.

Nevertheless, it confounds one to ponder just what the felt qualities of experience—the greenness of trees, sweetness of sugar, pleasure of orgasm, or burning of pain—have to do with the blob of gray stuff inside one's head. It is too enormous a leap from the circuitry of brain cells to the personal spectacle of experience, which one is ill prepared to make even in the age of neuroscience. The brilliant Leibniz could not conceive how the brain as a mechanism could give rise to subjective experience. Many philosophers and scientists even today cannot, and the Mind-Body Problem is a wilderness in which we are still wandering. In part, I believe, this is because we continue benighted with romantic notions of our own idealized being as subjects, on the one hand, and with simplistic idealizations of matter, on the other. In other words, we are victims of the subject-object split we study, being ourselves tied in the Gordian knot we attempt to unravel. In part, the concept of mechanism is at fault (or else arose from the same defective thinking). The systems with which Leibniz and Descartes were familiar were hopelessly simple. A modern computer is unfathomably more complex than a clock; yet even it is nowhere nearly as complex as the lowliest organism—a single cell. Nor is the organism an isolated system, *an artifact*. It is no more like a computer than like a clock.

We know that the cell is the product of a long and complex history of chemical and biological interactions within an intricate biosphere. A couple of billion years of research and development went into perfecting the first eukaryotic cell! The human brain contains about ten billion such cells, each with a hundred thousand connections or more, so that the storage capacity of an adult human brain is at least one million

billion bits—on the order of a million times more than personal computers in the year 2000. While this gap is being quickly enough eroded through advances in hardware, the key to intelligence—and hence consciousness—is not simply the brain's connectedness within itself, but also its connection *to* an environment, and the fact that this connection is charged with *motivation*. Organisms co-evolved in interaction with the world of other organisms around them; they evaluate stimuli from the world in light of their determination to survive and reproduce. So far, mercifully, computers do not. No computer (yet) stands in an embodied relationship to an environment, which provides not only its input, but also the *significance to itself* of that input, and thus a motivation for outputs insuring its continued existence.

It seems that such a relationship can only be established through an evolutionary contest. The premises of the embodied mind are not arbitrary, not programmed from without or imposed from on high, but built in to the values implied in genetic fitness. Hence, pain *must* "hurt" if the creature is to survive; sugar *must* taste "good." Space *must* look "three-dimensional" if there is to be perception of distance to accommodate movement through space. And reality *must* have a solidly "real" look to it if one is to negotiate a dangerous and otherwise significant world.

Why it is that light of wavelength .5 microns is perceived as "blue," while light of wavelength .7 microns is perceived as "red," is a far more subtle question, however. It raises the general question: what is the evolutionary significance of phenomenal qualities? In some sense they seem compulsory—red must be ruddy in the way that pain must hurt, and that 'tree' must conjure what it does in English. "Qualia" are not properties of the world-in-itself any more than adjectives are (though they *refer*, like adjectives, to the world and contain information *about* it). Neither are they a mental substance (an ethereal paint), nor a completely arbitrary fiction of the mind. Rather, they must be the irreducible product of intentional connections made within the organism, reflecting connections with the environment interactively established over thousands of generations. Mind *is* these connections, and experience is the brain's account to itself of them, in what amounts to its own language. Experience represents the world, not as photography does, but in the way that language does: by symbolic convention. (Significantly, the *person* of a viewpoint takes its name from language.) And the subjective experience of qualities such as color, smell, taste, touch, and auditory tone emerge from sensory input in a way analogous to how meaning emerges from the inchoate babble of syllables.

Language, too, is motivated. It has always been a tool to convince, manipulate, and deceive as well as to inform. While one may discourse dispassionately today about many subjects, the first human vocal expressions were probably not so different from the excited alarm calls of primates and other animals. On the other hand, what makes grammatical language such an invaluable tool is precisely that it may be used in a detached and flexible way, combining words and ideas in inventive new permutations removed from specific context or immediate survival value. The detached perception of an objective world—in which the motivated "meaning" of *redness* (blood?) is no longer compulsive—might have emerged from an earlier urgency of sensations in the way that grammatical language emerged from animal calls.

Intentional and causal descriptions are equivalent because they contain the same information expressed from different points of view. That we have (and are stuck with) two seemingly disparate perspectives is an inescapable consequence of self-awareness, without which there would be no Mind-Body Problem—but no humanity either. The importance of understanding the role of intentionality in consciousness —and the disparity between first and third-person descriptions—extends far beyond a technical solution to a philosophical puzzle, for it is also the key to freedom and responsibility in a world that alternately seems deterministic or chaotic.

1.4 The Immaculate Misconception

To be a human being is to be conscious of embodiment. What that is subjectively *like* can hardly be what it is like to be a (presumably) unself-conscious creature, such as a bat. But neither can it be what it is like to be a spirit without body, such as an angel or soul. Like the animal's, our sentience is conditioned by the natural context within which it has co-evolved with the sentience of other creatures. And that context is embodiment in a physical world of competing and cooperating biological organisms. This has never prevented humans from aspiring to a discarnate state, nor from pretending to have a disembodied point of view. The naiveté of the natural realist, in which human sentience unselfconsciously identifies with the body's programs and views the world as simply *there*, may be compared and contrasted with an idealism that sees only the self reflected in the mirror of experience, and that consciously denies the power of the world and the body over the self.

The great lesson of early twentieth-century physics—still being assimilated by the biological and social sciences—is that the twin Newtonian ideals of the isolated physical system and of the detached, omniscient observer are but useful fictions within limited contexts. When people first began to think scientifically about geology, the origins of the earth and cosmos, and the evolution of life, they did not immediately consider that the very terms and concepts of their investigation must themselves be a *product* of that evolution. Far from it, they accepted human reason and perception as absolutes above nature, transparent windows of an ivory tower overlooking an objective world. Moreover, they typically accepted the views of their own generation as the last word. The very concept of objectivity implicitly means considering the object in its own right, as though it were *not* the perception or conception of some agent. In practice, the meaning of scientific objectivity is less pretentious and austere: investigators must be interchangeable, and consensus among them arrives through standardized and mutually accepted procedures. But this only works because the world *does* appear to carry on as a consistent place when we are not looking, with universal laws, so that the definition of objective description rests implicitly upon the reasonable assumption that there *is* a real way the universe is, which is consistent and relatively isotropic for anyone who cares to look.

Consensus among humans is one thing—and hard enough to come by! If ever we do make contact with alien scientists, it may be far more difficult to achieve with them. Even so, we surely would share with such beings the fact of embodiment, with an evolutionary history behind it. The ball park might be bigger but it would still enclose some common ground. Gross consensus would be favored by an essential similarity among observers and by the fact of sharing in common a real world. There may well be a definite way the world is when no one is looking. Quantum physics has cast some doubt on this most basic premise of realism; but the question is too deep to be decided by a generation or two of physicists. We can be certain, however, that there is something wrong with the notion that objective reality is simply how it happens to appear in *our* cognition—or in that of any particular creature or generation.

The notion of how the world is *in itself*, without the participation of observers, is paradoxical because any knowledge or image that might be entertained certainly takes place in someone's cognition. We can know nothing of the world-in-itself, untouched by mind, so to speak;

for, any knowledge *is* the assertion of a mind. The Equation of Experience tells us that knowledge of the world is a joint product of both the world and the self. There is no way around fundamental epistemic participation in our knowledge of the world and of ourselves. Such realizations are inescapable consequences of self-consciousness. They can be denied, but never undone.

How the universe really is, apart from anyone's looking, is presumably how it looked before any observers had evolved to observe it. We may rightly assume that the world was in a different state three or four billion years ago. But the problem involved here is not change over time, but the meaning of "appearance" in a universe without observers. In trying to picture the unpicturable face of the world-in-itself, we have little recourse but to mistake it for its appearance to *us*. One is forced either to take the map as the territory or to remain silent—a dilemma that frequently results in the circular reasoning of what I call the "problem of cognitive domains."[24] The external world appears to subjective consciousness as an image constructed by the mind to reflect the external world, which means the latter then appears recursively to be an image constructed by the mind... The endpoint of the causal chain must be recycled as the beginning, so that something in the human cognitive domain is unavoidably taken for the world-in-itself.

Objective description supposedly takes place from a "third-person" point of view. But all description is necessarily *someone's*—which means in the *first* person. So-called objective description simply omits mention of the describer. In such accounts, the intention is to talk about the world, not about one's personal experience. The observer cannot pretend, however, to have some way of knowing about the external world other than through some form of personal experience. Reading, hearsay, belief, intuition, revelation, and inner certitude are all, in fact, personal experiences, along with sensation and observation. Measurement with instruments or by machines does not get us off the hook by exorcizing mind. These are but extensions of the observer's senses and intentions, and it is still some *mind* that will interpret the readings.

Science has created a modern myth of origins, a history of life and consciousness arising within matter and culminating in Western civilization's scientific worldview. This mythological creature chases its own tail. The scientific description of reality presumes to disrobe nature and raw experience to reveal the objective structure underlying appearances. But from the point of view of common sense and everyday life, it appears rather that science dresses the flesh of the world in its own abstractions. According to the story, we are the product of the

history it tells; but the story—which reaches back long before our existence—is the product of our modern imagination and telling. Humans were not there to witness the origins of the world, and their latest, most cherished accounts are but a few decades old, out of the billions of years in which the drama itself may have unfolded. Storytelling is an ancient, entertaining, and essential human interest. It is central to the search for meaning and truth. But no cosmological account should ever be confused with reality itself, or with the ideal of truth.

1.5 The Way of the Flesh

While nature is the mysterious thing that it is, it is also our image of it, reflecting human feelings, goals, and values. Behind these, moreover, stand our animal purposes as participants in the chthonic system of nature. We cannot avoid this participation, nor the embarrassing circularity of having our view of nature shaped by it. To have a view at all, one must stand somewhere, clothed in flesh.

The very gesture of calling nature a *system,* and defining its game-like elements, creates a perspective exterior to the system itself, a detachment and freedom from dictates that follow from immersion within it. The scientific *concept* of nature is therefore part of the human strategy to disengage from the natural system of which it is the concept. This circularity is part of the "bootstrap" operation of consciousness, whereby it reaches beyond limitations. Let us also remember that this reaching creates a dual perspective. For, we are at once pawns in the natural game and free players with a foothold in conceptual worlds outside the confines of nature. Many ideas *about* natural reality, moreover, are ultimately shaped by the need to play well *within* it. The concept of system, we shall see, imposes its own problems.

For the moment, let us say that the system of nature includes the whole of the physical world and its evolutionary history and future. The aspect we are most immediately involved in is the "game" of natural selection. Evolutionary psychology attempts to describe the human pathway through the contest of survival—that is, how genetic history has shaped present perception and behavior. The rule of the game is: survive to produce as many offspring as possible, who may also survive to reproduce... etc. This simply restates the fact that those players still in the game are by definition the ones whose ancestors stayed in the game long enough to reproduce. Survival of the fittest

means domination of the gene pool through natural selection, passing on to future generations their selective advantage. But 'fitness' means little more than success at reproducing, which makes the logic of the system wholly circular, if not mad. The characteristics that are desirable (from a point of view of a player within the game of natural selection) are simply those that lead to being here as a player—an insidiously recursive arrangement! They may not correspond at all to characteristics considered desirable from points of view outside the system.

Evolutionary psychology demonstrates how subjective human values reflect objective genetic rewards. This amounts to *connecting* the first and third points of view. More typically, however, the intent is to *reduce* one domain to another, as though it were too troublesome to think along more than a single dimension at once. Thus, morality may be reduced to genetic gain, psychology to biology, the mental to the physical, the human world to its animal origins. However, to either ignore animal origins or to reduce human nature to them is to try to sidestep the conflict between mind and body. I prefer rather to underline the conflict itself and the momentous reaction to it. Self-conscious mind, successfully or not, is perpetually in revolt against its perceived entrapment in the system of nature and its own identification with the body and survival. We are the creature with one foot in each of two worlds, and this is what is most interesting about us.

We are here because each and every one of our ancestors, back to the beginning of life, made at each turn exactly the choices that led to a life that included having offspring who in turn had offspring. The complexity of the human organism is in direct proportion to the convolutions of this evolutionary path; to the millions of invisible roads taken or not taken toward this simple goal of continuance; to the amount of trial and error that went into refining us as sophisticated replicators.

The "great chain of being," which is the net result of this process, is actually a pyramid. The "progress" of evolution lies in filling "layers" upward in complexity (and generally in physical size), while the layers themselves of this pyramid hardly evolve, but remain in place to support what is above. The snowball effect of accelerating complexification is related to this pyramidal structure, since it took longer to "solve" the earlier, more foundational problems of organization. But since there is no one *doing* this problem solving, a clearer way to describe the process might be to start with the notion of stasis rather than change. For, life is essentially homeostatic. It tries *not* to change, but to remain the same, to replicate itself identically. But errors are

inevitable in any copying process and a small few of them may be improvements. As some of these imperfect genetic copies have a differential advantage over others, a dynamic is already in place for an endless game of one-upmanship. In any arms race, bigger may be better; more complex may also be better. But this dynamic also tends to differentiate levels or niches, so that there is no question, for instance, of eukaryotes and prokaryotes being mutually exclusive. The point is that the expansion of complexity—the upward filling of the pyramid— happens *in spite* of equilibrium, even through disrupting it. But it also happens *because* of the continued stability of lower layers. Being at the top, we cannot remove much of the pyramid without risking its collapse, which would be fatal for us if not for those below. Microbes, which laid and continue to constitute the foundation, could survive without us, but not vice-versa.

A self-conscious creature may recognize its participation in the system of nature, as an embodied player in the game of selection. From a materialist perspective, for consciousness to exist at all it must have an embodied relation to the world, established through an evolutionary history. And this in turn means: to be an *earnest player in the game*, playing by the rules and for keeps. Earnestness means viewing the game from within, from the highly identified perspective of an individual playing piece. Identification with the body and its needs is a prerequisite to stay in the game. We are instinctively compelled to take seriously the pursuit of well-being (known to us subjectively as pleasure or comfort), the avoidance of damage or the threat of it (known to us as pain, discomfort, fear), and the supreme goal of reproduction (known to us as sexual pleasure or lust, and longings for family or relationship). There is little room for dabblers in the game of life; they would long ago have been out-reproduced by more earnest lineages— or would never have arisen. This is something of a paradox, given that the human species is a notorious dabbler and also, for the moment, highly successful. The paradox becomes mere irony when one considers the advantages conferred by points of view that are relatively free from automatic compulsions, if only to be identified on higher levels with the survival mandate. For instance, to seek the fulfillment or salvation of the soul rather than the flesh may lead—through the complex series of sublimations and reversals known as culture—to improved conditions for bodies in general and to greater reproductive success of the collective, if not the individual concerned.

To the degree the human being has one foot in the natural world,

the nature of perception (as well as the perception of nature) is determined by the rules of the game. As natural creatures, we tend to see the world in ways that facilitate survival and reproduction more than truth, for instance. At the same time, the world we see is increasingly unrecognizable as a natural setting. The rules of the game have to a large extent remained the same while the playing field has changed. To be sure, the human environment still appears divided into objects and actions with significance for our well-being. But our ways of seeing, categories, and neural pathways are in general a much older inheritance than the current outlines of the human world. Human being is therefore strung out in evolutionary time, so that we typically bring to bear in the modern world archaic mental processes formed in the "ancestral environment" or before. The tensions and the distortions of perception required to maintain sanity in an urban setting can be enormous. Life in a city, as Desmond Morris points out, is equivalent to the crowded life in captivity of zoo animals, and many human neuroses have their parallels in the behavior of captive animals.

That we are here because our ancestors reproduced appears an empty tautology, on the face of it. But it reveals a great deal when we look at what *sort* of organism we must be in order to have survived to be here posing these questions. Like characters in a novel, we come from a certain background, in this case an animal heritage. This informs all the categories of our thinking, but also inspires a deep rebellion against our upbringing in nature. This conflict continues to plague us with social and environmental consequences. Nothing could better portend a cheerful dénouement of the human story than to understand both this instinctual background and the rejection of it.

Let us consider, then, the circumstances of an embodied creature, a generic player in the game of natural selection, in order to examine how this is received specifically by the human self-consciousness. Lest this seem a pointless exercise, let us recall that at one time, one may speculate, the budding human consciousness might have been in such a circumstance: which is to say, leading more or less the life of a brute, yet horrified by awareness of its vulnerable and mortal condition.

To achieve any size and complexity, a multi-celled organism had to differentiate between cells that were to pursue their own future continuity, if on behalf of the organism as a whole, and those that were to serve the development, integrity, and continuity of the organism immediately in the present generation. Many individual cells, for example, are required to die in the initial growth of the body through

cell division—a kind of pruning known as programmed cell death. Others are required to sacrifice themselves in the normal maintenance of the body. The early institution of sexual reproduction committed the system of life to a drastic divide between a germ line and a somatic line. Only the sex cells are immortal, while the rest *must* die in each generation. The mortality of the body is therefore a built-in byproduct of sex. Reasons for the prevalence of the sexual system of reproduction are still controversial, but one important one appears to be its advantage in the arms race with parasites.[25] It seems, then, that death is an inevitable feature of life and a prerequisite for the arising of complex forms, which could not have occurred without an effective hedge against parasites.

An organism is distinguished from its environment by virtue of being a special region of the universe maintained by a flow of energy coming from and returning to that environment, which is its complement. Energy and nutrients are "pumped" from one to the other and heat and waste products exhausted in the other direction. The organism's distinctness is emphasized and maintained by a permeable membrane, across which it relates to its surroundings, including other organisms, from an implicitly self-centered and exploitative stance. To the organism, the world is an *it* to manipulate for its own maintenance. Even sexual liaisons are a (genetic) resource to be used. The way of the flesh is to be pitted against the world. To live is to consume other living creatures. To put it dramatically, every player in the system is a cannibal, a thief, and a murderer, forced at genetic gunpoint to brutalize other contestants! An intelligent self-conscious being cannot help but be deeply horrified to realize the nightmarish context of his or her life in the demonic frenzy of nature.[26]

Because this mutual exploitation occurs at every level and scale, parasites and disease are inevitable along with attack by larger predators. The body has defenses against invasion at the cellular level, but these are limited by the fact that bodies are constituted to live only to reproductive age, whereas the arms race of host and parasite is relentless. For the same reason, no doubt, the body's ability to self-repair is limited: nature will not invest more than it needs to in the individual soma, since it is the germ line that counts. The system of nature plays the actuarial odds, with no more regard for the individual than is required to optimize genetic winnings. It is the genes which survive into the next generation; the body is merely their expendable vehicle. This means that infirmity, always possible, is all the more likely after reproductive age. The fact that modern people typically live far

beyond that age may be a standing invitation to infirmity.

The interests of the individual organism coincide generally with those of the body, while the rules of the game are dictated by the interests of the genes. The interests of the individual human personality, however, are potentially independent of both. Humans suffer in awareness of their situation, therefore, to the degree that their actual purposes, visions, life plans, values, goals, actions, and experiences are at odds with the system of nature, thwarted by the body, or determined by forces outside themselves. From the point of view of the self-aware consciousness trapped within it, the system of nature is a mad machine, a kafkaesque bureaucracy without concern for individual welfare or happiness—except as that happens to favor success of the genes the individual harbors. Commitment to the game *means* obeying the dictates of genes. Besides the compulsion to eat fellow creatures, this commitment requires beating others of one's kind in competition for mates and for the resources necessary to attract them and insure successful progeny. This implies further aggression and brutality, as well as a narrow organization of one's interests, time and energies.

A creature's capacity to act relies upon the ability to evaluate stimuli, at least through the responses of pleasure and pain. Pleasure is a cognitive judgment that the stimulus is good for the organism (or, at any rate, for the genes). Pain indicates what is judged to be harmful. Since these assessments are essential for survival-to-reproduction, so are pleasure and pain. And since the organism is fragile, it must always be guarded. *Pain and fear are therefore preconditions for sentient life*. The self-conscious organism cannot help being aware of its vulnerable, dependent, and defensive relationship to the surrounding world, which looms all-powerful in its awareness. The very quality of *realness* with which the external world appears imbued signifies a self-preserving acknowledgement of the power of the environment over the organism.[27]

In summation, the organism is manifestly at the mercy of its embodiment and its world, which consists prominently of other creatures it attempts ruthlessly to use, and which attempt to use it, whether for food or habitat or breeding ground. Through selection, this contest dictates its perception and behavior. Evolution disposes us to be parochial and selfish and to interfere with the happiness of others.[28] The injuries of pain, illness, and infirmity are built into the system of nature, along with the insults of instinctual determinism, cunning brutality, and finally death.

While the human consciousness, in its own terms, may be independent of time and space and free of causality, the body which houses it is a prisoner of time and causal processes. Consciousness perforce imagines continuity—indeed, it cannot really imagine its own cessation. It is nonetheless confronted by the unassailable facts of aging and death. This is more than simple recognition of natural processes or the body's vulnerability in a dangerous world. It is a final doom and negation of personal identity and hope. Consciousness cannot fathom nor accept the apparent fact that its own presence and life are totally dependent on the functioning of the fragile and corruptible body. It cannot accept being a mere and temporary *thing*.

This is the context in which self-conscious mind finds itself embedded at every turn, and which is a deep source of human antagonism toward embodiment and nature. It is the driving force behind idealism and culture. What it is like to be a self-conscious body is informed by the monstrous and horrifying realization that one is food for worms—and little more than a worm oneself![29] The self-conscious being is doomed to be at odds with the body's joys and sufferings. The bizarre fact of being intimately and inexplicably connected with the body in all its peculiar details—of being, so to speak, chained to a living corpse—is not something adults normally care to dwell on. It may be a source of wonder to children, however, who have not yet learned to reject such thoughts as morbid. Ernest Becker points out that the young child's questions about sex are often really disguised questions about the meaning and implications of having a body.[30] A literal explanation of the mechanics of sexual plumbing will not satisfy such inquiry. When parents do intuit the intent of the question, they may give evasive answers because they have no other—the materialist answer is too hard to swallow even for them. More likely, they may defer to religious instruction or hope the child will forget about the matter, as they themselves have put it out of mind.

Embodiment is therefore a highly ambivalent circumstance for the self-conscious mind. All of culture, religion, the striving toward ideality, technology, and human enterprise in general, along with its aberrations, stem from the absurdities of a consciousness that finds itself half free and half imprisoned in matter.

1.6 The Body's Final Betrayal

While the Mind-Body Problem is usually framed as an abstract philosophical issue, nothing could be more personal and concrete than the great disillusionment that the body ultimately proves to the mind. From the outset, mind is duped by the system of nature into identification with the body, into believing the promises and premises of life. Our genes have programmed us to cooperate with the body's priorities and needs, and to blithely go along with life as though it were forever. The consciousness that we seem to ourselves to be is plugged into the body and its environment as a lamp into the power grid, utterly dependent on the vast infrastructure of nature to briefly shine. It is drunk with the electricity of life and half-blinded to its ephemeral and vulnerable situation, hanging by the filaments of a nervous system. Then, one day the bulb burns out and there is an end to that unique and self-recognizing source of light. The body succumbs to its built-in obsolescence, never intended to last forever. And in spite of all our efforts to ignore this or pretend otherwise, this foreknowledge gnaws at us deeply from an early age.

After initial discoveries, the gap between real and ideal, though repressed for a time, widens with age. While the youthful body is normally a transparent interface with the world, in old age we feel more its intrusive limitations, its incapacity to conform to the ideal patterned on the model of the child's body: athletic, lithe, centered, coordinated, graceful but unselfconscious, active, exuberant, playful, genuine, spontaneous, energetic, healthy, etc. Every cultural act, indeed every individual gesture that is distinctly human rather than animal, is an attempt to surmount the problem of dissolution and death. This is the problem of limitation posed by aging and mortality to a consciousness that, by its very nature, can only believe itself limitless and independent of time. That the all too real body ultimately fails consciousness and falls short of ideality is a very tangible mind-body problem. It's not that death comes as a surprise. Rather, the dilemma is precisely that we know all along so very well, but must go through the motions with vitality and enthusiasm for life's programs in spite of this knowledge.

There are other such mind-body problems—in this culture, particularly, where the very attempts to deny embodiment through luxury and convenience lead to the paradoxical obesity, malnourishment, lowered quality of life and lowered life expectancy of sedentary fast-food consumers. A society that has fled nature for citified living, physical labor for paper pushing, and common sense for pharmaceuticals, can

only expect to be at war with the body—which will always win in the end.

Many weighty tomes have been written about the Mind-Body Problem as a "technical" issue. The fact that it has been formulated as such, rather than as the Problem of Aging, Infirmity and Death, for example, or the Problem of Embodiment, is interesting in itself. It would seem to indicate that even philosophy, perhaps like all cultural pursuits, is a displacement or sublimation of concerns so fundamental and close to home that they dare not be confronted directly. Even as a quest for truth, the assault of philosophy is oblique. It attempts to trump the mortal coil by fostering an idealized, formalized, eternal realm—its own sterilized mental ground on which to hash out truth, rather than in the squishy close quarters of flesh. Perhaps philosophy is filled with hairsplitting and irresolvable issues because it is this environment itself, more than answers, that is important. Just as poetry is "passion recollected in tranquility," philosophy takes reality indoors, as it were, where it can be dealt with calmly. While no particular words or theory can really defend us against the sticks and stones of vulnerability, the edifice of philosophy itself may be the best philosophical answer to the problem of mortal embodiment. In a game you cannot win, how you approach playing is more significant than any move.

Even so, I believe that the solution to this technical problem is also, if obliquely, an answer to the existential dilemma as well. If the problem is ultimately personal, then any answer to it must also be personal. If no triumph over death is possible, we are left only with a dignified response, the satisfaction of playing a good game we know we are going to lose to an overwhelming adversary.

The human response to the hopelessness of mortality is complex. It can be viewed as a cultural form of grief, with its various stages. It *is*, after all, the loss of one's own life that is mourned in advance. First, there is denial. I suspect this is why people are inclined to believe they have immortal souls and will be resurrected even in their bodies. It's why the first half of life is an upward curve, as though there were no end in sight. And why people try to accumulate millions of dollars, when hundreds might do, and seek every form of excess—especially sex, status, wealth and power. It's why we worship youthfulness and the perfection and beauty of the body, which is biologically little more than a tube for digestion. It's why murder and suicide are important as ways of taking charge of death, why war is a spiteful strategy to beat the Grim Reaper to the punch. This is the denial of death, of which

Ernest Becker wrote so eloquently and insightfully. The knowledge of mortality—and not sexuality, as Freud had thought—is the primary motive of the repression upon which culture is built.[31]

But after sheer denial, there follow stages of negotiation: selling your soul to God or the Devil if only you are allowed the promise of more life. Creating heroic systems of thought that will live after you, stupendous monuments of architecture, political revolutions. Much of the bluster of masculine idealism and its effects in history correspond to the denial phase of the grief we experience at the frame mortality places around all human efforts. The enterprise of technological mastery and the universal appeal of "progress" correspond to the negotiating phase, heroically restructuring the world. In our technical age, still bargaining with death, we strategize to circumvent mortality through cryogenics, prosthesis, genetic engineering, artificial life. We aspire to renew the body, or replace it, or cash in our consciousness as an entity separate from the body—now artificial rather than supernatural, information rather than spirit.

Becker begins his discourse on the overwhelming consciousness of mortality with a discussion of the intrepid "heroism" of culture in general and of personal identity—both constructed to contradict the pain of death. Man hopes that his creations have lasting worth and meaning, heroically outliving and contradicting death and decay.[32] While this heroic self-assertion may be founded on the inbuilt tenacity of the organism, the courage to face death is the willingness to take in fully the contradictions of being a creature "half animal, half symbolic." To grant oneself fifty per cent independence of nature, however, is far too optimistic, if it means anything at all. As long as we die, we are one hundred per cent mortal!

Whatever we achieve between the covers of our little lives may be no more than a flicker. Yet, if this is all we can lay claim to, it is far more than nothing. The existential answer to mortality is the insistence that it can and *must* be enough—for the very reason that more is not possible. All forms of existentialism are willing at least to look death and ultimate realities in the eye. If some are stoically somber, it is perhaps because grief itself is an antidote to loss, a valiant protest against a rotten deal. While the preordained loss of our own lives (which is to us the loss of the whole world) may be the greatest loss we can fathom, it is possible to move through denial and negotiation, beyond bitterness or resignation even, to a dignified acceptance. After all, the alternative is never to have existed, never to have played at all!

I believe it is a mistake to hope for salvation from the human condition through technology as a literal *deus ex machina*. Such a hope derives not from the symbolic, intentional creature but from the animal, which is driven to survive and conditioned to look externally for solutions. We symbolic creatures have only the mythical life and world we (collectively) invent to mollify the sting of death. It is the story told at the campfire to dispel terror of the dark, where devouring beasts may lurk in wait; it is equally the voyage to other planets, terraforming, and the conquest of the dark of space. The story itself *is* the ideal world it posits. The campfire, as creative invention just as much as light, is the answer to the darkness. It is pointless to mock heroic efforts as ephemeral and vain; ironic sophistication is only a disguised form of heroism against an inevitability that is no personal defeat. Nature (our genes, our bodies, the cosmos) *can't* care for our happiness—because caring is intentional, part of the human realm. The feeling, or lack of it, has always been mutual: we haven't exactly been kind to nature, even to our natural bodies.

I call life a game not to deny its real urgencies, but to underline the fact that consciousness can embrace reality voluntarily. In this lies our freedom. The earnest games of life inherited from nature can yet be played with dignity, humor, good will and good sportsmanship—not as something forced from without, nor driven by the impossible need to win.

1.7 Self-Made Man

The self-conscious animal is haunted by a progression of realizations, beginning with that of its vulnerable mortality and physical finitude in contrast to the potential eternity and boundlessness suggested in consciousness. This progression goes on to include the indifference and enormity of the universe as a presence beyond human ken or control, and independent of human intentions. Out of this sense of the impersonal and objective life of the cosmos ultimately grew the key metaphor of mechanism, which turns the tables on the vastness of nature by reducing it to a device of human conception and proportion. But long before, this creature intuitively realized that it could and must define its own world; that hope lay in the realms of consciousness rather than in nature; and that it could shape the external world to conform in limited ways to its ideal expectations. Mankind would also have to adapt itself to the world of its making. If mankind wished to live apart

from nature, in a plastic bubble of reason and technology, it would have to remake itself as an artificial creature, a sort of Frankenstein or Superman designed to live among the dreams of reason.[33] This corresponded, in fact, to Man's deepest desires for self-generation. Above all, then, Man is this self-defining, self-generating, idealizing creature, fleeing mortality and embodiment, the corruption of time, the determinism of nature and the authority of the Real. The hope behind culture is for a more humanly conceived environment—but also that human artifacts and institutions may prevail as repositories of meaning beyond death and decay, so that mankind (and even the individual) may in some sense *count*. Thus, everything Man does is essentially heroic and religious, if ultimately vain.[34]

Moreover, cultural achievements, including the glories of technology, have been predominantly *men's* immortality projects—just as children may be considered the immortality projects of women. If these projects of self-generation and regeneration serve to deny the realities of embodiment and death, it has been a fruitful lie. For, humans have multiplied to cover the earth not only with their own bodies but also with all the accouterments of their "extended phenotype." And if it is true that we are the creature who strives to secede from nature, have we been so successful that 'human nature' is then a contradiction in terms? Is humanity a product and integral part of nature or is it, on the contrary, a product of its own definitions?

The answer, of course, is *both*. The question, moreover, goes straight to the heart of the perennial (and hopeless) dialogue between materialism and idealism, causality and intentionality, nature and nurture, determinism and free will, etc. The fact is that Man has one foot in each of two worlds; and the elusive human nature is to be found somewhere in the awkward bridge. Nature can never be left behind and the human essence will never be the idealized god it longs to become. But neither is Man any longer essentially an animal. The materialist will emphasize the natural building materials of the House of Man, while the idealist will underline its novel design. Together, they almost comprise a reasonable view. For, Man is specifically the creature who builds a world of ideas and ideals upon the platform of biological evolution. If this is conceived as a launching pad to *leave* nature, it is because the essence of that ideal realm is to be free of any foundation at all, to be entirely self-generating, without context. In truth, however, nature is the solid foundation of that realm, which is no spaceship but an earthbound mansion. It is the real theater in which the Ideal *can* be expressed, the stage upon which humans script their unnatural identity

and destiny. The lunatic fringe of science notwithstanding, an actor can generate an immortal character but never an immortal body.

In a sense, all organisms are self-defining, if not consciously.[35] That mankind insists upon self-definition, then, does not in itself remove us from nature. Even if culture and technology distance us symbolically and even literally from a natural setting, it might still be argued that these confirm our participation in nature because such expressions only serve the natural self-definition and destiny of the human organism. While it is specious to insist that whatever exists is natural by definition, we can be sure that whatever Man is or does is *both* part of nature *and* something contrived. Culture could be viewed as a kind of prosthetic device to compensate for the ways in which we are lost to nature in civilizing domesticity.[36] But the horse must be put before the cart: the prosthesis follows from the intention to escape nature.

The natural organism is self-defining, but only within a context and setting it has not itself created or defined. As player, it did not invent the game. To be sure, the animal has a degree of freedom above vegetation—namely, the capacity to move and act. But the human organism, successfully or not, seeks a further degree of freedom through defining its own context, creating its own setting, and willing its own acts. If so, then the human essence is as far removed from the animal as the animal is from the plant. While this does not remove us from nature, the intent of that essence is to displace nature with culture, the found world with an artificial one. The Freudian wisdom is that the child seeks to be its own parent, sprung from itself and not from nature via the biological parents. Man proposes to conquer death by creating his own life and world.[37]

Not only the Oedipus complex, then, but all of culture is a flight from origins, from the limits of nature and embodiment. The project of creating an ideal world—in both the normative and descriptive senses— is both an individual and a cultural undertaking of self-generation. It requires relentless vigilance, struggle, and tension. With so much energy engaged in death-defying acts, Man is nonetheless the sole creature who can long for surrender, abandon, and even the sleep of oblivion. And this paradox is a key aspect of the masculine mind in particular—a paradox in which Freud, too, was even personally caught: how to let down your defenses, relax the burden of self-mastery, melt in trust, or surrender to the feminine, to instinct, to mortality, without abandoning the labor of self-creation?[38]

The symbolic realm is the ground of culture, the human empire within which to create and recreate ourselves in our own image, even

before creating external gods to do it symbolically on our behalf; and long before creating literal machines and empires to transform the natural world. This realm is made by decree, by fiat, and not dictated by nature; it is governed by human rather than natural law. And herein lies its great appeal to the human spirit, which longs more than anything to be self-creating, and thereby free. The innermost and sacred (if masculine) dream is to be pure subject and agent, to be no object bound by the rules of an alien universe. To be a *person*—the object of love and respect, yes—but not some beast's or germ's dinner, not a mere tool of biology, an effect of some cause, a *thing*. By definition, our creations express our intentions, whereas the found world of nature does not, but in many ways appears to oppose them, while asserting its deterministic power over our being and even over our intentions. This may be merely another way to state the obvious: that we do not live in harmony with nature. Those who argue that Man cannot escape being part of nature implicitly embrace a materialist stance. They are thinking of the body, and they are right. But Man long ago took up residence in the mind, the spirit, finding ways to have in eternity the cake that can be eaten only briefly in the flesh.

Just as moot as the question of whether Man is part of nature or is truly self-creating is the debate over determinism and free will. Again, my answer includes both. The action of any creature must be viewed *both* as a product of natural cause *and* of its own intentionality, the two descriptions being parallel and complementary. Since all creatures have intentionality, just as all are subject to causal law, it is not intentionality itself that makes us free, but conscious embrace of it. *Within* determinism we may have a relative free will. Much to its horror, the human consciousness *finds* itself within an apparently deterministic system, but conceives and longs for freedom and escape to realms of its own design. Even to ask, in the abstract and once and for all, whether or not human behavior is determined, overlooks the significant dynamic of time and also ignores the impositions of other human wills upon one's liberty. We are not mere passive observers of destiny, but co-participants; at this stage in the game, our environment is not nature but the world made by and consisting of people. We will in the end be as free as we make ourselves and each other.

Choice appears free when one ignores the constraining limitations of the perspective with which one identifies. Standing back to look *at* that perspective as a finite system, however, one more soberly sees the causal determinants constraining the choices. Paradoxically, this per-

ception of limitation creates *new* opportunities for choice, visible beyond the perceived constraints. The question of free will is whether the actions of the self are determined from within or without. We know in principle that both can be true. It is a question of perspective, but also of the facts of the situation. When the self does not consider itself to *be* the organism, for instance, the latter is deemed to be external to the locus of consciousness with which it does identify. The self then may not identify with intentional processes originating within the organism (even though they *constitute in fact* the organism's free agency), but instead looks upon these as causal processes impinging upon the self from the external part of the world that the body is. In that situation, the self cannot experience itself as active and free, but only as passively constrained by something outside it. This can be as true of collective units as of individuals. On the political level, one is free when one's actions are determined by oneself rather than imposed by other people or groups. On the other hand, sometimes one's failure to claim freedom is projected onto others.

The organism's apparently deterministic nature, as a biological and physical object, may seem to occasion a loss of freedom. Experience, thought, and will, may seem mere effects of physical processes. But the whole situation can be viewed the other way around. The subject, as an intentional agent, makes logical connections internally. Because these are also physical connections, intention thereby changes the physical world. First the organism's brain state alters with the intention; this change may then be translated via the muscles into actions upon the world. Neural pathways are laid down by thought, just as roads are built by engineers who work for the political will of the governed. Moreover, the one-way causality of the mechanist view of mind is mere prejudice stemming from the physical sciences, where any given parcel of matter may be considered an isolated system, which is the passive recipient of influences from "outside." Within the organism, mind and matter are mutually imposing; influences travel in feedback loops both ways.[39] Inside and out are reversible spaces. The organism is environment for other creatures as much as they are for it.

It might be objected that certain experiments demonstrate that the body affects the mind in a one-way causal arrangement. Timed measurements indicate that the subjective experience of willing a bodily movement is in fact *preceded* by the action and projected backward in subjective time. This fact might hold weight as an argument against free will if by 'mind' one meant simply the experimental subject's conscious experience. But the whole point of the concept of intentionality

is to bridge the gap between first and third-person points of view. Brain processes can be described from either perspective; the logical event occurs simultaneously with the neurological event, because they are one and the same. The fact that the subjective experience occurs after the neuro(logical) event in question simply means that *further* neuro(logical) processing was responsible for conscious registration of the initial events.

The notion of genetic determinism—that the genes are a top-down program, which unilaterally dictates the development of the organism—mirrors the idealistic expectations that the head rules the body and that the organism is a machine. The gene was initially conceived as a self-contained package of information, and the genetic "code" was thought of as an encrypted message—an intentional construct, an artifact, and hence a closed system rather than part of a larger, open, causal system that includes the environment. But such genetic idealism is being tempered by further research showing the role of environment and phenotype, for instance in controlling the expression of genes by hormonal regulation of transcription.[40]

I would argue that *the only truly deterministic systems are artifacts—intentional constructs*. This is because they alone are closed, idealizations with a content fixed by definition, whereas nature and natural systems are not. It is therefore somewhat ironic that causality has been associated with determinism, while intentionality has been associated with free will. Free will is only free because consciousness can transcend the determinate content of its own creations. The creations themselves, however, are necessarily finite, closed, and hence determinate. It is not nature which is deterministic, but Man's thought systems and idealizations projected upon it. It might turn out that nature *is* deterministic, but *only* if nature proves to be an artifact, a thought, a simulation. Only, in other words, if nature is unnatural!

The question of self-definition, of course, is not only individual and philosophic, but political and collective as well. In *The Rogue Primate*, an impassioned plea for wildness and nature, John A. Livingston proposes that Man was the first domesticated animal. We set out to tame nature in our own image by breeding other creatures into domesticity. He enumerates the qualities bred into domesticates: mindlessness, apathy, dependency, defenselessness, docility and tractability, rootless transferability, non-selective feeding, herding instinct of compliance, tolerance of physical and psychological abuse (such as overcrowding), reduced sensory acuity and acceptance of monotony, lack of attune-

ment to environment or group, neoteny, and promiscuous sexuality.[41] The whole list applies devastatingly to modern human beings! He acknowledges that the dependence into which civilized people have fallen has made us more the servants than the masters of technology— and indeed one of its artifacts.[42] While domesticated animals are the creations of human beings, he argues, we ourselves arrived at this state naturally.[43] But human evolution was from the start conditioned by sexual and cultural selection: human populations intervened in natural selection by breeding themselves in ways parallel to their breeding of other species. From the beginning, the human domesticate had a hand in its own genetic destiny.

Most importantly, *one group has bred and domesticated another*, selecting for warlikeness and aggression in conquerors and submissiveness in the conquered. A certain type of human being has been selected through war and genocide, class and sexual domination, incarceration, and other cultural practices, resulting in domination of one group or class by another. Females have been selectively bred by males to be submissive and cooperative, good reproducers, supportive of male enterprise, etc. Males have been bred by female choice to be aggressive, etc. The institution of slavery was a form of genetic breeding, while modern economic institutions are a means of cultural selection, to encourage a monotypic human being.

Social animals are easier to manage because of a "compulsion to comply."[44] Domesticated, they become dependent on a top-down flow of orders, especially in conditions of overcrowding (cities) and stress (economic pressures in artificially maintained conditions of scarcity). They are less able to communicate among themselves (consumer isolation). While Man may aspire to self-generation, much of our vaunted freedom is relative to class, gender, and race. Much of our being has been formed and is controlled by others.

Chapter Two: A BRIEF HISTORY OF REALITY

> *We were not given dominion over the earth; our forebears earned it in their long nightmarish struggle against creatures far stronger, swifter, and better armed than themselves, when the terror of being ripped apart and devoured was never farther away than the darkness beyond.*— Barbara Ehrenreich[45]

2.1 Making and Unmaking the Real

The real physical universe we inhabit is what we have in common with all creatures. Diversity of form and variety of sentience occur in the context of a common external world and similar embodiment through parallel histories of evolution. Reality is a fundamental concern of all creatures, and in all levels of cognition. "Realness" must therefore be an essential attribute of any possible experience of the external world. It must be, after Kant, a category of mind that makes experience possible at all. The *meaning* of realness, as an experienced quality of objects, must refer not only to the independent existence of the world but also to the dependent existence of the cognizing creature. It implicates a *relationship* of creature to environment—specifically, the urgency of the environment's life and death hold over it.

Experiencing a real external world involves the mind's active formulation of cognitive models, which organize sensation into a coherent picture upon which actions can be reliably taken. The model involves judgment, implying the relationship of the organism to its environment. The meaning, in other words, of *every* experienced quality must be of the same sort as the meaning of pain or pleasure, insofar as it encodes an *evaluation* of stimuli relevant to the well-being of the organism. Thus, depth perception literally lets the organism know where it stands in relation to an object, as does the very objectness of a thing. The ascription of realness—by a "realizing faculty," as I call it—is automatic, unconscious, powerfully compelled, and so utterly essential to survival that it is difficult to identify *as* a mental act at all. Rather, we simply experience the object, the world, as "real."

Realness, therefore, has an equivocal status. Paradoxically, it is both an inherent aspect of the world and a quality lent or ascribed to experience by mind, based upon the organism's vital relationship to the world. This is unsurprising, given the truism that experience is a product of both self and world. For example, visual depth perception contains important knowledge of the relative distances to and between objects. But it is also a subjectively experienced sense of "three-dimen-

sionality," constructed by the visual system from comparison of binocular images, as anyone who has ever seen a "3-D" photo or movie can attest. Furthermore, this ambiguity attaches to most aspects and modalities of perception, under the right circumstances, since the sense of realness or objectification normally involves a projection outside the body. Vision in particular is so thoroughly and automatically projected that we live and move in external space, never thinking of it as *virtual*, or that the visual receptors are a specialized part of the *skin,* and that visual sensation actually takes place *upside down* on the back surface of the eyeballs. We do not even think of visual perception as *sensation*, but simply as the appearance of the world. On the other hand, the sense of touch, normally a sensation on the surface of the skin, can rather eerily be experienced as projected outside the body under the right experimental conditions. Sensations within the body are similarly ambivalent. Below a certain threshold, pain is experienced as mere sensation, located in the volume of the body, rather than as a compelling alarum. A flavor or smell can be experienced either as a property of something outside the body or as a sensation in the mouth or nose.

Following common sense, the scientific concept of realness dictates that something must be capable of observable influences to actually exist. This implies the activity of observers, so that, in a fundamental but paradoxical way, a phenomenon cannot be said to be real unless it is observable or somehow detectable—even though defined to exist independently of observers. Detectability, of course, does not necessarily entail sensory perception—only causal connection to the observer that *can* be registered, even if it is not. The key to the real existence of an entity is therefore its causal connection to the rest of the universe, which implies observability. It also implies that the observer, too, is part of the causally connected universe. Angels and disembodied spirits do not qualify as observers, unless they can communicate and interact with matter through physical means—which would imply that they are physical beings, part of the causal universe.

If realness is not simply an objective property of an independently existing world, but also a subjective attribution, what prevents it from being falsely ascribed, or in error? If the quality of realness is normally projected into experience, what prevents it from being projected into mere fantasy? The brain normally *does* project its cognitive models as real; that is how perception works. But brains are also normally committed to close sensory dialogue with the external world, seeking a

match between these models and sensory input. Darwin has shown us that this is a matter of advantage more than disinterested truth. Those correlations are "correct" which favor, or at least permit, survival to reproduction. We must therefore distinguish the *ideals* of truth and objectivity from the parallel natural functions from which they derive and which merely serve selective advantage. This is tricky business for social animals, among whom liars may gain advantage by appearing truthful.

It is important to grasp just how powerful the realizing faculty can be. It is the ability to convince ourselves of virtually anything at all. It has the potential to short-circuit the pathways of feedback between imagination and sensation, fantasy and reality, theory-making and theory-testing, self and world. The same faculty whereby, with good reason, the organism is compelled to respect the realness of the external world, may at the mind's subjective whim project the contents of the inner world as external and similarly commanding veneration. In fact, the subjective realm, to be taken seriously, *must* appear to have something of the force of objectivity. And aren't we more than willing to suspend disbelief? Like the innateness of the capacity for language, we have a ready capacity to live in virtual realities, quite without the aid of technology or drugs. Storytelling and mythmaking are as old as humanity. This capacity for indulging illusion betrays itself on one level, for instance, when a clump of dust is fearfully misperceived as a spider, or a rope as a snake; on another level, when a people convinces itself that its political interests are divine will or manifest destiny; on yet another, when a person's health problems are romanticized as due to alien abduction. In all cases liberties are taken in the interpretation of experience. In this era of postmodern sophistication, it may be difficult to appreciate how dangerous projection can be. Yet, we are only a few centuries removed from the mumbo-jumbo of the Inquisition, and only a couple of generations removed from the metaphysical exuberance of the Third Reich. We may not yet be through with projections that lead to holy wars.

If the realizing faculty and imagination pose hazards to our health, might there not have evolved some countermeasure capable of keeping these in check? I believe that *self-consciousness* plays just this role, among others. The projective liabilities of the realizing faculty, and of imagination run amok, are compensated by the qualifying ability of subjective consciousness to bracket experience *as* subjective. The projection is reassimilated as a content of mind, for which the self takes

responsibility. Imagination is the creative, positing aspect of subjectivity, whose dangers are kept in check by the loyal opposition of this negating aspect. This is the skeptical role of subjectivity, the ability to deconstruct experience, to de-realize what is perceived (normally quite correctly) as objective reality, by putting experience in "quotes." Conscious skepticism is the explicit arm of a wider psychic function, whose job it is to dissolve and digest projections and reconstitute them as parts of the self, just as the body reassimilates pathogens or defective cells and rebuilds matter from the environment as part of itself.[46] It is both the psychic immune system and how the self grows. The deforming properties of the "lens" of mind are then no longer seen as properties of the world, but as subjective artifacts. This frees the subject from its conditioning so that, paradoxically, subjective consciousness promotes objectivity. But it also establishes an inner domain of subjectivity wherein to play, so to speak, with optics, light, and lenses. This psychic assimilation of the world then reappears outwardly as the transformation of nature and the creation of culture—ultimately as technology. The human creature can turn itself inside out and has found novel ways, beyond literal eating, to assimilate the external world to its own being.

While one evolutionary significance of subjective consciousness lies in the capacity to qualify and relativize experience and thought, thereby restraining the creative excesses of the mind, another lies in conscious access to the inner laboratory, or studio, of the subjective domain, which is the home of imagination. This is no contradiction because, in both cases, the subject is liberated from the object: that is, liberated from some level of the organism's programming that defines its relation to the world. The ability to call into question the reality of what one perceives confers the ability to look more carefully before leaping. The presence of a loyal opposition fosters a more refined model of the world and a better "foreign policy." Through subjectivity, therefore, mind evolves at once toward relativity and objectivity. This is no paradox when we realize that these two apparently opposing movements are but facets of a dialectical cycle. The realizing tendency of mind posits an idea, schema, or model, which is in effect a theory about reality. It is literally an *ideal*, a Platonic form, which is normally checked against sensory input for fit; however, it can simply be posited unilaterally as belief, which is sometimes dangerous. The skeptical, de-realizing factor of subjective consciousness makes the mind accountable, insisting upon justification for belief. The model is thereby revised, improved, retested. The ideal, moreover, was abstracted from

reality in the first place. The dialectical cycle proceeds in both directions at once—top down and bottom up.

The interplay of positing and negating aspects of consciousness manifests in historical cycles, the opposing phases of which in culture may be characterized broadly as 'heroic' and 'ironic.' These poles are a unity, like those of a magnet, alternating as undercurrents which surface in philosophical, social, political, religious, moral, esthetic, and even scientific movements and fashions. The limiting nature of any proposition or system of thought guarantees a complementing shadow that is the other side of the coin. Every thesis defines its own antithesis. Where contradictions cannot be resolved *logically*—that is, outside time—they give rise to *temporal* alternations in the phases of a cycle. The pendulum of history swings back, fashions return; we move in spirals if not circles.

Throughout history, there has been a dialectical relationship between the playful, embroidering, subjective, ironic side of the human spirit and the heroic, serious, goal-oriented, realist, earnest side. The ironic mentality embraces limits and delights in playing within bounds. It understands all limits to be arbitrary, relative, intentional. The heroic mentality rejects limits as obstructions to absolute truth and personal freedom, while worshipping limitlessness as transcendent reality. The heroic is aspiring, straightforward, straight-laced, straight-lined, passionately simplistic, square, naive, concerned with content over form, and tending toward fascism and militarism in its drive toward monumental ideals and monolithic conceptions. The ironic is witty, sarcastic, curvaceous, ornate, sophisticated, skeptical, self-indulgent and self-referential, tending toward decadent aimlessness and empty formalism. Each is dangerous as an extreme. Together, they are the creative engine of history.

While consciousness is the great container of opposites, when the crucible fails contradiction must be lived out in time and conflict. The tensions of history arise first in the split between subject and object: between self and other and in our alienation from our own bodies. For we perceive ourselves, like all else, from two incompatible perspectives. Visually, one's body is an *other* (not only for other others but for oneself too). The body is an object in space among other objects. But we perceive it kinesthetically as well, from the inside. Most importantly, we perceive *through* it, identifying as subject with its priorities. The conflict between these perspectives can lead to denial that one *is* an object. And it can lead to denial that others are anything *but* objects.

The first is the quintessential metaphysical problem. The second is the perennial ethical, social, and political problem.

Unresolved dualities, such as the debate between idealism and materialism, result from the inability of the container of consciousness to legitimately hold both at once. No ultimate proof of either is possible, nor is there any generally acceptable ground on which to decide between them. This makes reconciliation, and even communication, difficult across entrenched lines. It is what makes the Mind-Body Problem intractable. My own criticisms of idealism center on failures of responsibility. Belief in gods or spirits, for example, disowns responsibility by projecting human ideas and ideals as supposedly external forces or entities (a dishonest game, since creative authorship is surreptitiously retained). But materialism can be similarly faulted for a corresponding bad faith. Blind technological materialism, for instance, hides its own political and economic agendas and ignores the avenues of self-control and self-development as alternatives to control of matter and unbridled development of the world. While it is no doubt possible to combine the evils of idealism and materialism, one might hope to combine both points of view positively in a kind of binocular wisdom.

Competition between the kinesthetic and visual senses, between first-person and third-person points of view, between idealism and materialism, or between heroic and ironic frames of mind, may help to explain why history appears to stutter. In what is itself an ironic maneuver, historian of science Thomas Kuhn, who coined the term 'paradigm shift', described the dialectical creative cycle of science through a political metaphor.[47] A great insight revolutionizes scientific theory, bringing about a fundamental shift to a new model. This becomes the guiding paradigm through which further research is organized, so that much scientific activity consists of a relatively bureaucratic phase of working out the details and implications of the new model. This he calls 'normal science', which proceeds until internal contradictions or discrepancies with observed reality again accumulate to such an extent that a new revolution in thought is called for—and the cycle repeats. Two mentalities are involved in this cycle: the brilliant insight of a Newton or Einstein and the more pedestrian programs of research that apply problem-solving techniques to fill out the model in detail. These have also been called divergent and convergent thinking styles.

Since modern science is a paradigm of rational collaboration, might Kuhn's metaphor be profitably turned the other way around? Why, we might ask, do civilizations rise and fall? Why do all great spiritual

revelations—such as those of Jesus, Moses, Mohammed, and Buddha—eventually lead to encrustations of distorting dogma and institution? Why do great political visions, such as those of Marx and Jefferson, eventually produce the evil empire? The Circassian Sufi mystic Murat Yagan, who integrates Islamic and Christian precepts, speaks of the eternal "veiling and unveiling of truth," whereby every posited ideal eventually gives rise to its own nemesis, calling for new prophets to clear the way again.[48] Might this be a process to understand within ourselves, so that human consciousness may ultimately take it responsibly in stride?

2.2 The Raw and the Cooked

The ideal of truth has evolutionary and conceptual origins in selective advantage, as a strategy in the game of survival. We are a successful species because of an intelligence that combines objectifying abstraction with manual dexterity to produce a significant technology. But the very nature of objectivity points beyond utility. Paradoxically, it could hardly be so advantageous if it did not. Objectivity fosters a (literal) superior grasp of the environment, but also a detachment from grasping interest, whether personal, genetic, or group. The ideal of objectivity transcends the parochial concerns in which it is grounded. Truth is born of utility, but grows beyond it because the self-conscious mind is inherently self-transcending and open-ended.

While the organism obviously acts *upon* the world to maintain its own being, this in itself implies no picture or concept *of* the world, let alone the verisimilitude of such a picture, and certainly no resemblance to the *human* picture. How true to reality a creature's perception is can only be evaluated in terms of genetic success (as mere advantage) or else by comparison to the picture humans see. People, of course, have grander pretensions than mere advantage. But when we do view those pretensions as moves within an evolutionary game, it is difficult to escape the paradoxical conclusion that even the ideals of truth and objectivity—whatever else they may be—are clever survival strategies. Then, could the *practical* success of science (as a formalization of the human picture regarding the natural world) be taken to affirm its *theoretical* validity? No—because, while one may embrace an evolutionary view to explain the origin of meanings, their truth cannot be defined or measured by utility.

The relationship between the ideal of truth and its roots in genetic

advantage resembles that between the concepts of 'truth' and 'proof' in formal axiomatic systems. Evolutionary success is more like proof-in-the-system-of-nature than it is like truth, whereas the idealizing mind conceives of absolute truth beyond such relative "provability." Proof is the relativized version of truth; it makes the validity of a proposition decidable by agreed-upon procedures, based on accepted assumptions. The act of embracing the assumptions and the rules of logic is *intentional*. The proposer is responsible to support claims of truth with arguments that other rational beings can follow or dispute. This precludes mere certitude, self-evidence, revelation, intuition, faith, divine infallibility, or "just knowing" as justifications for one's assertions.

A system said to be *complete* in mathematics is the equivalent of a closed physical system. The possibility of conceiving truth as a transcendent ideal corresponds to the built-in incompleteness of certain mathematical systems—apparently, those with the capacity to self-refer. This endows them with the openness characteristic of the self-aware human mind, as distinguished from the homeostatic closure of the organism, which acts upon the world (or what the human observer takes to be the world) without knowing it is doing so. The demand for proof and the provision of formal decision procedures, as opposed to blind acceptance on faith, formalizes the skepticism and relativization of thought in subjective consciousness. On the other hand, paradoxically, the very self-reference of subjectivity implies also the transcendent ideal of truth, through the mind's ability to step beyond any defined bounds. Naive absolutism is undermined by subjective consciousness at the same time that consciousness insinuates higher absolute conceptions. Again, this is a dialectical cycle, from which there can be no final rest.

While nature impresses itself upon mind through genetic conditioning, mind impresses itself upon nature through the very activity of perception. To be perceived at all, let alone to be conceived abstractly, the raw wilderness of the world-in-itself must be idealized. So to speak, it must be tamed, domesticated, mentally cooked. This metaphorical alchemy—and the difference between the world, as it is in itself, and as it is in the cognitive domains of various creatures—can be elucidated through the concepts of *analog* and *digital*.

A mercury thermometer must be calibrated in order to read it. The level of mercury is a perfect and continuous analogue of temperature; but, without markings, temperature can only be estimated as "more" or "less." A digital thermometer, on the other hand, displays the tempera-

ture "exactly"—but only to the nearest defined unit. One can only estimate the temperature *between* units of a scale. A digital domain *is* the scale*: discrete and discontinuous, precise by definition, but accurate only to the level of definition. An analog domain is the mercury itself, continuous and undivided, precise *in fact*, but unmeasurable until it can be read with a scale imposed upon it. An analog domain is infinitely dense. It is assumed to exist at all mathematical points, while defined at no specific point. A digital domain is defined *only* at specific points (e.g., the markings on the scale, like the natural integers within the real numbers). These are the boundaries of undefined gaps within a domain. An analog domain is a real territory, while a digital domain is a conceptual grid. The analog is implicit content; the digital is explicit form. The analog is nature, the thing-in-itself; the digital is artifact, idea and measure imposed upon the world. Together they are mind interacting with matter to create meaning.

A traditional clock is an analog device with a graduated scale. If the face of the clock indicates hours only, time to the minute requires a judgment call. With a digital clock, no estimation is called for—or possible—since a digital clock displays no analogue of the passage of time. If such a clock reads only hours, the entire duration between, say, three o'clock and four is *defined* to be three o'clock. It is *precisely* three *until* it is four. In that sense, a digital readout totally eliminates uncertainty. But since we believe that time does actually pass during that interval, in another sense digitization *increases* uncertainty, since we can only read to the nearest unit.

Were we fictional characters, and not real creatures in a real universe, we might be content to know the "exact" time or temperature indicated by our crude digital clock or thermometer. (Romeo and Juliet do not need to know the exact time of sunrise.) There would simply exist no time or temperature differences in between markings! But the real passage of time means that other events are happening during an interval between two defined events. The real level of mercury rises or falls between markings; the universe carries on between the ticks of the clock. Accuracy is therefore relative to the possibility of a finer-grained domain.

The analog (as a mathematical continuum) is in principle infinitely fine-grained. It can be simulated to any specified accuracy by the digital, but this also implies definition beyond any specified degree. At one extreme, the analog represents total lack of definition, the absence of structuring measures of events. (Consider the chaotic ultra-hot universe before the first symmetry breaking—literally before time.) At

the other extreme, the digital offers perfect definition: either 'on' or 'off', while no reality is implied between. Mind functions between these extremes because that is where the organism lives, in the actual world where there are always things happening during the real interval between events or states. Moreover, analog and digital are dialectically related descriptions. Matter appears to have its continuous and discontinuous aspects, relative to scale. Cognition is organized as digitizing operations performed on analog domains, and these concepts are relative to level of processing.

The distinction between analog and digital parallels that between cause and intention, real and ideal, physical and mental, nature and artifact. The causal world, which is the object of study of classical physics, may be an analog domain, while the concept of the closed deterministic system applied to that world is "digital" in that it is an artifact of definition. Human thought and invention in general, in contrast to nature, contain only elements intentionally proposed and their logical implications. The *materials* of a building, for instance, belong to the dense analog domain of the physical world, like the mercury of a thermometer. In contrast, its measured *design* is a mental construct, which is "sparsely" defined—like the gradations of the scale, like the lines which a blueprint literally is. It is but an outline. Similarly, the characters of a stage play are but sketches, stick figures, while the real actors have detailed lives off stage. It is pointless to ask how many times Juliet sneezed in the year before she met Romeo, for such details are not included in the script. Similarly, a theory in physics is a mathematical script for the behavior of matter—while matter itself presumably retains a rich private life of its own.

2.3 Is Modern Man Degenerate?

Progress may be our most important product (and this society's principal export), but it has not always been so.[49] Indeed, it could be said that the natural product of any organism is simply itself. The notion of development through linear time (whether by biological or cultural evolution) is recent, coinciding with writing, patriarchy, the historical era. The Christian concept of time, in particular, marked a departure from a cyclical universe to one with a beginning, middle and end. The Christian God is outside nature, time and space. The whole of Creation follows a prescribed course from a definite beginning toward a definite conclusion. In medieval thinking, progress was not social or

material but spiritual and otherworldly—the pilgrim's progress, replete with moral significance and landmarks. The Renaissance, however, saw a shift toward an open-ended time and an interest in improving the conditions of this life. Progress was no longer toward a preordained finish, but toward open-ended humanist goals and ideals. From this vantage, perfection on earth could be accomplished, or at least approached, in a future as yet unwritten.

Renaissance materialism was full of optimism for the rational improvement of the human condition. Successive dethronements of the human image by new scientific ideas were compensated by the promise of technology to create heaven on earth. The Copernican Revolution displaced Man's home from the center of the universe to the satellite of an insignificant star in the periphery of one among billions of galaxies, each composed of billions of such stars. But eventually it also empowered Man to leave the gravitational hold of the earth. Similarly, the Darwinian Revolution reduced Man from the glorious crown of Creation to a product of blind biological processes through eons of meaningless time. But it also gave him the godlike powers of biotechnology. The bigger and more objective the cosmological picture, the smaller the place of Man within it; at the same time, paradoxically, the more power accrued to *some* men, at least, in the name of advancement for all.

Evolution by natural selection does not imply progress, except perhaps in the sense of increasing complexity. Progress is a human value and ideal, not a natural phenomenon. And deeply ingrained in the human psyche is a competing idea, opposing that of progress: the notion of a golden age of perfection from which life has since degenerated. From a materialist perspective, matter has evolved in the physical universe, as a potential unfolding in time. But there have always been contraposing metaphysical ideas of *involution*, which hold that spirit embroils itself increasingly in the material world—a retrogression from a spiritual point of view. Such contradictory ideas are undercurrents in the concept of progress that grew out of millenarian Christianity. The Biblical story of the Fall illustrates concern over degeneration from an earlier state of grace, ease, and harmony and over the hubris which precipitated it. This theme is also expressed in the classical notion of the Ages of Man (Hesiod's 'golden race'), the *yugas* of Hinduism, and similar theosophical doctrines. It appears in esoteric idealist writings such as the *Urantia Book* and in the *Canopus* novels of Doris Lessing. While materialism expounds the evolution of mind from matter (and, perhaps, toward spirituality), idealism posits the prior existence of mind or spirit, its deepening ensnarement in matter, and its eventual libera-

tion and return to a more spiritual state. Technological advancement, consumerism, and the ideology of progress might be judged very differently from such varied perspectives. Indeed, Francis Bacon, the father of modern technology, was greatly concerned how the image of science would be perceived by his religious contemporaries.

Asked by a reporter what he thought of Western civilization, Gandhi wryly replied: "I think it would be a good idea!" The Western ideology of progress is an idea that has taken over the world. Whether it is indeed a *good* idea is a question posed ever more urgently by nature's responses to human extravagance and by the response of some peoples to long-term inequities imposed upon them by others. If violence, greed, and lust for power are the root disorders of our civilization, it would seem that these have been tolerated in the name of civilization itself, either because the gains appear to outweigh the losses or because we dare not imagine, or cannot organize, anything else. Such questioning becomes more reasonable as the downside of civilization becomes more unmistakable. But are there more theoretical or historical reasons as well for questioning the soundness of modernism and the ideology of progress? Is there something inherently defective about the thinking processes of Western Man, despite his accomplishments and cultural domination of the world?

Professor of Religion Leslie Dewart proposed an intriguing theory in this regard. "Westerners" are people of Indo-European descent and, according to him, the Indo-European languages reflect a profoundly different way of thinking and perceiving than other linguistic groups. Indo-European speakers use language to point transparently to (what they perceive as) objective reality. They hold external reality to be the *cause* of their perceptions and assertions, and of the certainties of which they accordingly feel assured. They disclaim responsibility for their mental acts by reifying them. As Ivan Illich has similarly pointed out, people who speak a nominalist language tend to assert proprietary relationships over the world, others, and even their work.[50] Non-Indo-European speakers, in contrast, consciously bear witness to their experience *as* experience, and give testimony to the contents of their consciousness as their own assertions, and not as manifest truth. They subjectify and relativize experience and are more apt to take responsibility for mental acts, which they are less inclined to project as external realities. They are more at ease with the tension between inside and out. For them, reality consists in the *relationship* between things more than in a fixed substantiality that things possess in their own right.[51]

A corollary of this hypothesis is that the Indo-European mentality suffers from a kind of inferiority complex. If reality consists in the substance of external things, how can the self believe in its own reality? The paradoxical answer, for the Indo-European mind, is that the self, too, must be a substance of a sort—either a personal soul or an abstract principle of mind (like the *Atman* of Vedic philosophy). Dewart sees it as an ironic absurdity to hold the world of objects more real than one's own subjectivity, and calls such a consciousness deficient. He views the non-Indo-European mentality as normal and the Indo-European one as a form of madness, pointing to another consequence: discounting its own reality, the Indo-European mind must suspect its contents as well, so that the reality of anything given in experience must be doubted. Therefore, ultimate reality, if it exists at all, must lie beyond experience altogether, in some realm that must be posited but cannot be experienced.[52] Hence: Plato's forms and Kant's thing-in-itself; Descartes' skepticism and Berkeley's recourse to the Mind of God as the venue for reality; the reductionism in science to purely abstract, formal, quantitative domains; the Vedic belief in an Absolute beyond all contents of consciousness.

It would make little sense, to the non-Indo-European mind, to think that things contain reality within themselves, in isolation from other things. This, of course, is what modern physics and cosmology are discovering, what the softer sciences are just beginning to suspect. The idea of isolated systems, independent of each other and the observer, was useful through the 19th century; without it, the great generalizations of classical physics, such as the conservation laws for matter and energy, would not have been possible. The ancients had believed in a unified, integrated cosmos, in which everything simultaneously affected everything else.[53] To unravel the effects of a particular cause it was necessary for their successors to disregard other influences that could be considered negligible. Now we have come full circle to a time when it is imperative to look at the functioning of wholes, when more subtle factors can no longer be ignored or are no longer so subtle. We have outgrown the isolated system; and as we are coming to see in this century, the isolation of societies, classes, and individuals similarly does not work.

We might ask at what point in the accelerating course of human development did things start to go wrong? We are now used to change as a way of life, but this itself is a recent occurrence. The way of the organism, after all, is homeostasis. The overwhelming majority of human history has been lived out for thousands of years in an essential-

ly unchanging way of life, relatively in balance with nature. It must be pointed out that this balance was found only after massive exterminations, especially of larger game, wherever early Man migrated. The tribal lifestyle may have been obliged then to settle into a more ecological approach to the diminished and smaller game species, toward whom it was forced to adopt a sort of categorical imperative: do not act in a way that renders life impossible for other creatures.[54]

If we measure the evolutionary success of other creatures by the stable niches they find, then why not Man? Author Daniel Quinn has pointed to the tribal lifestyle that persisted during most of human existence as the "gift of natural selection," the tried and true social organization that works best for people, refined over thousands of generations.[55] This way of life evolved organically, and along with it an attitude of respect for nature and of live-and-let-live toward other life forms. Our current civilization, in contrast, was *invented* in a short while and has gone off on a very different path:[56]

> The people of your culture cling with fanatical tenacity to the specialness of man. They want desperately to perceive a vast gulf between man and the rest of creation. This mythology of human superiority justifies their doing whatever they please with the world, just the way Hitler's mythology of Aryan superiority justified his doing whatever he pleased with Europe. But in the end this mythology is not deeply satisfying... The world for them is enemy territory, and they live in it everywhere like an army of occupation...[57]

If tribalism worked so well, we might ask why and how was it largely supplanted by civilization? Civilization is the way of life of permanent agricultural settlements. Apart from the taming of fire and the development of language, the discovery of agriculture and the shift from nomadic foraging to fixed settlements of ever-growing size and complexity are the most consequential cultural developments of all time. Everything that we know as civilization, for better and worse, derive from agriculture and settlement. Whether the cultivation of grains led to permanent habitation or vice-versa, storable surpluses and larger societies offered the possibility of control by ruling elites, resulting in hierarchy, differential accumulation of wealth, power over others—and, of course, technological development. Grains might also, incidentally, have weakened the body and mollified the mind, making people more dependent on the new social structures in which they were subordinated. There is evidence in skeletal remains that human stature and health declined with agricultural diet,[58] and pharmacological

evidence that a diet of wheat reduces aggressiveness and increases tolerance.[59] Larger settlements favored increase in transmitted disease and parasites; groups also quickly expanded to a scale beyond that in which one could personally know all members and easily recognize kinship relations. The tribal way, in contrast, had been hardier, healthier, more leisurely and equalitarian, and more socially unified.

Agriculture was harder work than gathering and hunting, and at first typically led to a lower quality of life. Before the very recent mechanization of agriculture, hunter-gatherers generally did less work for the same calories, but enjoyed a better quality of nourishment; because of a wide-ranging diet, they were less vulnerable to famine than primitive farmers dependent on a nutritionally poorer monoculture.[60] The "puzzle of agriculture" is not how it arose, but *why*—if it was so much more troublesome and debilitating than gathering and hunting. Whatever the historical reasons (and many have been proposed—from climatic change and population pressures to wheat addiction), it seems likely that, once tried, agriculture would not have been retained as a means of food production unless its benefits somehow outweighed the deficits. But, what kind of benefit and to whom? Once a hierarchical system is in place, society is no longer directed by consensus. A ratchet effect could have made it difficult to abandon civilization, with its class distinctions and hierarchies, once begun. Nevertheless, Quinn points to the sudden disappearance of cultures such as the Maya as evidence that the agricultural way of life *was* at times abandoned by people who disappeared from the historical record by reverting to a life of hunting and gathering. Perhaps the Mayans got fed up with their rat race and simply dropped out, returning to the jungle?[61] Some native peoples remained foragers until quite recently, declining to take up civilization in spite of being well aware of its advantages.

Perhaps the soundest explanation for the success of agriculture, however, is natural selection: farmers simply out-reproduced foragers. The population growth of foragers would have been severely limited by the need of mothers to carry their infants and small children while on the go.[62] Settlement would have obviated this limitation, giving a strong reproductive edge to agricultural peoples, in spite of their relative malnutrition (and that of mothers, in particular, under their increased reproductive burden). Gradually farmers outnumbered foragers, taking over their territories and pushing them into marginal areas and further disadvantage. It is a familiar story, even now. Perhaps the legend of the expulsion from the Garden of Paradise laments the passing of an easier way of life in nature, displaced by agricultural

civilization, with its obligation to literally earn bread by the sweat of the brow. The shift to agriculture may have been a major benchmark in Man's alienation both from nature and fellow Man, because it opposed people to competing pests and predators, unpredictable weather, and human marauders for whom settlement was an easy target.[63] It also began the process of removal from an intimate life in nature to a man-made environment.

2.4 The Masculine Birth of Consciousness

Two great psychological visionaries of the twentieth century sought to show, each in his way, how consciousness is conditioned by the unique human childhood. Freud saw the conflict between individual and society originating in the opposition of pleasure and reality "princi-ples." The early but protracted illusion of entitlement of the child, in the protective environment of family, clashes with the physical, social, and economic realities of the interdependent adult world. Libido competes with reason. Freud sided with rationality, adulthood, and society in this conflict, as any good Victorian would. An atheist, part of his program was to expunge what he considered the infantile illusions of religion from the human psyche.[64] Jung, originally Freud's disciple, was a more spiritual man who believed that the religious outlook was essential to the human psyche and its health. He sided with the individual's unfolding as a pilgrimage he called 'individuation.' Freud identified consciousness with the reality principle, against the unconscious, which represents the pleasure principle. For Jung, the dilemma was rather that the unconscious represents the will of the species or collective, against which the individual struggles to develop a conscious life and identity.[65] Freud was the reductive materialist, insistent upon human creatureliness; Jung, the embellishing idealist, emphasized human spirituality. Their quarrel was between the agnostic champion of reason and the metaphysician who sought to restore the gods by making psychological sense of them.[66] One common element in their theories, however, is sexual chauvinism.

Freud's notorious prejudice toward vaginal orgasm might have helped keep women in their Victorian place as child bearers. But it can also be viewed as a male idealization: how female sexual plumbing should work according to the masculine reasoning that a woman's subjective pleasure ought to correspond to the objective functioning of her organ of reproduction. Freud's misogyny is also apparent in his

dismissive interpretation of reports of childhood sexual abuse, made by female patients, and in the demeaning overtones of diagnostic labels such as 'hysteria.' The sexual bias of Jung's theory, on the other hand, is subtler and more abstract. It rationalizes the triumph of patriarchy, the domination of culture by masculine values, and the historical repression of the goddess religions as the ineluctable result of psychic necessity, the destiny of evolving consciousness.

There can be no doubt that nature is unconsciously identified with woman in the psyches of both genders. Moreover, the emergence of consciousness in the species appears to parallel the emergence of consciousness in the individual child. Even after birth, the mother's body is the natural environment of the child, from which life issues and is first nourished. Woman is the very context for the survival and growth of the child; similarly, the natural world is the context for the survival and growth of the species. But the maturing ego must also separate psychologically from the enveloping parent, who happens to be female. The infant consciousness of both genders must differentiate itself—Freud and Jung agree—from the maternal matrix in which it unfolds. For the little boy to come into his mature masculine identity, he must transfer identification with the mother to the father. (The girl has a complementary task: to transfer the numinous attachment surrounding the first parent to the other gender.) By analogy, the maturing collective consciousness also separates psychologically from nature; and males in particular try to establish their identity in exclusively masculine realms of their own making. The male transference of gender identification is projected symbolically as an historical switch from female to male deities. The parallel switch for girls may help to explain why women have been so willing to support masculine culture and religion.

The Jungian theory of the origin of consciousness and culture is based upon a parallel between the development of the individual and that of the species or collective. Phylogeny here mysteriously recapitulates ontogeny. In terms of this metaphor, we can understand the growing sense of alienation from nature, and the desire to establish a cultural world apart from it, on the parallel of the child's growing need for independence from mother. This parallel points to the need of the psychic system of consciousness to differentiate from the unconscious. The struggle for autonomy, as with the child, is characterized by reversals and ambivalence, since the psychic need for independence from nature opposes a continuing physical dependence.

The quest of the budding consciousness to come into being, individ-

ually and collectively, is viewed as masculine and *heroic*, and related to the hero myths of cultures in transition to patriarchy. This struggle is symbolized in myth as the perilous slaying of the maternal serpent, or dragon of the unconscious, which could just as well swallow the hero back up. The question remains why it is the *male* child's development that is singled out as the model for human psychic development. On one level, the answer appears to lie in developmental psychology. But in another sense, to identify consciousness as the highest value, and as implicitly masculine, is surely an androcentric prejudice. It also leaves unanswered the question of why there should be any resemblance between the course of an individual's psychic development and that of the collective. Perhaps "the collective" followed the male model because it was defined by men to consist of males, even as they defined consciousness in terms of masculine values!

In any case, the ontogeny of psychic development does seem to parallel the phylogeny of cultural development—or vice-versa. Thus, paleolithic culture could be said to correspond to human infancy, neolithic culture to early childhood. The mythologies and magical thinking of the neolithic bear comparison to the fantasies of young children. The historical era begins with later childhood and the pubescent exploits of culture heroes like Gilgamesh, Hercules, and Odysseus. Mythical and real male heroes, explorers, and conquerors do seem to express the (male) adolescent quest for liberation from the unconscious, the collective, the limits of the body—in short, the disengaging of the male psyche from the feminine. In this scheme, our civilization might be said to have entered young adulthood: the end of youthful idealism and the preoccupation with economic goals.

The Jungian system portrays the origin of consciousness on four levels: the developing ego of the child, the evolving consciousness of the species, the emerging identity of the individual within the collective, and the triumph of the masculine over the feminine. These are all described in terms of breaking away from the maternal, womb-like Eden of the unconscious: as body, as nature, as woman, as collective. However poetic, this cannot be taken literally as an historical paradise, because at no time can there have existed a human experience in nature that was purely benign. The human awareness of vulnerability within nature is *necessarily* ambivalent and filled with suffering. With awareness of mortality comes the dawning significance of seasonal regeneration; with subjectivity comes a horrifying sense of the closedness of nature as a system from which there is no bodily escape. Nature

is perceived as brutal, dark, and claustrophobic precisely because consciousness can stand outside it, if not physically, to imagine more spacious and desirable alternatives. The rebellion against nature has its parallels in the child's search for autonomy from its parents and in the individual's search for freedom within the collective. The autonomy of the little girl and that of the little boy, however, have different flavors. We metaphorize cultural development in terms of the boy's experience most likely because of the entirely circular fact that males have dominated that development. In many ways the Jungian account accurately portrays the boy's developing mind; some attention is given to the parallel development of the girl's psyche, but it seems patronizing in comparison—a story of how she adapts to an already male-dominated world.

Dorothy Dinnerstein's account of the differential development of the male and female psyche is less biased, coming from a feminist viewpoint.[67] In her version, the arising of consciousness is not inherently tied to gender. Consciousness is not glorified as an heroic struggle against the feminine, because the preeminence of motherhood in early child development is merely a contingent fact, with no metaphysical significance. All that is required to change it is to have men and women engage equally in early parenting; then the nurturance of little girls and little boys would be the same with regard to gender. To be sure, there would still be a breakaway from *the other*—from the caregiver— because the need to develop autonomy would remain. But individuation would not be genderized. And this would most clearly affect the fourth aspect of the origin of human consciousness: the war of the masculine upon the feminine. Since the other three aspects are also affected by gender, more is implied than parity between men and women.

The role of the individual within the collective, for example, is subtly conditioned by a masculine conception of the "rugged" individual in Western culture—the roving lone hero who, having saved the day, rides off into the sunset instead of back into his place within the home and the collective. Most of our cultural heroes have been tragic figures, in one way or another antisocial, isolated and alienated from love, relationship and community. Isolated, in other words, from the feminine. If children were raised from infancy equally by males and females, there might result a better integration within the individual, and so within society, of masculine and feminine traits. But these would not be erased as distinct modes of being, nor would the problems of individuation disappear. The rift between subject and object may be

aggravated and genderized in Western culture and philosophy by child rearing practices, but it is caused ultimately by self-consciousness.

2.5 The Rebellion Against Nature

Just as the human infant is helpless and dependent upon its mother for all needs, so early humans might have experienced themselves as dependent on Mother Nature's bounty while helpless against her ravages. The mother becomes the object of the infant's developing ambivalence toward its dependency and, just so, nature became the object of early humans' ambivalence toward theirs. One difficulty with this idea, however, is that *nature* is a modern concept. People immersed in the natural environment, like fish in water, could not have thought of nature in the abstract way that we do. But this fact, too, parallels the infant's gradually developing awareness of the mother as a separate person, and of distinct objects in the environment. Nature, to be experienced as an entity, had first to be personified as gods or as anthropomorphized animals. Nature was at first personal—and also feminine— just as mother was the first person in the infant's awareness. The absence of an abstract concept of nature simply meant that early Man's real fears, frustrations, and resentment at the seeming harshness of the cosmos, were fixed in an ambivalent relationship to the feminine and the body.

Nature represents "the will of the species"—or, in more contemporary terms, the interests of genes—which scarcely correspond to the interests of the individual soma. It is not surprising, then, that the budding human individuality, so utterly dependent initially upon loving personal attention from the mother, would take offense at the indifference of the system of nature and resent the breach between adult reality and the brief taste of ideal conditions experienced in the womb and often throughout childhood. In the natural realm, the individual organism is merely the expendable vehicle into the next generation for the genes it carries; myriads of individuals are routinely sacrificed to serve their interests. The self-conscious human individual cannot help but be at least subliminally aware of this outrage, however it is conceived. The dawning human ego, knowing nothing of genes, did not go to the sacrifice unconsciously—as a beast—nor willingly, either, but found ways to resist and struggle against the ambivalence of the Great Mother.[68]

The body, the individual phenotype, is the genotype's pawn, which

humans have the peculiar ability to experience as though it were something other than one's self. It is the body which is the playing piece in the game of natural selection and which binds one's subjective experience to the premises of the system of nature. It is understandable, then, that the human consciousness could turn not only against the natural world as the body's environment, but against the body itself as the immediate environment for consciousness—one's *own* body, and the corporality of the world in general. The notion of transcendence and the rejection of the body are suggested by the interior subjective space that seems to be distinct from it and from the external world. Withdrawal into the realm of mind, spirit, and the Ideal expresses alienation from the body. But such withdrawal is not logically or psychologically inevitable; it is far more a masculine than feminine theme. The developing consciousness of the male collective—as of the male child—finds expression in ascensionism, asceticism, and mortification of the body; in intellectualism, metaphysics, and spirituality; in the rejection of the feminine, and domination, if not hatred, of women. An essential point of both the rites of primitives and the initiation ceremonies of contemporary adolescents is to establish conscious superiority over the body.[69]

One could say that primitive Man, expecting nature to be personal, took her brutal indifference personally. Death, disease, natural disaster, and the incursions of predatory animals were anthropomorphized and personified. They were taken to be the result of the magical (that is, *intended*) deeds of human and superhuman agents. Indeed, the forces of nature *were* superhuman, insofar as relatively defenseless early people must have perceived them.

Mankind understood natural phenomena in personalistic terms because humans take themselves to *be* persons. Understanding of causality was first modeled on understanding the motivations of other people, as well as on the direct experience of will that comes from successfully intending the actions of one's own body.[70] This also served in the whole as a way to assimilate intimidating natural events to the human realm and to the conscious control of will, through wishful thinking. Whatever transpired in the natural surround, for good or ill, had to be the result of *someone's* positive or negative intention, someone's accomplishment or failure. Natural forces could and must be propitiated in the way that powerful people are. Hence, the importance of prayer, ritual, sacrificial offerings, and self-abnegation. The impersonal understanding of cause as "natural" came later, or was allowed to assert itself later, when identification of scientific laws and technology

permitted a different and more effective way to assimilate nature.

In part, the domination of nature is a reaction to domination *by* nature. But early women might have been less inclined to such a reaction than early men. Views of nature are traditionally genderized, as are the notions of matter and mind. 'Matter' comes from the Latin *mater* (mother), and 'mind' likely comes from the same Indo-European root as 'man' (men, as in *men*tal). The domination of nature and the domination of women are closely linked. But is nature such a bad mother as to provoke such violence against her, not to mention the drive for unlimited power, the repression of women, and the passion for creating an *un*natural world, all of which characterize modern Man? What could have happened to trigger such an overreaction?

The greatest injury to the human spirit is the indignity of being a helplessly passive victim. In a book about the passion for war, Barbara Ehrenreich points to the long dark night of prehistory in which our ancestors were not yet dominant—not yet successful predators but, quite the contrary, vulnerable *prey*. This would have been a key trauma in the infancy of the species. She underlines the likely terror, grief, depression, and impotent rage of people being preyed upon by larger and stronger animals, as the catalyst for a unique reversal in the history of animal life. Humans turned the table on nature by *learning* to assume instead the aggressive stance of predator.[71] In her theory, the need to take the offensive in regard to mortality is the deep root of the enduring energy for war. I think her idea has even broader significance. The early experience of victimization set humans on the general path of dominance that pitted them against nature and its feminine association. In its motivations, men's war on nature and woman is closely linked to their war first on animals and then on other men. It is the enduring energy for culture.

Whether waged against animals or people, war is a way of assimilating death and violence by making them intentional, pro-active. It is a way of taking charge, of turning victimization to aggression. But the whole of culture, in fact, may be viewed as a movement to take active charge of the human situation, substituting life in a man-made environment with its own rules and playing field, on human turf, for abject vulnerability in nature.

Ehrenreich calls the transition from cowering prey to unchallenged predator the single greatest advance in human evolution.[72] Every other advance is a refinement on its theme: turning the tables on nature. Owing to their self-conscious intelligence, early humans would have

unquestionably been sensitive to their vulnerable condition. Because they had the ability to do something about it, the deep mark left upon the human psyche motivated people to ensure, in so many words, that it would never happen again. Ehrenreich goes on to argue that animal and human sacrifice ritualized offerings to bloodthirsty primal powers, which were little more than idealizations of predatory animals. The psychological importance of sacrifice is that it is voluntary, reversing the condition of being passive prey. Thus the archaic meaning of sacrifice may refer to the fact, in early prehistory, of having to share meat with dangerous carnivores. Whether the earliest humans were scavengers or hunters, they were probably in competition with powerful carnivores for the remains of kills. It would have been possible to take psychological charge of the situation, in which meat—sometimes one's own flesh—is *taken away*, by first *offering* it oneself. Ehrenreich suggests that the original hero might have been a sacrificial victim, offered up by the collective, who managed to triumph over his predatory foe. This would have been a momentous coup, turning the tables in a very tangible way—and transporting Man from knock-kneed cowering to the swaggering of a Gilgamesh.

The male fascination with killing, moreover, was and continues to be an exercise in conquest over the animal world. Prehistoric excesses of hunting and animal sacrifice demonstrate a primordial blood lust. The slaughter to extinction of large game that humans engaged in during their first expansions onto new continents exceeds any possible need and can be seen as sheer revenge against nature.

To put it another way, the first power of nature appropriated by men was the ability to take away life. Woman already had the power to create life, which men surely must have envied. Furthermore, she could bleed and then regenerate herself. But men found a compensating power of their own—the ability to destroy and to make themselves and others bleed. Through war, death itself could be idealized, appropriated, embellished as part of the deliberate human world, an answer to the mere passivity of being prey and victim to mortality. Freud tried lamely to explain Man's bloodthirstiness as an instinct *toward* death, rather than as a way of coping with fear *of* death by boldly intentionalizing it. We fight wars and flirt with danger not because we are unconsciously attracted to dying, but in order to take charge of death and fear, making mortality a willful consequence of our own actions rather than a doom imposed by nature or fate. Freud was personally obsessed by anxiety over his own mortality, which he (unconsciously) attempted to master through various superstitions and

phobias—such as a dread of trains and predicting with numerology the date of his demise.[73] It may be because of taking it so personally that Freud did not see the general issue more clearly. Nevertheless there is something prophetic about his intuition of a "death instinct." Ironically, Man's rebellion, taken to the extreme, becomes a suicidal attack on all of life for indignities that nature long ago inflicted.[74]

Hunting, war, and human and animal sacrifice were highly ritualized collective enterprises. Their role was to dramatize, stylize, embroider, celebrate, sacralize, render symbolic. In short: to humanize death. The numinous aura of "sacredness" with which these activities were charged and ritually circumscribed mirrors the deadly seriousness with which the reality of the external world is imbued. Ritual and myth in general were the early human answer to nature's power, translating the reality of the found world into enacted story. Killing, in particular, when ritualized, was a way to take back power from nature through human aggression and initiative: not just killing on nature's terms, as an animal would, but in a specifically *human* way that denies affiliation with nature. It is the first forum for culturemaking. Despite resemblances to parallel activities in the animal world, sacrifice, war, and the hunt are significant precisely because they were *not* events in nature, but in a human world transformed by ritual and deliberately redefined in human terms. It is not just death that is transfigured but the whole dilemma of vulnerable embodiment and immersion in nature.

Thus, the felt situation of human dependency and victimization was (and continues to be) met with various idealist initiatives. Man first turned the table on nature by a pro-active sleight of mind. He continued to take ruthless revenge for early humiliations, once through the massacre-to-extinction of numerous species and now through the debasing reduction of other species to industrial products. Man covets and successfully appropriates through technology the powers of other creatures, of woman, and of nature at large. Ultimately, Man removes himself from the natural arena altogether. This is first accomplished by redefining human behavior in mythical and sublimated terms. Then by reconstructing nature as an artificial environment, of which humanity is owner and boss. Finally, by controlling life processes and leaving the planet and even reality itself.

Chapter Three: IDEALITY: the House that Man Built

Things should be as simple as possible, but not simpler. —Albert Einstein

3.1 The Nature of Ideals

The transformative power of mind begins with the mapping of the world into image. The self-conscious mind finds its home in the image itself, in the map, so to speak, more than in the territory of the Real, which is nature. This is because it has a direct hand in the design of the map and only an indirect influence over the territory, through physical effort. While every organism's survival depends on acknowledging the reality of the territory, it is understandable that self-conscious beings should also be deeply committed to their involvement with the map, which is the Ideal.[75]

Human beings carry the mapping process in both directions. Like any creature, we map the outer world to inner image; but then the image is translated back into the physical world by transforming idea into durable artifact. Idealization, like homeostasis, involves a loop that includes action upon the external world. While the animal does affect its surroundings, the human extends the cycle of homeostasis through culture and technology, which in turn affects thought again. The human world is a cultural realm of signs and artifacts—a world of ideality if not an ideal world—whereas the animal remains within the world of nature.

Even so, many social animals, and even some insects, could be said to have a sort of culture and some even a sort of technology. Primate societies in particular bear striking parallels to ours. Chimpanzees use natural objects, like sticks, as tools and have their own system of communication. A key difference, however, is the ability to abstract and idealize. This capacity is reflected in the infinite versatility of fully grammatical language and the parallel ability to translate intention plastically into manifest cultural forms and artifacts, which in themselves constitute a sort of language. Humans, it would seem, have a driving need not only to assimilate the outer as inner, but also to express the inner as outer, to transform with a Midas touch all that they can grasp with hand or mind. A mere glance suffices to incorporate a found object as an element of the inner world, and nothing the hand touches escapes embellishment.

A visit to an anthropological museum quickly reveals that many artifacts have no precisely known function, labeled simply 'ritual

object' or the like. The question of their meaning is less about identifying the practical use of tools than about deciphering a language of signs. For, most such objects were probably never utilitarian in the modern sense, which is predicated upon a one-way relation of subject to object. They may have been useful, but their uses were multidimensional, their presence affecting and reflecting back upon the user. Whatever their specific function or meaning in context, artifacts in all cultures collectively serve to establish a human *world*—an environment not found but designed, a realm of discourse equivalent to language as a medium of thought and expression. Every object, every available surface and material—beginning with the body itself—is occasion for decoration and a formal repository of meaning. Whether the object is first a container for storage and only secondarily a painted sculpture is a moot point; for wherever one looks, before the industrial age, function, form, and meaning are inseparable.

I propose that human beings are boundlessly inventive because of a deep-seated need to dwell in a world of their own making. This is so first of all because a self-conscious being *already* lives in such a world: the inner domain of subjective consciousness. An ideal world is foremost a world of ideas. But secondly, it is so because such a being consciously suffers in the system of nature and is highly motivated to make for itself a refuge both within the mind *and* in the external world. Yet even when externalized and physical, the human world is always and primarily symbolic—a mental world of signs, meanings, ideas.

The infantile experience of total helplessness motivates the child toward self-mastery and "learning the ropes" of the human environment. However, childhood is not only a time of serious learning but also of imagination, daydreams, and play. It is the time of initial discovery, not only of the external world but also of the interior one. Along with reality, the child discovers ideality in imagination. We might suppose, similarly, that early humans who huddled about a campfire through the terrifying night took refuge in imagination and the inventiveness of storytelling. The creative space of possibility, opened up in subjectivity through ideation and language, is the carrot that lured Man on to embellishment, invention, and daring to conceive a world made to human order. This is the same milieu created within language, for language is also an intentional realm, an artifact. Consciousness, language, and material culture are three aspects of the impulse to create an alternative, intentional, ideal world.

Another layer of motivation may characterize men in particular, who, more than women, seem to need to validate their separate identity.

Males have been the driving force, expressed through culture and technology, to dominate and secede from nature and create for themselves a parallel world, a second nature they can control. It is no coincidence that futurist visions of advanced alien civilizations largely project the masculine ethos of ours. For, masculine idealism has always aimed to transform the natural world into an invented, artificial one. Science fiction merely continues an ancient trend.

Idealism has both a normative and a descriptive sense. One indicates a standard of perfection; the other refers to the mental world of ideas as opposed to the physical world of things. These are intimately related, since any notion of what ought to be is itself an idea, and ideas serve as references against which to measure what actually is. While recognizably subjective, however, ideals are typically projected as objective realities, since otherwise they might seem to lack imperative force. Hence, Plato's idealism is both normative and descriptive. In a tidy reversal of common sense, the ideal world he prescribes is held at the same time to describe what *truly* exists—an eternal and objective standard of perfection, of which the actual world of appearances is but an imperfect and ephemeral copy.

The appearance of reality in experience results from the cognitive interpretation of sensory information, through mediating models or schemata stored within the brain. In that sense, the territory is a projection of the map, so that information processes within the brain are appropriately experienced as events and entities in the world when the input concerned originates in the environment. The Ideal is the map, with its "legend," through which reality is interpreted and navigated. But the map can also function prescriptively, as a blueprint.

Appetitive impulses organize and charge perception of the world in particular ways. Psychological objects may be fictive, and acknowledged as such while the tension between fantasy and reality is withstood and the distinction between inside and outside is maintained. But they may also be projected outward in various forms of wishful thinking, as real external objects, when consciousness cannot contain the logical tension within. This, I believe, is the origin of many spiritual concepts, conceived as desirable possibilities and then projected as already existing actualities. The Ideal is thereby seen as a preexisting order of reality, objective and independent of mind, and deeper or higher than physical reality. Idealism, in other words, objectifies human hopes. The mind's pretension to a native realm requires a certain amount of denial, of disconnection between its conscious categories and ideals and the

biological meanings and behaviors from which they arose and to which they ultimately refer. For otherwise, the possibility of reduction to the physical or commonplace threatens the autonomy of the Ideal, as has actually happened with the advance of science over religion.

Ideals often extrapolate and abstract animal capabilities, which are upgraded to consciously pursued standards. What is new on the evolutionary scene about the human creature is this very ability to contrive its own goals and standards, conceived in its own terms, even if they are clearly derived from, and layered upon, instinctual values. Every creature must be sensitive to what is relevant to its survival. But the specifically human innovation is to conceive what *ought* to exist—and to shape behavior toward that end, in many cases against instinct. We are the creature that tries, if pathetically, to conceive and create the best possible world for its kind. We refurbish, as distinctly human, instinctual values that are often significantly altered, perverted, or even reversed. The other side of this positive idealization is denial of animal origins, even to the extent of disowning the worst features of human behavior by projecting them falsely upon animals.[76]

What distinguishes human relationships from those of other creatures is not the capacity for affection, concern, or even altruism, but the ability to idealize these. This includes idealizing one's own and the other's being as personhood, and extending personal affection to a broader group of recipients of moral concern. Personhood is a fundamental category—both descriptive and normative. Like citizenship, the state of being a person has in principle no degrees or kinds, though history is replete with incidents in which whole groups of people are denied this status. While personhood as an ideal may be genderless, masculine and feminine are themselves ideals—not only descriptive categories, but norms of personal identity toward which people strive.

Of course, ideals may be false, inappropriate, misguided, hypocritical, and even lethal. Ideals do not necessarily override or displace biology; on the contrary, they are often its sly puppets. But even then they may leave us with a nagging sensitivity to inconsistency, a lingering conflict with older layers of our being, a longing for perfection.

Something in the human psyche loathes the indignity of being an organism at all: a convoluted alimentary tube driven by genes to fecundity, eating its way through the world until it too becomes food for literal worms. We have grander pretensions—to be as gods, pure, unbounded, with immortal eyes open upon an infinite horizon. The very concepts of spirit and spirituality deny the limiting animal context.

The idealistic belief that what one truly is, despite all appearances, is spirit or soul, expresses a characteristic revulsion at being trapped in the temporal sheath of flesh. The very import of culture is to make a sanctuary away from the horrors of nature and biological entrapment. Naturalist and novelist Annie Dillard writes of the gravid bellies of insects pumping out billions of eggs, of mandibles that bite off the heads of their mates, even while still embraced, and which turn to eat even the eggs that issue from their own bodies. She speaks eloquently of the senseless and amoral extravagance of the system of nature, which produces countless new beings only to destroy the overwhelming majority, concluding that the whole of life has signed a mad pact with the devil and that the price of life is ignominy and death.[77]

Rational intelligence may have survival value for the species and the genes, but its novelty is that it appears to serve the individual and the social group. However illusory, this shift in service from genotype to phenotype is already the foundation of the Ideal. For, it is the individual intelligence which conceives ideals in its search for life, liberty and happiness for itself and others of its kind. The individual is the spiritualized counterpart (and chief competitor) of the selfish gene. If idealism often leads away from personal benefit and toward collective altruism, it is because identity transcends not only genotype and instinctual programming, but also phenotype, embodiment, and cultural institution generally. Altruism may not appear rational when the individual is identified strictly with the body, but where identity lies with the Ideal, it is spiritual rather than physical survival that is at stake.

Humans balk at the contract signed on their behalf by their genes or animal being. They do not easily accept the absurdity and cruelty of nature. Moreover, they do not like to dwell on their helplessness in the face of mortality and natural limits. At first powerless to do anything about it, people turned to dream, denial, and magical wish-fulfillment in order to avoid or redefine their actual oppressive condition as organisms, and to express an indomitable longing for freedom. Whatever else it is, the religious impulse is the desire to escape from the limitations of the body and the mad embroilments of the system of nature. Through simple denial and inversion of reality, it proposes that one is *already* free—as spirit—no denizen of the chaotic, arbitrary, meaningless, and squishy organic world, but an ethereal citizen of a sane, orderly, loving, just, tidy and sensible kingdom, a parallel but invisible realm that is the true world within which humans move. That world is ideal in a double sense: conceived as *idea*, it expresses the aspiration to *perfection*. In both senses, the ideal is projected as already

present, external, and independent of human whim, real in the very way that the natural world appears to be.

The attribute of realness, we have seen, tacitly acknowledges the power of the environment over the organism. The human psyche, self-consciously and resentfully aware of its dependency, rebels against this authority of nature. It does so by inventing a surrogate world to be the true human home, to which it ascribes the quality of realness on a level superseding nature. This is tricky business. The surrogate reality must be perceived by the reality-oriented mind as even more awesome and commanding than the external world. We posit, therefore, gods who create the natural world and so stand above it. To believe in the authority of such inventions, however, we must ignore that they *are* inventions. The denial must be denied. But then, in making pacts with gods against nature, have we not bound ourselves to more powerful tyrants?

The rebellion against nature expresses a deep-seated directive to impose ideality upon the natural world, to transform nature and the human lot within it, and ultimately to replace nature with a world of human design. But because of the original commitment to reality—one might even say the worship of it—the psyche can never allow itself to be fully conscious of this project. We aspire to be the definers and creators of the universe, but cannot afford to let the right hand know what the left is doing. Such is the strength of this taboo that the chief blasphemy in monotheistic religions is the claim to *be* God. But that is nevertheless the very aspiration behind technology—and the pretension behind esoteric religion as well. Orthodox religion rejects the hubris of identifying with the divine, offering instead the consolation of remaining on the good side of an all-powerful divinity—secretly harboring, however, the inadmissible knowledge that *we* created *Him*, and not the other way around.

The ability to generalize, abstract, extrapolate from what is to what should be, leads to idealization in every realm and to a general obsession with perfection that serves in all cases to establish the human world. Four-legged ambulation is not good enough: we master the daring aerial feat of continual upright balance. However, neither will mere walking do: we dance, in ballrooms and on formal concert stages. But that too must be pushed to the extreme, for the ideal of dance is to leap and glide as though flying, on the impossible tips of the toes; to pirouette like a spinning top and lift each other in the air as though gravity did not exist; to defy fatigue, pain and all physical limits. Not

content with the ability to run upright on two legs, we set and break records in formal races and stylized competitions in the geometry of stadiums. A whole technology of paraphernalia, sports medicine, and technique have parlayed what once served in pursuit of prey, or flight from predators, into a realm of gratuity. Swimming has likewise been elaborated from the instinctive mammalian dog paddle into a competitive sport and a balletic art form; its strokes stylize and improvise upon the natural strokes of various creatures, while the muddy water hole is developed into the chlorinated rectilinear pool, with cordoned lanes and engineered diving boards, with water filtered and maintained at constant temperature. Even breathing has been formalized through yogic practices. Each and every animal activity has been transformed and liberated from its animal context, and so embellished in its human version that, until Darwin, people were able to pretend that they were not animals at all; that the human and the natural worlds are utterly discontinuous.

Clothing, of course, is not merely functional but also a symbolic way to remake the body. It literally masks the "naked" animal condition, while providing key information regarding class, gender, sexual status, etc.[78] First through decoration of the skin itself, and then through creation of a second skin of clothing, the body becomes an artifact, is claimed as a possession of the self. Hair is stylized in wigs and coiffures, facial and body hair through shaving. Nor is eating merely functional, but the social occasion of pomp and ceremony, governed by rules of etiquette which, however diverse, serve universally to establish that human dining is not brute devouring. Privacy attends urination, defecation, and copulation because these are abashedly animal functions. Physical modesty, as much as reason (and often contrary to it), distinguishes humans from beasts. In some public toilets in modern Japan, recordings of toilet-flushing sounds can be activated to mask the actual noises of one's business there. In Victorian England, etiquette enjoined the refined person not to smack the lips like a horse while eating; or swallow without chewing, like a stork; or gnaw bones like a dog; or lick the dish like a cat. Similar considerations admonished one not to show teeth when laughing, or gesticulate too vigorously while speaking.[79] Nakedness was considered bestial, as was unduly long hair for men. Working at night was frowned upon, for that was the active time of beasts of prey. Swimming was for fish—highly undignified![80] Lest one imagine that only European people refused association with animals, Darwin reported several native groups at the time of his voyages who stained their teeth to avoid showing "white

teeth like a dog." Chinese he encountered had contempt for the white teeth of the English, while the natives of the Upper Nile would knock out the four front teeth so as not to "resemble brutes." The Indians of Paraguay would pluck their eyebrows and eyelashes because they wished not "to be like horses."[81]

Of course, establishing the distinctly human identity is not only about denying animality; more importantly, it is about affirming a godlike power and spiritual nature. The great evolutionary significance of language, culture, and technology is not simply their utility for survival, nor their ability to shield people from natural vulnerability, but also that they signify a transcendent domain and dominion. Whereas the animal must suffer its passive existence in a found world, human beings create their own. The man-made world is spiritual in that it is intended rather than contingent, symbolic as well as material. Like a mathematical system, or a mythological fable, it contains only the premises deliberately put into it and their deducible consequences.

The great theoretical advantage of a world you have built yourself is that it ought to be entirely within your mental and physical grasp. Every novelist, mathematician, and engineer knows this is not in fact so. Mathematical systems are full of unforeseen implications. A writer's characters begin to dictate the story. Bridges and whole societies collapse unexpectedly. Still, there is a kind of closedness and predictability in intentional constructs that the natural world lacks. The theorems, conclusions, implications, developments, or game-like moves are in some sense contained implicitly in the assumptions right from the beginning, when not foreseeable in advance. Plots and characters unfold through the process of writing; new theorems are derived by prescribed methods. The sense of discovery or unfolding in regard to complex constructs leads easily to the conclusion that even the mental objects of the intentional realm have an objective existence like physical reality. Hence, there is a school of philosophical idealism even among mathematicians, some of whom believe that mathematical truths exist, in some objective and eternal sense, before they are intuited or proven.

I would point out, however, that mathematical objects are originally idealizations of experiences in the physical world. The concept of natural number, for instance, idealizes the integrity of physical objects —their "objectness," so to speak. Mathematical space abstracts and generalizes physical space. Arithmetical operators such as $+$, $=$, $<$, etc., idealize perceived relationships between real things. Set theory can be seen either as abstracting the formal properties of real objects or as

formalizing the mental ability to group elements bearing such properties in useful ways. While the transcendent reality of numbers, as of angels, is a conclusion to which the idealizing mind loves to leap, the rich relation between mathematics and physical reality is a mystery that remains to be explored.

3.2 The Ideal as Real

Natural or naive realism reflects an "animal faith" in the literal truth of cognition. One could say that cognitive simulation of the external world is thereby projected as real. The counterpart of natural realism, *natural idealism* is the intuition that true being lies in the simulation itself, in the realm of ideas or essences more than in the flux of the senses.[82] It too involves reifying mental contents, which in this case are not inspired directly by sensory input but are internally generated. Such contents might include images of gods, demons, angels, spirits, or other magical and animistic entities and principles; or they might be abstractions such as Beauty, Truth, or Justice. Either way, they are projected externally as having their own real, timeless, if nonmaterial, existence—lest they be dismissed simply as subjective imaginings.

Through abstraction, reification, and projection, ideality expands the realizing faculty of mind. While subjective consciousness re-appropriates projected psychic contents to an inner domain perceived as part of the self, the idealizing faculty assigns idealized aspects of external reality to a domain perceived as self-existing, independent of the self, and superordinate to both self and nature. The subject in both cases has power in domains knowingly authored. The Ideal is created in the subject's own preferred terms—and that is the whole point. The Ideal simplifies and abstracts reality, but it is also normative and, so, transforms reality more to the mind's liking. The Ideal, then, does not reflect reality in its fullness, nor even necessarily in its essence. It is a fiction that may be enforced upon reality through cultural practice and artifice. Above all, it has the potential to be realized through technology.

Taking reality seriously has universal survival value, so that creatures that do so have come to prevail. Taking ideality seriously might also have advantages that have become genetically ingrained. Ratification by natural selection does not, of course, establish truth. But normative idealism may sanctify the fundamental premises of a society, ensuring that its values go unchallenged. Just as the perceptual system of the organism has its sacrosanct premises, religious, moral, and political sacralization are the corresponding social ratifications of

premises that serve group cohesion, and hence survival. Patriotism is near to religion in tone and function, involving similar sentiments and unquestioning acceptance of ideology for the sake of cohesion and certitude.

Cultural differentiation in general serves group closure. The distinctness of one group from another rests on intricacies of custom, ceremony, social etiquette, costume, adornment, etc., and above all on language. All these details *must* vary from culture to culture, so that the unique identity and cohesiveness within each group can be maintained.[83] At the same time, however, such values, mores, practices, and differences cannot appear *arbitrary* if they are to be convincing to their owners. Each group must be convinced of the value or truth of its own ways. A great strain is placed on divergent groups in forced contact: how to maintain their cultural ways in the face of blatantly different practices? The price of cosmopolitanism is moral relativism, erosion of tradition, and the possible demoralization of society. Idealism, when engaged by tribal mentality, is a powerful force to counter this inevitable tendency in a global community, by reasserting cohesiveness within distinct groups. However, in-grouping in a crowded world may be a primate inheritance we can ill afford.

An ethical system must be based on accepted values, just as a formal system must have its assumed axioms, and a game must have its rules and defined elements. The central task of ethics is therefore to find basic values that can be agreed upon—the premises of the system. Traditionally, however, what facilitates such agreement is the shared conviction that these are *not* mere premises or arbitrary conventions but objective truths. Ideals and social conventions are cherished as intersubjectively given realities; for, what unites a group is a common perception of the world. In short, the Ideal must be perceived as real in order to be upheld consensually.

There is, of course, a model for this acceptance in childhood. The young child embraces the world, if not always the admonitions, of its parents. It "learns the ropes" of the surrounding culture and steps eagerly into the inherited ethos. Only in adolescence does the skeptic emerge, who, through reason, experience, and education, sees that the way of the elders is not written in stone.

God and king (or goddess and queen) idealize the parent and parental authority. Nostalgia for the benevolent authority of the parents is reflected in reverence for the gods as the personifications of authority and projections of ideals. Transcendence is not the only motive of

religion; the perennial resurgence of fundamentalism reflects the longing for the lost security and closure characteristic of childhood. Even humanist ideals had first to wear the mantle of divine authority; only later did the humanist rebellion against nature extend to God. Initially, science too had to be ratified with heavenly sanction: the laws of nature were divine decrees. In this more secular age, many look to the authority of science, ironically religious in origin, as the source of revealed truth. One ideological intent behind sociobiology, for example, is to find sanction for ideals within the natural order and its history. What *should* be, however, cannot logically be derived from what is or what was.

People share much genetically and by living together on the same planet. But there is great variety among both individuals and environments within this commonality, and the subjective variable allows for enormous variance in how the world is perceived. Societies solve this problem through shared ideals, beliefs and values, continually renewed within the group. At the same time, these may foster division, hatred, and strife *between* groups, which remains a weak point of human society. The cosmopolitan vision of a unified world culture depends on a conscious universal agreement about the games in play, their rules and premises. Zoologist Desmond Morris, author of *The Human Zoo*, expressed pessimism about the possibility of the naked ape ever reaching such universal accord. The source of his concern is our primate ancestry, which dictates in-grouping. The human striving toward objectivity, abstraction, and transcendence does offer some hope. Mathematics and science as international cooperative endeavors are hopeful examples and metaphors. But there is in-grouping even in these disciplines, which can be so specialized that many mathematicians and scientists have no idea or comprehension of what their colleagues are doing. Mathematics and science are the basis for a unified human culture because they substitute quantity for quality, rationality for faith, method for opinion, scrutiny for blind acceptance of appearances, intersubjective truth for wishful thinking. They do, however, depend on embracing disinterested reason and a drastically narrowed range of the things that can be expressed.

Money provides a similar basis for unity—literally a common coin. It also narrows value to one dimension, substituting quantity for quality of life. In the last fifty years, in particular, the culture of global consumerism has exerted an economic hegemony whereby every corner of the world is either enticed or forced to adopt the Western model.

Unfortunately, this model is far from disinterested, egalitarian, or truly uniting. Ostensibly reasonable, it is arguably impoverishing rather than enriching, even in quantitative terms. Reason seems insufficient to enforce a general cultural standard, in any case, for it does not prevent irrational and self-serving beliefs even among the relatively well educated and supposedly rational. It did not prevent the "Enlightenment" from plowing under whole cultures and their cosmologies to steal their gold, simply because of superior European weaponry and blind confidence in the superiority of "civilized" beliefs. It does not prevent the overdeveloped nations from continuing to pillage the world's natural resources and labor.

Moreover, rationalism is relative. From a twenty-first century perspective, the eighteenth century was scarcely out of the dark ages and the Inquisition. Newton, who died in 1727, wrote far more (that is eminently forgettable) on the subject of alchemy and his religious beliefs than he did on science. What is labeled superstition may be no more than a judgment, really, of one metaphysic upon another (Newton's scientific writings were cherished and collected, his other writings ignored and dispersed). The history of science is filled with discarded notions. Yet there are clear instances when belief is simply wishful thinking, without rational basis. However we romanticize aboriginal ways in our overly civilized world, the fact is that aboriginal magic, prayer, and cargo cults did not protect natives from the destruction of their cultures. Many died believing they would be shielded from the white man's bullets by the "ghost shirts" they wore into battle. The white man's magic was apparently stronger, his beliefs apparently truer. But what if the white man's beliefs and hubris lead him, in turn, to destruction? Shall future historians (if there are any) say that our science (not to mention our religion) was false? How do we detect the superstition in our own current thought?

Idealism often serves as philosophical justification for notions that (from a materialist perspective) are little more than superstition. It typically reifies mental qualities or constructs as entities independent of both mind and matter. (This is ironic, and paradoxical, given that idealistic philosophy implicitly denies the mind-independence of reality.) From an idealist point of view, soul, mind, spirit, and god may exist as entities more real than matter. To the materialist, they are either figures of speech or emergent properties of brains and bodies. They are qualities, normative ideas, wishful thinking—at best potentials realizable in some future state. They are ideals the idealist has reified and

projected backward in time to a golden age, or forward in time to a future paradise, or outside the skin, in some idealized and timeless place.

Materialist and idealist ontologies produce correspondingly divergent cosmologies and causal histories. They have radically different ways to understand current situations. Idealism typically inverts the causal relationships and temporal order of materialism. The materialist view is evolutionary: complex and sentient forms evolve from simple and insentient ones. The idealist view is involutionary: mind or spirit preexists and causes or endures the degenerate world of matter and appearances. The Word is made flesh, or descends into it. The Ideal is hypostatized as existing before and above matter, which is patterned crudely after it. This is just the reverse of the materialist view, which asserts that inert matter predates and gives rise to phenomena of mind; ideas are simplified images of complex realities, not their blueprints. The idealist goal of knowledge is to grasp the illusory nature of ephemeral experience and the truth of the Ideal—be it the Biblical Jehovah, the forms of Plato, the Brahman of Hinduism, or the eternal laws of mathematics and nature.

Ideals are projected not only outside body and mind, but also temporally, backward or forward in time. Having limited means to actualize their ideal worlds in the present, people were first obliged to *imagine* them, as unfolding in the future, as already realized in the past, or as existing outside time. Desired possibilities are thereby projected as already actual. Human aspirations of omniscience, omnipotence, and immortality, for instance, are projected as attributes of the eternal God. Earthly possibilities of utopia and dystopia are projected as future stations awaiting us: heaven and hell. The concept of heaven projects positive ideals of freedom, happiness, equality, and justice (along with the notion of personal immortality) into an afterlife of extended childhood administered by an ideal super-parent. The negative ideal of hell abstracts and expands upon the punishments meted out by earthly authorities (beginning with the parents) and projects them into the future. The human *intention* to progressively bring nature under control is projected into the mythical past as Man's lost Biblical *right* of dominion over nature in a preexisting order disturbed by human moral error. There is the implication that dominion is Man's natural estate, despite any temporary setback.

Plato's idealism takes a great projective leap to reify the entire realm of ideality as eternal reality. The Ideal is presumed to exist out of time, perfect, and far more imposing than reality. The Greek concept of a

Golden Age projects aspirations of human fulfillment backward in time; Telecleides and Hesiod told of a Golden Age of freedom from want, fear and disease. Similarly, in the Biblical story the idyllic state that Man would *like* to live in is projected backward as the state from which he fell. There is always a "good old days."

The twist of moral responsibility, like the inversion of time, is part of a general inverted logic whereby intention substitutes for cause. While the degeneration of the world into a hostile place may reflect Man's spiritual failing, there is a subtle triumph of reversal in this. The fact that natural cause is assimilated to human intention recasts the contingency of nature (and even human nature) in the dimension of will and purpose, under Man's control. Moral responsibility may be an inescapable concomitant of idealism, but the aspect of blame is projected and disowned; the buck is passed, while the aspect of power to shape one's fate is reclaimed. The man blames the woman, the woman blames the serpent, the serpent is but Satan in disguise, and Satan merely draws out the defect already in the human heart... Through it all, Man retains the power to redeem himself—ultimately through technology.

The medieval view of nature, reflecting Aristotle, is an idealist fairy tale, which inverts the causal and temporal order later proposed by evolutionary science. Instead of a picture in which the existence of plants occasions the arising of animals that feed upon them, and herbivores occasion the arising of carnivores that feed upon them, the Biblical story puts the human cart before the natural horse. Supported by the Stoic and Aristotelian concept of final cause, Man and his needs come first in the "natural" order of things. From that simple premise, everything falls into proper place through the infinite rational foresight of God. Plants exist *in order* to feed animals, and animals are provided in order to satisfy human needs. The Creation is an ultimate feat of reverse engineering.

The Biblical account has the advantage, moreover, that it surreptitiously renders Man innocent. It was God, not human hubris, who put Man at the center of things and decreed everything in nature at his disposal. It was God who gave Man the woman and the serpent; it was all a setup. From an anthropocentric viewpoint, the Garden was literally an ideal world, a paradise for a spoon fed mandarin, at the center of attention, in command. We do not have to look far to see whence such a notion could arise. Every person (and in many cultures, especially the little boy) begins life in this privileged position, at the center of the world, as it were.

This transference enables Man to overcome the inner emptiness and helplessness of the existential dilemma, by finding objects onto whom to project ideals and a consistent and palatable world in which they can be true. It is motivated by the fact that the overwhelmingly awesome power of the universe can be tamed by *personalizing* it, even before the external world is significantly shaped through culture and technology.[84] It is a way to translate the impersonal, uncaring, uncontrollable world back into the safer realm of childhood, where the infant had quasi-magical power over mother, the protection of father, and a community of caring relations.   One longs for freedom from the struggle to merely survive and from the vulnerabilities of the flesh, but also from the sheer blunt ending of life and consciousness. The self-conscious mind cannot fathom ceasing to be; it thirsts after the immortality and freedom from the limits of embodiment it can conceive. The psychological way to have such freedoms predates technological effort: *invoke* them by telling a story of an alternative reality in which they simply are true. The corruptible body is actually incorruptible spirit; the temporal personality is immortal soul in its pilgrim journey through incarnation. Immortality is then not a goal to be sought in the future but one's true state all along.

The difference between ideals and mere denial, delusion, or wishful thinking, is that ideals are publicly accorded intersubjective reality. They have the strength of the collective behind them. Being a persistent response to an irremediable condition, they have the momentum of generations of intent behind them. Being abstractions, they have the power of the essential and the general. But above all, they contain the implicit promise of realization through technological means. This latter, in practice, is the difference between aboriginal and white man's magic.

Spiritual ideals are premonitions of heaven on earth. The concept of heaven projects and reifies the ideal world as already accomplished or waiting in the wings. The paradox in the long millenarian tradition, for instance, is that the more fervently people believed in the immanent end of the world and the coming reign of Jesus, the more they took interest in social and technological progress in this life. It is as though they believed all along that heaven was destined to be realized on earth!

From this idealist view of Man, as an *already* spiritualized and transcendent being, the Biblical Fall explains the gulf between our actual animal nature and the divine potential toward which we strive. Time and evolution are arrested or reversed: the Ideal looks backward to the original state to which the Book of Revelation, referring forward,

has Man finally restored. Salvation bridges the gap between animal heritage and spiritual destiny by reinstating Man from a fallen condition.

Through the concept of sin and the inversion of time, the tension between actual and ideal is interpreted as a childish moral or behavioral failure. That mankind could fall from its previous state of grace through a single act of disobedience seems obviously modeled on manipulative parenting practices: the curious, adventurous, or willful child is threatened with loss of love—even expulsion—should it misbehave. This is a very different picture from that implied when the state of grace is yet to be achieved through maturity and one's own efforts at self-creation: the attempt to become an "adult of the species."

The esoteric significance of the divinity of Christ is that animal Man *becomes* divine, transformed. Like the primal hero who conquered the devouring beasts, Christ and Buddha prevailed against the beast within. That is, they actually succeeded in embodying the Ideal. Through the evolved individual, the way is opened for others to bridge the gap. Both were spiritual heroes or pioneers who blazed a trail. Islamic and Hebrew teachings are similarly replete with the ideal of the perfected Man. Perhaps all religions have an esoteric core that emphasizes the actual realization of ultimate ideals, through heroic effort tempered by humility.

It is no coincidence that religious orthodoxy condemns such notions as heretical: God is God and Man is Man, and the gulf between them cannot be bridged from the human side. (Perhaps this inadvertently reflects the tragic fact that the breakthroughs of evolved individuals cannot be genetically transmitted!) Realization of the divine potential is relegated in orthodox theology to the unique person of Jesus, whose role is less exemplary than to be ritual surrogate and intercessor with the parental god. In Christian dogma, we are not supposed to take too seriously the notion of becoming literally like Christ, but rather to admit the impossibility of such an aspiration and to accept as absolute the chasm between our sinful state and the perfection of Jesus. This humble admission itself is held to be the very door to magical reconciliation. God will save us if and only if we do not presume to save ourselves!

In this way, one is relieved of the burden of striving toward ideals, since we know in advance that perfection is not possible through effort, but only through the grace of God (who is already perfect because He is the projection of the Ideal). In this way orthodoxy may give lip service to ideals while refusing to take them seriously: one can sin all

week and clear the slate on Sunday. The cynical mentality of such "worship" is more that of the naughty child manipulating its parent than of the earnest and passionate pilgrim. Christhood is removed from the realm of aspiration by making it a unique status that is off limits to mortal Man and blasphemous to attempt. On the other hand, there *is* a sense to the doctrine of salvation by grace, and a legitimate meaning to the danger of blasphemy. For, the megalomanic nature of ego is to appropriate all powers to itself. Mental institutions are filled with people claiming to be God; and political institutions are filled with people who behave as though they think they are God.

Pity, empathy, and compassion—even for a suffering and dying god—may soften one's heart but do not necessarily oblige one to change. *Inspiration*, however, is more efficacious. This is why it is not enough for literature and the cinema to be filled with sympathetic, if flawed characters. We are not taken beyond ourselves and the ordinary unless the character can genuinely embody the Ideal, without glossing over obstacles. A cynical litany of human sordidness in the name of realism or ironic sophistication can only take one so far, in a negative wallowing whose positive counterpart begs to be demonstrated.

Morality and ethics reflect the basic need of the organism to assess stimuli and courses of action. The valuation of honesty "as the best policy," for instance, may be compared to the perception that sugar tastes "good." Both are cognitive judgments. It is obvious that sugar should be judged positively by the nervous system because of its chemical readiness as food. It is less obvious why honesty should be upheld as an ideal, given that a mixed strategy might be of greater value to the individual. The answer must lie in part in the highly cooperative sociality of human ancestry. Early humans, in small groups of individuals well known to each other and in frequent contact, probably had to deal with each other fairly if they were to survive at all. It makes common sense to treat well people with whom you are going to interact repeatedly, and who might have the opportunity to retaliate if you don't. Larger, more anonymous societies, composed largely of strangers and in contact with foreign groups, might have adopted this as a *precept*—reflecting not the actual but the desired state of society. The Golden Rule may refer back to a more innocent time when such things could be taken more or less for granted, but also forward in an attempt to realize the ideal.

Just as the blanket judgment of sugar's goodness leaves one vulnerable to deception by sugarcoated poisons, so there are reasons why not

everyone is honest, yet most people are. A society in which everyone naively assumes all parties to be honest is the perfect set-up for a liar or cheat. On the other hand, a society in which everyone lies and cheats can hardly be stable. The workable compromise is a society in which lying and cheating are common enough that dissimulators can be recognized, but not so common that society falls apart.

The moral sense is an internalized guide to the expectations of the group. It concerns the compatibility of behavior with intuited, self-evident, and supposedly absolute truth. Ethics, in contrast, I would define as having to do with self-consistency, based upon consciously accepted precepts. In that, it resembles law and the notion of formal proof in mathematics. Ethical principles, like democratically legislated laws, are norms or conventions of behavior to which people have *agreed*, for whatever reasons; whereas moral notions involve belief in the intrinsic validity of such principles. Good and evil, divine decree, or other moral sanctions are often called upon to justify ethical principles.

In the social games of life, with their cooperative and competitive aspects, the basic dualism is between self and other. The "other" may be food, tool, raw material, competitor, predator, enemy. But the other may also be ally, kinsman, totem—in fact, self. Ethical concern is extended by considering the object of attention to be *subject*—to be equivalent to 'I.' This is the basis of the 'I/thou' relationship and the inclusiveness of 'we.' The ethical teachings of religions have served to abstract, metaphorize, and extend kinship relations and genetically motivated altruisms based upon them. If we are "all God's children," then we have, so to speak, a 50% kinship as spiritual siblings. And if we are "all one," then we are 100% related as examples of the human type. Ultimately, "all my relations" includes all that exists.

Unfortunately, ethical and moral principles usually require a convincing metaphysic to underwrite them—the threat of hell or karma, for instance. We prefer that our relationships to one another be regulated by an assumed order of things above us, and independent of individual will or whim. But a conscious ethic must reverse this chain of command, so that collectively we agree to principles that serve the universal good.

It is the absolutism of metaphysical beliefs which renders them suitable as expressions of intuitive moral values. They command an authority parallel to the compulsion of instinct; the force of memes can match the force of genes if it has transcendent reality on its side. The survival instinct is sublimated, generalized, and transferred from the life

of the body to that of the soul. Identity is extended from the body and the social persona to a spiritual self. Salvation *is* survival—but of the spiritualized self.

Morality is sometimes little more than an illusion instigated by genes, ratified by religion, and used by political interests; but ethics must be based upon conscious consent. A moral absolute (like any thought, feeling, or experience) can be bracketed as culturally relative or deriving from instinct. On the other hand, we might consciously agree with it and voluntarily embrace it, in which case it becomes an ethical precept. To recognize that a belief has origins in genetic, cultural, or personal history does not invalidate it. Its validity is a separate issue, in the independent domain in which it is consciously asserted, and must be considered on its merit as such. In other words, whatever else it is, a moral belief may also be an ethical precept.

3.3 A Home Away from Home

Humanity has become its own environment. The conquest of the planet has been an effect of sheer numbers. Now we respond not only to the vicissitudes of nature but also to the increasing intricacies of the human landscape. Natural selection takes place in a milieu that is no longer natural, so that it blends with sexual selection and cultural selection, as well as with conscious political choice.

The fundamental need of mind, like that of the organism it represents, is for a consistent livable environment to engage. Just as the body requires an objective niche in the physical world, so the mind requires a domain that is proper to it, a field of action corresponding to the objective world, but defined in its own terms. A *world*, in this sense, is an environment defined by the mind. In effect, it is a game with identifiable elements, actions, structures and rules. The world of Monopoly is a paradigm example.

While the organism lives in nature, the human subject lives primarily in the human world. This means first of all in the subjective domain; secondly, in the social environment of others facilitated by language; and finally, in the constructed environment of artifacts. All of these constitute the human world, as opposed to nature; mind, as opposed to body; city and mechanism, as opposed to wilderness. While Man's first home away from the home of nature is the inner subjective space, this would never have developed had he not been a highly social, language-using creature. Right from the start, mankind's primary environment was composed of other people and their communications,

and it is probable that subjectivity was highly favored by the need to simulate, second-guess, or otherwise "psyche-out" the motivations of others and manage their responses.[85]

More than any other factor, language has made the human species and the human world.[86] Ideas and ideals found their first and immediate expression in language. The process of abstraction involved in idealizing is essentially linguistic; symbol formation is essentially a process of idealization. Words acquire a flexible autonomy independent of concrete referents or contexts. The grammatical "space" of a language parallels the interior mental space. Language is both instrument and model for the creation of an inner world of possibilities, freedoms, and ideal entities unfettered by the constraints and complexities of the outer world. It creates the possibility, and the precedent, for unlimited arbitrary combination of elements, which is the key to the creation of culture and technics.

While the subject-predicate distinction is fundamental in most languages, it corresponds to nothing in nature. We never see an action without inferring an agent and most often we perceive creatures doing something. But in language actions and things are detachable from each other. While it may violate common sense, any action may be ascribed to any agent without violating grammatical sense.[87] Grammar reflects the universal ability to combine abstracted elements in arbitrary ways. This is also a basic feature of the inner world, and a prerequisite of the technological world, which rearranges matter in ways that are arbitrary as far as the plan of nature is concerned.

It is probably useless to ask which came first, thought or language, for they are mutually stimulating and practically inseparable. The *formalization* of thought, however, follows language, both logically and historically. Language is the prototype of formalization and of formalizable systems such as mathematics, which Galileo nicknamed the language of nature, though it is more accurately the language of science. The ability to manipulate objects of thought in formalizable systems such as geometry, and in quasi-formalizable systems like music and scientific theory, mimics the manipulation of words in language more than it does the manipulation of physical objects in space. A word is both an object in its own right, to manipulate according to grammatical rules, and also a symbol of something else. A word can be connected to other verbal objects in ways that natural things may not be connected to other natural things, while suggesting how parts of artificial things may be intentionally connected or rearranged. As idea, the word belongs to the extended cognitive domain that constitutes

subjectivity. As sound, it is part of the physical world. And as symbol, it is part of the intersubjective cultural world. Language is the prototype for all forms of creative expression, including production of material artifacts, because such expression is intersubjective in the way that language is, translating inner image into a publicly accessible carrier of meaning.

Though we may think of civilization in terms of artifacts, it is first the minds, bodies, and wills of people that largely constitute the forces of the human environment. And being composed of people, the human world's obvious first principle is *personhood*. The concept of person-hood, or humanity, is a category that idealizes animate objects by imputing to them the interior life that is so utterly different from the objectness of inert things. Human relations understandably manifest the ambivalence and confusion troubling subjective consciousness around the dualism of subject and object. The fact that people are both subject and object is the bane of history as well as of philosophy. The Mind-Body Problem is an ongoing political catastrophe as well as a mental recreation for mild-mannered scholars.

Probably the foundational human institution is *the concept of humanity itself*, and the single greatest advance of civilization may be the (still tentative) expansion of the kin group to include genetically unrelated "others" as "us." Tragically, this seems always opposed by the innate tendency to in-grouping, whereby human identity must always be contrasted with some group held to be subhuman. Hence, the ambiguity of the concept of *animal* as a non-human life form. Animals are significant not only as features of the natural landscape and for their usefulness to people, but also as an intermediate category between person and thing. A strategy of ethnic and political groups even today is to refuse to consider outsiders as human. In past times in some places, we should remember, outsiders were hunted as prey for food!

The ideal of personhood enshrines our concept of the consciousness of others. *Thou* expresses a fundamental category of being, as do *I* and *it*. Because of the danger of mistaking a person for an object (even for food), the category itself has been invested with a numinous aura corresponding to that of one's own precious being. If 'I' am sacrosanct, then so must be 'you', since we are both subjects, persons. It is not because of genetic relatedness that people go to heroic lengths, at great personal risk, to save the lives of total strangers, but because they put themselves empathetically in the stranger's place. The ability to do this is supported by the sacralization of personhood or humanity.

The sacral Other indicates a respect for consciousness, sentience, life, being as its own end, subject as opposed to object, the transcendent or unknown as opposed to the fixed, delimited, controllable, and known. It addresses a relationship of I to Thou, whether to another person or to the mystery of the Unknown. For, to know is to circumscribe and delimit something as an object, an *it*, if only the object of knowing. And to refrain from this is to be suspended in an attitude of unknowing.

I say *unknowing* as distinguished from ignorance, because there is, significantly, no proper English word for the state of receptivity and surrender that is the complement—and no enemy—of positive knowledge. Unknowing opens one to transformation of one's own being. That is what *surrender* means, though the term has a surfeit of connotations. But the attitude of external focus and manipulation of the Other stems, at least in part, from fear of transformation; it is ego seeking to remain as it knows itself to be, in control, undefeated. And ego, by and large, has the upper hand in this world, so that idealistic impulses in every age are corrupted and co-opted by such homeostatic tendencies. The nature of power—including power over nature—is to command the Other, and thereby remain one's familiar self.

If reality is open-ended, however, there can be no last word, no final vision, no fixed or permanent object or knowledge, no ultimate control, no absolute truth, no final understanding of nature, and no certain identity of self. Objects are intentional constructs, fictions, finite and knowable by definition. If the physical universe proves to be infinite in dimension, complexity, or in its refusal to be finally ordered, then it is ultimately no object. Should it then be called subject? While the cosmos is not literally a person, it may nonetheless be every bit as inscrutable. The hubris of mind in its third-person stance is that it strives to contain the world as an object. It can scarcely do otherwise, for we are here only by virtue of the proven utility of this stance. But the survival value of this stance *in the future* is the very question at hand. If we cannot be rid of it, then perhaps at least it can be balanced by an attitude that acknowledges the world to be vaster than what is dreamed of in any philosophy.

The sacred is whatever harbors that sense of openness to the numinous—the immensity, mystery, and open-endedness of life. Persons are sacred because their complexity enables them, in principle, to outgrow any box we put them into. Physical reality may share this complexity and have this same quality of eluding containment. To say that personhood is sacred is to reiterate our conviction that persons are potentially

infinite, and therefore mysterious beyond bounds. What this tangibly means is that our stories about persons, and our play with them, are potentially inexhaustible. Unlike the object fixed in knowledge, the subject *can* unfold onto ever grander horizons, through the endless ability of consciousness to transcend itself. And the cosmos itself may prove to be of a similar nature. It is far easier, however, to deal with closed systems, static and delimited objects—and, of course, to be an object oneself.

While the isolated object and the closed system are useful idealizations, we do not know yet whether or not the cosmos itself is infinite in spatial extent or infinitely complex. What is clear is that the object, as intentional construct, is exactly and only what we determine it to be at a given moment in the unfolding of our knowledge of it. In this sense, all objects are conventions, fictions, inventions, artifacts. There *are* no natural objects, and no truly closed systems, only artificially isolated products of definition and theory that can be mistaken for the thing as found. Objectness is the result of a mental imposition that seeks to predict and control outcomes—a largely masculine project. But science only succeeds by *also* maintaining an essentially feminine receptivity toward the unknown, toward the feedback that the intrinsic reality of the object provides in answer to the questions posed or models proposed. It is a dialogue. If we were content to enjoy self-contained systems of speculation, Aristotle or the Bible would do nicely. It is the openness of science to the open-endedness of reality that allows it to refine its models and thereby increase its predictive power. There is respect for the mystery hidden in the world, its as yet unknown and untamed nature. What characterizes reality is precisely that it is full of surprises—just what we anticipate of persons as well.

While science is ideally a dialogue with nature, technology is far more a monologue. If technology inquires of nature, it is to better control it. The attitude of inquiry is kept subordinate to the intention to harness physical reality toward fixed goals. The feedback of nature in response does not penetrate to the core of the inquirer, but is deflected and redirected to further advance purposes that remain unquestioned. Communication is one-way, homeostatic.

Where the animal has drives, the human has ideals as well, competing for our attention and loyalty. The transformation of instinct to ideal is often so extreme a shift as to become a reversal and a denial of the biological root. A good example—because it is the original inspiration of sociobiology—is the notion of altruism.

Altruism as a biological phenomenon seems to contradict a basic tenet of Darwinism: self-interest. The suspicion among scientists was that there was an underlying self interest behind apparently altruistic acts among certain species. This was clarified when it was understood that it is the interest of the *gene*, not necessarily of the individual organism bearing it, that is furthered by these acts. Any creature is more disposed to compromise its own interests for those of its genetically close relatives than for those of strangers; the closer the relative, the greater the probability of altruism. There is no need to imagine conscious thought about any of this on the part of the creature. The fact that its genetic interests are served by the altruistic deed guarantees a higher reproductive rate among carriers of those genes, and therefore a selective advantage for organisms bearing kin altruism as a trait, which would naturally tend to predominate. While humans are hardly exempt from genetic laws of behavior, they have conceived ideals of altruism that do not necessarily conform to the genetic calculus. These supersede genetic traits as conscious counterparts that generalize and extend kinship altruism to a larger circle of "relations" under a wider set of circumstances.

What is most significant and modern about Jesus' ethical teaching, from a sociological point of view, is that it widens the circle of those deserving our love, respect, and concern to include all members of what we now recognize as Homo sapiens. That is, Jesus taught that the family of Man includes all people, not just our biological relatives, nor our group or tribe or race or nation or gender. The Good Samaritan was good because he helped a stranger who belonged to another group; Jesus chose him as example because he was not of the Hebrew tribe, yet acknowledged the humanity of another in need. His teaching was to love your neighbor as yourself—and that the neighborhood has no bounds. In particular he admonished us to love our enemies. Here two issues are addressed at once: to overcome the individual bias of self-interest, and to overcome the social phobia against otherness. Your enemy is your competitor, and often a member of another tribe as well.

Today we take for granted that all people, being members of the same biological species, are human. However, one reason why we continue nevertheless to witness "man's inhumanity to man" is probably because the modern category of 'human,' grounded in genetic or zoological classification, is such a recent achievement that it is not yet secure within our collective being, has not had time to sink into our genes. Indeed, there may be no genetic reason why it ever would. One reason, in other words, why we cannot consistently embrace the ideal

of brotherly love is because this ideal far exceeds the scope of its genetic counterpart: the "brother" we are called upon to love is no blood relative. This does not prevent the ideal from being functional. While one may have personal enemies in a tribal situation (with its close genetic ties), there would be a strong group pressure for enmity to be contained and damped. Impersonal enemies are far more likely in civilization. To love one's enemy as oneself is to overcome self-centeredness, and also alienation from the other as stranger. This has a very functional value in a densifying, shrinking world.

3.4 Idealism in Science and Religion

Science and religion share common motivations: the desire to assimilate the diversity of appearances to an essential unified reality; to organize experience into a meaningful whole; to establish a map of the world from which to orient and read an appropriate course of action; to find salvation from suffering; to achieve a godlike free will, omniscient understanding, detachment, objective truth; to discover the Absolute; to be free from the experiential, cognitive and physical limits of the flesh; to achieve immortality and freedom from disease, war, pestilence, hunger—in short, all the vulnerabilities of the body in nature and society. Science and religion share the motivation to transcend relative experience and create an ideal world.

The major religions and philosophical traditions universally search for the essential unity, simplicity and constancy behind the complex flux of appearances. Thus they are products of the mentality associated with the Indo-European languages, in contradistinction to minor religions belonging to other linguistic groups, which are less reductive.[88] The heir of this search in the West is science, which reduces all phenomena ultimately to configurations of basic units of matter and energy, time and space. But Eastern thought is equally reductive, seeking the underlying universal Self or Consciousness. One dwells on the idealized essence of the object, the other on the idealized essence of the subject.

The outer and the inner are thus two domains in which to try to realize the Ideal: through changing the environment or changing the self, the basic options available to an organism in regard to its environment. Science seeks to understand and transform the object, religion to understand and transform the subject. Just as religion may advocate transcending personal interest or advantage, and generally freeing oneself from egocentricity, so science advocates disinterested observa-

tion of the world through eliminating perceptual idiosyncrasies. Both pursue ideals of truth and objectivity, one ethical and existential, the other epistemic. Both seek an improvement of the human condition, one through reforming humanity, the other through reforming nature.

While there is scarcely a distinction between religion and natural philosophy in the East, it has been far from clear in the West either. The Greeks developed a diversity of philosophies instead of a unified monotheistic theology. But science grew immediately out of the environment of monastic Christianity, and only indirectly through the rediscovery of antique philosophy. On the other hand, while the Church itself was the immediate offspring of Judaism, it had taken hold mainly in the Hellenistic world. The metaphysics, dogma, and scholasticism of medieval Christianity were founded as much on Aristotle as on Hebrew scripture. The Christian notion of the immortal and resurrectable soul, for instance, likely rests more on a misinterpretation of Aristotle's concept of essence than on Judaic theology.

Renaissance humanism was partly inspired by a return to classical texts and direct experience, just as the Reformation insisted upon a return to Biblical texts and revelation, unmediated by Church authorities. All in all, however, modern science is a development of Christian culture and attitudes toward nature, and has in some ways succeeded Christianity as the religion of the West. On the other hand, religion has always served some of the functions now fulfilled by science. They may be competitors in the modern world, but hardly opposites. Each attempts to explain existence and Man's place in nature, to posit both an ontology and an epistemology, to uphold an ideal of truth, and to show a way toward betterment and salvation. Religion and science have common roots in animism and magic; both attempt to manipulate reality through formula. Their adherents still overlap, especially in the United States, where many technologists are religious males.[89]

Like humanity itself, the Christian God is separate from nature in the way that subject is from object. He stands outside nature much as the masculine identity has disengaged from the feminine. He precedes nature and creates it, just as Adam is supposed to have preceded and given rise to Eve in the patriarchal religion, reversing and denying the obvious order of things. Rather than being born of woman, he is born of spirit. A "rib" is taken from his side, reversing the theme of parthenogenesis, whereby Buddha was born from his mother's side and Mary conceived simply by hearing the words of the Logos. The separation of God from nature echoes Man's and harks back to the

separation of the child from the maternal matrix. The patriarchal God stands for the ideal of autonomy that the human father represents, the child's ally outside the maternal bond. The desire to control and transcend nature mirrors the male child's desire to gain the upper hand over the maternal force that controls him, to find ways to be above nature in the way that God is—and above woman in the way that his father is in patriarchy. Rather than be a mere product of nature (and of females), the masculine consciousness projects itself *as* the male God, creating the world from his own (seminal) thought and word, demonstrating the primacy of intentionality over causality, head over body or heart, and of male over female.

It is not so evident why men would have switched to a male god when they seemed to revere goddesses for a much longer period than recorded history. A masculine deity, however, personifies those male aspects central to the projects of ascensionism and dominion that are the foundation of patriarchal civilization. The goddesses were rather representatives *of* nature, while male gods represent Man *against* nature, or above it. In the natural order, the male is peripheral, derivative, a biological afterthought, while the female is primary. The patriarchal family is significant not only because civilization is patterned on it, but because, like male-dominated civilization, it is an institution giving expression to the deep-seated need of the male psyche to be central, essential, primary, in command.

The very fact that the Christian view of nature gave way to the secular scientific view intimates a continuity of intent and ethos between the two. There is but a fine line between the Biblical dominion appointed to Man over Creation and the domination of nature through technology; between the quest for godliness and for godlike powers. Thus Man is depicted in the Sistine Chapel as nearly the equal of God, and it is unclear whether it is God or Adam who has reached out to infuse life into the other.[90] (In his youth, Michelangelo had lived as a guest in the house of Lorenzo de Medici, where he was privy to the discussions of prominent humanists.) God is the projection and symbol of the innermost longing for perfection, transcendence, freedom, immortality, omniscience and omnipotence. The divine is the ideal we can conceive ourselves becoming, the human potential, as yet unmanifest in time though already full blown in eternity. Humanism and science were able to steal fire from religion as technology began to realize some of the powers represented in the image of God. There was less motivation to project them outside the human sphere.

Despite commonalities between religion and science, the restless character of scientific inquiry contrasts with the static, self-contained religious system of belief whose axioms are decreed into finality, just as the world is decreed into being by God. The one opens to a larger world (of nature and also of its own expanding complexity) and is driven forward into unknown and possibly infinite territory. The other closes upon itself, so that thought can ruminate securely over the certainties it has. The natural world can be probed ever more deeply, so that any given reading of it is provisional. An intentional creation, in contrast, may be full-blown and delineated at the moment of inception, because it contains only definitions and their logical consequences. The human longing for final truth reaches in both directions—in the unfolding of intentional constructs and in the progressive discovery of natural systems. Like religion, science seeks the end of the endless chain of being, the definitive elephant or tortoise upon whose back the cosmos rests. At the core of both lies an idealist expectation of finality. Science seeks the bottom line through ever refined observation and analysis, religion through fiat. Physics seeks to discover reality in a found world; metaphysics, to declare into being a humanly specified world. These threads are interwoven in technology, which fathoms nature in order to create artifice.

A feminist historian of science asks why it is taboo to suggest that science is simply another culturally relative social activity.[91] One answer is surely that what is threatened by this idea is not merely the methodology of science or its social relations but the very ideal of objective reality. To reveal the subjective roots of science may be to open the door to a relativism that regresses to mysticism. Another, and perhaps franker reason, however, may be the implied threat to technocratic empowerment. If we ceased to hide behind objectivism as an excuse to disown the intentions behind technology, we might be forced to rethink our uses of it.

The first scientists were devoutly religious men. Few in the age of the Inquisition could afford not to at least appear to be. While Descartes' sincerity as a Catholic might be questioned, no one could doubt the earnestness of Newton, who had less to fear from the Inquisition. Far more of his writings and scholarly efforts were concerned with religious studies than with natural philosophy, which itself was originally rationalized as a means to worship God and serve religious ideals. Natural law was first understood as divine law and decree, and the study of nature was considered an access to the mind of God. Men like Bacon

were genuine utopians who saw in technology an avenue to the kingdom of heaven on earth. Furthermore, at the outset little distinction was made, in the Puritan cauldron, between scientific, religious, or sociopolitical ideals and reforms. Science began to be institutionalized, differentiated from politics and social philosophy, only with the Restoration in 1660, in a conservative closing of ranks against radical demands for social reform. The British Royal Society was chartered in 1662, and the French Académie des Sciences in 1666, establishing the standards of an exclusive membership, and also creating a new division of labor between those who deal with values and those who deal with facts. Scientists and politicians were henceforth not to meddle in each other's affairs.[92]

The institutionalization of science did not purge it of religion or idealism, of course. Following Bacon's vision, science was supposed to transform the world for human benefit, to create a new Eden through technology. But if science has always had religious pretensions, it can also be said that religion has always claimed the idealist authority that science appropriated from it. For both, nature was considered a book to be read like scripture, a manifestation of God's mind. Apart from nature and scripture stood the human world, which was also intentional. In other words, to the early Renaissance mind, reality was *wholly* intentional, deriving either from the thoughts of God or from the thoughts of Man.

Scientific investigation was threatening to the Church less because its findings contradicted Aristotle than because observation of nature offered a standard of reference outside the closed system of scripture, dogma, and revelation. The profound implication of science was that the natural world *does* have its own substance, which is ultimately causal and accidental, not invented. It consists of matter, not of the thoughts of God. Through the reality of nature, science gained authority at religion's expense; materialism gained over idealism; and nature became an object for exploitation as well as study. As nature gained reality for Renaissance thinkers, it also loomed larger as a focus of human appetites.

Science can be viewed as the offspring of the masculine idealism of patriarchal religion and a materialism handed down from the earth-centered goddess religions. The triumph of science over medieval religious scholasticism therefore represents a limited regaining of some ground by the feminine principle. It is *nature*, after all—the independent existence of the physical world—which parts science from religion or metaphysics. The simple need for explanation can be satisfied by

mythology, metaphysics, or mysticism without recourse to natural facts. This is the great appeal of closed systems of thought, and why Aristotle, like the Bible, was embraced as final authority for so many centuries. But when nature is approached as an unknown and independent force outside the system of thought, that system is no longer closed. Nature is studied from a third-person perspective in order to see what it is in its own right. Science empowers Man externally because it engages what actually exists rather than story, speculation, or wishful thinking alone.

Each with its idealism, the reductionism of religion and that of science may both reflect symptoms of a deeper epistemic immaturity, the very malaise at the heart of the Mind-Body Problem. Both reify abstract ideas in order to confront the tangible suchness of the world. Both lead to paradox or reversals of common sense: the ultimate being of the self may appear to be a kind of substance, however subtle, while the ultimate being of matter may appear to be virtually empty. Hence, the notion in Hindu metaphysics, which Dewart finds preposterous, that what one truly is, in essence, is the indestructible Absolute; or the Buddhist ideal of *extinction*, which implies that the highest good in life is to escape from existence completely, to become not only dead but utterly nothing.[93] Hence also the quantum dilemmas in which causality and reality appear violated.

The religious mind may be uncomfortable with the existential freedom and responsibility involved in the search for meaning. Yet something parallel can be said of the scientific mind, which shuns responsibility for its own intentionality, for the economic context of research, for the social implications of knowledge and technology. Religion is a framework for orientation in life, as science is a framework for orientation to nature. In either domain, the reliance on alleged objective truth in place of acknowledged human intention reflects the mind's fundamental addiction to certainty and externality, the compulsion to reify, and a flight from accountability for mental acts.

The ethical dimension of religion, as opposed to the theological, is pertinent to the current ecological and social crises and should join forces with ethical thought in science, politics, industry, economics, etc. In place of vain attempts to reconcile or repudiate the metaphysics of science or religion, we ought to ponder the meaning of sacredness as an appropriate general attitude toward experience. Instead of battling over the minds of school children, science and religion could join forces to reclaim ethics, which both have tended to ignore. The problem is that, for the religious mind, ethics makes sense only by appeal to theology;

and for the scientific mind, it makes sense only by appeal to fact rather than value. It is the authority of God that traditionally gives force to moral law, just as it is the authority of nature that gives force to scientific theories; in neither case is it mere human intention. It is as though we are only willing to listen to our innermost longings and common sense when these are projected outside as bigger than us and compellingly authoritative. The same mentality underwrites God as all-powerful and nature as ineffably real, justifying science to discount subjectivity and religion to discount the primacy of human will. This is how science and religion collude on a deep level, while seemingly at odds as competing metaphysical systems.

On the one hand, God is above and separate from the world; on the other, God *is* the world. Such competing doctrines curiously resemble the Mind-Body Problem: we are our bodies, yet we also perceive ourselves to be distinct from the body and world which host us, and somehow above them. As idealists, we may even imagine that the world and the body cannot exist without our consciousness, rather than the other way around. And so we may conclude, as Berkeley did, that there must exist a God to be conscious of things when no one else is looking. Even supposing that nature is in some sense God's body, have we not then imputed to God the same problematic relationship to embodiment that we ourselves experience, and which even the Almighty cannot solve?

Modern concepts of ecological balance had precedent in religious arguments from design. If the world is God's meticulously planned creation, it would be blasphemy to tamper with any link in the chain of being. This implied that even noxious and apparently worthless species should be respected as serving a purpose in the larger picture.[94] In Christian mythology, Man envisioned himself in a custodial role, as though the Lord created for mankind a special place in the order of things as his viceroy or governor on Earth. The relationship between Man and nature was imagined through a political metaphor, and as long as Christianity remained a major social force this meant that people were restrained in their dealings with nature by their position and obligations within the hierarchical kingdom of God.[95] The general picture, of course, remained anthropocentric and male-centered; what is novel about ecological movements is the recognition of the intrinsic rights of other creatures and the value of nature in its own right, apart from human purposes and conceptions, including those projected onto the divine.

According to Bacon, though Man fell from a state of innocence and dominion over creation, both these losses can be recovered even in this life—the former through religious faith, the latter through science and technology.[96] As the means to this recovery, technology is so identified with science that an important distinction between them is sometimes blurred. One may argue that science is the cognitive or theoretical arm of technology; but science *can* be differentiated from both technology and metaphysics as assertive, masculine, idealist pursuits. Deferring to the ultimate authority of nature to answer its questions involves a kind of receptivity that distinguishes the intent of pure science from that of either metaphysics or applied science. The classical goal of science, which used to be called natural philosophy, is the truth of nature—independent of human (one should begin to read: masculine) purposes.

We may yet come to believe that the ultimate value of the study of nature is to enable us to understand, and so to better appreciate, the marvel and depth of existence. The ultimate significance of science may lie more in its mythical than its commercial potential, more in perception and vision than in technological empowerment. The ideology of progress through technology has served power and profit first, and only incidentally truth and unevenly the betterment of humanity. Truth is not mere fact and means to mastery; it is also the heart of vision needed to give meaning to life. The need for that vision is what moves people to religion and political ideology. The hope which the scientific ideal offers may be less material and preemptive than spiritual and redemptive. Its advantage over other visions is its detached universality, its transpersonal and trans-cultural language and focus, and the unperjured ideal of objective truth. Science may be the only ideology capable of uniting us. This may be the real tragedy of the corporate takeover of research and the conscription of science, like all else in our culture, to the service of commerce and consumerism.

3.5 The Concept of Nature

Nature has always been regarded in anthropocentric terms. In animistic belief, nature was haunted with projections of the human psyche. In Christian belief, it was God's gift to Man. Copernican astronomy and the voyages of the explorers forced the realization that Man was neither geographically nor metaphysically the center of the universe, and that great expanses of the world served no human pur-

pose whatever. (Ironically, the seeming emptiness of the New World posed an irresistible lure to industrious and appetitive Europeans.) The stars and planets had their own story, to which human life was but a footnote. It was not until the late 17th century, however, that plants and animals were studied for their intrinsic interest rather than for the uses to which they might be put. Some of the Greeks, it is true, had emphasized that nature should be valued in its own right; but their teachings had been overlaid by centuries of Christian dogma.[97] In the Aristotelian natural philosophy adopted by the Church, plants existed in order to feed animals, and animals to feed people.[98] In the doctrine of essences, the fact that nature is useful to people became codified as the principle that every natural thing has a specific purpose, which is an intrinsic property of its being. To the Church, intrinsic meant God-given, and the purpose involved was the divine plan. The ontology of nature shifted in the Renaissance, but hardly the anthropocentric view of its uses. Today, 'environment' still often means a reserve of resources for human use and a sinkhole for human pollution.[99]

The perception of nature, like all else, reflects cultural ideas. Nature is re-created first in concept, later with bulldozers. Concepts of nature are more than disinterested explanations; they are social schemata for understanding and justifying a given relationship to the environment.[100] These can be deconstructed by examining their conceptual and historical layers. (The domination of nature can largely be characterized, first of all, as masculine, then Indo-European, then Christian, and finally industrial.) How nature is viewed is also relative to the extent and contrast of the human world, the size and significance of civilization in proportion to wilderness. Towns and cultivated lands embody the civilized, spiritual essence of Man as opposed to the wild essence of the animal. The very word 'civilized' refers to city life (*civitas*), as opposed to the unrefined ways of the countryside; the Renaissance town was admired as the seat of civility, learning and sophistication.[101]

Response to wild nature follows evolving context. In the presence of too much wilderness, taste runs to geometric order and formality; in an atmosphere of too little, there is a preference for informality, irregularity, naturalness. Like all esthetic tastes, the image of nature is relative to class. On the frontier, a formal garden would stand as the emblem of wealth and culture, since only the rich would have the means to create and maintain such lavish order. On the other hand, in a dense urban context, or where the premium is on cultivation, the status symbol might be a wantonly unused parcel of land that only the rich could afford to squander. By the close of the 18th century, most of England

had come to resemble either a formal garden or an industrial wasteland and tastes began to shift toward a nostalgia for the wild. The domination of nature was for the first time perceived as a double-edged sword. 102

The new scientific worldview reflected a shift in attitude toward nature and society alike, presenting itself as a perception of the world as it "naturally" is: consisting of isolated things and systems from which the mind stood apart. This both served and was stimulated by the ethos of economic and military conquest.

Scientific description favors the visual sense. The so-called secondary qualities of the more subjective senses were displaced by the quantifiable variables of position in space and its time derivatives. The theoretical concept of matter as an abstract, inert, modular, and standardized substance endorsed the use of nature as "raw material" for human industry, there for the taking. Hence, the rise of modern science coincided with the beginning of the industrial age. Prior to that, in the patriarchal Christian world, nature had been considered the property of the Almighty; and in the pagan world nature had been the very body of the divine feminine. By the time of the Renaissance, the Christian world had convinced itself that Man had inherited nature through patrilineal descent. Man was not only entitled, but morally obligated, to make the most of this inheritance.

The question of to whom nature belongs evolved along with human numbers and social organization. In the ancestral environment, when people were few, personal property and real estate in the modern sense would have been unthinkable. Equality, cooperation, and sharing would have been the only way to survive in a hand-to-mouth situation. The world *was* nature, the context and theater of life. If it was hostile, one had to pull together against it. With the advent of agriculture and settlement, a distinctly man-made environment emerged as a bulwark against the natural one. While the roving band might have held a territory respected by other groups, the agricultural village or town was the fixed center of a definite claim that could be developed and had to be protected. Personal ownership could be meaningfully distinguished from a commons, and territorial claims would be clearly distinguished both from those of other settlements and from the wild.

Definition and ownership of the commons has always been central to the struggle over the ownership or control of resources—and hence to the concept of nature. Notwithstanding roots as far back as the 13th century, the infamous Enclosure Acts in Britain are essentially an adjunct of the Industrial Revolution. As part of the agricultural reforms

sought to feed urban populations, common lands were effectively privatized, fenced, reorganized for industrial farming over the course of the 18th century, displacing smaller or subsistence farmers off the land and into the urban work force. At roughly the same time, communication and thought itself were commodified through the notion of copyright.[103] Patent laws began to enable privatization of culture along with environment.

Also from that time, parks and natural preserves emerged as a museum for earlier relationships to nature, which overpopulated urban society could no longer afford.[104] They allow the nostalgic fantasy of wilderness and naturalness in the context of artifice and civilization. Nature became another consumer experience, another tourist attraction, tamed, emasculated, popularly viewed with a mixture of pride and suspicion as something quaint. At the impressive modern National Museum in Wellington, New Zealand, one of the displays is a carefully groomed walled garden of "native bush," the ironic legacy of two centuries of European conquest which nearly denuded the North Island of its native forests, turning subtropical wild into English countryside and corporate tree farms. As in city zoos, here nature has literally become a natural history exhibit. Because the wild is rapidly disappearing from the earth, we in the 21st century have inherited a romantic view of it very recent in human experience, and which does not correspond to the harsh realities that inspired the ancestral drive to tame the wild. Only with 18th-century Romanticism, followed by the Arts and Crafts Movement, was nature viewed as a welcome relief from the crassness of the human world. These movements were not nostalgic emotional indulgences but well thought-out responses to the horrifying conditions of urban life imposed by industrialization, the spreading ugliness and pollution of cities, the impoverishment of the working class, and the artless bric-a-brac of mass production.[105]

While the image of nature in art, as in science, has varied through time, the depictions of animals and people in paleolithic cave paintings, in pre-Columbian sculptures, or in Northwest Coast native art, for instance, are stylized because art has always been, like science, a means to express the Ideal. If they are not "realistic," it is not for lack of attention or skill, since relatively realistic depictions are sometimes also found alongside the more stylized ones.

Painting and sculpture, after all, were ways of remaking reality long before computer-enhanced cinematography. Perspective developed in Western art along with the study of optics because Renaissance science

and art were parallel investigations of the object disengaged from the subject. Realism in painting became a means to explore the principles of optics, light, and color mediating the visual relation of subject and object. Impressionism and Surrealism explored the subject's mediating role via sensation, imagination and feeling. Both realism and departures from realism in European art indicated mastery of objective principles, just as ever refined technology and increasingly abstruse physical theory demonstrate grasp of natural law. The power to accurately *represent* was both sign and aspect of the conquest of nature and the mastery of reality—whether it was the external world or the internal world represented, and whether the representation was literal or abstract, graphic or scientific. Even realism, taken to hyper-realist extreme, expresses an idealized vision through its very austerity.

If the goal of art has often been to imitate life, it has always also proposed an ideal for life to imitate. This was apparent in English landscape painting of the 18th century, when the ideal of nature expressed in art was a standard against which nature itself was judged inadequate. In this way too, nature was assimilated to the human world, the real to the ideal. Real scenery was considered "picturesque" in the measure it resembled the idealized version in pictures.[106] Painters like Gainsborough likely believed the painted waterfall was in some sense superior to the natural one. Such Platonic inversions present glimpses of alternative worlds. While modern art tends no longer to concern itself with grand ideals of beauty, it is very much preoccupied with alternative perceptions, novel realizations of image and materials, and technical mastery. If in our day art is less sweeping in its goals, and more individualist in its visions—less normative and more descriptive, perhaps—what it describes is nonetheless ideal.

Even scientific representations of nature have never been truly realistic, fully cognizant of nature's complexity or independent existence. Science, like art, is a business of idealizing. Nor has nature stood, at least in the modern West, as a positive symbol of the Unknown. We pay a price for this slight; for without nature's independent being, however inscrutable or unsavory, we are alone with our own creations. There is in us a deep need to empower our own subjective being, to appropriate everything to human design. But there is also the equal need to be part of something larger than us—the need for reality itself.[107] The attraction of nature is its wildness, the very fact that it is not man-made.[108]

Chapter 4: THE MYSTIQUE OF MECHANISM

I want to make a machine that will be proud of me —Danny Hillis 109

4.1 What Is a Machine?

Mechanism as concept and as credo is the empowering metaphor behind science and technology and every aspect of modernity. It is the archetype of the age, thought translated into form, if not yet the word become flesh. The machine is the paradigm of system, method, formalization, and control. As artifact, it embodies these and also serves as the modern slave or beast of burden.

While the machine is a system in its own right, it has served primarily as tool, not only of production but also of understanding; it enshrines the manipulative stance toward the world. Man has power over the machine, first as a product of definition and then as an object created for use. Mechanism is the model through which our civilization understands natural and human systems and grasps reality both literally and figuratively. It is the objectifying lens through which even life is viewed, the foundation of genetic science.

To hold that nature is a machine at human service, however, fails to fully acknowledge the reality of nature. This is because a machine is an artifact, while nature is not. Certainly, mechanism does facilitate negotiating and manipulating the world; a thing can be mentally handled by assuming it to be a system of which one is not a part and which is the object of a unilateral relationship. This greatly simplifies the complex interaction of subject and object and constitutes the meaning and source of power. But control is a double-edged sword and mechanism is an ambivalent image, according to whether we find ourselves outside the machine, controlling it as a tool, or inside a machine that controls us.

From the mechanist perspective, the causal system of nature appears as a World Machine we inhabit, of which our bodies are mere parts, subject to its mechanics. Nature controls us even internally through the body's genetic conditioning. Though we attempt to get outside nature and re-create it literally as machines *we* can control, the more this project succeeds, ironically, the more the human world as a whole actually becomes an engulfing machine. While mechanism is the instrument and symbol of human empowerment, it is also the greatest threat to democratic distribution of power—and ultimately, perhaps, to human hegemony on the planet. In one sense, mechanism is the means to become as the gods, even to create artificial persons; in another

sense, it is the nemesis of the ideals of freedom, personhood, and transcendence the gods personify. The reason behind the separation from nature may be to create heaven on earth, but life in an environment that has become a literal machine promises to be a new kind of hell.

The machine embodies the ideal of a well-defined, reversible closed system, specifying a future state predictable from an initial state—an output for every input. Actual machines, such as engines, are not closed to the environment, of course, which is the source of their inputs and the sink for their outputs. But they are closed in the sense that these may be regarded merely as the initial and final states of an isolated system. More generally, the machine is the ideal of the controllable, well-defined, repeatable procedure: the *algorithm*. Mechanism refers not just to hardware but to all rule-bound methods for rationally promoting efficiency and control. The ultimate fulfillment of the machine ideal would involve the mechanization of all matter and the regulation of all interactions and relationships by rule and protocol. Ever since the eighteenth century, the essence of the World Machine has been order in the service of hierarchical control. A man-made world is one that promises people control not only of nature, but also of other people.

Though serving as a model of nature, mechanism is unnatural by definition. It is the very thing nature cannot produce. This is because the machine is an isolated system and a product of intention and top-down design, whereas in nature there *are* no isolated systems and no designer: the natural world is found, not made. Furthermore, intention is a byproduct of nature, not (as idealism holds) the other way around. There is therefore considerable irony in the fact that the machine has been adopted as the very plan of nature; that organisms are regarded as natural machines; that even the cosmos as a whole continues to be regarded as a vast machine or (lately) a computer. The obsession with mechanism chases its own tail: the machine concept, abstracted and idealized from experience with natural systems, is projected back upon nature as the organizing principle behind the very life and consciousness that creates the machine concept. But far from being a reasonable model for understanding nature, mechanism is, in fact, the very *opposite* of nature. Mechanism and nature are disjunct in the way that mind and matter are, a disjunction in both cases resulting from an imposed way of looking and acting. Mechanism is proposed as the means to control nature—including human nature—but nature does not consist

of isolated systems controlled from the outside, and creatures are not machines that have been programmed from the top down. The wholeness of wild creatures renders mechanical descriptions of them misleading and ethical and legal systems irrelevant to them. Only the domesticated human has need of rules and formulas, either to describe or to prescribe his or her world.[110]

The machine became the dominant metaphor of Western thinking because it assimilates impersonal cause and alien matter to human definition and will—particularly the will of ruling classes. Through the machine, natural order is understood in terms of human design and purpose. Through technology, found reality is reconfigured as artifact —first in thought and then in deed. This opened wide the door to the re-creation of nature in a man-made image, an image formerly taken as divine. It is also the metaphor behind the masculine project to organize society as a tool of power. Political, military, and economic institutions and chains of command are social mechanisms which once ran on animal or slave labor before there were literal engines. While mechanical devices predated mechanism as an abstract concept and as a general principle of organization, hierarchical social organization was in place long before the age of the machine. The machine as a controllable closed system is the pinnacle of government from a despot's point of view. It encapsulates the top-down exercise of power through formal prescriptions and bureaucracies. Mechanism is no less than a formula for taking over the planet and even the cosmos through the contagion of method, because mechanism (like power) is potentially self-reproducing, capable ultimately of consuming all of society and nature. The concept of the self-replicating automaton represents literally just this capability.

All artifice, however, begins in imagination. The very quality of the interior space of thought is a laboratory where elements originally drawn from perceptual experience can be combined in new and arbitrary ways—just as in language. These elements are idealized forms in the way that words and geometric figures are: products of definition, which can obey syntactic rules rather than natural law. To abstract is to define, to simplify, to streamline and reduce to an essence, to trace a schematic outline. An idea *is* a mental artifact, a prototype of the physical artifact when that idea is the design for an invention or machine. A schematic drawing, blueprint, or patentable concept retains an ambivalent status as representation; it is both the pure idea and also an intermediate step to its material realization. Even the manufactured

device continues to symbolically represent the idea behind it. The thing and the idea stand for each other.

The relation established by Plato between the ideal form and its material example describes that between the machine and its blueprint. The physical machine is only an approximation of the machine-as-idea, which retains its ideal status as a cultural artifact, a thought. No physical machine perfectly embodies the ideal after which it is patterned, even when it is brand new; the device only works at all because of the tolerance of theory for deviations from the ideal. (As a car engine wears out, and its form departs more and more from the ideal, it works less efficiently and eventually not at all.) Conversely, no idealization can perfectly encapsulate the reality it models. The theory only works so long as the tolerance of expectations exceeds observational accuracy.

A dynamical system, such as an automobile, is isolated in that it can be clearly distinguished from its environment and the rest of the cosmos. Such idealizations are the stock and trade of classical physics and of engineering. What happens outside the defined system is ignored, except as it changes the state of the system itself; when environmental effects are considered at all, they are implicitly secondary. The concept of pollution, like the pollution itself, is a byproduct of idealization, considered incidental to some process singled out for its human utility. Pollution is therefore ignored until it becomes a "problem": a focus of concerns beyond the goals that produced it. Nature obviously makes no such distinctions and ignores the artificial boundaries we draw, as anyone can attest who has seen an old vehicle reclaimed by bush or jungle. In nature, there *is* no pollution because there are no isolated systems. Everything that is a byproduct of one subsystem is a raw material for some other subsystem, and cannot arise otherwise.

4.2 Is Reality Exhaustible in Thought?

Only if idealism were literally true, and reality were nothing more than a simulation in a brain, could it be perfectly modeled by other simulations, such as scientific theories and computer programs. In other words, only if nature turns out to be a *device* must it be possible to map it thoroughly with other devices, or to "exhaust" its being through rational analysis. However, according to Gödel's famous theorems, even then the character of the particular construct or system in question ought also to make a difference. If not all of mathematics can be formally mapped, then why would physical reality be amenable to

complete formalization, even if it happened to be an intentional construct? Furthermore, at least according to the materialist view first propounded by J.S. Mill, mathematics must have been modeled on nature, not vice-versa.

While this may not decide between idealism and materialism, it does reformulate the question. A true materialist ought to hold that reality is *in principle* inexhaustible by thought, richer and denser than any possible model of it. The analog world can be simulated to any degree of approximation by digital processes, but never perfectly. And those who take the contrary view, that physical reality *is* formally exhaustible, ought to admit their implicit idealism. In former times, the venue (and back-up copy, so to speak) for phenomenal reality was held to be the mind of God, who created matter (one supposes) by drafting it in thought. More currently, as the computer is the key mechanist metaphor, some physicists with an implicit idealist bent speculate that the physical cosmos itself constitutes a giant simulation. It is, in other words, a construct reducible to thought. Still others combine these notions, claiming that God is the point toward which the cosmos is evolving as a vast computer, that the destiny of physical matter is to become intelligent, etc. The universe is supposed to evolve from a causal system into an intentional system through the technological intervention of intelligent life. [111]

The ontology of science argues for, and from, a materialist viewpoint: all phenomena, including those of mind, are reducible ultimately to physical processes of matter and energy. But the epistemic program of science often presumes the contrary. Insisting that physical reality can be formally exhausted in laws, algorithms, computer programs, models, or simulations implies that the analog domain of the Real is no other than the digital domain of the Ideal; that matter can be perfectly mapped by the mind's descriptions. The implicit faith of scientists, that reality can be completely and finally exhausted in analysis, implies that it is not causal after all, but intentional; not real but ideal. The ontological materialism of science turns out to rest upon a bedrock of epistemic idealism. Scientific law is then a script for the behavior of matter. Thus, while a Shakespeare play defines only a skimpy world at best, nothing in this faith prevents an infinitely detailed script for the cosmic drama, specifying every depth from which the action of the play might causally unfold: the timely firing of neurons in Juliet's brain, the quantum interactions in Romeo's body, etc. In such an idealist view, there is little difference between scientific prediction and textual interpretation—or Biblical prophecy, for that matter. But if the limitative theorems of the

last century are true, we will never write a complete script for matter that is any briefer or simpler than reality itself.

Prophecy can work only within an intentionally constructed system or text. To believe otherwise is mystification and superstition. But for the same reason, reversible closed systems are fully predictable only because they are intentional constructs—artifacts or fictions. Only such idealizations can be truly deterministic. Whether in the mind of God, of Shakespeare, or of the scientist, definite connections preexist between events because they are logical rather than causal connections (they are like hyperlinks). One can move freely backward and forward within a story or text, because the entire content of the story is already established. The notion of prophecy also expresses the wish that life *should* be a story—that is, an intentional creation rather than a contingent series of unpredictable events. This same wishful thinking underlies the concept of the closed, reversible, deterministic system. The masculine pretension behind scientific idealism is to occupy a place outside nature, to be above it as the mind of God is above its creation, as an author is above a text. The goal is to know the design of nature as only a designer can.

The concept of the Universal Machine was first put forth by Alan Turing, who worked on the early development of computation for use in wartime decryption of military communications. The thought experiment named after him relies on the key assumption that the only important information involved in a communication is what can be conveyed in writing or over a teletype. The concept of the Universal Machine he proposed is the basic idea behind the computer and simulation. It is universal in that it can simulate any other machine, in the broad sense of a formalizable system. This would include, of course, any other simulation or intentional construct. This is a different issue from simulating *reality*, however, unless it turns out that reality itself is a simulation, artifact, construct, or machine.

Turing proposed that human intelligence can in principle be simulated by a Universal Machine—that is, a computer. But this assumption relies on a particular interpretation of intelligence. Of course, the notion of intelligence can (circularly) be taken to mean only semantic content —effectively, whatever can be communicated through written statements. The "software" of the mind can be *defined* as an isolated "finite state machine," as opposed to the analog reality of the brain, for example, which is an inextricable part of the body and the world. Perhaps realizing the moot point here, Turing offered his principle as a

bold, if unproven, heuristic guideline. The concept involves a digital, teletype-like message coming from an unrevealed source, which might be either a computer or a human being. The task of the human recipient is to determine, by posing questions and analyzing responses, whether the message is generated by a human or by an artificial intelligence. (Internet users confront a similar situation insofar as typed e-mail conversations do not reveal the voice qualities, intonations, emotional inflections, age, gender, or even biological nature of their correspondents.)   While this will always involve a judgment call, Turing's point was that if you can't tell the difference, maybe there isn't one.

A version of this "test," in this case face to face, appears in the movie *Bladerunner*, using analysis of subtle eye movements to determine whether the subject is human or a realistic android impostor. It is, in effect, a lie detector. Such a test is not infallible, but defines a contest of one-upmanship between the program, which tries to fool humans, and the human interrogator who tries to detect the ruse or trip up the impersonator. A computer program, such as presumably animates the android, might attempt to imitate human behavior even at the level of involuntary physiological response. But the basic premise behind simulation involves a funnel through which all behavior must pass: the program that is its formalization. In other words, it is assumed that all aspects of an organism's behavior as a physical system can be reduced to the equivalent of an algorithm, or written message! While this is merely an assumption (and not a very plausible one), it is the working hypothesis of artificial intelligence. This means, first of all, that "intelligence" is taken to be a semantic phenomenon; and, secondly, that what is important in intelligence and its simulations is significance in the human domain of meaning. But the literal duplication of an intelligent organism has little to do with human meanings. The heuristic of the Turing Test—that if we can't tell the difference then it makes no difference—becomes a technological fudge factor, in which subtle differences and their potential consequences may be ignored for limited practical payoff. Subtle differences, however, may ultimately be crucial. Even when they are not catastrophic, they may lead to false expectations, as in the pipe dream of "uploading" human minds into computers, where they can supposedly live in simulated "realities" or be "downloaded" into new bodies.

Simulation likely originated with mimicking other creatures, reflecting Man's appropriation of nature. Tools such as stones and blades

imitated specialized adaptations such as teeth and claws; spears imitated horns, etc. In the modern sense, simulation involves the general idea that a natural process can be reverse-engineered. By taking it apart, at least in thought, it can be imitated and reconstructed as an artifact analogous to the original process. The flight of airplanes imitates the flight of birds and insects only in this rough sense; whereas the flight of a working model airplane simulates that of a real airplane with genuine precision. This is because, though small, the model *is* a real airplane; they are both flying machines, artifacts. A model insect or bird, however, even if it flies, is not a real one—precisely because it is an artifact. The concept of the Universal Machine is that it can simulate any other *machine* exhaustively. But whether a machine, program, artifact, or intentional construct can exhaustively simulate an organism, or *any* aspect of analog reality, is quite another question.

The characteristic and deceptive "chunking" involved in language and thought alike, whereby a rose is a rose is a rose, is the feature of mind that makes perfect simulation seem plausible. But there are many varieties of rose and every individual flower is unique. The baseball player and the pitching machine may both be called pitchers, but the machine only crudely imitates the person, no matter how accurately it hurls the ball. It is a fundamental deception to think that these are the "same" action. When one "piece" of behavior seems to resemble another, it is implicitly being compared not to the real action in its wholeness but to a common formalism or ideal ("pitching"), which has been abstracted as the essence of that behavior. Similarly, one may falsely think the essence of a natural system ("pitcher") has been captured in a program or blueprint for the construction of that system. Common sense recalls the differences between the human thrower and the simple device—and the differences between the intricate human action of throwing and the mechanical hurling of the ball. The concept of simulation, however, rests on obscuring such distinctions by conflating all that can pass semantically under a given rubric. The algorithm, program, or formalism is the bottleneck through which the whole being of the object, system, or behavior must pass in order to be simulated.

One thing is said to simulate another, therefore, when they both embody a common formalism. This can work perfectly well for two artifacts such as an aircraft and a working model airplane. These are in principle two alternative constructions from the same design, scaled differently, two realizations or tokens of a common ideal. It is a basic fallacy, however, to think that the being of a natural object is exhausted in a program, formalism, model, or ideal abstracted from it, which is

then mistakenly believed to be its blueprint or essence in the same sense that the aeronautical engineer's design is the blueprint capturing the essence of the flying machine. The natural object is a found object, not an invention constructed from design. The structure, program, or blueprint is imposed after the fact, through an analysis that can never be guaranteed complete or perfectly accurate. This mechanist fallacy, involved in the reverse engineering of natural systems and organisms, is the belief that it is possible to perfectly replicate a natural object by first codifying its structure and behavior and then constructing an artifact from that design. The artifact *will* instantiate the design, of course. But it will *not* duplicate the natural object, any more than an airplane duplicates a bird. This is why "beaming up" à la Star Trek will never work as transportation.

Computer simulation rests on the principle that a digital program can indefinitely approximate any analog reality. This is a useful principle for devices such as televisions and CD players, whose product is not a truly exhaustive replication of an analog original but a subjectively satisfactory representation in the consciousness of the human user. In other words, simulation is useful for creating entertainments and virtual realities, for eyes and ears that cannot tell the difference, but not for exhaustively replicating reality. The fact that digital sound, for example, subjectively passes for the original does not mean it exhaustively replicates it. This distinction, unimportant to most music listeners, becomes highly relevant in AI and robotics. It is only laxness about it that permits cyberspace fantasies of reverse-engineering brains, downloading minds, or fabricating artificial creatures, where the motive to create a useful artifact is confused with the unconscious drive to create life and reality itself. It is one thing to seek humanly useful technology, fully cognizant of the tradeoffs involved. It is quite another thing to dream of total control over matter, as though it were possible, desirable, and inevitable.

The Creation, inherited by science from religion, was the intentional act *par excellence*. Made by divine decree or fiat, embodying the Creator's thought and will, the Creation is an artifact with moving parts. It is no coincidence that mechanism emerged at once as scientific model of the universe and as inspiration for the Industrial Revolution—both from the womb of Christian idealism. The Newtonian world machine is rationally comprehensible because it is conceived as though it were a device, inspired by literal machines. What constitutes analog reality, however, is precisely that it was *not* created by anyone at all, but found

by human beings in an incompletely known state.

Western culture has projected upon God the creative intelligence, will, and thought of the artisan, imagining by analogy that the world and its creatures were made as earthenware is fashioned by the potter, or as clocks by the watchmaker. But the potter or sculptor, like the tinker, makes nothing from scratch and does no more than impose form and ideal upon the clay or metal, which resists such tentatives because of its own real properties. Even when making a likeness of something, the resemblance is relative, a question of name and degree. The analog substrate of the medium remains whatever it is in its own right while it carries the function and form intended, but only symbolically and approximately. This is why, in ancient creation myth, the material of the cosmos already is present in some way—perhaps as a part of an original deity's body. In Genesis, the primal material is there "without form and void." The idealist science that grew out of Christianity considered the impenetrable being of nature merely a temporary inconvenience: one day it should be literally possible to create something from nothing, to have a Theory of Everything, to fashion a work of art or industry molecule by molecule.

What characterizes the real analog world, however, is its potentially bottomless complexity and limitless density of detail. This distinguishes it from the finite, digital, and lean structure of the intentional artifact, the geometry of the Ideal, which consists of defined and countable elements and transformations and combinations of them. In the mechanist metaphor, these are the parts of a machine—definite, formally specified, and exhaustively knowable. The artifact can only appear one step behind anticipation, so to speak, while the real world can only appear one step ahead.

While the apparent exhaustibility of nature is suggested by practical success at simulating reality, the nature of simulation must be clarified and put in context. While products of intention have an inescapable order and clarity, products of natural cause have an inescapable chaos, a residue of randomness. Any isolated system is artificial in principle, a mere artifact of thought; there is no inherent reason such mental schemes should coincide with reality. The real and potentially infinite interconnectedness of all things, on the other hand, may imply that ultimately there is only one unified system: the cosmos as a whole. Only if reality truly has a digital or fractal (self-similar) structure, or is otherwise an intentional construct (a machine), might exhaustiveness be possible. Certainly, there appears to be a fundamental digital character to matter and energy, perhaps even space and time. It appears even that

quantization plays a necessary role in the very existence of the cosmos. Until we fully plumb the mystery of this role, which is essentially the ancient problem of the continuum (or the One and the Many), we will not be in a position to say what digital aspects of reality are inherent rather than imposed by our ways of thinking.

The problem of adequately modeling reality may amount to finding an algorithm to express a random sequence. A machine (that is, a deterministic system, a program) cannot generate a true random sequence, nor can it be counted upon to find an expression for one that is shorter than the given random sequence itself. This is known as the Halting Problem, which states mathematically that there can be no finite all-purpose program to examine any other program and decide whether it contains an infinite loop such that it would never stop if started.[112] It describes, in effect, the relation between digital thought and analog matter, between intentional formalizations and the causal systems they model, between simulation and reality, theory and actuality, mechanism and nature. Related to Gödel's theorems, it sets a limit upon the ability of mind or computer to formally describe reality. And this would include, naturally, the ability to formalize the brain's workings or the structure of an organism.

Nothing in theory prevents a program or computer from organizing *itself*, however, through learning, in much the way that brains apparently do. The point is not that brains, being flesh, constitute a different type of structure than computers, but that formal analysis of the structure of the brain, used to model brains from the top down, is limited by the implications of the Halting Problem, or similar considerations. Consciousness may indeed be a simulation "running" in the brain. If so, our concept of the brain is then part of that simulation. And the human brain may be a very good Universal Machine, which can simulate any other simulation. But this does not mean that it can exhaustively simulate reality; much less does it mean that reality itself is a simulation. There remains an unbridgeable gulf between simulation and reality: the same gulf that separates mind from matter, thought and perception from the world-in-itself.

One is simply mistaken to think that if nature is comprehensible then it must be of the same character as thought: that is, intentional. It is an error to think that if something can be decoded by analysis, then it must have been encoded in the first place. Something is not a message simply because it has order that can be understood! But such inverted logic has

led one metaphysician of technology to see "the operation of a complex self-aware mind" in the thermal motions of the atoms in a rock, for instance, and to conclude that anything at all can be interpreted as possessing mind and intelligence, because "one day's unintelligible sounds and squiggles become another day's meaningful thoughts if one masters a foreign language in the interim."[113] One might as well imagine that someone carefully arranged the tea leaves in which one's fortune is read! For this gives infinite latitude to project whatever significance one likes into an input—to see rocks as minds, noise as communication. But a foreign language is not random noise; and this is so quite apart from whether one understands it. Random noise is not a message. The implicit idealism behind such confusions is betrayed by that author's claim that "minds and worlds don't exist objectively at all, but like beauty and value exist only... as interpretations in the eye of a beholder."[114] While vibrations of atoms in a crystalline state *could* be used to store and process information, before we conclude that a rock is a *mind* we would have to first demonstrate that it does in fact constitute a *brain*. Something is a message, not because it is comprehensible, but because it was encoded in the first place and because it is *about* something that two or more agents can hold in common; because, in other words, it had a sender, a meaning, and an intended recipient. Similarly, something is a simulation if there was first a process of simulating, something simulated, and someone's reason for it.

The implicit idealist faith behind the notion of perfect simulation is that the properties of a thing can be represented completely and with precision. A 'property', however, is a human construct, an assertion that disregards a potential infinity of other assertions. The collected properties of a physical object do not constitute the object, although they do constitute an artifact. Any list of properties which thought could assign to an object is selective and finite. It cannot exhaust the being of a natural thing, but it could exhaustively describe an artificial thing. Using Shakespeare's folios as the authoritative reference, we can know all that there is to know about Juliet, or her balcony, or her thoughts about Romeo. But that is not very much.

When from the outset the object is *taken* to be a collection of properties, however, it is mistakenly assumed to be exhaustible, because such collections are finite artifacts. Once the circularity of this reasoning slips by, one predictably fails to see any difference between reality and its "perfect" simulations. In that idealist frame of mind it is tempting to see the universe itself as a simulation (of what, I wonder?) and one's own existence as nothing but numbers being crunched in a vast com-

puter (thoughts in the mind of God?)[115] But such a fantasy is no more than a technologically updated version of Descartes' skeptical thought experiment, in which the "evil genius" who counterfeits your sensory input is replaced by a computer. The answer is the same as to Descartes' solipsism: there *is* a way to tell the difference between reality and simulation, for no simulation *can* be perfect. What is *meant* by reality is in part externality and independence of mind; but in part it is also inexhaustible richness of detail.

The ideal of perfect knowledge, and hence the possibility of perfect simulation, was personified in physics by the 19th-century "demons" of Laplace and Maxwell. Like the evil genius of Descartes, these are hypothetical beings of perfect knowledge. They amount to epistemological thought experiments in which limitless knowledge is invoked to explore the limits of physical concepts. Laplace's demon is an intelligence with infinitely detailed information about the states of all particles in the universe—perfect knowledge of the "initial conditions" from which any future or past state could be calculated in a completely deterministic universe. Maxwell's demon, similarly, keeps track of the individual molecules in an enclosed gas, so that he can sort them by energy into compartments, thus decreasing the entropy and apparently defying the second law of thermodynamics. But as later physicists showed, the decrease in entropy that an intelligence could accomplish through such knowledge would be more than compensated by an increase in entropy required to obtain that knowledge.[116] If the universe is infinite, then perhaps infinite energy and computational power could be brought to bear on a finite closed system. However, it seems doubtful that such resources could be usefully applied to the cosmos itself as a whole, as some recent speculations purport, in order to guide the course of its evolution.

The concept of the organism as a machine is seriously flawed. It is true that an organism can, with some justification, be viewed as closed to efficient causation from outside, by virtue of containing its own reasons for all aspects of its structure and functioning.[117] Maturana and Varela expressed a similar notion in the concept of *autopoiesis*: the organism's self-definition, whereby no environment need be considered at all. The whole point of their argument is to avoid the projections and reductions that human observers are prone to read into the organism and its situation. The organism can be viewed as simply maintaining its inputs and outputs within acceptable bounds, without reference to meanings supplied by an outside world. From the human

observer's viewpoint, however, there is definitely a distinction between the organism and its environment, though the skin enveloping a cell, or a multi-celled organism, is a permeable boundary that constantly involves a flux of substances and information across it; though the entire history of the organism, both ontogenetic and phylogenetic, is bound up with an environment of other co-evolving systems and creatures.

The organism cannot be considered apart from its long history of interactions with the world. The information conveyed in both directions across the boundary of the organism is carried on exchanges of physical energy, so that its intentional relations with the world are also causal relations involving it in larger systems. What is 'system' and what is 'environment' are reversible relations, since both are complementary regions of space acting causally upon each other. But there is an asymmetry in the respective sizes of organism and environment, and in the fact that the organism's environment does not necessarily constitute another organism for which the first is reciprocally environment.

It might seem that the organism could be fully analyzed in the same sense that the genetic code appears to be exhaustively codifiable. However, we cannot truly understand the structure and functioning of even the simplest creature and its genetic "blueprint" without grasping its complex interactions with environments that are the source and reference of its intentionality. Just as a computer program draws not only upon the mechanics of the computer but also upon the semantically rich environment of the programmer (which might include the whole universe), so the developing embryo, for instance, does not simply unfold according to a program spelled out by a finite number of genes, but also through complex chemical interactions with the uterine environment and beyond. The genetic program, in other words, is not a purely syntactic system, but is rich in references that extend indefinitely outside itself. While the organism is in one sense self-defining, it is also both causally and intentionally connected to the rest of the universe. Simply identifying genetic units of information cannot be taken as exhaustive understanding of the genetic "code," any more than identifying units of a foreign language as words implies understanding their meaning or the language as a whole.

The quest to create artificial organisms rests on the theoretical possibility of analyzing natural ones as mechanisms, just as simulation relies on blueprinting the thing simulated. Much of the optimism of genetic engineering, too, rests on the assumption that organisms can be

understood as mechanisms. But no natural thing, living or not, is literally a machine. Mechanism is a way of looking, and so, of producing artifacts at a glance. It has its uses and limitations. Imitating organisms is not an effective way to produce them artificially, because such a strategy can only produce artifacts.[118]

The design of a machine might be inspired by observing natural systems, but someone designs and builds it, step by step. By fiat, it has a finitely delimitable structure, a precisely "correct" set of well-defined parts. It can be dismantled into this same set of parts by reversing the process of construction; the process of design is the reverse of analysis. As with nature, there can be surprises, since the machine might not function as intended; but this could be due to a flaw in theory, in design, or in manufacture. Whether a design is sound in principle is analogous to whether a theorem can be proven in mathematics. This is different from a scientific experiment, in which nature is an unknown outside the defined system of the experimental setup. Though we speak of "experimental" designs, the testing of a machine is only partially analogous to testing a theory in physics, where it is nature that is queried and provides the answers.

The mechanistic view of nature applies the machine metaphor to the cosmos at large, as well as to identifiable subsystems within it. It is sometimes assumed, in other words, that the universe itself is a machine, which can be analyzed into its "true" parts in the same reversible way that an engine can be assembled and disassembled. It has already been noted that this aspect of mechanism reflects the religious and animistic view of the cosmos as an intentional creation. In a book published in 1802, theologian William Paley proposed an argument for the existence of God, which has since been known as the "watchmaker argument." If you were out on a stroll in nature and you came upon a watch lying on the ground, he reasoned, you would think of it very differently than if it were a stone lying on the ground. It stands out as having a rational design, and must therefore have had an intelligent maker and a date of manufacture—perfectly reasonable so far. He then goes on to assert that the works of nature similarly bear the marks of design that would indicate an intelligent creator. But that is an unwarranted leap that projects human intentionality back onto nature after the fact. In a wily inversion of the watchmaker argument, one critic of the mechanistic view of organisms has likened the machine metaphor in biology to taking a hammer to a watch.[119] A hammer can certainly reduce a watch to a variety of pieces, but these may not be the original "true" parts, and the exercise will shed little light on either the structure

and functioning of the components nor the process of fabrication. We might nickname it 'Maxwell's Hammer', for it represents another sort of demon, in effect, who proposes to find the true parts of any system through exhaustive analysis. And Maxwell's Hammer is as futile in relation to any natural system as it is in regard to organisms. We are simply always guessing at the parts, since we did not make them in the first place.

Maxwell's Hammer might be irrelevant if the hypothetical parts of a system and their interrelationships are complex enough to acquire the ability to *self-assemble*. At some unspecified threshold of complexification, one is no longer dealing with a human artifact but with a self-defining system. Which, of course, is what organisms are. There should be little doubt that artificial organisms *could* create themselves under the right circumstances; after all, life did it! But there is every reason to doubt that these would remain within the sort of human control, or even understanding, exerted over conventional machines.

Artifacts only mediate the intentionality of their creators. While a computer can imitate intelligent behavior, one cannot simply program it to *be* intelligent, because intelligence is not an assembled collection of specified attributes, abilities, or behaviors. Rather, all of these are original artifacts of Maxwell's Hammer that are gleaned, so to speak, from smashing organisms. An organism cannot be disassembled in thought or in practice to create a list of properties constituting intelligence, consciousness, or life, for example, which could then be re-assembled in an artificial version. Each property on such a list, and the list as a whole, are man-made things. They are meaningful to the human observer, but not to the organism. Such artifacts *can* be re-assembled, like Frankenstein's monster, to create *something*; but this would necessarily be another artifact, not an organism. (Shelley was too generous in according the stitched together parts life, autonomy and consciousness.) While it might be possible to program "aversive behavior," for example, one could not simply install a pain module into an android and expect it to have conscious experience of pain. One cannot create an organism with its own intentionality by assembling what we believe are the properties or components of organisms, any more than one can create a book that thinks for itself merely by stringing together between two covers a sufficiently vast collection of sentences. Only when the sentences can assemble *themselves*, and have *reasons* to do so, might a book in fact become intelligent.

4.3 Womb Envy

What leads people, then, to aspire to create artificial life? We have noted the deep relationship between mechanism and the masculine. The eternal restlessness of Man, expressed in men's projects of re-creating nature, may never be finally satiable because nature itself may be a bottomless well of ambiguous complexity. Why, then, is this restless quest for certainty so ingrained and so persistently a masculine more than feminine theme? Undeniably, women have been bound to nurturing and supportive roles throughout most of human existence—when not by biology, then by men. Perhaps, therefore, the question could be put the other way around: what has alienated men from contentment in their possible roles as supporters of the feminine, conservers of nature and tradition, and nurturers of coming generations?

For as long as they have been human, male and female alike have been aware of mortality, the vulnerabilities of flesh, and the heartlessness of the system of nature. Men, however, might have been more sensitive to crucial differences between their own apparent place in the natural order and that of women, along with differences in their relationship to their children and their own bodies. Women have always had the compensating ability to regenerate life from within their bodies, to be the very vehicle of life. Moreover, for the woman to rebel either against her genetic role or her integration in the web of life would have been resisted by both natural and sexual selection, when not by society. A race of women not devoted to the task of reproduction would have been an evolutionary contradiction. It is not a *logical* contradiction, of course, and in the present state of overpopulation it may be a necessity.

The male role, in contrast, is not so clearly defined. The role of the male in the system of nature is to supply a separate genetic factor; but the female, not the male, regenerates life out of her own body. She knows clearly who her children are, while the male enjoys no such certainty. At the dawn of history he did not even seem to know his own role in procreation, and certainly knew nothing of sperm and ova. The woman was the mysterious and miraculous bearer of life, which must have instilled a certain awe and envy in men. Moreover, it is far more feasible today for a man to care for a baby than it would have been in the ancestral environment. Whatever we make of it today, there was a historical division of labor based on physiology, implying very different roles and mentalities for men and women, with far-reaching consequences for the development of civilization.

This left men in a position of relative insecurity not so different, one

could say, from that of their sperm: many competing in a hostile environment for genetic access to the selective female. Female consciousness and loyalties would have been more identified with the life processes taking place within her. While both might have felt the alienation and horror of embodied vulnerability, this would have fallen more heavily upon the male consciousness, which had less mitigating identification with body, nature, and life. In contrast to the female, he would believe himself to be as peripheral and expendable as his sperm actually is. If he didn't mate with a given woman, chances are someone else would. It would not be him, moreover, who gave birth and had a close physical intimacy with the child; and he would never be sure of the child's genetic kinship to him. These imbalances, I would assert, put the male consciousness in a precarious position. While this may simply be the way things are in nature, Man is the creature who rejects the ways of nature and the animal position within it, and who intends to do something about it.

If primitive men did not stay at home with the kids and were not centered in their biology in the way that women were, their time and consciousness could turn to other things. While men might have simply gathered food with the women and children, there was little constraining them to do so. On the other hand, scavenging, and then hunting, would have given the male collective a sense of identity, purpose, and value of its own, and something to bargain with in the battle of the sexes. It might have engaged and developed a side of the mind already disposed toward the external environment, in contrast to the woman's heightened bodily and social awareness. The daring, cooperation, and agonistic interest involved in the hunt and in competition with other carnivores might have fostered a taste for the adrenaline and action reflected in today's team sports and video games, both predominantly masculine interests. It would have set the tone, and the stage, for every form of heroic struggle, including war and the conquest of nature. It would have required a very different relation to embodiment and the Other than that involved in motherhood. While the male could oppose and transcend the body and its limitations, the female was obliged and privileged to cooperate with them. The male killed the Other, while the female nurtured it. These differences, mutually perceptible if not always mutually comprehensible, are the stuff of the battle of the sexes elaborated ever since, and in which women have been overwhelmingly the losers, to judge by male standards.

The advent of agriculture and animal husbandry would have radically affected gender symmetry. The mentality and qualities of charac-

ter required for farming are entirely different from those that make good hunters, and would require the invention of new skills and the formation of new fundamental attitudes toward nature. Both the development of agriculture and that of animal husbandry fostered a depersonalized mindset of control and management. The hunter faces another intelligence, and must enter into the mind of the opponent. With the wild animal, there is something of an I/thou relationship, whereas crops and herds are bred and managed as artifacts, as systems —an It. Agriculture requires long-term rational planning and an administrative approach, while hunting requires moment-to-moment alertness, intuition, and stealth. Agriculture brought an end to the nomadic life; animal domestication brought an end, at least symbolically, to the wildness of nature. The ludic, agonistic, and intimately cooperative ethos of the hunt was displaced in agricultural civilization by rational, hierarchical administration of resources and labor.[120]

The transition to a sedentary, planned economy might have been more natural and favorable for the woman, who was already used to the long cycle of child rearing, and for whom moving about constantly with babies would have been a hardship. Horticulture was likely woman's invention, since she might more easily have exploited the accidental sprouting of gathered seeds and noted the conditions under which plants thrived. Similarly, as nurturer, she would more likely than man have been responsible for the first domestication of animals. These discoveries would have been natural extensions of her existing skills as nurturer, whereas they would have been a radical departure for the hunter, with a different meaning.

Encounters with powerful animals, which could be fatal, trained men for encounters with other men. While the discovery of animal "husbandry" by women would have involved only an extension of nurturance to other species, its appropriation by men would have involved not only the co-opting of a nurturing role but also the permanent triumph of predator over prey, the ending of an agonistic relationship, and the beginning a far more one-sided one of measured exploitation. Animals ceased to be worthy opponents and became living property, a resource to be managed. Livestock had to be protected and cared for, much as children, creating a reciprocal relationship of mutual dependence between Man and animal; breeding them might have vicariously satisfied male envy of female procreativity. In the male psyche, however, the domestication of animals represented not only a parody of motherhood but also the conquest and enslavement of an enemy, and a psychological precedent for the institution of human

slavery. Animal and human slaves alike were needed to meet the increased burden of agricultural labor. The ultimate slave would eventually be the machine, the final expression of an evolving attitude of objectification and use.

The progressive appropriation of feminine abilities by men included displacement of her natural authority by its masculine caricature in patriarchal and military authority. Women were literally the first slaves, which definitively turned the tables on feminine power. Men compensated for woman's authority over the male child by objectifying, controlling, and infantalizing *her*, inverting roles so that the Great Mother was eventually reduced to the Playboy Bunny. They shifted the natural balance of power, favored by female selectivity, by creating a social system in which women were forced to compete for male-controlled resources. The general shift in the male mind toward objectification implied an increasing split between object and subject, body and mind, nature and culture—and between female and male. Men resolved the insecurity of their place in nature by disowning their mortal, vulnerable, feeling side. This they projected onto woman, appropriating to themselves the ideal, intentional, eternal realm of thought and symbol-making, and leaving to woman only her biological identity.[121] And even this was appropriated as men's property.

The isolation of subject from object was reflected in the remove from nature represented by life in permanent settlements. It was also reflected in the distance between men and women, manifest in male dominance, which included the symbolic appropriation of women's natural powers as well as their authority. By the time of Aristotle, we read that the male semen is the active, creative, "spiritual" principle responsible for new life, whereas the mother does no more than passively supply the environment for its growth. In Aristotle's metaphorical imagery, as in the social reality of the time, the male was the farmer who plows the field and plants his seed in the feminine soil whose fertility he owns and manages. Masculine idealism reigns supreme over the earth and the feminine; men's jealous monopoly of the mental realm is reflected in the exclusion of women from literacy and learning. The farmer and animal breeder owns and controls everything: seed, soil, and harvest, livestock and offspring. Thus, in early patriarchal civilizations, as today in some places, women and children were as much the property of men as were their fields and herds, to dispose of however they wished.

No doubt, the idea of human slavery was suggested by the domesti-

cation of animals. The first slaves, however, were likely women captured from conquered tribes.[122] This practice might in turn have been suggested by the "exchange of women" and "bride stealing" in tribal cultures. While war might have replaced the agonistic thrill of the hunt for males, it had deeper and far-reaching repercussions in the creation of new institutions such as slavery, class structure, and social hierarchy and domination. Slaves were the spared survivors of military defeats, creating a new category of human status, just as animal domestication created a new relationship with other species that were, in effect, the captured and defeated survivors of the war of men on animals. Conquered peoples typically formed the basis of a peasant class in amalgamated societies where the victors became the warrior nobility.[123] Select males had the armed power to take, hold, and control anything that could be considered object at all; above all, war embodied the attitude of conquest and domination. The managerial mentality and social organization required for farming and herding made it feasible to maintain a civilization gained by conquest. The thread through all of this is the increasing power of subject over object, of 'I' over 'it', which expresses itself as identification with the head. Ascensionism, far from being the opposite of mechanism, is its very essence. Mechanism, like the idealism it expresses, represents the power of the head over the body and matter, which began with an upright posture and continued in its ascension to the moon.

4.4 Power Tools

Technology has always served power, whether political, economic or military. From the time of the Renaissance, close relationships developed among the mechanization of warfare, of mining, and of manufacturing. Armies required mass-produced, standardized equipment with interchangeable parts: everything from guns and cannons and their ammunitions to "uniforms" and standard issue for foot soldiers. Navies could be quickly built up on demand from standard prefabricated ship parts. Mining supplied the materials of warfare and in some ways was conducted as a war upon nature, so that mining sites resembled bombed-out battlefields, and the dangers and hardships of miners resembled those of the soldier. From the earliest times, military need stimulated innovation and economy, which filtered down into society as "spinoff."[124] The duress of mining established the modern paradigm of hard labor, work that is physically overtaxing, dangerous, and alienating.[125] The need for mechanized production, however,

followed the mechanization of society itself, which began long before with hierarchy. Thus, armies and ship crews (whether military or merchant) were organized, like factories and governments, in absolute chains of command, as social machines with replaceable human parts.

To extend the power and advantage of privileged groups requires not only literal mechanical advantage. More importantly, social machines serve to distribute power and wealth unequally, and military machines to defend it or steal it in the first place. To control more than one's fair share of resources requires lording it over others; but even access to mechanical power depends on the cooperation of others, whether they are factory workers, bureaucrats, or soldiers.[126] This age-old circumstance could change with the advent of total automation.

Machines for making money can be entirely conceptual and abstract financial "instruments," doing away with physical products, real services, and the need for armed pillaging. Much of the overdeveloped world today no longer operates a manufacturing economy, but has shifted to an investment economy dependent on overseas factories using legalized slave labor. The social struggles of the Industrial Revolution in Europe and America have simply been pushed offshore, out of sight and mind. Management and labor live not only in separate parts of town, marked by the railway tracks, but in entirely different societies, isolated by thousands of miles, national borders, and economic treaties. Far from being a collective effort to produce the commonwealth, an investment economy is less an economy at all than a system for distributing the spoils of overseas plunder. Modern imperialism is far more than nationalism spilling beyond its border. It is the dominance of a global monoculture even at home, the monopoly of the industrial mode of production and the consumer way of life, and the prevalence of experts, specialists, and bureaucrats in every sphere.[127]

To the extent that "goods" are actually produced in the investment economy, they are incidental to the production of profit: the relative advantage that has always been the true reason for production in the capitalist system. Every product is first a pretext and a strategy for winning in zero-sum games, and only incidentally, if at all, an expansion of the collective overall wealth. Automation does not necessarily make a better, nor a cheaper product for the consumer. It *does* increase the profit to the manufacturer in a mass market.[128] Mass production and industrial technology serve no altruistic plan to improve the human condition, as Bacon first envisioned; rather, they serve investors. Even the scientific establishment has become a knowledge factory, with

specialized workers hierarchically organized in what differs little from assembly-line work. Increasingly, the purpose of research is not knowledge, but profit.

The very ideal of the scientific method, which seized upon mechanism as its paradigm, was first understood as a way of standardizing observers and replacing individual opinion by formal method. This reflected the hopes of bourgeois society for government by law rather than the whim of kings. In this way, the autocracy of medieval church and state could be challenged, in the intellectual as well as political sphere, by a more impartial rule of procedure.[129] Utopias tend to become dystopian, however, because normative social idealism is founded on the descriptive idealism underlying mechanism. A social system *is* a machine; and a machine is a prison if you are inside it.

The Renaissance standard of scientific expertise was what a single brilliant mind could master. Scientific law and order paralleled social law and order, which in turn mimicked divine law and order. The system of nature was perceived to have a monolithic, if hierarchical, structure like the social system of the day. Both were conceived to be as simple and orderly as a machine, which could be operated by a single supreme will—whether God, king, or natural philosopher. The body politick should obey the directions of the reigning will, just as the cosmic mechanism obeyed divine will and the body (now viewed as a machine) obeyed its owner's will.[130] As the scientific establishment grew, it was increasingly organized along industrial and bureaucratic lines distinctly masculine in their emphasis on hierarchy, order, method, and efficiency. The metaphorical power of the machine to galvanize thought and reorganize society extended even to Comenius' ecstatic vision of mass education.[131] There, school boys would be stamped out as by a printing press: "as free from failure as these mechanical contrivances." Public school became a baby-sitting service for industrial workers and a training ground for future employees on assembly lines. As students looked to their teachers for authoritative guidance, so would they in later life look to their bosses and political leaders.[132]

The reductionist program of science served the political will of Enlightenment rulers to reduce Man to a reliable component, with controllable uniform behavior, in armies, bureaucracies, factories, and society at large. The new mechanist view of organisms was taken to heart. After all, the rhythms of machines were perhaps inspired in the first place by those of the body, and automation is simply the quest for

repeatable systems as reliable as the heart or the movements of planets.[133] Machines were extensions of the body; and the body itself, like all else, could be understood as a machine.

Today we see that the body is less like a machine than like a polity. The individual parts have come together by a kind of contract for mutual benefit, but retain their identity as cells, which can under pathological circumstances reassert their independence. While human polities have tried a spectrum of arrangements, according relative degrees of importance to the individual and the collective, it is clear that even societies which centralize in the name of the common good may actually be mechanisms for extending the will of the few. Power structures cannot exist without a robotic subservience, which parodies the willingness of cells, even unto death, to sacrifice their individual interests. In stratified societies, status is maintained or improved through cooperating with one's oppressors in oppressing those below.

The alliances and power struggles of chimpanzees have been widely studied, and it seems that we share with our closest primate relatives a penchant for politicking and a sensitivity to hierarchy. In humans this has been studied, for instance, as obedience to authority. After the Nazi debacle, there was great interest among social thinkers to understand how mass atrocities can occur among civilized people. Stanley Milgram's psychological experiments demonstrated that the perception of authority plays a key role in the willingness of subjects to obey directions to inflict pain on other persons.[134]

Hannah Arendt's incisive analysis of the Eichmann trial, and other interviews with Nazi war criminals, revealed that what lay behind the systematic cruelty and terror of the S.S. was by and large a banal mentality of middle-class bureaucrats obeying orders and aspiring to do their job well, within the established hierarchy, even though their "job" happened to involve exterminating a whole sector of their own society. It is clear that other major factors were depersonalization, whereby an identifiable group is not accorded full human status, and dissociation, whereby one does not think of one's actions in their full and real implications but only in a kind of technical context. Albert Speer, Hitler's chief architect, commented on the blind devotion of technicians to their tasks. Deliberately euphemistic and impersonal language made it feasible to be concerned only with the competence with which one accomplished the assigned task, and never with its real nature. Hence, victims poisoned in gas vans and chambers were dispassionately assessed in "scientific" terms of weight, fluids emitted (when they

vomited), and gas consumed during their "processing."[135] The Nazis were motivated to develop the technology of the gas chambers precisely because of problems with earlier trials. Initially, victims were simply shot, execution style. But even the hardened soldiers specially selected for this job suffered breakdowns from the horror of what they were personally doing, especially when the mass executions included children. The gas chambers were a method, above all, of mechanizing and thus depersonalizing mass murder.

Such innovations, to avoid directly facing the real horror, involve a sinister manipulation of consciousness so as to avoid moral conflict. This is reflected in the management of media during wartime so that public awareness cannot interfere with military intention. It has now become a regular feature of peacetime as well in the form of "spin doctoring," hired public relations campaigns, and media management. Military technology itself is increasingly designed for push-button action at a distance, so that the victims of aerial, missile, or tank bombing are never seen or heard. Not only on the battlefield, and not only in war, but everywhere within civilian hierarchies too, distancing, depersonalization, and "just doing one's job" are features of the power machine essential to its untroubled operation.

It can be argued that civilization would not be possible without centralized hierarchical organization. Certainly the military would not be possible, nor large corporations or national governments. Let us bear in mind, however, that any hierarchical organization is a tool in *someone's* hand. Hierarchies are devices for carrying out superiors' decisions without confusion or question. But confusion and indecision are natural responses to the richly ranging texture of experience moment to moment, which includes empathy for others. Hierarchical organization and the rule of procedure, on the other hand, mean life by the template. The richly analog context of openness to direct experience, which ought normally to inform our actions, is replaced by a formula. Units in a chain of command are not supposed to make their own decisions, based on diverse and potentially contradictory experience, thought, and feeling, but to apply their skills only to interpreting and carrying out accepted procedure, or orders issued by others, within a circumscribed latitude of discretion. In short, they are to bracket their humanity. This permits and requires ignoring the questions, doubts, protests and fears that normally arise in course of considering an action, as well as alternatives that might creatively present themselves. In other words, it precludes the exercise of wisdom.

The mechanization and globalization of commerce has an effect like the mechanization of war. In the modern investment economy, those who make the profits may never lay eyes on those who bear the costs. 136 The general drift of consumer society is toward isolation of the individual, who interacts increasingly with machines more than people. Ironically, as people become physically packed ever closer in urban settings, their psychological distance increases.

Until the Renaissance, the centerpiece and chief monument of any European city was the cathedral; for ages before, it was the temple. Now it is the steel and glass office tower, the business block, or bank. Economic activity, of course, can be viewed as a rational pursuit expressing the primary incentive of organisms to maintain themselves. But nothing that humans do is straightforward. Every activity bears not only its earnest, serious, "heroic" face value but also its formal, playful, "ironic" aspects. Business is not only survival activity but also a cultural form, a cognitive mind set, a forum for relating to experience, the world, other people. Increasingly, it is the only game in town, the universal worldview and meeting place, which serves to organize energies, relationships, and perceptions and to pass time as busyness. We have already noted how game-like systems serve a cognitive function, to mediate and structure experience and mollify anxieties in the face of the unknown. We have also seen how binary decision procedures and the agonistic, competitive aspects of games have special appeal to the male psyche. What remains is to connect the dots and conclude that business is the masculine secular lens through which modern people disarm the mysteries of life, rendering it banal.

But go into any anthropological museum and you will find a wide variety of mysterious "ritual objects" whose utilitarian function is unknown. View a collection of artifacts from ancient civilizations and you will see a universal embellishment of every surface and form, even of household utensils. Go to a museum of pre-industrial tools (such as at Troyes, in France) and you will find that even tools themselves—the most expressly utilitarian objects—are as much a format and pretext for decoration and esthetic play as any fine art. There is a universal impulse to play, to poeticize and beautify, and to creatively generate a cultural language of forms, often embellishing upon natural patterns. The import of this creative need is so great as to dominate all cultural production until the modern era. With mechanized production, however-er, something drastically changed. The industrial products of 18th and 19th-century industry continued to express motifs derived from nature,

by adapting artisanal forms and designs to mass production. However, the machines themselves could not so easily be cast in the image of nature, but began to inspire a new image in the human psyche: the image of power and method that is the core of mechanism and which underwrites the modern sensibility. Whereas pre-industrial artifacts had unconsciously served removal from nature, the machine boldly proclaims it. Whereas ancient and prehistoric cultural forms and artifacts performed sacred as well as mundane functions, in modernity we find a predominance of secular institutions and purportedly utilitarian things. Pre-industry abounded in objects that assert ideality through whimsy. Industrial technology emphasizes instead the means of production itself (the machine) as an esthetic standard, the ideal of system translated into form. It also reflects a shift in values or concerns and in the distribution of power. Not quality but quantity, not beauty but money became the dominant value. In the new factory economy, he who owned the machine controlled the production and reaped the benefit. The pre-industrial tool was as much esthetic object as practical instrument, and far more democratic. The machine is instrument far more than esthetic object, expressing and encouraging differentials of power.

The business world is still a man's world, in spite of increasing participation of women. Its premises are masculine, harkening back to the revenge on nature and predatory relationships, not to mention the exchange of women as the earliest form of trade and social treaty between men. It is simplistic and reductionist, based on the quantification of all value.

As an object of trade, a commodity is valued not for its own sake so much as to obtain something else, a means to an end. In that it is more like the tool than the product made by the tool. The ability to create objects, or control their use as implements, is one form of power; the power to own them and exchange them for other objects is another. In both cases, the "object" is valued less for its own worth (or for its power over the self, as sacred objects were venerated) than for the power it yields *to* the self. When "goods" are considered for their exchange value more than for their use value, they have an ambivalent status in commerce both for the consumer and the producer. When nothing is valued for its own sake, then nothing is truly valued. Everything is symbolic—but of what, ultimately?

In its own right, money is a purely syntactic device. Pursued for the sake of happiness, well-being, personal advancement, even for buying the favors of women, it makes rational sense. For then it is "semantical-

ly" meaningful, referring to something tangible outside itself as symbol. But unlimited moneymaking, growth, and winning for its own sake make little sense at all until we realize that the very abstractness of the goal, and its detachment from bodily priorities, *is* the deeper meaning of money and what gives winning such appeal to the masculine mind. The game of business is pursued not only for material gain but also for the ready-made agonistic goals it provides and the social world it facilitates.

Business has the appeal to the adult mind that the arcade parlor has to the teenage mind. Money, moreover, is a language all can understand. Business, like science, quantifies the found world; money is a common denominator, which facilitates intersubjectivity by ordering value along a single dimension. The individual power that can be derived from success in business is supported in a general way by the collective power to do business at all. A world is thereby made in which commerce is a universally accepted basis for human interaction. One power follows from the other, since only the collective game, combined with an abstract measure of value, permits large concentrations of individual wealth. Business, like mathematics, is a mental realm of ideality, abstraction, numbers. In towers of glass and steel rather than ivory, the stratosphere of high finance disdains nature, feeling, subjectivity. While value is inherently a qualitative notion, the mapping of all value onto the dollar is the ultimate reduction of the reductionist age.

Money and media are the glues of consumer society. The incessant mind bath of commercial advertising in magazines and newspapers, on television, radio, and online, provides information ostensibly useful to the consumer and influence over the consumer that is presumably useful to the marketer. But above all, it provides a universal ethos in which everyone can believe they know what life is about, what is real, important, of value. The advertising media keep us on track as tireless consumers. They *define* normality and human relations for us. The glib portrayals, in television commercials, of people as inane and petty, whose most serious problem is a troublesome stain and whose greatest joy is the discovery of a cleanser able to remove it, day after day relentlessly lower our expectations of life, of who we might be and what to aspire to. Breaking into rhapsodies or intimate confidences over Product X profanes the sense of life as something to celebrate at all, trivializes all meaning, and mocks human dignity. And that is what advertising is *supposed* to do: reduce the individual to an unthinking part whose sole function and reason for being is to spend money, so as to power an economic machine whose sole purpose is profit.

Chapter 5: SUPER MAN: dreams and nightmares of transhumanism

Never send a human to do a machine's job —*The Matrix*

5.1 The Importance of Being Human

The concept of humanity evolves along with humanity itself. The very category of humankind betokens a persistent, if uneven, social progress through ever greater inclusiveness, in theory when not in practice. Because humanness is an ideal, however, it is both a fiction, different in every age, and a goal under continual review. The transhumanist ideals of the twenty-first century expand upon the humanism of the Renaissance and traditional definitions of the human being. They reflect the same hope for idealized existence that has always motivated human culture, and religion in particular. If they strain credibility, it is because they are literally unbalanced ideas, emphasizing technological over social and moral development.

Technological progress is hardly an integrated program carried out by "humanity" through a unified collective will. Quite the contrary, technology has mainly served the violent struggles between groups, while the ideal of a united human race, peacefully and equitably pursuing the common good and betterment through technology, remains a fleeting myth.[137] While transhumanism is full of talk about conscious evolution and species-level achievements, such discussions fail to distinguish the diverse interests at play in the social history and development of technology.

Human nature itself is now widely considered a malleable object for technological development. But this reflects a level of self-alienation not present in society before the modern era. Heretofore, the human essence was considered spiritual, integral and inviolate rather than material and subject to analytical deconstruction and mechanical reconstruction. It was as external to physical nature as the gods who personified agency and personhood itself. As human mastery advanced through technology, the elusiveness of personhood retreated in proportion. Ideals of human being, implicit in religion and initially projected as divine, were gradually assimilated into the psyche as a circumscribed object of rational study. In spite of psychology, a residue of mystery still permits mystification and a latitude for having it both ways. The overlap of religion and technology, for instance, allows some devout geneticists to argue that tinkering with the hardware of the body is not an ethical problem because it cannot alter what is essential about human

nature, which, after all, resides in the soul rather than the body![138]

If Man is spirit, genetic engineering may be harmless but also pointless. And if Man is animal or machine, then seeking godhood may be pointless, though it has probably never been harmless. What does it profit Man to gain all power over nature and society and lose his own soul? The answer can only be: the possibility to *actually* occupy a territory that was once *merely* conceptual or ideal; to realize a potential long coveted but heretofore reserved to the divine. New horizons of creation and self-creation promised by technology, and which used to be the province of God, are now proposed in earnest as powers within human reach.

The ability to transform oneself through moral effort, and to redefine oneself as a spiritual being, has always been the cornerstone of religion. There is some irony in the fact that modern science and technology, with their focus on control of the external world, are descended from monastic Christianity, which understood the kingdom of heaven to lie within. Technology has taken up the cause of human salvation, but generally through transforming the environment instead of the self. Yet Western culture has always harbored, alongside the program to master nature, a parallel desire to master *human* nature, whether through spiritual or technological means. There was little distinction in alchemy, for instance, between mastery of the inner and the outer realms. The dream of godhood seems always to have included the blasphemous will to create life and intelligence, and to improve upon forms of these naturally found—including the human form. To the outward-oriented ego, self-transformation through technology seems a far quicker fix than through lifelong spiritual learning. Technology is the modern shortcut to the realization of ancient spiritual dreams, which appear to be at last on the threshold of implementation.

"We see humans as a transitional stage standing between our animal heritage and our posthuman future," writes a prophet of the transhumanist movement.[139] "For the first time in all time, a living creature understands its origin and can undertake to design its future," states a molecular biologist.[140] These pronouncements are typical of the current wave of faith in technology, which one critic calls *technological fundamentalism*.[141] They express a hopeful vision of post-human salvation, in which the species has finally gained mastery of its destiny and human ascendancy has unlimited horizons. It is a vision that harbors deep contradictions and dubious idealist assumptions long ingrained in Western thought.

Technological achievements are never species acts, but always

reflect the interests of specific individuals and groups. Both statements quoted above, moreover, assume a future paradoxically fixed by the present. On what basis can a creature design its future and even its own nature, except on the basis of its present intentions and values? If the present is seen as a transition to a projected future, is that future not already viewed as preordained? Does not a post-human destiny merely represent an intensification of the perennial rebellion against nature and embodiment, an impossible quest for absolute freedom?

Transhumanism advocates several avenues for modifying the human condition and the human being. Most realistic and close to hand, perhaps, is genetic engineering: the eugenics concept. Individual qualities can be enhanced and human nature refined through breeding and direct manipulation of genes. But human capabilities and life span could also be augmented with the addition of non-biological components: the cyborg concept. This might include, at the extreme, the downloading of minds into robot bodies. Finally, subjective human experience can be custom made through artificial inputs to the brain: the virtual reality concept. Each of these three avenues counts upon high technology to transfigure an experience and an embodiment external to a fixed epistemic ego. They also beg the question of what a desirable future ought to be. All abandon the notion of what is natural, in favor of what can be technically accomplished; the virtual reality option abandons even the concept of reality. None seek personal growth in the classical humanist sense, nor foster the ability to transform oneself *from within* that has always been the hallmark of spiritual paths. In this way, Super Man tries to create heaven on earth, either by reconstructing the earth and his own body and brain, or by redesigning his experience in an ultimate solipsism.

A deep-seated drive to transcendence underlies the aspirations and individualism of transhumanists. If transhumanism is the lunatic fringe of techno optimism, it is also a symptom of deeper and more general confusions in this culture, which originate in the rejection of the human condition. This drive includes revulsion at bodily functions like defecating, and at the frailties, grossness, limitations and aging of the flesh. The eventual decay and recycling of one's own form provoke moral indignation at the fact of embodiment. These are spiritual anxieties in a technological garb, little different from traditional religious sentiments echoing archaic concerns. It would seem that the ability to conceive life as it could be has forever poisoned the human psyche against simple acceptance of animal existence. Transhumanism is the modern secular

voice of this idealist protest, a spiritual cry in the wilderness:

> We do not accept the undesirable aspects of the human condition. We challenge natural and traditional limitations on our possibilities. We champion the use of science and technology to eradicate constraints on life span, intelligence, personal vitality, and freedom. We recognize the absurdity of meekly accepting "natural" limits to our life spans. We expect life to move beyond the confines of the Earth—the cradle of human and transhuman intelligence—to inhabit the cosmos…142

Transhumanism shares with religion a wariness of life in the body as it is—indeed, of all limitation. The early Christian communalist movement, with its emphasis on brotherly and sisterly love, sexual austerity, and spiritual transfiguration, viewed the body as poised on the brink of a vast transformation, which would dissolve sexual differences.143 Such sentiments are alive and well in the transhumanist vision of future society. Far from being genderless however, this vision is rather an assertion of heroic masculinity. But what could sex even *mean* for a disembodied mind, or one equipped with an artificial body?

The Tin Woodsman, the Cowardly Lion, and the Scarecrow could well serve as cautionary figures in a postmodern allegory. Elaborating on Baum, we might imagine the Tin Woodsman as a bionic conversion —a man who has been modified into a robot through transhumanist technology. (Perhaps some homeless brain was informationally transferred into a mechanical body.) In the *Oz* story, he seeks to recover a "heart"—that is, a relationship to other beings based on biological kinship and the emotions deriving originally from embodiment. His mind was downloaded but not his heart, nor presumably his sex, which were somehow lost in translation.

The Cowardly Lion has been genetically engineered, but something is missing in him too: courage. He is designed to be physically superior, but it is the moral loftiness associated with the real effort required to overcome one's limitations from within that is lost. He lacks conviction and self-confidence because he knows his body is an artifact, a mere tool of someone else's purpose. Since he did not self-create, nor evolve naturally, he lacks his own intentionality, purpose, and reason for being.

The Scarecrow is made of generic stuffing, the abstract universal material that is the ultimate engineering dream and the ideal of nanotechnology. He could represent the quest to rearrange matter accord-

ing to whim, and to create life and intelligence from scratch. He is made to look like a man, but the resemblance is superficial; he doesn't even fool real crows. This symbolizes the folly of the top-down approach, and the fallacy of simulation. What the Scarecrow lacks is a brain: a real, fleshly one, indefinitely complex, which can only evolve from the bottom up. The Scarecrow was created to simulate a human being, to provide the illusion of reality. But, as with Pinocchio, it is authenticity itself that is lacking.

There can be little doubt that transcendental ideals have served a positive function in the evolution both of society and of individual identity. The individual is the rival of the "selfish gene"; but in the system of nature, the individual scarcely counts except as a statistic. The shift in allegiance from genotype to phenotype is already the foundation of culture and may in part explain the embarrassment about sexuality in some cultures, since sexuality is ruled by genetic conditioning.

A sociobiologist might argue that all human institutions are bound to natural origins and could not arise or persist without conferring a genetic advantage or at least not being disadvantageous. Fair enough. But this is rather like saying that play ultimately serves the reality principle. That may be true in many instances, but this does not mean that play can be *reduced* to its utilitarian functions. Like mathematics, play is its own domain, with a convoluted and rich relationship to reality. Humans have been so successful on this planet because they are able to implement thought to create an environment for themselves that is not completely determined by the constraints of survival, the scripts of biological matter, or the seemingly arbitrary and often bizarre suchness of found reality. And whether this advantage accrues from a true freedom of will or by means of an extremely sophisticated determinism is a moot question, since these are hardly mutually exclusive. The real point is that we seem to fare better as apparently free spirits in our self-created cultural realms, with or without modern technology, than as brute slaves to the system of nature.

Freud articulated the contradictions of being a highly social, self-conscious animal with a layered being, rendering the psyche a battleground between instinct and morality, between competitive individualistic impulses and the need to live cooperatively, between a lower and a higher self, pursuing animal goals through the spiritualizing need for cooperation, compromise, and restraint.[144] Such insights have been elaborated by sociobiology. Our moral and spiritual pretensions,

however, do not arise exclusively from our nature as social animals, except insofar as consciousness itself ultimately does. It is not *only* the need to live civilly with others that motivates morality or leads us to repugn selfishness, but a more general rejection of animality, embodiment, mortality, conditioning, determinism, finiteness. That we do not accept being bossed around by our genes and the laws of nature stems from a self-conscious passion for freedom and ideality.

While Freud's purpose was to create a science out of his speculations, Nietzsche envisioned a new morality. Both were Victorians, drawing on the Darwinian revolution and the liberating nineteenth-century optimism of positive science. But whereas Freud, the realist, tended to pessimism regarding the human condition with its built-in contradictions, Nietzsche's idealism led him to enjoin that the human condition should be entirely transcended: "Man is something to be overcome." Though he had no notion of achieving this technologically, Nietzsche has been adopted by transhumanists as their visionary forerunner. In mid-twentieth century, his themes were taken up in more contemporary language by the futurist Robert Ettinger. The rejection of life in the body was given technical credibility in Ettinger's portrait of Super Man as a biologically altered human, whose godlikeness was proverbially next to cleanliness. Future human bodies could enjoy a more hygienic plumbing; thanks to zero-residue foods, excretion would be all but eliminated(!)[145] The so-called anal character is casually known as an obsession with order and control, but it also reveals a deep concern behind Idealism. Excretion seems to demonstrate

> the sheer *nonsense* of creation: to fashion the sublime miracle of the human face, the *mysterium tremendum* of radiant feminine beauty, the veritable goddesses that women are... to take such a miracle and put miracles again within it, deep in the mystery of eyes that peer out... to do all this and combine it with an anus that shits! It is too much. Nature mocks us…[146]

That is, nature mocks the ideality Man puts forth to rival her! Ernest Becker makes a shrewd observation that "children toilet-train themselves." After an initial fascination and symbolic play with bodily waste products, they are as interested as adults in symbolically repudiating the realities of the body. Toilet training is an early experience of the attempt to transcend embodiment. Through it the child learns to deny what the anus represents:

> that in fact, he is nothing *but* body so far as nature is concerned... The

anus and its incomprehensible, repulsive products, represents not only physical determinism and boundness, but the fate as well of all that is physical: decay and death... [T]he upsetting thing about anality is that it reveals that all culture, all man's creative life-ways, are in some basic part of them a fabricated protest against natural reality, a denial of the truth of the human condition, and an attempt to forget the pathetic creature that man is.[147]

I would only add that it is not simply an attempt to forget or repress an unpleasant reality, but also to construct in its place an idealized substitute.

The ultimate in cleanliness, of course, would be to have no body at all. Apart from hygiene, the advantages of existing as pure information would include immortality (perhaps through back-up copies of the mind, if cryonic preservation of the brain does not pan out), teleportation (fax yourself to another galaxy), and choice of custom embodiment, designer-matched to the occasion (X-man ditches his natural body to become the *program* animating remote robot interfaces.)

These are exciting concepts—if you are male, under thirty, live in your head, and have little political awareness or feminine influence in your life. A dualism is suggested within masculinity itself: between Dionysian and Saturnian forces.[148] But male-created history is a dialectic of the energetic *and* consolidating aspects of the masculine. It would be grossly misleading to identify patriarchy with the Saturnian (older and controlling) aspect only. The domination of history by men includes the youthful, rebellious, restless, positing, inventive Dionysian aspect as well. This is just what the transhumanist vision expresses; it appeals to young males and promises a major strengthening of the masculine stranglehold on the collective consciousness, in spite of its anarchical individualism. The Dionysian forces are hardly opposed to the Saturnian; they are the two arms of masculine power.

It seems unlikely that the human race could ever act with unity to determine its own future through eugenics; at present there simply is no such unity. A particular nation, race, class, or faction might succeed, however, in dictating the terms of that future to others. It might also be argued that this very disunity is one of the problems eugenics could overcome. We could breed ourselves into greater homogeneity and accord. To say the least, this would have its genetic as well as political dangers, given that both genetic and cultural viability depend upon diversity. The imposition of an ideal type through genetic engineering could be disastrous in the way that monocultures of all sorts threaten to

be, not only through vulnerability to disease (the evolutionary reason for genetic diversity in the first place) but also because it might enshrine maladaptive or destructive traits, while removing genetic alternatives. We may already be suffering the consequences of such traits bred into ourselves through urbane values. The prospect of consciously directing evolution through eugenics implies either the responsibility of second-guessing what variations are actually adaptive or of determining some ideal to which we should all adhere for other reasons. In the first case, moral life is reduced to ratifying natural selection. In the second, the moral horizon might recede endlessly in debate.

"Would $30,000 be too much to pay to ensure that a child would be born healthier or wiser, in some way, and better able to compete in the world?" asks a molecular biologist and futurist.[149] This is a salient question, if you are rich in a rich country and the costs to be counted are only financial. And it could be argued, as it was by Nazi eugenicists, that the failure to pre-select against various medical conditions is unbearably costly to a society that is obliged to care for the handicapped or ill.[150] Such arguments are nearly irrelevant to the world's impoverished masses, however, who go without adequate medical care in any case.

Why not simply bite the bullet and accept that eugenics will be a handy tool of the ruling elite in a world inevitably bound for extreme class divisions? In a chilling but plausible account of the near future by the above author, there are two biological classes, genetically divergent enough that they can no longer interbreed, and psychologically different enough that the superior race, at least, would not want to. About ten percent of the population has all the wealth and power by virtue of genetic superiority, through abilities that are superhuman by present standards. They would include all the familiar social types and careers, each enhanced with specific genes to give them an edge in their respective fields, not only in competition with each other but, more to the point, in lording it over the other ninety percent. It is hard to see, however, how any person could be "born wiser." This sort of slip betrays an overweighted faith in genetic factors and implicitly equates competitiveness with wisdom, happiness and success. Why not rather wish your children more loving and better able to contribute to a humane and just world, for instance?

It would be difficult to open the door to eugenics only slightly. Once a rationale is in place for improving some aspects of genetic makeup, there are no clear indications where to draw lines. I am arguing less against eugenics, however, than against the unconscious

assumptions and motivations that are likely to underlie *all* technological manipulations before wisdom has indeed caught up with technical savvy. There is behind these assumptions an inviolate core of identity and values, which wills to transform aspects of embodiment considered peripheral and "not-self." What right does this usurper have to speak for the whole organism and its destiny, let alone for the whole species? The very concept of eugenics expresses the power relationship of control over the 'other' and the 'environment,' without the balancing reciprocal influences of these latter upon the so-called self. "Self-transformation," whether through spiritual or technological means, is an oxymoron, since self can act only upon the *not*-self, and can *be* transformed only by the not-self.

Eugenics is another expression of masculine will aspiring to play god. While it might be right to improve the human genome in certain ways, it is doubtful that consensus could ever be reached on such matters, and frightening that the majority should presume to decide the fate of minorities. Worse still is the likelihood that such decisions will be made by an invisible elite; or not be consciously addressed at all, but made incrementally and by default in the marketplace by consumers and by technicians pursuing shortsighted goals.

Nevertheless, given the billions of dollars North Americans already spend on cosmetics and psychotropic drugs, a commercial eugenics civilization may be all but inevitable, as parents will seek to artificially enhance their progeny, just as they already do their own looks and moods.[151] While it is never impossible to refuse new technologies, or to discriminate in their use, the ratchet effect of keeping up with the Joneses in a frivolous culture works against refusal. No one, after all, considered shortness of stature a disease until human growth hormone was promoted commercially as a "treatment" for it.[152]

Gene therapy as currently practiced is not eugenics. It does not propose to engineer a new race, but merely to correct deviations from the natural norm. Moreover, it is often argued that genetic "engineering" is really but an appropriation of naturally occurring bacterial maneuvers.[153] But the notion of genetic defect does presuppose an ideal of perfection in which we are already culturally steeped. It was first established in the nineteenth century that ideals of feminine beauty all over the world, for instance, are a matter of perceptual averaging—that is, a minimum of deviation from the norm. The fashion and advertising industries have taken this to heart, flaunting models who look more like mannequins than like anyone in particular. Makeup, airbrushing techniques, and now computer image enhance-

ment idealize the human form. The promise of genetics to live up to such ideals may prove overwhelmingly tempting—especially to a sedentary society with no discipline to moderate its consumption of anything. Moreover, since the ultimate goal of technology is complete control of matter at the molecular level, it is not so far-fetched that the technical domination of nature would seek to include every aspect of human constitution, molecule by molecule. As one zany commentator reports; "no one in his right mind... is going to want his old body back."[154]

5.2 Immortality

The fragile crucible of consciousness, new on the evolutionary scene, could scarcely contain for long anything within it as big as the idea of 'God.' Perhaps it is with good reason that the human psyche has projected the divine outside itself and always considered claims of divinity to be blasphemous. For, secreted within the worship of God are covetous pretensions to godhood itself. "Man is becoming God—that is the simple fact. Man is God in the making." The author of these words goes on to inform us that "those who see in National Socialism nothing more than a political movement know scarcely anything of it. It is more even than a religion: it is the will to create mankind anew." The author is Adolf Hitler.[155]

Transhumanism is nothing if not the will to create mankind anew. And chief among divine attributes to be emulated through technology are omniscience, omnipotence, and immortality—masculine aspirations from the beginning. Curiously absent are benevolence, love, and spiritual surrender, more identified with the feminine. Transhumanism, apparently, is not the quest for Super Woman.

Unlike lesser accomplishments, such as space flight, which merely imitate and extrapolate natural functions of other creatures, a true expression of transcendent powers would be the conquest of all-too-natural mortality. Death has always been the body's final slap in the human face, and no amount of wished-for reincarnation, resurrection, or life after death can truly make up for it. Only literal triumph over the grave will do. And so, foremost on the transhumanist program is the project of eternal life. The advance of technology closes rapidly on imagination, so that Super Man is no longer merely a figment of spiritual longing but a seemingly plausible goal. Immortality could be the ultimate engineering project.

According to Freud, preoccupation with death is at the core of all

civilization. It begins with the infant's difficulty to accept separation from the mother, and ends with the difficulty to accept separation from the life of the body. We cannot accept death for the same reasons we cannot accept incarnated life in nature. The connection between them reminds us of Buddha's teaching that all suffering results from birth. Birth leads to life identified with the body, which, through lust, leads to more birth before it ends in death. For the East, the goal has been to relinquish identification with the mortal body and be freed from the tedious cycle of incarnation. But Freud was no metaphysician; as a Westerner, he could never reject life in principle, or in favor of some bloodless Nirvana. His focus was not on the existential significance of entering life identified with a body, but rather on the infant's early formative experience of trauma and dependency at leaving the womb. Death, according to him, is abhorrent because it resonates with infantile helplessness.[156] Freud the Victorian scientist and humanist could not take seriously the religious annihilation he pejoratively understood as a longing to return to the womb, nor the future life of an immortal soul he understood as wishful thinking.

Unlike humanists, transhumanists abhor what they consider the untenable position of apologizing for mortality:

> It is understandable that people make excuses for death. Until recently there was absolutely nothing we could do about death and it made some degree of sense to create these comforting philosophies according to which dying of old age is natural and good. Such beliefs used to be relatively harmless. But they have outlived their purpose. Today we can begin to foresee the possibility of eventually abolishing aging and we have the option of taking active measures to stay alive until then, through life extension techniques or cryonics. [157]

Ironically, transhumanism is little more than another "comforting philosophy," riddled with contradiction. Cryonic preservation, for instance, is hardly a measure to stay alive but is a lawful practice only after the party has been pronounced legally dead! Most often the head alone is frozen, on the dubious assumptions that it contains the essence of the person; that future technology will somehow be able to restore to it a new body; and that someone in the future would bother to do so. In truth, we are no closer to immortality now than a thousand or a million years ago. The imperative behind all of this, moreover, is sentimental attachment to personal continuance, the psychological counterpart of the genetically programmed compulsion to stay alive at any cost. It is less futuristic than archaically driven. But where does this attachment to

psychic continuity come from, and with it the revulsion toward death? Does it derive, as Freud would say, from early experience? Is it, as Kant would say, a priori? Is it, as the Buddhists would say, based on delusion?

The bottom line, I believe, is that one cannot really imagine ceasing to exist—an end to consciousness, as opposed to the body. The body's finish may be viewed as just a change of scenery or of actors, whereas the mind's finish is the end of the play. For consciousness to try to imagine its own end is like trying to picture what lies outside the universe or what existed before its origin. Self-consciousness fancies itself in the paradoxical position of hanging around to savor its own absence. Thus, while we can imagine the act of dying we cannot imagine *being* dead. Even in imagining my body rotting away, I am implicitly imagining my consciousness still active to witness it. Convinced of its own indelible existence, the epistemic ego appears to itself able to withstand any transformation, even the death of the body upon which it depends.

Everything in our perception and thinking is touched by our animal origins and adaptation to the physical world, and tends to be conceived in literal and provincial terms. This includes our expectations of perfection and immortality. As Xenophanes observed, concepts of gods and of heavens and hells tend to be very human and mundane, mere projections of the experiences, concerns, desires and fears of this life. The tendency, therefore, is to imagine the imagination's resiliency and the mind's ability to self-transcend as the continuity of an actual entity: the soul, conceived as a subtle, quasi-physical body that can survive death. The hope for immortality intuitively expresses in one fell swoop the body's survival mandate, the reifying concreteness of imagination, the inherently transcendental nature of consciousness, and good old wishful thinking.

The denial of death, so much a part of religion and all culture, has found a new lease in technology. The project of immortality, which heretofore could only be longing exerted through metaphysical belief, has come to seem a legitimate engineering problem. Before the twentieth century, human energies were engaged, in one way or another, to suppress the awareness of mortality. Now they are engaged to defeat death itself through a variety of technologies, which range from conventional medical and genetic research on longevity to cryonics, cloning, transcription of the self into other formats, and resurrection of the dead by computers. Apart from the question of whether these latter-

day strategies are technically feasible, there remain underlying fundamental questions begged by all such enterprises. Is mortality a necessary feature of life? Is immortality really desirable? Is it for all or only for an elite? But to turn these issues the other way around, we could ask rather: how can death be accepted as natural in a world committed to flight from nature and mortality?[158] And what is the significance of *selves* that they should or should not continue forever?

A company offering cryonic services includes in its sales pitch the invitation to contemplate a world in which brilliant personages such as Newton, Lincoln, Goethe, Shakespeare, and Einstein would remain alive to enrich our world for centuries rather than mere decades.[159] By the same argument, however, we must contemplate a world in which we might forever be stuck with the likes of Al Capone, Hitler, Stalin, and Jack the Ripper. The cryonics movement counts on the long shot that vaults of frozen bodies (or, in most cases, just the heads) might withstand geological, political, and economic upheavals long enough for science to find ways to restore them to life. It remains unclear exactly why future scientists would want to perform such demanding procedures, beyond the first interest of scientific novelty, or why future society would allow them to do so in a world already suffering from overpopulation. Even if the ultra-rich could buy their way to eternal life, through cryonics or interminable organ transplants, future society would hardly be enriched thereby unless brilliance or greatness is redefined as the ability to amass fortunes.

A current science fiction theme that has made its way into recent films is the idea of growing human clones in vats or artificial wombs. In Hollywood's imagination, these can be used to provide fresh copies of your body to which your mind, personality, or soul can be transferred. Alternatively, they could be used as doubles for VIPs. A high-ranking political official could thus have cloned decoys; and, by the same token, an impostor could usurp his or her place or gain access to restricted areas or information. Your deceased spouse or child could be re-created from their toenails, as could you. Brainless clones could be produced for replacement body parts for their cell donors; apparently at least one scientist claims he will be able to do this within the next few years.[160] It is already feasible for a woman to bear a child who is a clone of herself. This child would technically be her late-born identical twin, genetically the child of her parents.[161] It certainly would not be *her*.

Concerning identity, "replacement arguments" can only go so far. A wooden leg, for example, is not a true replacement. If I had two

wooden legs, two hooks for arms, two glass eyes, etc., it would become increasingly difficult to say that I remain the same person, let alone the same body. Could I have a wooden brain? A mistaken assumption informing replacement arguments is that true analogues of anatomical parts are possible and can function together as a true analogue of the original whole; this is the problem with Frankenstein's monster. Another fallacy involves the retreating identity of the person losing natural parts or functions. While we still consider a quadriplegic to be a person, it is unclear how many *mental* functions can be lost before one loses status as a human person. Pushing to the extreme, the idealist assumption (of a soul, for instance) is that identity resides somehow interior to *any* contemplated loss, and therefore to any part of one's body or mind. But this cannot actually be true, if materialism is true.

The mad scientist's concept of achieving immortality through transferring the informational content of the brain to a fresh body is a high-tech version of the replacement argument. It proposes exhausting the brain informationally through transection, layer by layer, like peeling an onion.[162] Even if this could be somehow accomplished nondestructively, it ignores the interrelationship between "layers," which are artifacts with no real existence in the brain. How, then, could they be reconstituted in a living, functioning whole? Life and brains are about connectivity, not isolated parts, and it would take an intelligence many times more powerful than the human mind to exhaustively analyze and model the connectivity of the brain that is being transposed (if such exhaustiveness were even possible in principle). Why bother preserving a mere conventional brain that has been rendered obsolete by such a vastly more intelligent surgeon? The whole argument rests ultimately on sentimental attachment to personal identity—in short, vanity!

There is employment here for contemporary philosophers, to sort out the logical and moral issues surrounding such "cloning," particularly as it inflames the popular imagination. The main appeal, of course, is the prospect of immortality. The concept of downloading your mind into a new body, whether mechanical or cloned, or uploading as pure information stored in a supercomputer, is glibly proposed as the equivalent of making backup copies of a computer file. While inspired by the computer metaphor, it is motivated by the ancient quest for personal immortality and fueled by the illusion of egoic existence. But the self is virtual and not physically real in the way that the body is. More to the point, neither the body nor the brain is a mechanism or program in the way that the computer is. From a materialist perspective,

selfhood is merely the accidental and temporary outlook of a particular body. That body is programmed to seek its own well-being, to survive well enough and long enough to reproduce; it is merely the sheaf for the immortal genes. It does not seek and cannot find indefinite continuance but effectively is programmed to self-destruct. The self or ego emerging as an "epiphenomenon" of the body does not accept the body's fate, nor its place within the system of nature; but this does not mean it has or ever can have the power to do much about it. The self is merely a bit of programming with its own ideas, many of which are founded ironically on the body's programming for survival. The loathing of *premature* death may express the body's instinct to survive, which makes sense from the gene's point of view: live to reproduce. The drive to escape mortality at any age and *as a fear of not being*, however, makes no genetic sense, for the sexual system of reproduction *depends* on mortality of the soma. Of course there may also be fear of the pain and ignominy that might be suffered in dying; there may be fear of loss and of the unknown—aggravated, perhaps, by moralizing notions of afterlife punishment.

In any case, like the spiritual notion of reincarnation, the idea of continuing egoic existence through a series of technologically implemented incarnations is nonsense and inherently self-contradictory from a materialist point of view, even while it trades on hard technology. In the traditional spiritual concept of reincarnation, the old identity is left behind in favor of a new embodiment. Body, memory, and every trace of identity and social involvement in this life are abandoned and replaced by a new body, memory, identity and place in life. What, then, is the self that survives from one lifetime to the next if it is not such personal identity? How can "I" claim to be reincarnated if there is no continuity of the subjective sense of being or identity? (I realize the New Age has spuriously solved this problem with "past-life regression" and memories that are supposed to persist from other incarnations.) In the ultimate technological version of this fantasy, a fresh body can be reconstructed, programmed with all the old memories and sense of identity, to carry on from the time of death. This may seem subjectively desirable, but what is the point from an objective perspective? Indeed, why is *this* ego, *this* sense of identity, *this* personality or mind so special? The attachment to "my" continuity may be no more than bias and sentimentality. And if "I" seek a new improved body *and* mind, in what sense would this still be "me"?

Such notions illustrate the general alienated stance of the ego, which prefers to change anything in the world so long as it remains un-

changed itself. This is the very meaning of "power": manipulating the world while remaining unaffected oneself. But while no one in his right mind may want his old body back, no one should want his old brain back either! Old wine is put into new bottles because age in wine is supposed to be good. But in the Darwinian system, the age and accumulated experience of the individual is no advantage, since individuals do not get to transfer their wisdom directly into the next generation. If we are going to create new bodies, why not also create new and self-improving minds to operate them? The subjective obsession with immortality as personal continuity should be distinguished from an objective view of immortality as a long-term means to perfection of the individual, collective, and species over time. The former is an irrational hangover of biological programming—the survival instinct personalized. The latter *could* make sense, if self-perfection were feasible in a Lamarckian system: one in which experience can directly change the organism's constitution, bypassing the system of sexual reproduction and natural selection of random mutations (which system, of course, is the source and reason-for-being of the survival instinct!) In other words, immortality could be considered for whatever benefits might accrue to the collective; but an immortal being makes sense only if it is individually self-perfecting. The tragedy of human mortality is not the disappearance of "I" but the fact that, by the time (if ever) we attain any wisdom, we already have one foot in the grave and little time or energy to put it into practice.

Personal continuity ought to be based on the responsibility to live for the good of all. This parallels the classic Buddhist ethic to work for the liberation of all beings and the advancement of life or consciousness at large, rather than merely for personal enlightenment or salvation. (To put it another way, the significance of enlightenment is hardly that it frees one from suffering. On the contrary, enlightenment as an unconditional relationship to experience may open one to greater suffering.)[163] If one is attached to the personal "story" one is living through, more than to life as an objective phenomenon, this simply reflects the genetically-programmed deception that convinces us we are special. It is more of the mad system of nature. While it may be a natural desire, the notion that "I" should be immortalized, resurrected, or "saved," whether by spiritual or technological means, is grotesquely egoistic from an objective point of view. Perhaps only the person's finest moments or thoughts, or only those of extraordinary people, merit preservation; and then only for the sake of how they contribute to the collective project of ongoing life and consciousness. This is, in

principle, the system of cultural selection already in operation, whatever its faults.

One respected astronomer has proposed an absurdly baroque way to insure immortality by preserving all of everyone's memories.[164] According to this scheme, post-human intelligence is bound inevitably to expand in some advanced form throughout the universe, essentially converting all of matter into mind, or at least into computation. The whole cosmos, in other words, would effectively become a computer, supposedly so powerful that to retroactively simulate all human lives that had ever existed would be a trivial task. Whether or not this omnipotent computer could be identified with God, let alone with a loving compassionate Savior who would be motivated to "resurrect" human selves to eternal life in simulation, it would at least have no evident reason not to do so. The author, who disclaims any religious motivation, thinks it inevitable that we shall all live again in computer heaven, even those who by conventional standards may not deserve to. Furthermore, in order not to leave anyone out, *all possible* lives could be resurrected! But the extravagance of this smacks of the Creationist extravagance of a vast, empty universe dedicated to supporting intelligence in a unique oasis, made outright for the sole benefit of a single species. Such apparent overkill of nature is an effect of supposing that life was created by design. In this scenario, an afterlife *would* be created by design. From a scientific point of view, however, life is not an intentional creation—which is precisely what makes it real, rather than simulated, in the first place. According to present scientific understanding, the cosmic coincidences leading to life did not *aim* to produce life, let alone consciousness or our individual personalities. By the same token, if such an infinite cosmic computer managed to evolve itself, as astounding as that event would be, *we* might be completely without significance to its own vaster perspective.

The quest for immortality is based on the subjective *sense* of self as significant and existing apart from the objects of experience, including the body. Perhaps, more than logic, it was the forcefulness of this sense of self-existence that persuaded Descartes he could not doubt his own conscious existence, even though he felt compelled to doubt any particular content of experience. The illusion, specifically, is of a self apart from and against the body as a mere object in the external world. From a materialist perspective, however, Descartes' view of the privileged existence of the conscious ego is simply wrong. If anything is

real and indubitable, it is the body and the world. And if anything should be doubted as illusory, it is one's existence as a conscious self, an ego, which is ultimately nothing other than the first-person perspective of the body. It is the continuance of this conscious self that is mistakenly sought in the quest for immortality. It would be far more logical to seek the immortality of the body!

By definition, an immortal body would have to learn and evolve in a Lamarckian way (rather than through selection across generations). It would perforce be able to make much greater use of its learning, having indefinite time to do so. It is possible, even probable, that this prolonged learning would lead to some kind of wisdom, a possibility reminiscent of the notion of the soul's progress through successive reincarnations. This concept of soul, in fact, is the intuitive version of an immortal Lamarckian learner! Ego, of course, is a mental construct serving the interests of the mortal body. If those interests were in fact secured with a more invulnerable organism, then defense of the body and its priorities might be less of an issue. Unlike the immortal gene and the gene-driven body, which is a product of mortality, an immortal body should tend toward selflessness and disinterest rather than self-preservation.

The system of sexual reproduction is the *sine qua non* of higher life forms. But this system depends upon selection of more adaptive varieties across generations; it depends, in other words, upon the limited life span of individuals who must be expendable in principle. Then too, the development of a complex organism requires that some of its cells be willing to sacrifice their theoretical immortality for the sake of the collectivity that is the organism. Thus, most cells are programmed to die at some time during the career of the organism. The development of the fetus, for instance, can only take place because of the willingness of certain cells to be pruned out of the elaborating form. Similarly, the immune system depends upon the kamikaze willingness of specialized individual cells to die in action. In fact, the only cells in a sexually reproducing organism not programmed to die, after about fifty cell divisions or sooner, are the sex cells, which carry genetic material indefinitely into future generations. Fifty cell divisions are coincidentally about the number required to grow a fully formed individual from the original cell.

In the differentiation between the genes and the somatic cells making up the body, which is their vessel across generations, it is as though the genes did not trust their servants to go willingly to the grave at the

appointed time. A program to self-destruct has accordingly been installed in every somatic cell, which may be activated in a number of ways by hormones or other cells that enforce this as yet incompletely understood 'programmed cell death.'

The principles and details of how and why evolution depends upon mortality are important to understand, since they have implications for human projects of immortality. If an immortal being could somehow be produced, it would have to contend in some alternative way with the problem of pathogens, not to mention overpopulation. There is even some evidence that the elderly are more susceptible to disease simply because they have contributed to the adaptations of viruses earlier in their long lives.[165] An immortal being might be increasingly vulnerable, with time, to pathogens ever tailored to its defenses, whereas a sexually reshuffled organism would reset the competitive race of mutual adaptation with each generation. Immortality would require the plasticity and intelligence to adapt to pathogens within the individual lifetime (Lamarckian adaptation) rather than across generations. But a being with an infinite life span could make an infinite contribution to the evolution of the viruses attacking it, and might have to be infinitely resourceful to combat them.

A different sort of difficulty besetting eternal life would be the problem of recurrence. If the universe were eternal, and yet finite, every event of history would eventually repeat. Similarly, an immortal entity living through it all would eventually return to the same state, in a repeating loop of déja vu. Aside from such extremes, it seems clear that a long-lived mind would have to continue to grow to escape the problem of boredom. But given indefinite time, would a mind eventually grow so much as to become unrecognizable even to itself?[166] In what sense, then, would this be the "same" person over time? If what we mean by immortality is continuity of a self, it seems that eternal life would paradoxically preclude it.

Reputation, moreover, would be a serious consideration among immortals.[167] A basic tenet of game theory is that cooperation is favored in situations of repeated contact: we are motivated to behave fairly with those we know we are going to have dealings with again. Eternal life might encourage an enlightened, equitable and ethical society, but could also become a hell from which it is impossible to escape, if things went wrong for you. If you *weren't* decent to others, you would have all the more time to watch your mistakes add up, alienating others who would have all eternity to exact revenge.[168]

The possibility of resurrection after death may console some but has

its ominous side. Those whose philosophy is founded on release from the meaningless cycle of existence might feel they had been dealt a dirty trick. Surprise resurrection of the dead in an overwhelmingly more complex future could be the occasion for sadistic pranks and would constitute a violation of fundamental rights—in this case, the right to not exist. Delaying natural death or extending longevity will not abolish the fear of dying, but may aggravate it. If an anticipated life span is ten times longer, the fear of accident or disease that cut it short might be ten times greater as well.[169]

5.3 Superintelligence

After immortality, the next item on the transhumanist agenda is to extend the mental and physical capabilities of human beings, even to the point of abandoning the human form. Or, alternatively: to create new types of intelligence to supersede the human form. Both assume the mandate of intelligence (in one form or another) to develop indefinitely, and to go forth from this planet even to convert all inert matter in the cosmos into (artificial) intelligence. Following the Biblical injunction to be fruitful and multiply, this echoes an ancient expansionist dream of the ethnic tribe, religion, or nation to extend its hegemony—in this case supposedly transferred to the species as a whole—in a futurist Manifest Destiny. It reflects the masculine project of ascension and sovereignty of mind over matter. While space colonization is seen by some as a practical solution to the problems of overpopulation, pollution, and shortage of resources, others dismiss it as a squandering of resources better spent at home. Above all, it may be a romantic adventure to "go where no man has gone."

Perhaps it is the destiny of a self-conscious organism to consciously choose its biological and cultural direction. But who are the individuals to take charge of such a project, and according to what lights? The concerns of those in political and economic power generally could not be further from the long-term cause of human evolution.

Since masculine ascensionism does identify with consciousness (or mind) more than with biological humanness (or body), an engineered future might well include a post-human phase. Because there are two competing sets of values at cross-purposes here, there could easily be a conflict between the unfolding of post-human intelligence and the fulfillment of old-fashioned homo sapiens. From a classical humanist point of view the creation, witting or not, of superintelligence, and

even of an entire supernature, would represent a loss of control and a defeat of the original intention behind the mastery of nature. People struggled long and hard to rise to the top of the food chain. Creating artificial beings in the name of expanding the values represented by intelligence or mind is a literally heady program that may endanger this place at the top. For some, however, this is no incidental risk but the very goal to be celebrated.

The masculine hubris is to replace nature and her wisdom with artifice and technical cleverness; it is less to study nature for our edification than to reconstruct her. But isn't there something adolescent about relating to nature as a challenge or a set of limits to be evaded?[170] This enterprise is far more romantic than utilitarian, more grandiose than sedate terms like 'engineering' or 'technology' convey. Its sheer exuberance smacks of the heroic exploits of teenage boys. This does not mean that the dreams of power unleashed upon nature do not have a rational basis or that technological progress is simply illusory. The story is mixed, like the motives behind it.

Civilization represents a long-term investment of social energies. Besides requiring more labor, agricultural society called for the alienation of labor and the creation of social disparities. It relied upon the exploitation of animals and a class of human slaves considered little more than animals, with both expressing the general estrangement of subject from object. The willingness to treat others as objects is the internal contradiction within civilization that has always threatened its stability. With the advent of the machine, it seemed that at least some of the burden and alienation of labor had been relieved. Human or animal slaves were theoretically no longer necessary, since machinery could be employed to do their work more efficiently and guiltlessly. Though this has never been the actual purpose or use of technology and industrialization, but only an unequal benefit for some, the machine has become the inert and insentient servant, which neither suffers nor rebels and poses no ethical or political dilemmas. That is to say, until now.

While one agenda in the development of technology would harness the material world to tangible human needs, another is the desire for power over others, over matter, and even the power to create life, to play god. The commercial and military drives behind technology are variations on these themes. While all lead to the domination of nature and people, they have differing implications. As the complexity of machines approaches that of living things, we must ask ourselves what will happen when machines too become sentient? Will they happily

volunteer to be our servants? Or will they compete with us for their existence and struggle with us for freedom as did human slaves?

Having it both ways is not inherently precluded. We *could* maintain a class of machines that are clearly insentient and lack a will of their own, for the purpose of doing the labor of civilization. We could in addition cultivate artificial beings with whom to have ethical and even emotional relationships, who are not for us an *it* but a new *thou*: someone challenging to talk to and share with, rather than exploit. But what if such new beings become enough more intelligent and powerful than we that they are tempted to consider *us* the "it"? Having it both ways means clearly distinguishing the two classes of machine and the two stances of relationship—as well as faith that conscious machines would also value this distinction, which humans themselves have only inconsistently honored. The broader problem is that the modern psyche remains possessed by the paradigm of power or control, which is used for the archaic purpose of domination and status. What reason is there to impute to machines motivations more benevolent than our own or to believe they could guide us wisely?

Transhumanists and other technological optimists ignore the social implications of technology and the political-economic factors which shape its development. Only in the blind faith of a new religion can anyone still gush, as people did in the 1950s, over the prospect that robots will yet liberate "everyone" from poverty and the need to work. Coolly allowing for disruptive unemployment in the short term, one apostle assures us that intelligent machines will guarantee "the comfortable phase of a tribal village" in the middle term. As though it were the ultimate fulfillment of the same promise, we are then offered "the end of the dominance of biological humans" in the long term.[171] Some of us, of course, already live comfortably in neo-tribal villages. Do we represent the future of the world or are we part of what will remain a privileged minority? And why exactly would anyone in their right mind celebrate the end of humanity?

The image of the mad scientist predates even the origins of science in alchemy. The Greeks had portrayed their blacksmith god, Hephaistos, as creating a lifelike bronze automaton. Aristotle argued in support of human slavery, against the possibility of machines for weaving or building, testifying that automation was indeed on the minds of his contemporaries.[172] Roger Bacon (13th century) is said to have created a talking mechanical brass head. But what it spoke seemed gibberish and this apocryphal story bears lessons for the present day. If

we succeed in creating superintelligence, would *we* be able to comprehend it or would its pronouncements seem indecipherable to a natural mind? The brass head is an apt symbol of artificial intelligence without priorities assigned through embodiment in the web of life. It presumes the inherent separability of mind and body that is the basis of transhumanist fantasies:

> Further in the future, if we upload ourselves and exist primarily in the computational world (downloading ourselves into a range of bodies as it suits us), the range of possible forms and their ease of adoption will seem practically unlimited. 173

> Some posthumans may even find it advantageous to get rid of their bodies and live as information patterns on large super-fast computer networks. 174

But mind and body are *not* separable. Indulging the computer metaphor, we could say that mind evolved as the "software" of the body/brain through interactive participation in the contest of natural selection, not through top-down programming by engineers.

The fact that computers are made to imitate aspects of our own thought processes does not make them "think" in any but a metaphorical sense. I do not dispute that computers of the future *could* think; but if they do, I dispute that they will be *computers* in the presently understood sense—that is, disembodied intelligence that merely simulates isolated aspects of human thought or behavior, with no intentionality of its own. For similar reasons, I dispute that human consciousness can live in a disembodied state as information inside a computer. The idea of uploading and downloading minds, as though they were digital programs, is sheer nonsense, derived from idealizing abstract intelligence, "pure mind" separate from the body. Like the soul, this is no more than reified wishful thinking, a wish that is madness itself in spite of its venerable history in religious thought. In fact, the notion that abstract intelligence can upload from an embodied state and download into it is the technological version of the discarnation and incarnation of the perennial soul.

The ideal of pure mind transcends any embodied context in the way that the ideal of the formal system transcends particular algebras, arithmetics, or geometries. The specific "axioms" of the human mind, however, are imposed by its evolutionary history as an organism, that is, by its embodiment. In contrast, the abstraction of pure mind comes with no built-in axioms or initial conditions, no context, no operating system, as it were. Like the discarnate soul, pure (disembodied) intelli-

gence cannot be an *individual* mind, not the concrete mind of a person or creature. Conversely, I doubt that a human consciousness could divest itself completely of its particular individuality and history, or adapt to not having a body or a world to respond to, were that somehow feasible. Such an awkward situation corresponds to what is traditionally conceived as a ghost, a type of entity thought to be frightfully unhappy.

Telepresence is the ability to interface one's consciousness with remote sensors or a remote artificial body. This *is* feasible, of course, if understood as conventional remote control of a machine, which is not an organism with its own purposes. It could go as far as the concept of an exoskeletal robot you "wear" to increase your sensory and motor powers, except that the robot could also be distant from its control interface with your human senses and motor functions. But the operator keeps his or her own body, and the robot lacks its own intentionality. Transhumanists, however, glibly blur these distinctions and consider telepresence just another consumer option or inalienable right of an intelligence which is disembodied in principle. In such thinking, your body is merely a tool to be used by your mind, and it is simply an inconvenience of nature that you are not already able to choose any embodiment you like, including one that is in another place than wherever "you" happen to be stored as "information." But "you," in that case, would in truth simply be another (virtual) program that must be run on a real computer. Either that computer would have its own intentionality—in which case your entire consciousness would be nothing more than a subroutine (a passing dream in its mind?)—or else it would be operated by the intentionality of other agents, and "you" would be nothing more than a data file for *them*.

Freedom from embodiment is a goal closely aligned with the quest for immortality. The notion of the mind as a separable entity (an information pattern, program, or data set), which could be stored as a computer file outside the brain or body, thus gives rise to fanciful schemes for extracting the supposedly required information from the brain:

> The idea is that after scanning the synaptic structure of a brain, we could implement the same computations on an electronic medium that would normally take place in the neural network of the brain. A brain scan of sufficient resolution could be produced by disassembling the brain atom for atom by means of nanotechnology. 175

Would taking apart a computer atom for atom, however, tell us how it works? As Leibniz observed centuries ago, the mechanical structure of a brain (if that even can be grasped) does not necessarily reveal its function. The functioning of a brain, natural or artificial, can only be understood in terms of its intentional organization, since the 'function' of something is a matter either of its own intentionality (if an organism) or that of its creator/user (if an artifact). The intentionality of an organism reflects in turn its relations with an environment of other creatures.

The idea of implementing the brain's "computations" in electronic form rests on the dubious assumption that patterns of nerve discharge can be exhaustively decoded, on the analogy of computer programs, as though they had been programmed in the first place. Computer programs are comprehensible because they *were* created in the first place by human programmers (or by other programs, which comes to the same thing). Moreover, the limited experience to date with self-programming neural networks is that no one really knows how they solve the problems put to them. Nebulous ideas of 'brain scan' and disassembling the brain 'atom for atom' betray the fact that transhumanists, and indeed present scientific understanding, haven't the foggiest notion of what "decoding" the brain's neural networks might consist. Such concepts are mere blank cheques for imaginary procedures, which it is blithely assumed that the progress of science will soon fill in. The metaphysical underpinning for this assumption rests in the abstract idea of 'information,' the foundational concept of computation. Thus a roboticist and futurist asserts that

> a human brain equivalent could be encoded in less than one hundred million megabytes, or 10^{15} bits. If it takes a thousand times more storage to encode a body and its surrounding environment, a human with living space might consume 10^{18} bits, a large city of a million inhabitants could be efficiently stored in 10^{24} bits, and the entire existing world population would fit in 10^{28}. Thus, in an ultimate cyberspace, the physical 10^{45} bits of a single human body could contain the efficiently coded biospheres of a thousand galaxies— or a quadrillion individuals each with a quadrillion times the capacity of a human mind. 176

This line of reasoning glibly ignores the details of molecular, atomic or subatomic description, let alone the complexity of the "surrounding environment" and whatever information is needed to encode the functional relationships involved. In the extreme opposite case, in which it would not be permissible to ignore *any* details in a simulation,

the only possible simulation would be the thing itself that is simulated! This is Borges' conundrum of making a full-scale map of the world, with the obvious dilemma of where to put it. Any simulation along the lines suggested above must be grossly simpler than the reality it simulates; otherwise it would not be possible to compress the information in the way implied. Supposedly, a thousand galaxies with all their inhabitants and their lived worlds and histories could be "efficiently encoded" in the physical complexity (information capacity) of a single human body. It may turn out, however, that a human body could at best encode only itself. Where does the truth lie between these extremes?

Yet the sheer pace of technological development instills an overweening confidence in some. As the same author correctly observes, the most complex machines fifty years ago were simpler than bacteria in behavior. Machines developed in complexity during the ensuing half century to a level which took biology half a billion years to achieve.
177 It cannot be assumed, however, that organisms are machines in essence. Nor can it be assumed that the complexity of machines (isolated systems, as we currently think of them) can ever approach that of living organisms, which implicate their entire environment, and potentially the whole universe, in their relationships. And it cannot be assumed that technological and evolutionary development are equivalent processes based on similar premises. Evolution does not appear to be an intentional process at all. It is not "product development" of particular species, but co-evolution of many species together over characteristic time scales.

The key concepts to distinguish machine from organism are *intentionality* and *embodiment*. No machine, no matter how complex, as yet has its own intentionality, if for no other reason than because this has never been explicitly the goal of its human developers. The tinkering of mad scientists aside, the serious application, and funding, of robotics requires mechanisms that serve human purpose and remain ultimately under control, even if fast and cheap. However, true artificial life, with its own intentionality, *could* effectively evolve through games of selection such as are currently explored in the field of computer simulation known as A-Life. Such entities might then be coupled with physical systems, giving them real embodiment and real power over their own "lives"—and perhaps ours! The absurdity of disembodied minds is therefore to be distinguished from the theoretic possibility of highly intelligent artificial organisms that are products of artificial evolution.

Genetic engineering is one avenue toward embodied superintelligence. A-Life that accidentally "leaks" out of its simulated environment

to find its own real embodiment is another. So is A-Life that is cultured with its own simulated embodiment and then deliberately coupled with hardware; or nanotechnology which is self-programming hardware from the start and which continues to evolve in a real environment. The least likely avenue toward artificial organisms is classical AI, which develops both software and hardware from a top-down approach, and then tries to join them. In the end, however, we must ask what is the *point* of facilitating the evolution of true artificial life, however it is done, aside from the sheer claim to have done it or the hackneyed profit motive? Superintelligent artificial organisms might indeed be the last invention that humans will ever make. If superintelligence could take care of any further scientific or technological development much better than we could, might it not do *everything* better as well? Would there be any further need or place for human life, except perhaps in a zoo?

One of the pioneers of A-Life warns of the impending invasion of the biosphere by artificial organisms:

> Within fifty to a hundred years, a new class of organisms is likely to emerge... the advent of artificial life will be the most significant historical event since the emergence of human beings. The impact on humanity and the biosphere could be enormous, larger than the industrial revolution, nuclear weapons, or environmental pollution. We must take steps now to shape the emergence of artificial organisms; they have the potential to be either the ugliest terrestrial disaster, or the most beautiful creation of humanity. 178

If the possibility of "the ugliest terrestrial disaster" were not troubling enough, there is the added disturbing implication that this is a natural stage of evolution, something just happening by itself and not through the efforts of scientists. The assumption is that the only recourse is the relatively passive option to "shape" this development as though it were inevitable.

Whether or not artificial life could be "the most beautiful creation of humanity," the assessment of imminent danger is correct. Like *ice nine*, Kurt Vonnegut's fictional isotope of water, artificial organisms released into the environment could trigger an ultimate catastrophe, an evolutionary avalanche in which such creatures spread throughout the biosphere, displacing natural species on a massive scale, even to the point of extinction of all organic life. On the other hand, some will argue that these would simply be new organisms. Introduced initially by human hands, they might compete successfully in the existing

biosphere and find a legitimate place within it. Despite their origin, they would in the long run define themselves as natural. It could be argued, even, that this would open a new evolutionary epoch, analogous to the Age of Mammals, and that any mass extinction that might ensue would be no more tragic than the passing of the dinosaurs. Except that the cart has here been put before the horse! The demise of the dinosaurs was not *caused* by mammals, which simply took advantage of the dinosaurs' absence. Nor were mammals consciously invented and introduced into the biosphere to usher in a glorious new chapter in the advance of life! Such heroic apology for scientific madness is reminiscent of Creationism. Only now, at last, the creator is Man.

Mad or not, scientists *are* working from both ends to create new, "improved" life. On the molecular level, efforts are being made through biotechnology and nanotechnology to gain complete control of matter, living and inert. The successful merger of these two disciplines is supposed to erase any distinction between living and nonliving matter and supply the ability to engineer new life forms atom by atom. On the macroscopic scale, efforts are being made to create superintelligent computers and robots, which could exceed human competence a million times over. Meeting in the middle, pure "body" would encounter pure "mind" as nanotechnology attempts to merge with super-intelligence. What golden spike will be driven to mark this final, technological triumph of idealism? A brief moment of godlike power—to be paid for, ironically, by a total loss of control over technology and an end to human ascendancy on the planet? As though creating life were not hubris enough, high-energy physicists dream of creating whole "baby universes" in the laboratory, with the slight risk, incidentally, of destroying *this* one!

The technological "singularity" is a name coined by Von Neumann for change accelerating exponentially toward a crunch, beyond which it escapes control. According to a transhumanist proponent and science fiction writer, this necessarily means the displacement of humanity by super-intelligence:

> Within thirty years, we will have the technological means to create super-human intelligence. Shortly after, the human era will be ended... For me, the superhumanity is the essence of the Singularity. Without that we would get a glut of technical riches, never properly absorbed. 179

Note that the Singularity and "superhumanity" are lauded as the *right* course of development; a mere conventional "glut of technical

riches" (which is very close to what the world is presently experiencing) would represent a failure of human destiny rather than its fulfillment. This is in stark contrast to the vision of classical humanists, like Bacon, of a future where technology remains within humanity's grasp and at its service. Some think we can have it both ways:

> The machines will be dangerously powerful physically and mentally, but can probably be constructed to be law-abiding... There should be few qualms about keeping even very superior thinking machines in disenfranchised bondage. It takes force... to counter inherited needs and motivations... to enslave a human being. Robots, on the other hand, do not have natural survival or any other instincts. Every nuance of their motivation is a design choice. 180

But robots without instincts will not *have* motivation; conversely, any robot with motivation will necessarily have instinct. Indeed, it is a contradiction to speak of motivation as a design choice! A motivation is an intention of an organism as a self-defining system, whereas a design choice is made by an agent outside the system. We must distinguish clearly between machines and robots that are human tools (extensions of the designers' motivations) and machines that are autopoietic systems (creatures with their own motivations). Direct control is possible only over the former; the latter would be controllable only in the conventional and limited ways that natural organisms presently are.

The muddle-headed refusal to make this distinction follows from an idealist bias and the basic fallacy of the computer metaphor; it can lead to sheer absurdity:

> Computers already contain many non-human entities that resemble truly bodiless minds... The chess program's thoughts and sensations—its consciousness—are pure chess, uncomplicated by physical considerations. Unlike a transplanted human mind requiring a simulated body, a chess program is pure mind. 181

But a chess program is no mind at all, and certainly does not have thoughts and sensations! Moreover, a mind uncomplicated by physical considerations is a contradiction in terms; for, the business of mind *is* physical considerations. The concept of "pure" (i.e., unembodied) mind is an idealist delusion. Certainly, matter can *reflect* intelligence without being alive. Your desktop computer is an example. But the intelligence of an artifact is not its own but that of its designers. An artifact would have to have its own intentionality to have its own intelligence. To constitute a mind, it would have to be an organism,

embodied. It would have to be an autopoietic system: self-defining, self-organizing, self-maintaining, as well as self-reproducing. At present, only natural life bears this description.

If we wish to retain control over technology, there will be necessary limits to its autonomy; and this in turn imposes limits to its intelligence, if by this we mean the sort of general and self-interested intelligence we expect from living beings. To set straight one futurist's example, a smart bullet *could* report its origin and its destination, but it could never report *feelings* about its target, mission, or user unless it was only incidentally a bullet (such as a man who happens to be fired from a circus cannon). If it could have feelings and pass moral judgments, its own self-definition might be in conflict with the human user's definition of it as projectile. We could, for amusement, imagine a mercenary bullet, which dutifully plays its bullet role on condition of being paid in some kind significant to itself. But a conscious bullet would be its "own man," and could make its own demands. It might be a tool in the way that animals and slaves have been, but not in the way that 19th-century machines were.

This is less a design choice than a political one. Despite its aspirations, the conventional top-down approach of robotics and "old AI" can *only* lead to tools; the bottom-up approach of neural nets and artificial life *might* lead to genuine artificial organisms with survival and other instincts, because they could, like us, evolve their own intentionality through selection. But then they could not remain under human control. We must choose, while we still can, between what should be clear alternatives: *either* a technology that serves us and remains under our control *or* "the most exalted role" of siring new forms of being that could easily supplant us or bring us into servitude to them. It is silly to hope that truly intelligent machines will "like dutiful children caring for aging parents... provide a long, luxurious retirement for biological humanity."[182] Only clarity of intention can avoid disaster resulting from the naive and confused belief that we can both retain control *and* create an autonomous artificial intelligence.

Nanotechnology is the ultimate engineering dream. It promises the ideal of an infinitely plastic universal building material that is also a totally versatile factory. Supposedly, this material would be completely programmable at the molecular level. "Nanites" would be microscopic robots, available in the gazillions, which could be programmed to manufacture virtually anything at all or to organize themselves into any desired configuration. According to your need, one minute they could

be a bicycle and the next a toaster! Being small, they could be introduced into the bloodstream to serve as artificial antibodies to clean the blood or be sprinkled in the house to clean your carpet, unobtrusively carrying dust and grit out the door at night, like trained picnic ants or helpful elves in fairy tales. Being artificial microorganisms, in effect, they could also be introduced into the body as dangerous new pathogens, set to attack the immune systems of specific targets. They could be the ultimate biological weapon: programmable, instantly adapting smart germs.

Nanotechnology could also be the feasible basis of genuine artificial life, self-organizing at the "cellular" level. The existence of bacteria and cells, as "natural nanomachines," argues for the possibility in principle of self-replicating artificial ones: nature has already done it. Some experts believe the first universal assembler, capable of assembling a copy of itself, will be built within a few decades.[183] But the fact that microorganisms *happened* naturally already does not imply that it is possible to *build* them. It may well be possible to build a (nano)assembler that mimics the activity of ribosomes in assembling polypeptides, for example; this assembler promises an atom-by-atom precision that conventional chemistry lacks. Again, however, the more such entities resemble life, the *less* they will be subject to top-down control. The crucial distinction must be maintained between engineered systems and self-creating systems with genuine autonomy, which would elude control.

There also remains the question of what would power autonomous self-replicators. The computational problem of creating artificial mind is one thing. The problem of creating artificial metabolism is quite another. The chemical storage of solar energy in photosynthesis is a complex and sophisticated process. What equivalent energy source could power the race of machines? Antimatter batteries and super-strength materials such as "Higgsinium," which substitutes heavier negatively charged-particles for electrons, have been proposed as the stuff of exotic artificial life forms.[184] Yet they are more the stuff of science fiction. Nanites might be solar powered, like plant life is through photosynthesis. On a cloudy day, however, it seems that energy could be a fundamental obstacle to active artificial creatures, as opposed to passive artificial plants, unless they followed the path of real life. The analogous obstacle in the development of metabolism for motile animal life was overcome by cannibalizing other self-replicators for the energy they stored. If machines followed suit, cannibalizing other machines (or organisms), this would hardly represent a moral

advance over nature nor a security for humans, but would present all the threats associated with animal as opposed to vegetal life.

The goal of nanotechnology is to render matter completely malleable and controllable at the molecular or atomic level—the ultimate triumph of human will. But if matter had the potential to be infinitely plastic, why does it exist naturally only in certain stable forms? To what extent are physical, chemical, and biological constraints on matter necessary? The dream of complete control of matter is tantamount to insisting that reality must conform to human expectation. It must be *ideal*, not real, and the system of nature must be intentional and not causal, digital and not analog. The reality of matter, however, implies that it may not be so easily reconfigured by the engineer. The evolution of both inert and living matter has followed highly specific paths. If this indicates that few, or no, other paths are available for nature to take, then how can we assume complete malleability? Why, for instance, are there only a certain number of naturally occurring amino acids when more are theoretically possible? What special conditions must be created for the existence of the others, and why has nature failed to create them?

The ideal of the artist and the engineer alike is a perfectly plastic medium. What this means, in effect, is a material with no fixed properties of its own. But the hallmark of physical reality that makes it resistant to human will is the possession of its own properties. Nature makes the rules, not us. The ideal of transhumanism, on the other hand, is to make the rules ourselves; and nanotechnology is seen as the means to forge a deep incursion into nature's territory by gaining direct control over the associations of molecules.

Sometimes the rules can be bent and applied in ways which nature, perhaps in her wisdom, has ignored. This, of course, is what allows the manufacture of the synthetic products of organic chemistry. There is no waste or pollution in nature, however, because all byproducts of living systems are recycled as inputs for other living systems. While they may represent constraints that have been overcome, the products of synthetic chemistry constitute pollutants to the extent that they cannot readily be recycled by organisms or natural processes. Their sudden introduction into the environment by human fiat produces catastrophic change, unlike the natural innovations that occur by incremental evolution within a complex biosphere of mutually sustaining, adapting, and checking organisms. There is no pollution in nature because natural systems exist in slowly shifting equilibrium. The possibilities that exist

at any time, for a natural participant in equilibrium within the system, are limited by all other participants and their interactions. But this is exactly the sort of constraint that human will would resist. Thus a transhumanist can boldly assert, against common sense, that nanotechnology will provide the way to produce any commodity with absolutely no waste or pollution.[185] But why would a chemical process controlled atom by atom not result in the same waste products as the conventional chemical reaction it duplicates? It is not what happens within the isolated subsystem or process that defines pollution, but what happens outside it. What about the energy required to power assemblers and the heat that would have to be dissipated? Whether we clutter the earth with plastics produced by conventional chemistry or with broken nanites and their products, energy is still used, waste byproducts are still produced, and the resulting imposition upon nature is still pollution.

It might be argued that nano-materials, as reprogrammable matter, could ultimately recycle themselves and their waste products, relieving nature of the burden. To be effectively so, these materials would have to circulate within a self-contained system emulating natural principles, a second nature whose outputs to the surrounding natural world would have to *be* natural and in amounts assimilable by nature. Some interesting industrial experiments have been performed along such lines, using conventional chemical processes. Closed-loop manufacturing or industrial ecology mimics the natural recycling activities of ecosystems. Rather than being discharged into the environment as pollution, a byproduct of some industrial process is recuperated and sold as raw material to another industry. That is a crude beginning. *If* such a system could be 100% effective and in place throughout the world, there might indeed be zero industrial pollution.[186] I suspect this would place rather severe constraints on what could be produced, however, and on who could afford to consume it.

The prototype at the heart of nanotechnology is the theoretical Self-Replicating Automaton, proposed in the 1950s by John von Neumann as a means of cheap space colonization. The significance of this concept parallels that of the Universal Machine (the computer) in its generality. A self-replicating automaton is a machine programmed to find and assemble the necessary materials into a copy of itself. The idea is that such a device, sent as a space probe to another planet, could make and fuel several copies of itself to continue on to other planets, and those copies would make other copies, and so forth in an expanding net. In effect, it's a proliferating imitation organism.

Organisms develop within the rich and highly specific environment of egg, womb, and parental matrix. The genetic code is like a key and its environment, the lock. One thinker has used this to argue against the possibility of self-replicating automatons—at least of the von Neumann variety.[187] He concludes that such self-reproducing machines are not feasible, much less inevitable. The environmental matrix of outer space would be extremely poor and hostile compared to the environment of the developing embryo or even the thin primordial soup in which the first self-replicators are supposed to have arisen on earth. Moreover, the spontaneous development of life involves a long history of interaction between embryos and environments. The natural organism stands on the shoulders of its ancestors, while the self-replicating automaton stands only on the shoulders of its programmers and designers.

At the other extreme, another author paints a tongue-in-cheek picture of American suburbia in the nano era. Sunday afternoon includes a bottle of Dom Perignon 1964, which has just been produced in the handy home manufacturing system. He wryly adds that the younger back-to-nature generation, in a reverse snobbism, might bring a bottle of *natural* wine to the family gathering.[188] Humor aside, a germane question is whether it is possible, through molecular engineering, to reproduce the exact nuances of a particular vintage of wine, to the extent that it would be indistinguishable to trained wine tasters from the real thing. The "Wine Test," like the Turing Test, is a subjective argument. To fool human beings is one thing; to fool nature is another. This is an instance of the general problem of simulation: whether the information content defining a wine (for example) can be exhaustively extracted by an outside agent. In reverse, it is the problem of control: how would programmable matter be reprogrammed from the macroscopic scale? How would one, for instance, recall an invading army of artificial microbes? Apart from problems of communication between orders of scale, there would arise the same tradeoff between autonomy and control which applies to macroscopic robots: the more the entities of nanotechnology resemble the real organisms after which they are modeled, the less controllable they will be. Hence the frank admissions of nanotechnology's chief proponent, about the serious dangers posed by self-replicating artificial organisms:

> Dangerous replicators could easily be too tough, small, and rapidly spreading to stop... Replicators can be more potent than nuclear weapons: ...to destroy all life with replicators would require only a single speck made of ordinary elements. 189

More subtle dangers include the possible uses of nanotechnology by an elite to control, and even dispense with, the masses of society. If everything can be produced by nanofactories and all tasks can be performed by intelligent robots, human beings will be expendable both as producers and as consumers.[190] At the very least, the sudden increase in manufacturing capability that nanotechnology promises could produce the sort of explosion of bad taste unleashed by 19th-century mass production. Even assuming the most benign of scenarios, what would humans *do* in a world where all needs are met by machines?

The ideal of complete control over molecular chemistry would certainly have its application to human biology and psychology, promising perpetual happiness and the elimination of disease. As an engineering approach, nanotechnology does not distinguish between living and nonliving matter. It is the ultimate vindication of the view of the organism as a machine, whose parts are molecules. If the machine breaks down, or if you want to modify it, all you have to do is go in and rearrange, repair, or replace some of these parts. The essence of the molecular approach is this ideal of direct and intimate microscopic control, rather than the "shotgun" methods of macroscopic chemistry and physics. But, like other mechanistic approaches, it ignores the fact that an organism is not an isolated and clearly definable unit, but an elusive player in a complex system involving many other players, not to mention complex relationships within itself that may never be grasped.

While molecular technology may be the ultimate theoretical trump card for genetic manipulation, there are more conventional ways to master and expand human nature. According to one geneticist, in vitro fertilization marked the point in history when humans gained control over their evolutionary destiny.[191] Perhaps he means the point at which *males* gained technical control over reproduction? Certainly, the liberation of reproduction from female anatomy would change social relations and satisfy a long-standing male ambition to appropriate this female power. It might also re-open the door to further biological evolution of human intelligence, through increased encephalization heretofore limited by the constriction of the birth canal.

Complete control of human biology at the cellular and molecular levels promises a new phase of human being—the "posthuman"—who is smarter than any genius, invulnerable to disease, ageless and tireless, essentially enlightened, and with "a greatly expanded capacity to feel

emotions and to experience pleasure and love."[192] As irresistible as that sounds, pipe dreams must be distinguished from real possibilities, and the real possibilities must be evaluated in the light of what is wise and truly desirable.

5.4 Subjective Heaven

Transhumanists dream of improving human experience by perfecting, augmenting, or replacing the physical body and brain, as well as by mastering the external environment. One advocate outlines how

> nanotechnology and genetic engineering will eliminate aversive experience from the living world. Over the next thousand years or so, the biological substrates of suffering will be eradicated completely. 'Physical' and 'mental' pain alike are destined to disappear into evolutionary history. The biochemistry of everyday discontents will be genetically phased out too. Instead, matter and energy will be sculpted into perfectly life-loving superbeings. Their states of mind are likely to be incomparably diverse by comparison with today. Yet all will share at least one common feature: a sublime and all-pervasive happiness. 193

The body can be manipulated as an object, and experience can be manipulated through the body. But it can also be manipulated more directly. The ultimate subjective heaven would bypass physical reality altogether. This would be disembodied life in a simulation, where "aversive experience" is simply deleted from the program.

The pharmaceutical industry already offers numerous legal drugs for altering mood and regulating personality. If many people accept this as normal, it is because we live in an age that affirms the ego's right to manipulate experience without adverse consequence. People have always used mind-altering substances, but often judiciously and in a sacred context. The widespread use of drugs for personal, subjective, narcissist or escapist reasons is a modern outgrowth of a trend toward subjectivism that began in the Renaissance.

The idealism behind virtual reality has deep roots, particularly in religion. Certainly Christianity predisposed Western thinking toward idealism, with heaven and hell as virtual realities; Protestantism in particular has conditioned the modern mind to dwell on personal salvation. Why waste effort on saving the material world, when it is a passing phase on the soul's journey and merely the expendable backdrop for working out one's spiritual destiny?[194]

Super Man may be vaunted for bending steel, but he is, ultimately,

subjective Man. His supreme power is the ability to bypass the external world altogether and bend experience with the mind—first directly through imagination, and eventually indirectly, through technologies for manipulating experience. Reality is trumped by approaching experience as a consumer product, a technological artifact. The doctrine that the world is not real, and that you may as well orchestrate all experience as self-stimulation, frees you to shop for experiences just as you would for other products, even to custom-order a personality or life history. In the posthuman world, you can choose to stay perpetually high and be anyone you like, enjoying a "glorious spectrum of new options," which include a designer mix and match of moods, emotional stability, initiative, and euphoria through the use of drugs and genetic therapy.[195] The ultimate consumer freedom is also the ultimate vindication of idealism. There is a range of artificial "realities" to choose among, to live in as an "uploaded" (disembodied) mind; and a variety of robot bodies into which the mind can be "downloaded" should one choose to continue life in the physical world.[196] Reality itself is just another consumer option, a flip of the channel. However, the very fact that such withdrawal into fantasy and solipsism depends on real technology gives the lie to the whole scheme.

Many transhumanists laud the trend toward subjectivization and adopt it as the most advanced phase of their agenda. While physical space will be colonized by life and its extensions, some believe, it will eventually be abandoned for cyberspace.[197] Permanent virtual reality would be the ultimate technological realization of the subjective realm, the new human home. The post-human journey will outlive the replacement of nature by artifact, and even the creation of life and superintelligence, only to relocate permanently from external to internal space, the idealist dream come true. This has even been proposed to explain the lack of evidence for extraterrestrial civilizations: they've already gone to cyberland![198] It is a supreme expression of faith in the infallibility of technology that no one remains behind to mind the shop!

In one quasi-scientific speculation by a legitimate scientist, everyone is to be "resurrected" in cyberspace by an infinitely powerful computer towards the end of time. Each person's experience in this simulated heaven is tailored to please him or her by the vast computational power of the "Omega Point." The entire universe has become artificial intelligence—virtually the mind of God—with nothing better to do than provide each man, for example, with "the most beautiful woman whose existence is logically possible." Reading the logical fine print, it is clear

that there can only be *one* such creature: each man would solipsistically "have" the identical supremely beautiful woman in his private mental space. He himself could also "have" the same perfect "body" as every other man! And why not the same perfect mind and memories? In what, then, would individuality consist? There would be only one perfect man and one perfect woman, and neither would be real. The Ideal, the archetype, perfection, is singular; diversity and individuality lie rather in imperfection.

The real world is imperfect because it is contingent. It cannot answer perfectly to anyone's wishes. A normatively ideal world can only be perfect when it is descriptively ideal as well: when it is an intentional creation, perfect by definition from the outset. Hence, medieval Christian scholars agonized over the question of why the world appears to be a far from perfect place, since it ought to be perfect as God's creation. The whole doctrine of sin and redemption, beginning with the Fall, attempts to circumvent this difficulty without admitting that the world is imperfect precisely because it was *not* intentionally created. At root, the problem is the gulf between the ideal and the actual, between human and natural order. Man suffers because reality, including the reality of the body, does not conform to his ideas and wishes.

If it was not possible for an omnipotent God to create a perfect world in the past, why would it be in the future? The answer seems to be that God too is a work in progress. The Omega Point is initiated as a human project, which attains infinite powers in the far future: it *becomes* God, in effect. The obvious heresy of this view is mollified by the sophistry of having the Omega Point appear to exist out of time—that is, eternally and even now while not yet: the classic idealist trick. In spite of the mathematical arguments for the claim that nature is to be finally reconstituted as mind through technology, the underlying metaphysics is less a scientific theory than a doctrine of salvation.

Being idealists, transhumanists blur the distinction between simulated and actual environments. They hold (with Descartes) that experience is simply experience, whether of the real world or virtual. But Sartre decades ago identified the key difference between the real and the virtual (in his terms, between sensory and eidetic images).[199] And that difference is *detail*. Limited information is encoded in the imaginary scene (of a dream, for instance) compared to the real one. Only in a cursory way does the mental image resemble the reality of which it is an image. And when inspected for further information, the mental image reveals nothing more than was already available to the mind and encoded in the image in the first place, through contact with the real

thing, perhaps elaborated in imagination. The image is an artifact, an icon, a product and representation of one's limited existing knowledge of the thing it pictures; it cannot be searched for new information that is not already actually possessed in some form. New information can only come from further exposure to the real thing itself, which may be the repository of unlimited detail. The crucial difference between propositional knowledge (which is the basis of simulation) and analog reality is that the former, being finite and intentional, is informationally sparse, while the latter is informationally dense, and perhaps infinitely so.

This difference could form the basis for a sort of test of phenomenal experience. The Turing Test, recall, assesses whether a (possibly) simulated mind responds to questions with the depth of a human person. The same concept could be applied to the investigation of "apparent reality," to determine whether it is virtual or real. Instead of asking verbal questions, one could query simulated environments in the ways that scientists probe the real environment. This could take the form, say, of experiments performed within the suspected simulation. The results could be analyzed to assess whether the apparent environment is real or simulated. If answers to such queries could not be distinguished from the sort of results obtained by probing physical reality, then on Turing's principle either the simulation should be considered real or reality should be considered a simulation!

In probing either a simulated mind or a simulated world, one is trying to determine whether the system is finitely mechanical (a program) or has the potentially unlimited responsiveness we associate with real physical matter as well as with conscious beings. Note that the Turing Test presupposes that one can *in principle* tell the difference between reality and simulation, but goes on to stipulate that, where one cannot, the simulation may as well be considered real. In one sense, to pass the test, the simulation need only be good enough to fool humans or their super-intelligent computer surrogates. (This is admittedly a subjective criterion and could simply define a spiral of one-upmanship.) A simulation of reality would be ultimately realistic if, like physical reality, it could generate an infinite depth of detail, so that attempting to model it would pose a challenge indistinguishable, to humans and their extensions, from that of modeling reality. Some are convinced this will be possible in the very distant future, where is it estimated that all possible visible universes could be replicated down to quantum-level detail, when computer capacity reaches ten to the ten to the 123rd power bits. Supposedly, the capacity of the "Omega Point" will greatly exceed this in the distant future.[200] This presupposes,

however, that knowledge of physical detail, and physical influences themselves, will not exceed a quantum threshold in the future. It assumes also that reality can be appropriately compressed. Furthermore, the reason proffered why this computation capacity will be virtually infinite assumes that intelligence will inevitably engulf the cosmos, turning it into a vast computer. This possibility depends on the questionable assumption that the universe will collapse under its own gravitation in the far future.[201] Not to mention the problem of modeling a universe that contains the Omega Point!

A desired experience is not the experience of a desirable reality. The idea behind simulated heaven, in contrast to a real utopia, is to conjure a desired experience subjectively—not as experience of a desirable real world. If you believe (as I do) that truth corresponds to a mind-independent reality, then subjective heaven would be a lie even when brought to you, ironically, by hard and real technology. The difference is not, as in *The Matrix*, a choice between two pills; it is rather a choice between pill and no pill.

Transhumanism, like science fiction, is important because it carries mainstream attitudes and currents of thought to extremity where they can be more clearly seen. Like our notions regarding extraterrestrial life, ideas of transplanted minds and virtual worlds force us to examine misguided concepts of body, mind, nature and reality. Conversely, a clear understanding of fundamental concepts such as reality and illusion, and of fundamental relationships, such as between mind and body, can help to sort out what is feasible in futurist technology and what is pipe dream.

Granted the computer metaphor, a human mind, so to speak, is software for running a human body in the real world. Its referents, images, vocabulary and values have to do with the body in its environment. Moreover, the mind's fundamental orientation is external; its core allegiance is to reality. The concept of reality is a function of embodiment, and the very meaning of 'real' has to do with physical survival. A "transplanted" or disembodied mind, however, is *just* the software, so to speak. What would happen to a mind that somehow lost its body? Even transhumanists recognize this as a problematic situation:

> To remain sane, a transplanted mind will require a consistent sensory and motor image, derived from a body or a simulation. Transplanted human minds will often be without physical bodies, but hardly ever without the illusion of having them. 202

Could illusion ever suffice to a mind that is genetically, and perhaps philosophically, committed to reality? It might be argued that human beings sit on the fence of this question, some favoring reality and others illusion. But, unless you are a die-hard idealist, you will admit that even the endless debates of philosophy are the indulgences of embodied minds, carried out in the real world.

There is no doubt that virtual reality can be made ever more realistic and that the illusion of having a different body and world can become an ever more convincing entertainment. Nevertheless, however close the approximation, there remains an infinite gap between the real-seeming and the genuinely real. "Remote" experiences are real because they are experiences of the external world by an embodied person using extended sensing devices. Even if the (robot) body providing sensory input is surrogate, one still has (is) one's own natural body, the source of one's intentionality. Virtual experiences, on the other hand, are experiences of simulations and not of real environments. The case where a disembodied brain is connected to a real artificial body may be problematic, but is clearly different from the case where a disembodied brain is connected to a simulation.

The willing suspension of disbelief during a conventional entertainment—a play or movie, for instance—remains willing throughout, lest the entertainment fail to entertain. The theatergoer does not lose the distinction between fiction and reality, but voluntarily and temporarily brackets it. To move permanently to cyberspace would supposedly mean forfeiting this distinction and any possible meaning it could have. Simulation might substitute so convincingly for reality that the mind in question could no longer tell the difference (especially if it did not intend to in the first place) and would lose all motivation to look for it. The eagerness of the human mind for such entrapment, and its vulnerability to deception, is attested by the alarming number of hours North Americans spend in front of the TV and their toleration of the far-fetched manipulations of screenwriters, spin doctors, news and advertising—not to mention their political leaders. Yet the fact remains that even TV addicts have a real life to return to.

The idea of downloading one's mind into a simulation is motivated by the desire for freedom from real embodiment, for which is substituted controlled experience in an artificially benign, if unreal, environment. This substitution presumes, of course, that one remains in a position to specify the virtual reality. But this involves a paradoxical dilemma. Once I become nothing but a subprogram in a computer, how will I control the simulation it runs? How else but with my body

will I prevent someone, who has remained "behind" in physical space, from controlling my simulated environment in a way I do not like? What if I change my mind and want back into real-time where I can reprogram the simulation or exit it? On the other hand, if somehow I retain that control, will I not always be dogged with the knowledge that the simulation is an illusion I control? One cannot have it both ways. Reality is real precisely because it is beyond "direct" manipulation; real experience passes through a feedback loop, which includes a real environment that is external and independent. To know that one lives in an illusion, however cheery, would itself be a form of suffering. One can ignore such knowledge (as many addicts do) but one cannot escape its real consequences.

If experience could be shaped *only* by changing the external world, one might be captive of an all too real world. Presumably this is the state of animal existence, the stifling constriction imposed by nature that constituted a primal motivation for the search for subjective freedom in the first place. But the other extreme would be equally stultifying: entrapment in a humanly created (or computer-generated) illusion. The essence of self-consciousness is that it resists any confinement at all.

Natural minds exist to confront real environments; and subjective consciousness was a genetically favored strategy in that confrontation, even if it has gone on to establish its own realms and priorities. To take subjective freedom to the extreme of bypassing the interaction with a real environment would be self-defeating madness.

5.5 Hubris and Heroics

Before the Renaissance, people sought the authority of the Church and the past for direction. They looked to the prophets, apostles and early Church fathers, to the classical poets and philosophers and, of course, to tradition. With the humanist rise of subjectivity, they began to be more interested in the achievements of their own generation and in the power of consciousness itself. Grounded in Judeo-Christian tradition, the belief in progress, which was to combine so fruitfully with science, was based on trust in the salutary effect of knowledge. 203 Perhaps this faith in burgeoning knowledge and in human ability amounted to a burst of expansiveness after the depression of the Dark Ages. If so, it was eventually to be followed by more sober realizations: that moral progress is a social, economic and political responsibility in a naturalistic world, and that there might be limits to the expansion of knowledge and the material progress the natural world could sustain.

Transhumanism, however, reasserts the faith in limitless knowledge and growth, and the "boundless search for improvement."[204] Though it disclaims any fixed dogma, progress *is* the dogma:

> We who prize moving forward, thrusting past old limits, and seeking new abilities, will no longer be confined by our genetic, biological, and neurological heritage. We will ignore the biological fundamentalists who will invoke 'God's plan', or 'the natural order of things', in an effort to imprison us at the human level. We will move through the transhuman stage into posthumanity, where our physical and intellectual capacities will exceed a human's as a human's exceed an ape's. To fully flower, self-transformation requires a rebellion against humanity. 205

Such overweening confidence was once called hubris. The commitment to overcome all limitations of nature and embodiment, even the human form itself, used to be the province of religion, where it was circumscribed by the authority of God and church, or tempered by the understanding that spiritual power is properly wielded over the self, not over the world. But the rebellion against mere humanity is also a rebellion against the Maker of the human form. Divine power is coveted in efforts to overcome mortality, pain and illness, physical vulnerabilities and limitations. The whole purpose of technology is to storm heaven, take the divine throne, and claim godlike power. This is perhaps the import of the Tower of Babel story, for it is an ancient quest. The Tower incident, of course, is not the first Biblical conflict of Man's hubris with divine will. The Fall, among other interpretations, can be read as a cautionary tale about knowledge applied outside the context of values. This is the very imbalance in which we find ourselves today, where mere know-how outstrips the wisdom required for its application. The story in Genesis has humanity dismissed for insubordination, so to speak, as caretaker of the garden. Later ages interpreted this as a temporary setback. Adam could regain his original position, perhaps after some further job training in science and technology!

It was not simple disobedience that incurred the Lord's wrath, however, but Man's upwardly mobile pretension to become as the gods, to presume for himself the objectivity and completeness of knowledge required to know what is best in the grand scheme of things. The transition from gathering to agriculture is explained as a moral transgression—hubris. To top it all off, Man was reaching also for immortality: the "tree of life" itself.[206]

Having recuperated from centuries of lost face, Man today is *running* down that genetic path to the tree of life, this time armed with

science he thinks will finally storm heaven's gates. Flaming swords may still bar the technical way, but the expedition may be ill conceived for other reasons. The quest for immortality and limitlessness is like trying to have an infinite bank account. Even if it can be done, what is the point? How much can be spent on personal satisfaction? Beyond what the body can directly consume in physical pleasures, power can only be neurotically satisfying unless it is used for the general good. By insisting on unlimited consumption, whether of time, experience or money, the ego asserts its grandeur and even infinitude. Greed of any sort is about denying all limits.

On the threshold of the scientific revolution, the alchemists had only the skimpiest real knowledge of the structure of matter. Pathetically naive, they believed that with a few technical tricks they could unlock all the secrets of nature and gain the mastery needed to duplicate the work of creation.[207] Every generation of thinkers seems to renew a dangerous faith in the complete control of the natural and human worlds. Thus computer scientists dream of a "global algorithm," which treats physical and social reality as a programmable simulation, and teach courses on saving the world through technology.[208] Physicists dream of Theories of Everything. The alchemists' dreamt of the transmutation of elements, which has become the reality, and nightmare, of nuclear energy.

Gene splicing is snipping a bit of DNA from some living source and inserting it into another organism, which can just as easily be another species. But such DNA may include genetic parasites—viruses, plasmids, and other transposable elements—which are also transferred with it across species boundaries. While such horizontal gene transfer does occur accidentally, it is dangerous and fortunately rare. So-called Asian flu probably resulted from the close quarters in which pigs, ducks and chickens live with humans there, since genes of different viruses can become shuffled through proximity, creating new viruses. AIDS was possibly transferred from Chimpanzees to humans through blood transfusions, and Mad Cow Disease probably jumped from sheep to cows.[209] While these events did not involve artificial gene splicing, they did occur through human meddling. Genetic engineering, which deliberately transgresses natural species barriers to genetic parasites, could result in similar disasters.

Genetic technology considers DNA (like all matter, in the mechanist paradigm) as abstract building blocks to freely reassemble in novel combinations. In disregarding species boundaries, the new alchemy

considers natural forms not as sacrosanct or reasoned, but as reflecting nature's arbitrary and limited imagination. Glorying in new technical tricks, it fails to ponder why there are species at all, which is the very question Darwin set out to answer but could not before the discoveries of genetics and microbiology. Whatever else its reason for being, the species barrier serves to isolate parasites specific to given creatures. For similar reasons the sperm's genetic package is required to leave behind its cytoplasm—the possible host of parasites—upon entering the egg. The boundaries of species might also be compared to the discreet energy levels of electrons. Without thresholds of transition from one state to another, nothing would prevent electrons from simply radiating away all of their energy, making stable atoms—and therefore matter as we know it—impossible. Similarly, without discrete species, there would be no barriers to the transmission of parasites, and probably higher multi-cellular life could not have evolved at all. In general, we must consider that there are deep reasons why things are as they are in nature and that to change them may have serious consequences. At the very least, we ought to thoroughly understand the evolutionary role and mechanism of speciation before introducing transgenic organisms —if ever.

One key to this role might be the fact that significant variations are more likely to find each other in limited population groups. Species boundaries define population groups in which variations may take effect. But molecular biologists now refer to (human) genetic variations as "errors" in the genetic "code", as though the DNA sequence were an intentionally encrypted message whose definitive clarity and meaning are corrupted by variation. Far from it, variation may rather be the repository of diversity necessary to the continuing viability of the species. Mutations, which may be needed future options, cannot simply be dismissed as mistakes. Eliminating "bad" (recessive) genes risks depleting the gene pool and reducing the human genome to a vulnerable monoculture.[210] The same mentality is rapidly turning the whole world into a monoculture, and with similar risks.

While science has generally moved away from focus on isolated elements in favor of complex patterns, commercial gene biology has not, but continues to view "the gene" as a golden goose for investors and a raw material for engineers, one which will behave in exactly the desired way wherever it is placed.[211] Since genetic experiments are no longer confined to the laboratory, but are widespread in the environment by now, evidence is mounting that the question is not so simple. Genes from genetically modified food crops are jumping to nearby

wild varieties with unforeseeable consequences. There is evidence that genes for antibiotic resistance in genetically modified food can transfer to bacteria in the gut, reducing human immunity.[212] While genetic biology is an exciting new frontier of knowledge, one must be careful to distinguish scientific understanding from commercial enthusiasm, and to fully grasp the separate issue of control, and its limits, in the engineering approach.

Neither the Copernican, the Darwinian, nor the Freudian revolution has dispelled the Renaissance hubris. Ironically, successive dethronements of Man from the conceptual center have simply encouraged grander visions of conquest and a subtler anthropocentrism. Now fashionable in cosmology, the "Anthropic Principle" reasons, innocently enough, that the past of the universe must have been such as to presently harbor intelligent life (since here we are!) But it is stretched unreasonably by some to suggest that the future of the universe *must* also be such as to permit intelligence to expand indefinitely throughout it. This extension is offered on no logical grounds other than wishful thinking about human destiny, sprinkled with gratuitous equations.

Darwin's theory ought to have finally put Man in his place in the system of nature, but has rather fed the ambition to re-create life through genetics. And Freud, one might think, would have laid the pretension of rationality finally to rest. Instead, pseudo-rationality has become the cornerstone of economic thinking, so that the so-called rational player is defined, ironically enough, as one who pursues self-interest. The legacy of Freud, whose Victorian mind sided pessimistically with civilization against the instinctual sources of discontent, has degenerated into a smorgasbord of therapies and philosophies promising unbridled self-fulfillment, in secular versions of salvation that are just another consumer product. While the scientific ideal of humanism was dispassionate reason and knowledge for general human betterment, in our age science is more directly harnessed to profit. The further lessons of Einstein and Gödel, of the quantum theorists and the sociobiologists, could all serve to finally instill a sense of humility. But anthropocentrism dies hard.

Transhumanism holds that technology represents the cutting edge of evolution, which is assumed to have a positive direction. Western culture in general has come to share this bias, viewing technological development as natural and inevitable. To oppose any particular innovation is to oppose "progress," which is seen to be as relentless and

independent of human will as biological evolution.[213] Thus even a reputable scientist can opine that the human ability to manipulate genes, having been acquired *through* evolution, is itself evolution at work![214] What a consolation in the laboratory for bio-technicians to know that they may be furthering evolution's destiny! And not only for geneticists, but also for computer scientists who believe that "evolution has found a way around the computational limits of neural circuitry. Cleverly, it has created organisms that in turn created a computational technology a million times faster than carbon-based neurons..."[215] But evolution is no "clever agent." If natural history is to be personified, why not stick to God as the agent ultimately responsible for computer technology?

An earlier generation of thinkers had a more sober view of biological evolution, observing that its course has often been retrogressive. The vast majority of species have become extinct, after all, and many that remain have degenerated. J. B. Haldane commented wryly that just as penguins had lost flight, snakes their limbs, and oysters and barnacles their heads, Man could yet lose his intelligence.[216]

Technological evolution is so much faster than moral evolution because it is easier to alter the external world than the self. As already noted, the attitude behind technological advance actually *precludes* self-transformation, because it expresses the intention of self to remain unchanged, while manipulating the world. In most futurist visions and popular science fiction, the technology to come may look very different, but the characters, even of alien races, retain familiar human motivations. Objects change, but hardly subjects. Thus, people three hundred years from now may be portrayed as still having the values which now characterize the American dream: individual health, wealth, and happiness at the expense of others who do not "compete" as successfully. The same social categories and occupations remain important. There will be genetically enhanced football players and artists to entertain and cater to genetically enhanced businessmen and politicians. Presumably there will also be genetically enhanced philosophers and social theorists to make it all cohere! But if they are so intelligent, why can they not create a truly different world—of social equality and justice, for instance?

5.6 Fallacies of Control

Through deep inquiry, Buddha identified what he considered the root cause of suffering: attachment or desire. This approach places full

responsibility on the subject for experience and the power to change it. His conclusion: desire nothing, and you will not be disappointed. This is hardly the Western way, the way of technology, which would rather bend the world to human desire. Technology too would relieve human suffering, but the approach is external and blatantly indulges desire. Transhumanists would reprogram the human mind not through self-inquiry or discipline but through genetic engineering, pharmaceuticals, brain implants—all in pursuit of a more desirable experience. Suppose, however, you did have the ability to reach inside your brain and alter its "wiring." What would you change, and at what level? Suppose you resolved to change the neurocircuitry involved in some "core beliefs." On the basis of what other assumptions would you justify this change? *Those* beliefs would remain. And meanwhile, you could be tampering with something better left alone. A project, for instance, to render your body immune to pain by deactivating all pain receptors would hardly be wise.

The same dilemma exists with or without technology, for one can take an external approach to the self as an object with parts that can be replaced, manipulated, mastered. The problem is that the "module" that may be most in need of transformation can remain safely in control, hidden from its own view because it is the very agent doing the manipulating behind the scenes. The core of identity is unchallenged while focus remains upon relatively minor aspects of character. This only demonstrates the ego's cunning, how it survives. It is the reason why spiritual "technologies" and paths of transformation often do not work. For the same reason, high tech paths of transformation may not work either. Because the self in self-mastery or self-transformation is the very place from which the world is viewed and action taken, a technological approach is bound to leave the subject untouched and unempowered at the deepest level. To be sure, such a path will accomplish *something*, but the change may not be what we truly want or need. In the name of progress, for instance, it might transform the earth into a garbage heap, society into a prison, or the individual into a well-adjusted moron. The confidence of the West in technological solutions is based on a tempting illusion of control, which is neither desirable nor feasible, and on an apparent success that may be due more to luck than to soundness of method.[217]

The courage of Buddha was to allow ego to atrophy, precisely by *not* manipulating experience but embracing it head on. His great introspective discovery was that this ego is more virtual than real in any case. Transhumanists, on the other hand, are committed to what they

believe is life's essentially Faustian program of "self-overcoming," what Nietzsche called the will to power.[218] This may be less the essence of *life*, however, than the essence of *the masculine*. At the least, it is a very male-sounding definition and view of life. And this will to power is far more a defensive strategy of self-perpetuation than a heroic quest for transformation. The paradox of self-transformation has not entirely escaped transhumanists; but the key understanding is subverted by the commitment to preserve identity.[219] The kind of self-transformation envisioned is not radical transformation of the core or essence of the person, nor growth in the humanist sense, but business as usual for the ego, with a few augmented capabilities.

The issue of controlling technology looms over this generation, to judge by the plethora of Hollywood films about intelligent machines turned antisocial, or about high-tech spying and social control. Since technology *is* control, it is ultimately an issue of whether (or when) there occurs a point of no return in technological development, beyond which technology as a whole will have passed out of human control. It seems already to have passed out of deliberative civil or democratic control. It behooves us to ask, before it is too late: under what conditions can intelligence be created which remains a tool of human purpose, to serve general human benefit?

Transhumanists, like other technological optimists, propose a glorious future for mankind. This is to be achieved through new technologies that converge on age-old dreams of total control over matter. At the same time, transhumanists intend that conventional humanity, with old-fashioned control over technology, should be superseded by post-human forms of intelligence, which would certainly be beyond the control of their human progenitors. Whether or not they grasp the contradiction, it should not escape the rest of us. It was apparent to the prescient social critic, Lewis Mumford, even half a century ago:

> ...those who have seen most deeply into the problem have reason to suppose that if man actually succeeded in fabricating such machines [artificial organisms] he would not be able to control them, since if they were truly alive they would not only be autonomous but subject to other influences, including their own caprices, besides those of man. 220

The question that must first be decided by agreement, then, is whether we *wish* to retain control over technology as a tool of human purpose, or whether we wish for it to become autonomous, harboring its own

purposes, alive, perhaps displacing us. The absurdly hopeless context of such decisions, as discussed earlier, is the fact that there is no collective political will to make them, scarcely even a will to regain democratic control over society. Even so, suppose that the decision could somehow be made to limit the development of automation to a controllable level. What precisely would that level be?

Here in fact is a problem that could define a whole area of research. Given that the level in question involves self-organization, the question then becomes: how to prevent machines (for example, robots, nanites, supercomputers) from becoming organisms? The purpose of this discipline would be to study the differences between organisms and machines, between autopoietic and non-autopoietic systems, and the boundaries, interfaces, and possible hybrids between natural and artificial teleologies. As well as inquiring into the potential of machines to live and be sentient, it might also ask such questions as: at what point does an organism cease being a product of nature and become consciously self-defining (the edge along which humans live)? Conversely, under what conditions does it forfeit being naturally self-defining and become a tool of someone else's intentionality? (Perhaps the other edge!) A parallel line of inquiry could engage the general problem of how people can collectively retain or regain autonomous control of their lives, economies, and governments.

Metabolism and reproduction are separable functions of life.[221] A metabolism maintains itself by a flow of energy through it. An entity might be self-replicating without being metabolic; conversely, there could exist metabolism without replication. In the age of mechanism, when it is glibly assumed that an organism is essentially a machine, the crucial thing to understand is the precise difference between organism and machine. If we hope for a robot technology that will remain subservient to human purpose, we must ensure that *metabolism never be joined with self-replication*. It must remain *non-autopoietic*: without self-definition and purpose of its own. For, in the history of life, organism was the direct outcome of self-replicating metabolism. It is important to understand exactly where to draw the line—and never to cross it!

The fact that making tools and making artificial organisms are deeply at odds does not prevent confounding them, giving rise to new engineering fields with names like *embryonics*, which designs electrical components with characteristics borrowed from organisms.[222] Nor does common sense prohibit transhumanists from imagining that

artificial organisms will somehow remain the tools or willing slaves of people. It is tempting to think that what was troublesome about the animal or human slave, after all, could be designed out of machines: "A creature that was built de novo might possibly be a much more benign entity than one with a kernel based on fang and talon."[223]

This creature, the fantasy continues, might even graciously serve as an extraordinary new host for human consciousness, a new body to slip on like a glove. One futurist describes his concept of an amazing nano-organism, a "trillion-limbed device with a brain to match." It has the miraculous ability to fragment into a cloud of separate flying nano-organisms, and then regroup again into its usual structure. "The laws of physics will seem to melt in the face of intention and will," he gushes.[224] The question is: *whose* intention and will? We are slyly invited to "imagine inhabiting such a body," as though it could be put on like a suit of clothes. But then comes the admission that it would need a brain to match its trillion limbs. Why would this intelligence put itself at my service? What does it even *mean* to inhabit a body that already has its own brain—in this case, a vastly superior one? What does it mean to have a superorganism for a body, when any organism is by definition its own body?

This "bush robot", so called because of its structure, is a very interesting hypothetical creature in its own right. It can act upon the external environment on any scale of its fractal organization. The analogue in the living world, if such existed, would be a creature with conscious control of its body's cells and organs, each of which would have the manual dexterity and intelligence of the organism as a whole. Its parts would be detachable and could exist autonomously or recon-figure in some other shape and organization. But, if each part, being an independent robot, would have the same intelligence as the whole, does this mean, to put it the other way around, that the whole in its assem-bled configuration would be no more intelligent than one of its parts? There is a creature in the natural world something like this—the slime mold—and it's not particularly brilliant!

Another author invites us to imagine

a willing slave, who has one thousand times your capabilities in every way. Imagine a creature who could satisfy your every safe wish (whatever that means) and still have 99.9% of its time free for other activities. There would be a new universe we never really understood, but filled with benevolent gods (though one of my wishes might be to become one of them). 225

The author of this telling statement wants his technology to be godlike, a thousand times more powerful than himself. He also wants it to be not only benevolent, but his personal and willing slave—at little cost to itself, and therefore no source of guilt, since after serving him night and day it still has most of its time and energy free. To top it all off, he wants to *become* this creature himself!

Every human being *did* have such a willing slave: it was called a mother. It seems to be a characteristically male fantasy to recreate that privileged position held as an infant, although real mothers hardly have 99% of their time left over to themselves after serving their children! It is also a male fantasy to acquire the awesome powers of the mother, a thousand times more capable than the infant! The author's suggestion of a mysterious universe filled with benevolent gods is, of course, anything but new; the twist is that this brave new world would be created by *men*, and that the "gods" would not be spirits or doting mothers but machines. Magic and religion were Man's early bids to conquer forces at the limit of comprehension, to control the gods and make of them idealized servants, and then even to become them. Technology offers the same dream and with it the same contradictions. The difference is that, this time, neither the gods nor the ensuing struggle for control will be imaginary, nor part of the innocence of childhood.

Ironically, and no doubt fortunately, the very muddle-headedness of the top-down approach obstructs the arising of artificial organisms. Even the more sophisticated, bottom-up approaches to artificial intelligence are still "task-oriented," rather than "environment-oriented," in that simulations such as genetic algorithms address problems imposed by programmers rather than the challenges of fitting into a complex real ecology.[226] This is because their utility lies in accomplishing humanly-assigned tasks, and reflects the basic contradiction between artificial life as tool and as organism. Even Eric Drexler, the father of nanotechnology, appears to contradict himself on the question of whether nanites will be alive. His justifiable concern over potential catastrophes, which could occur through unleashing self-replicators in the natural environment, leads him to emphasize their being mere machines. However, his arguments for the positive potential of nanotechnology rely on the analogy with living cells, which he views as nature's proof of the feasibility of self-replicating machines. If living cells are nano-machines, then won't nano-machines be alive? And if alive, will they be any less autonomous than other organisms?

Even the notion of "intelligence" in computation remains ambiguous and similarly continues to be clouded by failure to grasp the essential distinction between machine and organism. It is an axiom of information-processing theory that a computer could have, or exceed, human-level intelligence by virtue of its information processing capacity. This latter is a quantitative measure of the rate of "floating point operations per second," based on Shannon's abstract definition of information. But information is not *meaning*. Such information processing is not *for* the computer but for its human users—in *their* cognitive domain. The computer, if it has no intentionality of its own, has no use for the information; it has no cognitive domain in which the information is meaningful to itself. Not information in the technical sense, but meaning, is what is relevant to intelligence.[227] In that sense, intelligence cannot be programmed from the top down, but must be self-generating.[228] The intelligence of "smart" technology is that of the humans behind the design.

Paranoia about automation usually concerns the possibility of mechanical failure. Most accidents involving technology, however, are the result of human rather than machine error. Perhaps paranoia should be directed rather at mechanical *success*. At present, the invention and design of automated technology remains largely in human hands. But soon the development of technology itself may be fully automated, and therefore potentially beyond human control. Perhaps the blasé attitude society has shown so far toward this prospect reflects a lingering overconfidence in the inherent superiority of human to machine intelligence, believing that a creature with general intelligence will always find ways to control one without it.[229] If so, that edge can only exist so long as machines do *not* have general intelligence and are not truly smart.

The problem of reorganizing society, so that it could feasibly perfect itself, might be deferred to massive artificial intelligence: a supermind thousands or millions of times more powerful than even the world collectivity of human brains. Such AI would have to be regarded as omniscient and deferred to in the way that religious people revere the will and wisdom of God. This artificial god would have to be assumed benevolent, moreover. This would in fact be the technological creation of God by Man, realizing at last in material form an ideal that has been projected as a spiritual reality all along. At such a point, however, the gods would be truly independent of human will.

Chapter 6: IT'S (STILL) A MAN'S WORLD

If love is the answer, could you please rephrase the question?
—Lily Tomlin

6.1 Technology and the World Machine

The postwar optimism of mid-twentieth century, which deeply embraced the humanist faith in progress through science and technology, has reemerged with the collapse of Communism in the new globalist doctrine of transnational capitalism as world savior. Relying less on the metaphysics of science and more on the promise of certain technologies to generate fortunes, it is a far more secular faith for a more jaded world. Though science may have come under suspicion within overdeveloped nations since the 1950s, if we are to judge by the consumer marketplace and the stock exchange, confidence in technology remains undampened.

Modern consumers are loath to consider that the future must lie in *less* rather than more production and consumption. Progress and technology have been erroneously identified with maximum physical, psychological, and social interventions, using a maximum of energy.230 In the poor countries, the materialism represented by high technology may be irrelevant or, as in the Islamic ones, bitterly resented for its spiritual poverty. And just as the contemporary political landscape is shaped not only by the humanist appeal of globalism and modernity, but also by tribalism, religion and tradition, so technology itself continues to be inspired by both rational and less rational undercurrents.

It is still widely professed that robotics and superintelligent computers will usher in a golden age of leisure, at least for Western middle and upper classes. This, in spite of evidence that middle classes in these countries are shrinking and people are working harder to maintain the same standard of living, when they can find jobs at all. It is still widely claimed that automation will serve the "re-humanization" of industrial work by upgrading unskilled workers to technicians, even though labor overall is being downgraded and the bulk of relatively unskilled and underpaid work in the West has been shifted to the Third World, where no such pretension operates. Even in the most developed countries, new classes of slave labor are emerging. No doubt life is still easier and safer in these countries—but for whom and for how long? To automatically credit the ease of the West to technology, in any case, ignores other factors of abundance such as better organization and infrastruc-

tures like fire departments, health care, sanitation, education, good water and nutrition.[231] This is not even to mention the underlying subsidy that overdeveloped countries continue to receive from exploiting other parts of the world: *the true and unacknowledged source of the affluence of the West*. Technology cannot be separated from the systems and institutions that produce it. It is questionable whether it has improved the human lot as a whole, and even more doubtful that it will in the future if it continues to reflect present values and institutions.

Humanism has traditionally viewed nature as a resource to exploit and a venue for the human drama. Nature's utility has not been a universal benefit, but has favored the protagonists of history, who have long tended to be rich, white, male, and shortsighted. Provided by God for masculine use, nature *has* no intrinsic value. To that extent it is ideal —not real, in the sense of having its own independent being. Once a divine thought, it has become an entry in a ledger.

In the humanist-Christian heritage, nature is not an absolute order in which Man is an integral but incidental part. Rather, it is something he can and should improve upon. The three thousand or so "defects" in the human genome listed as genetic diseases in standard textbooks are now viewed as the lamentable deficiencies of an improvident nature, which humans have every reason to try to correct.[232]

If technological optimism is the faith that mankind's problems will be solved through technology, economic optimism is the faith that they will be solved through "a combination of free markets, science, and liberal democracy."[233] Economic optimists observe that, on average, people are better off today than ever before. The demographics reveal, however, that the rich have never been richer, the poor never comparatively poorer nor proportionately more numerous. Growth has been attended by ever greater disparity.

Economic optimists mostly hold that the greater good will be served by markets uncontrolled by government, where economic motives are allowed to dominate civic institutions and political will (and certainly ecological considerations). Many economists seem to honestly believe the trickle-down principle that all classes will be better off, able to realize their hopes in mutual harmony, if only trade and investment are allowed to rampage the planet. Unlike transhumanist pipe dreams, such fantasies have the ear of the powerful, who are happy enough to be provided with a self-serving dogma giving them carte blanche to reap fortunes in the name of the greater good.[234]

Of course, there are also economic pessimists, often biologists and ecologists, who claim with common sense that finite natural resources

impose limits on the growth of population and consumption. Some political theorists even emphasize that inequitable distribution itself constitutes a limit to growth.[235] While economic optimists hold that scarcity is the classical stimulus to growth, others have pointed out that scarcity can also hinder the supply of ingenuity needed to overcome it.[236]

This debate over limited physical resources versus limitless know-how parallels the familiar debates between materialism and idealism, nature and nurture, etc.—suggesting an irresolvable ideological conflict. In practice, however, it is skewed by the fact that politicians of every stripe inevitably concur that economic growth is a good thing.[237] Expansion is the very definition of a "healthy" economy. Endless growth is seen as not only possible but necessary, lest the whole system collapse. Unfortunately this hysterical race is taking place on a real planet; nature cannot regenerate at the rate that capital is supposed to grow. Trees in an optimal environment such as British Columbia grow at the rate of 2 to 3 per cent per year. No "sensible" investor would tie up their capital at such a low rate of return.[238] Rather than accept the limits of nature, the corporate imagination would redesign nature genetically to grow as fast as money in the bank![239] But economic growth, as measured by Gross Domestic Product, is not a measure of overall human progress any more than it reflects the sustainable re-growth of nature. It simply shows where we stand in regard to the maximum rate at which profit can be generated, the ideal efficiency of moneymaking machines. It is therefore little more than an index of greed, of the rate of widening of the poverty gap, and of the degrada-tion of nature.

Nature is an overriding presence, not simply another voice in a human debate. Blind faith in the ability of science and technology to overcome all types of scarcity are simply more hubris. Nature itself imposes cognitive and epistemological barriers to scientific knowledge, which is never a function of human will alone. Moreover, the escalat-ing costs of research and its diminishing returns may limit the progress of science, which is also vulnerable to social upheaval and political climate.[240] This is to say nothing of natural climate or upheaval: an ice age or global flooding due to melting polar caps could seriously impede the application of scientific ingenuity.

Optimists place great store in the future ability of technology to better nature in meeting human needs, even to the point of sustaining colonies in space or long voyages to the stars in artificial ecosystems. The dream of intergalactic travel that every *Star Trek* fan takes for

granted depends in truth on reproducing natural ecosystems—indeed, the biosphere as a whole—on board ship in outer space. This, in turn, depends on the exhaustive comprehension of these systems. The failure of the experimental "Biosphere 2," as it was called, provides dramatic evidence that such understanding is elusive. In spite of a multimillion dollar budget, unlimited access to technology and energy, and the benefit of terrestrial soil, this hermetically-sealed artificial ecosystem failed to support its eight human occupants with the required food, water, and air for the projected two years, in a sealed canopy which covered over a hectare of land and enclosed 200,000 cubic meters of volume. This is a far cry from the cramped conditions of spacecraft, or from a space station that will depend on continuous supplies from earth. A manned voyage to the stars would require travel for generations. If we cannot live sustainably in isolation from the original biosphere for a short while right here on earth, how will we live permanently in space?[241]

The new genetic, information, and nano technologies are supposed to usher in a golden age of abundance, well-being, and leisure—but not for everyone. They are infused with the ideology of free markets and the promise of a boon to all, which they cannot *and are not intended to* deliver. The high cost of high-tech medicine, for example, would admittedly bankrupt society if it were universal.[242] Reprogenetic technology is implicitly for the few. For new medical technologies to become the universal benefit to mankind they are touted to be, the structure and values of Western society would have to change from an opportunistic individualism to an altruistic communalism. Though not unthinkable, such a change is hardly in the interests of those who finance, develop, market and administer these technologies. It is hardly unthinkable, for instance, that pharmaceutical drugs and medical services should be a constitutional right, in an economy where everyone is paid alike and where motivation is for social good rather than profit or personal advantage. But that, of course, is utopian communism at its best! The West gloats over the failure of communism at its worst, without examining the reasons for that failure: relentless harassment from the capitalist world and rampant corruption within. The latter reflects the prevalence, within nominally communist society, of the same destructive values that are the very ideals of capitalist society, in contrast to its official rhetoric: individual greed, self-indulgence, and self-assertion, which breed hierarchy, class difference, corruption and domination in any society. We ought rather to mourn the collapse of

the communist experiment—not as a defeat by superior capitalism but as a failure of the high ideals of equality, community, and altruism. Above all, we ought to be wary of the fusion of new technology and global capital, and the ideological claims of both to bring us a new utopia in the form of a bio-industrially redesigned planet.[243]

People growing up in an automated society do tend to view the world in terms of mechanism. Despite nominal rejection as the current *scientific* paradigm, mechanism remains the general inspiration of modern society and economics. The personal computer is a far more powerful metaphor shaping human consciousness than the elusive competing metaphors of quantum physicists or postmodern deconstructionists. Generations growing up using computers to organize their affairs easily come to believe that nature itself is organized like a program and ought to respond like a computer to their commands.[244] The fulfillment of the mechanist metaphor implies complete automation of society, the reduction of all human relationships to formula, and conversion of the planet itself to a giant virtual machine. We see small examples of these changes daily, ranging from automated telephone reception and banking—with no one to speak to when the system fails —to automated court fines with judgments no longer discretionary, and to which there is no appeal.

Under our noses, and against common sense, the mechanist paradigm has taken over the whole means of production, reorienting it away from people's ability to directly provide for their own needs, toward factory production controlled by the few. Production itself has been redefined as making *money* and consolidating economic power. The modern financial world proclaims a deceptively neutral-sounding ethos of "investment," an artificial ecology. Behind a benevolent facade, global financial institutions are tools to increase the share of those who control them, by impoverishing nature and society at large. The ideal of plenty for all, envisioned by Bacon and Marx, is subverted to the dreams of the few for personal power and gain. The past two hundred years have confirmed common sense: that economic mechanism can only bring a loss for most people of the means of production as well as of the rewards.

Traditional subsistence practices, such as laying up preserves and building your own home, are next to unthinkable in modern society, disparaged as old-fashioned and second-rate forms of production. The poor are dispossessed of their economic autonomy and of their traditional polytechnologies through the takeover of monotechnics[245] and

what Illich calls *radical monopoly*. This occurs when the industrial mode of production corners not just a market but a society's imagination, so that people lose sight of the fact that they *can* do things for themselves.[246] This kind of monopolizing is a logical extension of the patriarchal takeover, since patriarchy is inseparable both from possessing the mechanisms of power and being possessed *by* the mechanist metaphor. Moreover, the new world created by the Industrial Revolution had a gender as well as a class dimension from the outset, for it greatly expanded the variety of men's work while hardly that of women.

Mechanized economics, like mechanized farming, is an incursion of masculine thought into traditional bottom-up ways of subsistence, with their traditional gender balances. This incursion recapitulates the attacks upon civilization by warrior-dominated nomadic tribes, which wreaked havoc upon early agrarian societies. The notion in capitalist economics, that maximal profit should be extracted from one resource and reinvested in another exploitative enterprise, parallels the nomadic principle of overgrazing one area and then moving on to the next. This is our genetic heritage, the prevailing mindset of conquerors who once pillaged agricultural settlements from horseback and now rove the world in business class to pillage consumer and labor classes and what is left of nature.

As a legal entity with personal rights, the corporation has been enshrined by shortsighted courts as a virtual immortal life form. Designed to shield and extend the power of the real people behind it, it is the economic equivalent of artificial intelligence, a man-made pathogen that has escaped legal containment, just as genetically modified organisms and artificial life risk to escape biological containments. Corporations are scarcely any longer under public control, but now control the public. And like so many portrayals of machines run amok in science fiction, the corporation can be crude, automatic, heartless and unfeeling in its behavior.[247]

Transnational capitalism as a whole is such a virtual machine, an artificial parasite, which lives on slave labor and sucks wealth as a nonrenewable resource wherever it can. While the rhetoric of globalism is that all countries and all segments of society will ultimately benefit from free markets, in truth the rich get richer and everyone else poorer —and not only quantitatively. As the world becomes a monoculture, its diversity is reduced to a few standard services and products in look-alike cities around the globe. This is the actual *purpose* of globalism, moreover, and the ultimate economic fulfillment of the mechanist

metaphor: to remake the whole world as a monolithic engine of profit. The consumer culture itself has become a virtual factory for turning out consumer clones and values, designed to function as an economic artery to a handful of ultra-powerful men. Just as pre-industrial society milked and bled its animal stocks for sustenance and slave labor; and just as industrial society herded peasantry into a new class of laboring poor; so corporate capitalism manages herds of consumer-investors, on the one hand, and herds of dehumanized foreign laborers, on the other.

Until mid-twentieth century, the owners of capital depended on labor to turn the wheels of production—mostly of real, material goods. The cheaper the labor, the greater the profit. While labor movements militated successfully for a fairer share of the benefits of industrialization, it was also ultimately in the interest of the entrepreneurial class to share wealth, since someone had to buy the goods produced in order to generate profit for the manufacturer. But right from the start, in spite of the idealism of visionaries like Bacon, industrial production was an accelerated means to the accumulation of individual wealth far more than it was a strategy for the general improvement of the human lot. A factory was not only an assembly of machines producing goods such as clothing; it was itself a machine whose product was profit. To be sure, the literal product may have been an item of real value, because people, initially at least, had the common sense to buy only things that were actually useful and durable. But it was first and foremost the pretext for a transaction systematically favoring the producer over the consumer. In consequence, cheap goods benefit the manufacturer and distributor far more than the consumer. Above and beyond the real general increase of wealth through the efficient production of goods, every turn of the wheel and every click of the cash register meant the greater accumulation of wealth in some hands than in others. Initially, the overall wealth of society did increase, but not equally, and the balance of forces resulted in a pyramidal social structure with a large consumer class occupying the middle layers.

Mid 20th century saw several refinements to this system. First, consumers succumbed to seductive advertising, which no longer spoke to their rational faculties of self-interest, but rather to unconscious insecurities, promising to increase their "sex appeal." This meant that pretexts for transactions could become ever flimsier. Consumption was encouraged simply because it turns the gears of the profit machine. This eventually became enshrined as a dogma: consumer spending is a civic duty, and public support of private corporations a government obliga-

tion in a society predicated on growth. Both are required to spin the economy, which must ever expand to accommodate the social tensions created by a widening poverty gap that is in part created by growth itself. A greedy society, in other words, can only hold together through the promise of economic growth, since only expansion (falsely) reassures everyone that they will eventually get a bigger (though proportionately ever smaller) piece of the pie. Poverty levels rise as consumer luxuries are redefined as "necessities" beyond the reach of increasing numbers of people.[248] The difficulty of expanding with the economy puts everyone on a treadmill, whether they like it or not, and on which more and more people cannot keep up. This economy, referred to affectionately as the Rat Race, is no longer, if it ever was, the neutral or benign social environment that is the collective sum of everyone's productive efforts. *It is not a commons, but a private holding*. It is hardly the circulating and life-giving blood of the social organism imagined by Adam Smith. There *is* an invisible guiding hand, but it is not attached to the body politick. It is rather the remote arm of privilege.

The second refinement was the discovery that sustainability is not profitable. To a medieval or aboriginal mind, it would have made obvious sense to "browse" without depleting a natural resource. With the rise of trade, however, capital itself became the ultimate resource. It is more profitable to rapidly exploit a natural resource to exhaustion, and then reinvest the "liquid" profits in some other enterprise, exhausting some other natural resource in turn.

Industrialization not only standardizes products and production methods, but also changes the nature of the products and of the labor that produces them, while rendering us insensitive to such distinctions. Both trade laws and consumer attitudes look upon commercial products independently of their history, means of production, or genetic composition. A tuna is a tuna regardless of the practices used to catch it. A tomato is a tomato whether organic or genetically modified.[249] A pair of running shoes is just a pair of runners even if produced in the slave-like conditions of an Asian sweat shop. A rose is a rose is a rose. (By such black-market logic, a stolen Rolex is simply a bargain!) In addition to the coercions of language itself, this kind of thought is a measure of how much the modern mind has brainwashed itself through greed, where the only consideration is the bottom line. Saving a buck by buying the cheapest goods from the cheapest source is the passive consumer counterpart of the profit motive, complementing the corporate drive to demand the highest price and pay the lowest wages,

regardless of context or human cost.

Because of price-fixing, patenting, and virtual monopolies, competition in the so-called free economy is a farce. Instead of corporations, it is people who are forced to compete with each other—for vanishing jobs, and simply to make ends meet. Because of industry's disregard for ecological values, and its triumph over labor, the struggle between corporate lobbies and ecology groups has upstaged the old struggle between management and labor. Mechanized and chemicalized food production wreaks increasing havoc on the soils and oceans in the name of sustaining the world's burgeoning population, while what they actually sustain is corporate profit. Regarding fisheries, forests, and crops as simple mechanical systems results in monocultures vulnerable to disease and collapse.[250] It implies gigantic harvesting machines which inflict enormous ecological damage. Vast tracts of the ocean floor, like whole forests, are destroyed in days by fish factories and dragnet methods. No effort is made to "replant" the ocean bottom, on which the whole ecological chain of marine life depends.

Now the middle class itself has become a resource to be harvested to extinction by modern predatory capitalism. The shift from production to investment, and the accompanying decline in real living standard of most people since about 1970, helps to explain the global widening poverty gap, not only between rich and poor nations but also within the overdeveloped nations themselves. It gives the lie to the promise of universal abundance through technology and trickle-down. Contrary to the prevailing doctrine that free markets will cure all social ills and "naturally" distribute wealth, in truth globalism represents a concerted scramble to grab existing assets in a situation of declining production of real goods. Its very purpose is to redistribute wealth upwardly rather than to actually create it. While wealth, in any case, must be redefined in a way that impinges less on the planet, the persistent phenomenon of increasing unemployment is not an incidental series of temporary crises but a determined strategy of global capitalism and a sea-change in civilization that cannot be remedied within present institutions.[251] There is no going back to full employment in a system which is no longer willing to pay for labor and soon will not need it. As you may have noticed, while politicians vocally deplore unemployment, the stock market always responds to it positively.[252]

Modern economic theory is little more than apology and propaganda for the takeover of the world economy by large corporations.[253] Because of its false doctrines, not to mention payoffs to corrupt politi-

cians, governments everywhere are dismantling themselves in a frenzy to give away public assets to private business, only adding to public impoverishment. The emerging global feudalism is not interested in sustainable ventures nor in the general human welfare, though it uses both these as rhetoric. Nor has it any commitment to maintain the middle class it once needed. Already the limited production necessary to supply the upper classes is guaranteed at very little cost through a slave labor class offshore. In the near future, when managerial and clerical tasks as well as production can be assigned to intelligent machines, those who control the means of production will require neither a human labor force nor a consumer force to maintain their wealth. What they will need is a very large police force!

Such dystopian horrors aside, the present reality is a universal widening poverty gap and the decay of civil society as a result of the policies of globalism in both developing and developed nations around the world. The homeless poor in the West hold up a mirror for bourgeois society to see its own eventual fate.[254] Every country with a national debt is, after all, a "debtor nation." The beneficiaries of international aid have mostly been business elites within developing countries, while industrial development there, especially of agriculture, has mainly served to destroy local economies and natural environments upon which poorer people depended for their subsistence.[255] The same is true of the new "aid" provided by global capital in the form of loans by such agencies as the IMF and the World Bank. These are loans that already impoverished developing countries cannot hope to repay. What they do accomplish is an effective takeover of control of the economies of such countries, which are thereby conscripted into the transnational program of unrestrained movement of capital and goods across borders, with unrestricted access to cheap labor. Third World governments are effectively extorted into submission by the threat of calling the loans, with the result that these countries lose the very right of self-determination the West so loudly vaunts. Local public policy can no longer intervene on behalf of the poor in the form of labor laws, unions, minimum wages, fair trade regulations, or environmental legislation.

Whole sectors of the former communist world are being swallowed up by capitalism and downgraded to virtual Third-World status in the process. The reunification of Germany, for example, proved to be an opportunity for West German businesses to make an unprecedented killing through privatization of formerly state-run industries in a

gigantic giveaway of East German public resources.[256] This had not only the effect of economically downgrading a whole nation to second-class citizens, but also of destroying a way of life that in some ways, ironically, formerly enjoyed greater diversity of thought. New book-stores now carry the standard fare of Stephen King instead of local authors; serious books that used to cost four dollars have been replaced by frivolous ones that cost thirty dollars—a month's rent in the old regime.[257]

The fusion of globalism and technology moves toward ultimate power while promising heaven in a global shopping mall. It offers the same standard franchises and consumer goods the world over, in the same global culture with the same international architecture in every city. This was parodied in Jacque Tati's prescient extravaganza of the 1970s, *Playtime*, where glimpses of famous Parisian monuments are only seen reflected in the closing doors of glass office towers. While genetic engineers propose headless chickens and immortality as con-sumer rights, with the freedom to plug our bodiless minds into a variety of optional artificial embodiments, we might remember the lesson of a more recent film, *The Matrix*: that human beings could themselves become little more than headless chickens, cultivated for someone else's purposes. It can be no great consolation that our overlords are not yet intelligent machines, but only our mortal fellows, the human masters of a global financial empire. One way or the other, slaves and machines are interchangeable from the perspective of the mechanist vision and the world economic machine, which will use whichever is cheaper—or the most cost-effective combination. It should come as no great surprise that the dream of limitless freedom, based on riches wantonly taken from nature and the rest of the world, inevitably bears an impossible price to pay.

6.2 No Free Lunch

Every idea casts a shadow that returns to haunt it, claiming its moment on the stage of history, which therefore breathes, as it were, through a dialectic of opposites. This is because the propositional nature of thought guarantees a complement to any assertion, another side of the coin, which is a proposition in its own right, an anti-thesis. Any idea or scheme, no matter how clever or complete, omits *some-thing* that could be perilous to ignore. The very nature of the Ideal is to assume that thought can be complete and mind should have its own

way, without the niggling interference of details. But we are real embodied creatures, not simply minds. We live in the complex world of matter and energy, not in the oversimplified storybook world of thought, where anything goes simply because it has been said or conceived.

The modern presumption, that we can have our self-entitled ways on the planet with little or no price to pay, is a dangerously naive expression of the dark side of idealism. A narcissistic generation assumes that an ideal lifestyle can be extracted from nature and other societies, pursuing indefinite expansion of wealth and technology in disregard of future generations, and without encountering interference from larger social or ecological realities. I would like to propose that we assume the very opposite. Call it feedback, karma, justice, or the Second Law of Thermodynamics—it's the working hypothesis that every shortsighted gain at the expense of the whole is adjusted to by the whole in a way that affects the offending part.

Biological life, human society, and machines are all systems that depend on an external reservoir of energy. For life, it is solar energy falling on the earth; for society it is the energy and materials supplied by nature and by other, subservient societies; for machines it is the dwindling reservoir of fossil fuels. But just as a refrigerator creates cold in a contained location by heating the environment outside it (which makes it ever more difficult to maintain the cold inside), the organization of life, of society, and of machines is maintained at the expense of their environments with diminishing returns. While *one* automobile might run forever on the world's supply of fossil fuels without exhausting them or creating noticeable pollution, a billion of them will not. The free lunch depends on an infinitely resilient environment; but the earth is not infinite and nature is resilient only within elastic bounds that are already on the verge of snapping. The bigger the effect of the part, the bigger the counter-effect of the whole. And when the part is large in relation to the whole, like industrial civilization on the planet, its impact is enormous. There are limits to the overall progress our civilization can make against the backdrop of nature and against that of the world community.

Of course, nature itself consists of innumerable agents in competition. The less organized and more equal they are, however, the more they tend to cancel each other out. And the other side of this picture is that nature is eminently cooperative. Every organism—even a single eukaryotic cell—is itself a community of cooperating individuals that have sacrificed their identity for a symbiotic advantage.

The biosphere as a whole works because any single agent is held in place and in check by the entirety. This is partly because the whole is much larger than any part and can absorb and circumscribe its influence. More importantly, its influence only develops in the first place under conditions to which many other agents have contributed and are able to adapt. This mutual adaptation takes place slowly and incrementally, limiting the effects of parts. It is a statistical system, co-evolving in equilibrium. This means that the actions and significance of any part can only be defined and understood in terms of the whole—in terms of the actions and responses of other agents, upon which the individual organism implicitly depends. It also means that the actions of an individual are at every step restricted and countered by those of other individuals, in a system of mutual restraints. In a certain sense, there *are* no individuals; all arose together and none could exist without the others. In contrast, humans use technology, hyper-organization, and vast alliances to distort the power of individuals over their fellows, which also magnify the collective power of the species to impact the rest of the biosphere and aggravate the adjustments the planet must make to us. Culture alters the time scale of change from the ultra slow pace of biological evolution to the catastrophically rapid pace of technological advance. The biosphere may simply be unable to adapt to changes initiated by people fast enough to maintain equilibrium. Multiply these factors and you have the fact that a single human individual may be in a position to do things that seriously affect all of life for generations to come.

The fact that technological society can throw the system of nature out of equilibrium does not mean that it can exist independently of nature. It does mean that the accumulated responses of nature may not be incremental or in equilibrium, but may produce delayed, sudden, and huge effects. There is no free lunch in the long term and on the large scale, neither in society nor in nature, because equilibrium implies that there is no overall long-term domination of one part by another and no progress without the slow co-evolution of the whole. The investment economy is in complete denial of this simple truth. If we applied the same common sense to economics that is involved in ecological principles, we might have a world that is just as well as sustainable.

Furthermore, non-equilibrium implies catastrophic response or even eventual collapse of the supporting whole. It is only because of the short life span of human individuals that there can be any illusion of beating the system. We hope to gain our relative advantages by cheat-

ing time, and by acting in ways that common sense would frankly admit are stupid, before the rest of society or nature can either catch up to our actions or fail completely.

Perhaps the first uncontrolled side effect of technology was forest fire. Sometimes, however, human intervention only worsens a problem it was addressed to solve. Thus, the modern campaign against forest fire, by allowing the accumulation of flammable underbrush, has produced a forest that is paradoxically more vulnerable to conflagration.[259]

Similarly, asthma is inadvertently promoted by vacuum cleaners that do not effectively remove dust mite excreta from carpets, but simply repel them into the air, where they remain suspended for days. Some health conditions may actually be aggravated by hygiene. In fact the very sterility of modern environments may be in part responsible for a general weakening of immune defenses, or at least a lowered immunity to certain diseases like polio.[260] The "insult accumulation" theory of disease points to a fundamental balance of trade-offs. On the one hand, childhood infections increase immunity later in life; on the other hand, they appear to cause lasting tissue damage, which may increase the risk of arterial and heart disease.[261]

Iatrogenic disease and the poor returns on society's investment in medicine suggest not only a false hope of medical progress, but that the public is being suckered by the medical and pharmaceutical professions, which themselves prove to be an ironic threat to health.[262] It seems, more-over, that in the period 1955 to 1975 a trend was first identified that can only have worsened since. During that interval, the general cost of living in the U.S. went up 74 per cent, while the cost to the patient of medical care more than tripled and public spending on health care increased tenfold! The life expectancy of adult American males, however, *declined* during the same period.[263] Illich introduced the concept of *nemesis* as a revenge effect in the professionalization of medicine.[264] It means divine retribution or justice: karma. But the idea applies more widely to the backfiring of "progress" in general, to the worldwide side effects of the Western consumer model, the dark side of the American Dream.

Technology has always had its ironic shadow side. Domestication of animals may have symbolized the triumph of reason over animal passion. But, while the delight in subjugating animals stood in the European mind for the ideal of self-mastery, in fact it often expressed brutality and served to bolster social status rather than to tame the

animal within men.[265] The horse was "broken" to become the foremost implement of war.

In modern times, an ironic, if innocuous side effect of life online is the commercialization of the Internet. Not only is information for sale, but cyberspace itself. Many had idealistically hoped the Internet would facilitate the free flow of information on a show-and-tell basis; it is now permeated with a market mentality and inundated with commercial advertisement. The Web as a source of information is regrettably far more like the yellow pages than like a library.

The practice of monoculture is essential to mechanized agribusiness, which is supposed to save the planet from starvation. Ironically, it systematically destroys local "weeds," which are in fact a major supply of nutrition in the Third World. Forty-thousand children go blind in India every year for lack of Vitamin A, because industrialized agriculture has destroyed the wild plants that were its local source.[266] In many cases the crops produced instead are not even for local consumption, but are luxury cash crops for export, like coffee, cocoa, sugar, tea, flowers. Moreover, the overall system of industrialized agriculture (the "Green Revolution") requires some *sixty* times more energy than local intensive farming—in the form of fertilizers, machines, pesticides, transportation, marketing, etc.

There is nothing new, of course, about the incidental costs of "progress." The thirty-some copies of the original Gutenberg Bible, printed on vellum in 1456, used the skins of five thousand calves! Entire oak forests were cut down in merry olde England to build castles and monasteries. Building and maintaining the English feet denuded first England and then other parts of the world from Scandinavia to New Zealand. Whole forests were also consumed by glass works and metal smelters before the discovery of coal.[267]

In many parts of the world soils have been permanently ruined through mismanagement, even though the intention was to use them more productively to meet human needs. Haiti, like Bangladesh (and, for that matter, Lebanon, once famous for its cedars), was formerly covered with lush forests, of which less than 2% remain today. But due to massive soil erosion, *half* of the land cleared there for farming is sadly unreclaimable.[268]

Genetically engineered crops are the latest frontier in food production. Because the field of genetics is so new and because the genetic makeup of organisms is so utterly complex, there is more risk of unforeseeable consequence due to an ill-considered engineering approach than in perhaps any other technology. In 1998, a scientist

working in the UK discovered highly adverse effects of genetically engineered potatoes on rats. A protein or virus involved in gene-splitting was causing tumors and significant shrinkage of rats' brains after only ten days of trial feeding on genetically modified potatoes! This researcher conscientiously announced his findings to the public and was forced by his research institute to "retire." He was eventually reinstated because of public pressure, and a three-year ban was imposed by the British government on engineered crops of any kind.[269]

The co-discoverer of the AIDS virus reported in 1990 on a strain of super AIDS "accidentally" developed in laboratory mice through introducing the human AIDS virus genome into mouse embryos. This new virus could reproduce more rapidly, infect new kinds of cells and possibly be transmitted through the air.[270] Viruses can also cross species boundaries through the medical transplanting of organs, from pigs into humans, for instance. The UK banned all xenotransplants pending further study of the risk of transgenic viruses.[271]

While most new genes introduced experimentally into organisms will only reduce fitness, as happens with most natural variations, the occasional super variant could easily upset ecological balances, driving natural species to extinction.[272] Meanwhile, the insurance industry as a whole has refused to insure the release of genetically engineered organisms against possible environmental catastrophe, since it has no way to assess the risks.[273]

Some costly side effects of technological intervention are revealed in health statistics. The risk to your health of staying in hospital is an example. A 1984 study of hospital records showed that 7.7% of all hospital stays involved at least one "adverse event," with more than half of those resulting from physician error.[274] Immunization also has its risks. A small percentage of those inoculated against a disease catch it, or something else, from the vaccination serum. This happened in 1976, when a thousand people developed paralytic Guillain-Barr syndrome following a mass immunization against a swine flu.[275]

Attempts to control ecosystems for human purposes often backfire because the complexity of the systems involved is little understood. But sometimes a simple lack of common sense is at fault. The billion-dollar cleanup operation following the *Exxon Valdez* disaster was supposed to rescue marine shore life. But the technique applied involved blasting the shoreline with high velocity scalding water. This in fact killed many organisms that had survived the oil itself and forced oil into sub-tidal areas where it killed organisms not initially affected.[276]

Other ironies involve more or less foreseeable tradeoffs. Extremely tall industrial smokestacks, for example, improve air locally but pollute more globally, with pollutants remaining in the air longer and higher in the atmosphere to create acid rain by converting to sulfuric and nitric acids.[277] Electronic precipitators were invented to remove soot particles from emissions that once dirtied buildings in the vicinity of industrial smokestacks. But then it was discovered that the soot actually protects buildings by reacting with the more harmful sulfur and nitrogen oxides in emissions and producing a coating of relatively harmless compounds.[278]

Part of the general problem of unforeseen consequences is that action is taken on incomplete information. While this may be inevitable because knowledge can *never* be complete, more often it means that action is premature; someone has jumped the gun before adequate research concerning possible consequences has even been attempted. There is a strong profit incentive to act quickly for those who first possess or exploit technological secrets, to gain patents that are guarded for a limited time only, to claim the market advantage of a first strike.

Ecosystems are complex, involving many co-participants, whose behavior may be unpredictable. This fact gives rise to revenge effects where attempts to control creatures designated as pests may backfire. Pests, after all, are simply other creatures going about their business in the common environment, but in a way that happens to interfere with human purposes. Sometimes attempting to poison an insect pest simply kills off its competitors and predators, thereby helping it to multiply and spread into new niches. This occurred with the campaign against fire ants in the U.S., which were inadvertently helped by a broad-spectrum pesticide to increase their proportion of the resident ant population from 1% to 99% in only four years![279] The massive use of pesticides, even natural ones like Bacillus thuringensis, simply applies intensely selective genetic pressure to develop resistance in the target insects. The quantities of Bt present in nature are too small to constitute a selective pressure for resistance genes, a situation changed by its widespread intentional application.[280] The inorganic chemicals used against insect pests in the early 20th century were more difficult for insects to adapt to than their modern successors, because they attacked multiple chemical sites in the pest organisms. DDT and other synthetic chemicals are more specific in their action and, so, easier to defend against, which only increased the potential reward for new, more resistant strains.[281]

If nature's "revenges" sometimes border on perversity, it is not nature which is perverse but human cleverness. By 1940, thirty-some species of burrowing rodents in the United States, with a matching set of flea species, had become carriers of the plague. This was a direct result of a scheme by ranchers to eradicate the prairie dog by deliberately introducing infected animals into their colonies.[282] Similarly, Mad Cow disease may be a transgenic byproduct of the perverse practice of forcing cannibalism upon vegetarian animals by feeding them ground up livestock.

While the growth and ease of Europe's middle classes from the Renaissance onward was a byproduct of mechanization, as well as of foreign exploitation, so were wasted resources and landscapes, cities and lungs blackened with soot, crowded and degrading slums, and automated mass warfare.[283] Technological progress has been accompanied by militarism, moral and environmental decay, increased crime and violence, the threat of terrorism, and the decline of family and community values. The family wage system all but collapsed in twentieth-century America because it no longer represented the most efficient investment of capital.[284]

What Ivan Illich calls "paralyzing affluence" leads to "modernized poverty" even in the rich countries.[285] Many of the so-called improvements of mass culture are counterproductive. Computerized systems do *not* save the consumer's time in bank queues or on phone lines, and convenience food impoverishes your health. It takes time away from social interaction to consume (and pay for) television programming and home beauty treatments.

The time it takes to install and debug a new program is an example of "shadow work," a term Illich coined to designate the consumer's unpaid work necessary to make a commodity useful.[286] The term also evokes other modern shifts of burden from producer to consumer: filling out your own bank deposit slips or tax forms, pumping your own gas, assembling a prefabricated module of furniture, waiting on the phone on "hold," driving across town to stand in line to pay for an item on sale, the time it takes to remove and dispose of or recycle packaging, not to mention to pay for it.

Shadow work, which exists only in an industrial economy, must be contrasted with subsistence, which lies outside that economy. One is exacted by the system of nature, the other by the modern system of production and marketing. Shadow work is one hidden cost of "convenience;" other costs include pollution and unnecessary depletion of

resources, trash and litter from packaging, and inflated prices. Convenience items may not really be all that convenient, save labor, or do anything useful at all, because they are designed to make money, not to satisfy real need. Time lost in stalled or accelerating traffic, medicine that makes you sicker, education and media that disinform you and "dumb you down," and political and professional elites who disempower you and render you dependent upon their guidance, all are further instances of counterproductive modernity.[287]

How many people would knowingly buy genetically modified food if they pondered the risks involved to their grandchildren? A survey in 1997 revealed that 93 percent of the public believed all biotech food should be labeled as such.[288] Clear as that might seem, it does hide some ambiguities. Does it imply people feel they should have the option to buy GM food? Or are they voting with their opinion against it? Or does this poll indicate that people are concerned to preserve the option to buy conventional food, which is threatened by the lack of labeling? These questions reflect the difficulty of all choices regarding technology, since everything is a tradeoff. We can have cheaper food and convenience now, but at some undetermined cost to the future in reduced health, in ecological damage, and in diminished variety. GM foods are in the news, but we have been living with the same conundrum for generations. Industrial production of food has already polluted or dried up water tables and exhausted and poisoned soils over the globe, seriously undermined the effectiveness of antibiotics, and provided consumers with a diet that is killing them. We may have our cake and eat it, but how long can we live on cake?

Although agricultural production has increased dramatically since the Middle Ages, the proportion of crops lost to diseases, insects, and weeds has remained constant: about one third.[289] This could give us pause to reflect whether it is really possible to win the war against pests, let alone to gain overall control of nature. Perhaps the best that can be hoped for is not a final victory but a temporary advantage through tradeoffs of one sort or another.

The Ideal is ideal, after all, because it can be imagined but not reached. Three distinct ideals were represented in the New World dream: a utopia of ethical social relations; a benign natural paradise; and a world defined by human imagination and under human control.[290] Given what we now know of our genetic heritage and composition, the first seems elusive. If anything, the alliance of technology with modern economics is leading ever further from social utopia

as well as from natural paradise. We now realize that nature was not designed around our needs, so the second ideal also seems fundamentally unrealistic. The third option, pursued through technology, seems to the modern mentality most achievable. But it is inconsistent with the other two: mechanization and control lead neither to social utopia nor to harmony with nature, but to dystopian nightmares. Perhaps, like the beacons of lighthouses, ideals may not mark steerage to a safe haven, so much as treacherous shoals.

6.3 Control and Surrender

The mission of idealism, to rise above the system of nature and create a world more to the taste of a self-conscious creature, has largely been diverted to personal material gain. Moreover, idealism has been appropriated and defined by males to express *their* purposes—through technology, empire, and religion. Ironically, in many cultures the spiritual impulse has been deflected from its true goal of tempering the excesses of the masculine with the influence of the feminine. Two competing and contradictory intentions seem to inform the human heart: surrender and control. Accordingly, religion has two aspects; one opens receptively, the other asserts.

The masculine must have something under it to dominate, as well as something over it to worship and to hold its aggression in check. This may help to account for the ambivalent status of woman as both chattel and icon, and also for the contradictory nature of religion as a search for both surrender and for empowerment. Apart from love sweet love, I believe, what the world needs most is spirituality without theology, ethics without metaphysics, surrender without dependency on a vengeful god or on bureaucratic power structures to enforce it. Only by voluntarily embracing such humility can one take full responsibility for life in this world.

Ascensionism is a masculine innovation, which has become the hallmark of all cultural expression under patriarchy. The corruption of spiritual intent magnified men and the masculine at the expense of women, the feminine, and nature; it thwarted whatever chance society had for a peaceful and balanced development. Christianity, Islam, and Judaism have justified male violence, the enslavement of one people or class by another, and the systematic exclusion and repression of women. These evils, of course, began long before the so-called axial

religions, which only followed the shift to patriarchy. The subordination of women is already evident in Sumerian records of the third millennium B.C. While women were undoubtedly the first inventors and discoverers of the implements and processes upon which civilization is founded, they were also the first slaves. They developed horticulture and the fabrication of vessels for storing food, but these arts were quickly appropriated by men, following a pattern in which men envy, usurp and transform female functions, beginning with reproduction.

Nothing could be more natural than the mother's authority over the child and nature's authority over the organism. Both possess us from within—nature through her laws and genetic programming, mother through early dependency. While the female can identify with both mother and nature, the male is disposed to rebel against both. He seeks on other ground to compensate a deficient identity, by mimicking and inverting the authority of the female and of nature over him and within him. He does this first by redefining everything in terms of the interior mental world, which is itself an imitation of the female's interiority and the immanence of nature. The Ideal is *his* world, built parallel to hers. Not only is the male reproductive function decreed, as in Aristotle, to be the original and true power of generation, but all creative and generative abilities are redefined as masculine, while the woman is associated with "mere" matter, passivity, and the mortal weight of the flesh. In the beginning was the word, the Logos, the masculine principle of thought, the realm of the spirit, from which the material world of nature is imperfectly copied or descended. Such as we have come to know it in patriarchal culture, *idealism itself* is the key reversal through which the masculine has turned the tables on nature and the feminine.

The rebellion against nature, the body, and woman originates in the claustrophobic perception of being trapped within a closed and limiting system. Freedom is associated with the transcendent perceiver, while limitation is associated with the perceived: the body and the environing world. Woman (mother) *was* the first environment and literally what was first and foremost perceived. One's body, therefore, is identified with *her* body and with nature, the body of the world. It may be perceived as prison, as constraining Other. The desire to be a soul, a spiritual essence not identified with the body, is in part the desire to be subject only, a fly on the wall, and no object of the limiting and controlling attention of other subjects. It is the desire to be the agent in sole control of one's experience and fate. The corollary of this desire is the tendency to regard the world, including the body, as utterly *object* to

be acted upon by the self. The self is in a contest to control experience, whether the opponent is another person, one's own body, or the cosmos at large. It seeks to win this contest either through self-mastery or by mastery of the external world. The latter way is the root of the drive for control, whose ultimate satisfaction is the subjugation or elimination of the threatening Other. The former is the spiritual quest for surrender, whose final, paradoxical satisfaction is the subjugation or elimination of the self.

As she is the first "object" in the consciousness of the child, any ambivalence toward the mother is transferred to all women and to the environment at large—that is, to nature. But rejection of the feminine presence is only half the story of this ambivalent relationship to otherness. The other half is a longing for union or merging with it. In the male-dominated society, the female is for the male a symbol of the mysterious Other, inspiring not only the drive to conquer and contain it but also to open to it and merge with it. These are two phases in an epistemic cycle, which begins with opening and ends in closure— properly, of course, to reopen on some new level or in new territory. The fundamental mistake involved in intellectual fixity is to identify knowledge strictly with the closure phase, and with a negative view of the Unknown or Other as something to be isolated, contained, and resisted. This cycle may also be understood in terms of the metaphor of assimilation. As food, the known is the part of reality that is already dead, consumed, digested. The unknown part is the fresh and unconsumed, to which we are drawn by appetite and eros.

Man's personification of the Unknown and the Other as woman, like his personification of it as god, may also serve to mitigate his loneliness in nature. She accepts this role in part because it shelters her from the existential confrontation with the void that he takes upon himself.[291] Furthermore, her submission to one man or one patriarchal order shelters her from other men and their dangerous world. Men and women approach surrender from different perspectives. In surrender, woman follows her conditioning while man transcends his.

The longing is for the transformation of self, which comes through interaction as well as through merging. It is the need to be touched, moved, affected, challenged deeply in one's being, not merely entertained and left intact. The escapist significance of alcohol, drugs, TV, virtual reality, sex, and consumerism is that the experiencing self remains untouched at the heart of experience, while soothed or entertained; one is paradoxically in control in the very attempt to lose

control. Inner change happens in a situation of dialogue with reality or in the silence of surrender, either of which might or might not be personified in another human being.

Kant's imperative, to treat the Other not as means but as end, applies not only to people but to experience, to reality at large. "Being here now" involves embracing the moment for its potential to affect us, perhaps modifying our goals. It is not necessarily attention to the details of sensation or the physical world, nor, in Zen fashion, the chopping of wood and carrying of water. Rather, it is openness to the whole continuum of experience, including thought and feeling, in such a way that one can be affected and transformed by it. The point is not that sensation is more valid than thought, but that being moved is as important as being mover. It is an attitude of surrender or vulnerability to the Unknown behind the mask of experience. While the future is goal-oriented and distant, something one can maneuver toward and manipulate, the present moment stares one intimately in the face, like a lover whose eyes cannot be averted.

Subjective consciousness allows us to step outside the box, to see our purposes and ideas in context, and differently, as others might see them. This should not mean creating a state of permanent and pathological alienation, legitimized as objectivity. Consciousness includes feeling, which expresses one's *relationship* to the object, as well as perception of its intrinsic qualities. Pathologically detached consciousness places the subject in a fixed stance of attempting to control and assimilate the object. The stance of surrender is rather to inquire into its mystery and its power to affect the self. One implies the transformation of the object; the other, of the subject.

These two stances of ego in relationship to general experience coexist also within the scientific worldview. The scientist inquires into the mystery of the cosmos; the technologist finds uses for the answers. The inquiry into nature has been predominantly a male enterprise, and the detached consciousness is characteristically masculine, while nature herself is characterized as feminine. While technology is not *logically* tied to particular motivations, the technological stance tends to reflect the defensive and controlling attitude of the male mind.

The technological stance extends even to the masculine attitude toward lovemaking and sexual behavior. It may be a moot question whether the objectification of woman or of nature came first—another question for the detached mind. But the fact that they are intimately linked should inspire curiosity about this connection and its implica-

tions, both in regard to sexuality and technology. For, in making love with woman we have the same choice as in our inquiry of nature: to allow ourselves to be overcome and transformed by the mystery of the experience or to remain in control and to protect a fixed identity. One attitude surrenders control and leads to union; the other maintains distance and leads to use and abuse. One is a stance of opening, softening, dissolving; the other, of hardening, closing, reasserting established identity and boundaries. As with nature, woman can be considered a resource, used to please ourselves or to demonstrate our technical prowess while nominally pleasing her. The superficiality of lust, as portrayed in the sexualizing ethos of the media, is a defense against the softening in surrender that woman importunes. The physical intensity of the sexual act may in itself seem overwhelming, forcing a surrender, at least in orgasm. But against the primal longing to be overcome stands always the compulsion to remain in control, intact.

The possessiveness at the root of monogamy, therefore, reflects not only the infantile wish to own the mother, but also a later boyhood discovery that the vulnerability involved in attachment to women is only bearable if such feelings, and the women who are their object, are kept under control.[292] While exclusivity may serve this end, so may its opposite. Relating to one's sexual experience as a consumer product, as a matter of one's own pleasure and an extension of oneself rather than a door to the Other, may indicate fear of losing control over one's experience and life. "Fear of commitment" and the defensive strategy of "playing the field" are identified typically with males. To the degree that women have bought into the masculine sexual model, however, these are female ploys as well. Women increasingly embrace the same defensive distancing and control of experience that lead men to paste together the ideal lover from a collage of partners or body parts. With a single partner taken seriously, one may be obliged to relinquish control and escape routes, adapting to the fact that the other, like reality, cannot be forced to be all that one desires.

The very distinction between self and other may blur in sex. One is then neither a sex object for the other, nor the isolated subject one took oneself to be. Neither knows in a fixed way what either is: the unknown subject confronts the unknown object. But in detached sex one retains the same identity, at the price of also limiting the identity and meaning of the other. Detached sex is mechanical because the whole point of it is to keep things predictable, circumscribed, chasing known pleasures with known strategies. Safe sex indeed!

Chivalry was a code both of love and war.[293] "Surrender" is the link between sex and death that chivalry forged, because both sex and death can be overwhelming experiences. Like death, the military act of surrender implies a defeat for both the male ego and the man's genetic interests. In the time of chivalry, much of the language of love was inspired by military and hunting imagery, venerating the patriarchal warrior order perhaps more than it did women.

Nevertheless, the ideal of chivalry imposed order and structure on the brutality of war and sexual conquest alike. Its very purpose may have been to humanize the sheer animality of male bloodlust, through ritual codes that would appear to the modern mind absurdly stilted, restrained, and impractical. As a siege of woman it had a related significance. Just as the object of war was not unbridled slaughter, but a kind of regulated symbolic contest, so the feminine object of courtly love was rarely in fact an actual sexual possession. Her conquest, too, was symbolic, transfiguring the animality of his lust. She was perforce a distanced object of veneration, since she was already spoken for or otherwise unavailable by circumstance or intent. His efforts to win "his" lady's love were themselves highly ritualized. They were doomed, in principle, since they were actually about surrender more than conquest.

Marriage as a patriarchal institution was a male right of ownership and control over the woman, her sexuality and reproductive function. But courtly love, as the historical basis of romantic or "true" love, was something radically different. From the point of view of goal-oriented sexual contest and possession, chivalry was impossible love, frustrated but driven, and condemned to a shadow existence outside the mainstream order and mentality of patriarchy and property. It was about passion, therefore, and not the action of conquest, control, or the triumph of will. Chivalry involved restraint of animal motivations and channeling of ego drives that usually served external power and control. The loss of control in passion leads symbolically (and sometimes literally, as in the story of Tristan and Isolde) to death. Death is the ultimate defeat of ego, reason and control. Surrender to love, and in love, is a kind of ego death, a surrender of masculine purpose and presumption.

In the Tristan story, Isolde is betrothed to King Marc, Tristan's uncle and liege. It is an arranged marriage of state, since Isolde is heiress of a neighboring kingdom. In marriage, she becomes Marc's property, extending his power. His nephew is bound to him by kinship and fealty, and is therefore his property as well. Nevertheless Tristan falls in love with the new queen and she with him likewise. They

conspire to meet in secret, are suspected, and much of the tale relates the charming and suspenseful ruses of their clandestine adventures. But Tristan is torn between his duty to Marc and his passion for Isolde; he is also concerned for the danger he places her in, since their illicit affair is treasonous and punishable for both by death. He resolves to avoid her, and meets another woman—curiously also named Isolde, as if to underline the parallel lives he must choose between. He marries her, but never consummates this marriage, always tormented by his forbidden love for the first Isolde, which does finally lead to the death of both lovers.

However, the tragedy of the story is not mortality, which symbolizes surrender, but the conflict between two modes of love and relation to the feminine that could not be resolved in the life of the times. Tristan, the man of action, does not simply run off with Isolde the Fair, to steal her to be his own property.[294] Nor does he resign himself to a conventional married life with the other Isolde who is his lawful possession. Either of these options would have signified the business-as-usual of patriarchy and masculine assertion. His passion is bound up with a fate he cannot and does not *wish* to control, and he passively allows it to overtake him. From the perspective of conventional wisdom, this is a cautionary tale. But symbolically, from the perspective of a greater wisdom that would balance control with surrender, Tristan's fatal indecision is a higher-level choice to transcend the masculine ethos of medieval Europe.

Through the songs of the Troubadours, this tale and others of its kind, along with the whole cult of chivalry, became associated with the gentle and other-worldly religion of the Cathars in southern France, which in some ways could be viewed as a resurgence of the feminine. Perhaps it was so viewed by the Holy Inquisition, which annihilated the strongholds of Cathar faith in a bloody crusade against this "heresy" at the beginning of the 13th Century.

The Romance of Tristan and Isolde has held such sway over Western consciousness that it has become, though ironically distorted, the archetype of romantic love. The narcissism of consumer society has mystified the magic of love at first sight and trivialized sex as the very symbol of consumer freedom and self-indulgence, entirely missing the point of the story. But such inversions are a psychological defense against the very power of the feminine to infect the masculine psyche.

So, likely, was the Inquisition a defensive backlash of the patriarchal Church against diverse challenges to its worldly authority, which arose in the liberal spirit of the Renaissance. It could be argued that women

were selected as scapegoats simply because they were a defenseless target. Since women were hardly a small minority, however, we must look for other reasons as well. The "witches" who were burnt at the stake by the millions throughout Europe were often the female counterparts of the alchemists: "wise women" who were traditional midwives, herbologists, and repositories of folk medicine heralding back to the goddess religions. The male establishment had set out to appropriate female powers, which in this instance stood in the way of the new masculine profession of medicine. More broadly, the philosophical materialism and democracy of science itself were heresies threatening the philosophical idealism and entrenched power of the Church fathers. The interest in nature and the independent reality of matter represented one aspect of a resurgence of the feminine; another was the eruption of such themes as courtly love, the cult of the Virgin, and the "femininity" of radical cults such as that surrounding the young mystic Francis of Assisi, which recapitulated the humility and surrender of Jesus. What better way to suppress the feminine than in the persons of women?

6.4 The Grand Error of Nature

If Man is to be a self-making, ideal creature, then how can he be of woman born, between two excretions, as the saying goes? The association of the feminine with the vulnerable human condition—with the existential dilemmas of mortality, finitude, and animal nature—will persist as long as human beings come into this world through the wombs of women. It is the infant's early experience with the mother which renders "female intentionality" so overawing and apparently threatening to the dependent child's budding autonomy, but even more so to his secret projects of self-generation, transcendence and immortality. We identify nature with woman because nature holds a power over us like that which our human mothers did over us as infants. She is *all*, the object of the infant's every passion and the source of relief from every need. While the growing child may be wary of being smothered in the maternal matrix from which he or she seeks symbolically to break away, nature inescapably drags each of us back into her womb at the end of life. And though it be the great idealist dream, we can never in life leave our natural home of embodied physicality. Who could be to blame for this imprisonment within the confines of nature but woman herself, who brought us into the world in the first place? And what better way to begin to turn the tables on nature than by isolating,

containing, conquering and taming the dangerous influence of the feminine?

Men handle that influence by taking refuge in diverse all-male clubs, which allow them to recuperate from dependence and assert their competence and dignity in everything from armies and secret societies to sports matches and hunting trips. Men protect themselves in other ways too, by disengaging emotionally from women, keeping them controllable objects.[295]

One reason why male culture-bringers throughout time have typi-cally rejected women, sexuality, and marriage may be that lust for woman concludes in family life—in the responsibilities of paternity and the mundane joys of the hearth—rather than in pursuit of grander heroic ambitions. The horizon of the family is closed, limited by kinship, repetitive in the way that creature life always is. But even at the beginning of culture, before the advent of the individual, the hero, and the open horizon of history, men sought to pursue spiritual realities in isolation from women, in divisions of labor, in secret societies, sects, rituals and religions, which from the outset appeared in opposition to the matriarchate.[296] The caves of paleolithic peoples, painted with shamanistic hunting scenes, appear to have been meeting places rather than dwellings, and seem to reflect male more than female themes and concerns. There is ample documentation, in anthropological studies even in the last century, of exclusively male groups and their anti-feminine bias. An explanation sometimes proposed is that men suffered economically, socially, and perhaps psychologically under female domination in early horticultural society, which diminished the signifi-cance of hunting. If so, men compensated for this demotion through magical-religious means and by withdrawing into the company of their own.[297]

The *kina* of the Yamana Indians of Tierra del Fuego is both a myth and a rite observed only by men, who paint and mask themselves to represent spirits with the intention of intimidating the women. In the story they enact, however, this same rite had formerly been performed by the women, led by the "moon woman," Kina. That is, the rite was appropriated by the men and the situation ritually inverted. The men's subordinate position was broken by the "sun man," who led the men of old to slaughter the women and take over their ritual, except for little girls who were spared to carry on the life of the tribe.[298] This is a very revealing story—a Jungian slip, as it were—in which the men's fear, resentment, and aggression is literally but thinly masked. Whether or not the mythical coup was an historical event, the kina still serves to

keep the women in their place. The point of this ritual, and of others like it around the world, is for men to remind themselves of the need for such threat, and to convince women to take it seriously enough to keep to their place in the social order.

It is not only for conscious political, power-related reasons that women are excluded from masculine spirituality and idealism. As earlier noted, the different responses of the male and female psyche to the process of individuation mean a far more determined and "heroic" disengagement of the boy from the mother, and of the male subculture from the collective. The female subculture seems less driven by the need for ego identity and heroism, and this may be one reason for the antifeminism of male groups, who do not wish to be "polluted" by feminine values. Woman and sex are a danger zone wherever men are insufficiently sure of themselves.[299] Men are associated with spirit because it is *they* who represent the human impulse toward transcendence. Women might participate in it, but only marginally.[300] This, of course, begs the question of how much "transcendence" is a male more than human preoccupation.

The feminine is quarantined not only to prevent contamination of masculine enterprises, but also to objectify it, to better distance, appropriate and control it. Aspects of the feminine are contained, as though in a laboratory, in order to imitate them and reclaim them as masculine. Ironically, the feminine is a major inspiration for the masculine idealism that rejects it. Men have always sought to appropriate the life-giving, reproductive, nurturing functions of women. The *couvade* is an institution whereby the man acquires the right to parent his child by imitating the pains and sequestered isolation of the mother in childbirth. In some cultures, male acts of ritual bloodletting parallel the females' menstrual and postpartum bleeding. Sub-incision of the penis is practiced by male Aborigines to create an artificial vagina; the wound is periodically reopened to simulate menstruation. In New Guinea, this is ritually achieved through self-inflicted nose-bleeding. Priests of the Great Mother in ancient Mycenaea and Crete would cut their arms, so that blood flowed freely, without showing pain. The blood sacrifice of war in ancient Hawaii was considered the man's childbearing, while childbearing was considered the woman's brave sacrifice. The Aztecs equated a man's death in war to a woman's death in childbirth. In some cultures war was considered a ritual bloodletting parallel to menstruation.[301]

Lest we think that womb envy is a matter of primitive history only,

recall that the delivery of babies was taken over in the modern era as a male prerogative, and childbearing was eventually redefined as a medical problem to be managed in hospitals under male supervision. It was then the male doctor, rather than the mother or her midwife assistant, who birthed or "delivered" the child. Breast-feeding was displaced by bottle-feeding an industrial formula developed by male chemists, which could be administered to the infant by fathers. Finally, through genetic engineering, cloning, artificial insemination and incubation in artificial wombs, as well as through the projects of artificial life, men attempt to appropriate control over the biology of reproduction and the very creation of life. These functions are no longer the particular domain of woman, inspiring awe and reverence for her, for the feminine, and for life, but have been stolen by men and reduced to a set of technical procedures.

In Steven Spielberg's film *Artificial Intelligence*, set in a high-tech world of the near future, a woman is not allowed to have a second natural child, but is permitted to adopt an artificial substitute: a boy android that is astonishingly lifelike in its emotional responses. The illogic of this premise (why would an artificial child be preferable to a real one?) betrays the true intent: controlling not population but reproduction, displacing female-created life with male-created artifice. The play of the artificial boy upon his adopted mother's emotions represents the triumph of masculine ingenuity over feminine sentiments and instincts: the ultimate test of the masculine project of simulating life is whether it can fool a real mother. Ironically, the film largely follows the quest of this "pinocchio" to become a real son. Virtually immortal, his deepest wish is to be reunited, if only for a day, with his long-dead human mother, to be enfolded at last in feminine love.

"All witchcraft comes from carnal lust, which is in women insatiable," says the *Malleus Malificarum*, in which celibate male scholars accuse women of being obsessed by sex. Were women so oversexed in medieval days, or is this a trick of the male mind, a reversal through denial and projection upon women of men's repressed lust?

Of course, women can sustain multiple orgasms, and their biological and emotional self-sufficiency likely do trigger insecurities among men. Rather than face these, however, men typically pretend to be the ones who are independent, powerful, and sexually privileged. Such buried insecurity is compensated by making a world in which *they* hold the power, the political and economic independence; by creating realms of

enterprise away from family and home, so that they appear to be the ones who are self-contained; by imitating, mastering, displacing, and appropriating nature so that they appear as the ones with enviable creative powers; by pursuing attitudes of sexual conquest and bravado, along with detachment, so that they seem at once sexually and spiritually superior. Man compensates his humiliating insecurity by endless posturing and flexing of literal and figurative muscles; he indulges his revenge for peripheral expendability by marginalizing and repressing women and expunging the feminine from within himself. Surely woman sees this and has contempt for the lie and the liar, as well as for the treatment she has received. Woman's cagey exploitation of male foibles becomes her own resentful compensation for the inferior position to which she has been relegated. It becomes her own lie: the belief that she knows best and is really in control, the knowing wink of superiority.

That suspicion is mutual between the genders is no indication of parity or of life in balance. Darwin observed, around 1870, that the proportion of Aboriginal men to women was between two and three to one. This turned out to be a result of deliberate female infanticide—in fact, gynocide.[302] (Compare what is happening now, for instance, in modern China.) He also mentions, almost casually, that many primitive women were treated virtually as slaves or beasts of burden.[303] Far from the sex object or beauty queen that is the modern ideal of the alluring woman, "primitive" women were sometimes denied any adornment all. He chalks this up to the selfish and brutish treatment of women as a source of labor, though males of other species are typically more highly ornamented.[304] With humans, it may also reflect the greater need of the male to differentiate himself from the natural state, since the body was the original surface available for idealizing adornment.

While it may have begun the other way around, fashion is now the preoccupation of the fairer sex. The focus of men's compulsion to idealize and transform has shifted from their own bodies to those of women and the larger world. The technological urban world has become men's surrogate body, the sign of their ideal life and separation from nature. It is ironic that the gender obsessed with fashion today tries so hard to impress the one that appears to care least about the other's status.[305] But female fashion *is* about male status; while men may care less about the woman's social standing than women care about the man's, they *are* concerned about their own standing in other men's eyes. The adorned woman is status symbol for her man. This

might include her social standing, but by no means needs to. It is not how she is viewed in her own right that counts for him, but rather how she is viewed by other men as a sexual object—his possession—which reflects not *her* wealth or standing but his.

The male objectification of woman serves to contain the feminine within the bounds of male culture and definition. That way, he knows just what she is, and her power over him is limited to her wiles and sex-appeal. It is the woman's *subjectivity*, her empowerment as an agent, which is resisted, contained and minimized through objectifying her body and limiting her social power. The male's more conservative approach to his own appearance reflects his insistence on subjective being and power, projecting bodily presence rather upon her. The near invisibility of the man in the gray flannel suit emphasizes his desire to be all subject and no object; and he wants the woman to be the opposite. The woman in patriarchal society can only claim her subjectivity through the man, or in traditional ways he approves, such as motherhood, which will not challenge the political structure. In modern, democratic, post-sexual-revolution society, women are free to become virtual men, though women's economic power remains fixed well below that of men, at a magically persistent ceiling. For the same work, the average pay to a woman is three-fifths of that received by a man, the same ratio as a hundred years ago.[306]

The transition from the polytheism of the goddess religions to male monotheism, and the displacement of goddesses by male deities, reflects the transition from matriliny to patriliny and patriarchy, from the clan to the father family and the state ruled by a king. It coincides with the oppression of women and of female sexuality. Both the Hebrew and Greek traditions held the woman to be inferior even in reproduction: the active causal principle becomes the male "seed," the woman being merely the "soil" in which it is planted and nurtured. In this way, the child too becomes his possession. The emphasis on sexual morality, combined with the double standard for men and women in Hebrew law and scripture, served to establish the certitude of paternity required for patrilineal descent.[307] This triumph is reflected in the change to a male-dominated pantheon.[308] The figure of speech "son of man," used repeatedly in both the Old and New Testaments, may have referred to the fact that the male followers of the patriarchal religion no longer considered themselves "born of woman," an expression which became synonymous with mortality. The transition to patriarchal religion thus represents the male's transfiguration from mortal product

of nature to self-generating spirit and creator of the human world. The observable pattern in archeology and mythology indicates demotion of the mother-goddess and the ascendancy of her male consort or son, who eventually emerges as a storm god of the mountains to form the male creator god at the top of the pantheon. Through the shifting relations of the goddesses and gods, power is symbolically transferred from female to male and from the body to the head.

The Hebrew prophets introduced into Yahwism the revolutionary notion of religious intolerance which has permeated the three Semitic religions ever since. Infidelity to Yahweh through worship of the goddess was equated, under patriarchal monogamy, with the sin of whoring.[309] The books of Isaiah and Ezekiel resound with threats and curses upon the "pagan" followers of the goddess and accounts of the Hebrews' campaigns, authorized by Yahweh, to repress them through mass slaughter. The very vehemence of these campaigns attests, however, to the persistence of fertility and goddess cults and of female resistance to the patriarchal takeover.[310]

Jealous and *zealous* are variants of the same word. The zealous intolerance of the prophets reflects the husband's exclusive rights over the wife in patriarchal monogamy and the head's assumed jurisdiction over the body. The jealous supremacy of the one true God over all other gods mirrors the supremacy of mind or spirit over all other aspects of being. This is the supremacy of the transcendent subject, as an abstract principle, over mere phenomenal contents of experience, and certainly over physical matter and nature. In the pantheons of other religions, minor gods typically symbolized *attributes* of life, psychological being, the world, or phenomenal experience. Thus, a similar situation occurred in northern India with the Aryan invasion, where the dark-skinned southern goddess-worshippers retain many local deities who are understood as attributes of the divine, but over which the Aryan Brahman is now held to reign supreme as the abstract principle of consciousness beyond and underlying all qualities, "not this, not that." The Brahmin caste named themselves after their superior god, and appointed themselves lords over the other castes, with the same enthusiasm that the Yahwists named themselves after their god, whose zeal justified ruthless conquests of neighboring tribes of "idol-worshippers."

This is not to deny that monotheism signified an intellectual and cultural, if not necessarily a spiritual, advance. Both Yahwism and Brahmanism represent the quest for essence and abstraction, the general and eternal over the ephemeral, a movement toward ultimate under-

standing of the diversity of the world. Brahmanism, through its later development as Advaita Vedanta, is a powerful affirmation of an existential ground of being. Jewish monotheism is particularly admirable for its development of ethical values and practices and its rejection of priestly hierarchy in favor of communal worship.[311] This insistence, along with the moral admonitions of the prophets, is mirrored in Protestant fundamentalism. Islam is admirable for its inculcation of non-materialistic humility and surrender to the Almighty. But the place of women in Indian, Jewish, Christian, and Islamic society and religion remains subordinate even today.

In the patriarchal religions, lust was not regarded as the natural (though characteristically male) biological drive, but projected upon women as the cunning arousers of male desires and male competition.[312] The enmity placed between woman and the serpent, associated with Goddess religion and its relaxed sexuality, signifies the sexual oppression of women, whose sexual life under patriarchy was confined to the reproductive function.[313] Her sexuality, like her subjectivity in general, were diminished in male eyes from something he should lovingly serve to something designed to serve him. As his property, she became another domesticated animal—for breeding or for pleasure.

Adam is estranged by his ascensionist ambitions not only from God and nature, but also from Eve, who becomes scapegoat for the human condition. When confronted by the Lord, he turns against her, blaming his misdeed upon "the woman thou gavest me," and hence, indirectly, upon Yahweh himself. It was she who tempted him out of his self-contained and timeless nest of ideality. She is both the real womb and the birth from it into contingency and his-story. He can never forgive her for her enviable life-giving creativity, which provided his existence, upstaging all his pretensions at self-generation; nor for expelling him from his uterine paradise. Nor can he forgive God for human mortality and the hard realities of nature, as opposed to the idyllic life of the Garden where Man and lion and lamb lived together in perpetual harmony.

Energy, or the active dimension of cause in physical systems, was from medieval times associated with the masculine principle of agency, spirit, will, or mind, in distinction to matter, which was identified with woman. Given their inferiority in his view, Aristotle considered the very existence of women to be an enigma. He thought there ought to be *one* type of human being, capable of hermaphroditic self-replication. Naturally, this being was implicitly male![314]

The antifeminism of Aristotle in the post-Hellenic world was matched by that of Augustine in the medieval Christian world. One stood upon the shoulders of the other. Augustine, like Buddha, traced the fallen state of man to the original sin of procreation. His doctrine of original sin was probably influenced by his own unmanageable sexual drive. The apparent intractability of lust led him to oppose doctrines of free will associated with ascetic movements embracing the possibility of successful sexual transcendence. Augustine "proved," in a great triumph of theory over fact, that it was impossible to manage sexuality by means of willful effort, thus discrediting the notions of spiritual marriage, celibacy in mixed communities, and gender equality in the Church.[315]

The idea of asceticism in general had emerged in the first generation of Christians, who set forth to establish the kingdom of heaven on earth; to redefine life, human relations, and social institutions in the spirit of Christ. Ascetic Christian sects were model utopian communities, bold attempts to live the teachings of Jesus by directly creating in their own generation the new order he advocated. These communities had the advantage, over later all-male orders, of joining male and female perspectives rather than opposing them. Long before Augustine, celibate women and men had successfully lived, taught, traveled, and preached together, providing the powerful example of their own harmonious way of life. This movement constituted a potential social as well as spiritual revolution, for it threatened to replace the patriarchal family and the hierarchical state with a socialistic community of celibates.[316] They were living proof that the love of Christ could overcome all divisions, even those of class and gender. That these early Christians upheld a utopian ideal of community, however, does not in itself explain the rejection of sexuality. Whether or not celibate himself, Jesus never condemned sexuality per se, but only lust.

Christianity had been a small subversive sect struggling against the worldly authority of Rome, a rebellion against the establishment. Under the emperor Constantine it *became* the establishment. Initially, it had fed its ranks by opposing not only instinct and sinful human nature, but also Roman oppression. Later, it was convenient to insist that central authority, whether of church or state, was needed because of the inherent weakness of personal will—whether in regard to sex or the management of society.[317]   Man was at the mercy of his predetermined fate (today we might say: his genes), from which only the grace of God or the patriarchal might of the orthodox Church could save him. But the shift in attitude away from the feasibility of a "chaste

mingling of the sexes," which occurred between the first and fourth centuries AD, was less a reassessment of lust (about which there could hardly have been much new information) than a political maneuver of orthodoxy against the rival and radical charismatic cults it branded as heretical. In contrast to earlier ascetics living coeducationally, women had come to symbolize all that the monks were struggling against in the form of sexual temptation, corruption by the world, and heresy.[318]

The early Christians had taken for granted that lust could be overcome in such a way that men and women could cohabit and work together cooperatively in close quarters, as brothers and sisters or simply as unisex individuals. The female devotee had been an ally in this project. Later ascetic movements, in contrast, enforced celibacy by repudiating the feminine, segregating the sexes, and reducing the role of women in the Church to the point of exclusion and eventual persecution. These movements became all-male societies, based upon misogyny and an assumed male superiority. Their success at sexual purity was far from uniform. In some cases, monastics carried on debauched illicit relations with women while continuing to castigate them as the evil source of temptation. In others, men turned to homoerotic, homosexual, and pederast expressions of lust; by the 11th century, these were not only tolerated but celebrated.[319] In either case, conspicuous by their absence, women remained the object of men's negative projections. The masculine quest for union with God— and between men—was pursued at the cost of separation from the other half of the human race.

Medieval Christianity had become a religion of empire, an instrument of worldly power, and an increasingly male-only club. Many of the Church's higher clerical offices were drawn from the warrior class, the ruling nobility which was the feudal patriarchy. Celibacy represented the way of the warrior—becoming the spiritual warrior or adventurer of the mind. Monastic celibacy also served to rationalize the dispossession many men experienced sexually as well as legally through the practice of primogeniture. From their perspective, the monastic life offered a way out of social despair; from the ruling elite's perspective, it defused resistance to their own monopoly on sex and property. Rejecting the mundane role of household life with which marriage was associated, some monastics might well have preferred the life of the mind and creative production to reproduction, spiritual adventure to the hearth. For similar reasons, perhaps, romance and sexual exploits are still vaunted by men, while marriage is deprecated as a loss of freedom.

The two successive strategies adopted by religious men to deal with their own lascivious tendencies were opposed in tone and certainly in consequences for women. The strategy that won out was to circumvent temptation by excluding and castigating women:

> Recognizing that the wickedness of women is greater than all the other wickedness of the world, and that there is no anger like that of women, and that the poison of asps and dragons is more curable and less dangerous to men than the familiarity of women, [we] have unanimously decreed for the safety of our souls, no less than for that of our bodies and goods, that we will on no account receive any more sisters to the increase of our perdition, but will avoid them like poisonous animals. 320

As well as reflecting a misogynist attitude, monastic celibacy no doubt also reflected a pragmatic recognition of the universal power of the male sexual drive—not only as a direct compulsion to sexual activity, but as an indirect cause of murders, violence, and social mayhem through competitiveness and the coveting of worldly riches and power that provide access to women. Sex increased the stake in this world, with the time-consuming pursuit of mundane affairs required for family life. All in all, Christian celibacy represented a great, if failed, Western experiment to sublimate male nature.

Certainly, excluding women removed the external stimulus and redirected sexual energies toward production. Monastics, no longer able to rely upon the labor of the expelled women, became adept inventors and whole monasteries became virtual factories cleverly run on water power. With time on their hands, monks invented the first clocks, the better to perform their offices night or day with an idealized punctuality liberated from natural rhythms. As the forerunners of scientists, they amassed and developed considerable artisanal and technical knowledge. But these pent up energies also found destructive avenues of expression. The history of the medieval and Renaissance Church is riddled with schisms, political intrigues, assassinations and massacres, repression of minority beliefs—and, of course, oppression of women. At the height of the crisis posed by the Reformation, women became more than symbolic victims of male hysteria. Outright scapegoats, their persecution as "witches" amounted to a genocidal campaign against the female gender, which remained, in the orthodox male mind, associated with heresy and the temptations of the devil flesh.

Celibacy primed the pump of Western science, by creating a way of life devoted to contemplation and study. It was in the celibate culture of learning of the cathedral schools and universities that the Western intellectual tradition first developed; it was a world literally without women.[321] Science grew up in this monastic ethos, and many of the great philosophers and scientists—among them Newton and Boyle—were celibate or solitary, part of a long tradition repudiating women and family life. A founding member of the Royal Society expressed his dim view of the fairer sex in 1659:

> You are the true hyenas, that allure us with the fairness of your skins; and when folly hath brought us within your reach, you leap upon us and devour us. You are the traitors to wisdom, the impediment to industry... the clogs to virtue, and goads that drive us all to vice, impiety, and ruine. You are... the grand Error of Nature. 322

While Galileo had three children by his mistress, he never married, but exiled himself from his children the better to pursue his studies.[323] Even Einstein, a philanderer and father twice married, was essentially of the monastic disposition, shunning the complications of emotional embroilment, and longing for the peace and simplicity he found in the eternal truths of mathematics. Freud, the grand patriarch, took pride in the virtual celibacy of his later life.[324] He described the heroic male as "a man whose sexual need and activity were exceptionally reduced, as if a higher aspiration had raised him above the common animal need of mankind." This might seem ironic for a thinker whose monumental contributions centered on sexuality. But Freud's thought was not only reductive. While libido might be the driving energy behind civilization, it was the heroic ability to transcend its bounds and shape its expression in sublimated forms which defined culture and human consciousness.

Renaissance scientists, inventors, and explorers became heroes of a new sort, as intellectual conquests supplemented military ones. Commerce, too, provided a new forum for male vitality. Humanism invoked a Promethean concept of Man as a secular creature whose reason liberated him from dependency on divine revelation, bringing him a huge step closer to the core project of self-generation, ready to rebel against Heaven and dominate the planet.[325] But there was a cold underside to the Enlightenment, which was at once a movement toward radical change but also, preeminently, a search for rational order. The scientific movement divorced itself quickly enough from utopian movements for social, political, and religious change in the air at the time. While nature was vaunted as a new avenue for exploring the mind

of God, the language of nature was seen to be mathematics, not an emotional babble of political passions. The natural philosophers of the 17th century tended to ally themselves conservatively with the established powers of church and state, in search of a restored political as well as intellectual order.[326]

It is not surprising, then, that there was some overlap between the inquisition of nature and the Church's Inquisition, prosecuted largely against women. Nor was it surprising that the new exploits of science and exploration continued the monastic tradition of repudiating and excluding women. The Copernican theory symbolically displaced woman from center to periphery, to circle about man as earth did about the sun or the moon about the earth, while the revival of Aristotle in biological thought shifted the active principle from female to male. Women, as always, were associated with the reform movements and radical sects of the day because of their greater freedom and visible participation within them; thus the independence of women remained associated with the threat of heresy, disorder, and change.[327] The sexist metaphors of Bacon, Machiavelli and others were rooted in the witchcraft trials, in which Bacon participated on the team of the prosecution, as Attorney General under the tutelage of his misogynist king, James I. Much of his language and metaphor promoting science were inspired by courtroom proceedings and had a distinctly sexual nuance, in reference to the alleged sexual practices of witches.[328] The secrets of nature were to be probed and prodded just as confessions were exacted by torture from accused women. Technology was useful for both. The witch-hunt, in the so-called Age of Reason, combined long-standing patriarchal misogyny, a vicious return of repressed medieval superstition, and the political expedient of a suitable scapegoat for the chaos of the time. The Inquisition sacrificed expendable old women, and the feminine at large, to the worldly power of the Church fathers. With trumped-up charges and proceedings, a religious frenzy was incited that for centuries successfully distracted attention from real social issues of the times, which included redistribution of wealth and power.[329]

The quarantine of the feminine should not be viewed as a phase modern society has outlived, so much as its very foundation. While *women* have been allowed relative equality and safety in the modern Western world, this has largely been so in the measure that they have become masculinized and co-opted within the male power system. The *feminine*, in contrast, remains repressed and recessive even in the West. Men continue to live out their childhood fantasies of keeping a female

in live captivity, one who will energetically support and protect the man's projects with her maternal blessing and self-sacrificing help.[330] Even as men abandon the traditional breadwinner role, many continue in the expectation of nurturance and submissive service as a fundamental right owed to them by women, while holding women in contempt as sex objects, predatory parasites, and as an alien subspecies they can't live with and can't live without.[331]

One must question, as feminist scholars have, the objectivity of a science whose culture is gender biased and which was founded on the repression of the feminine.[332] While science is tainted by gender bias, gender itself is seen through masculine biases validated as "scientific." Science expresses a cultural preference for masculine values, while the feminine is devalued as the opposite of objective: emotional, subjective, merely personal and anecdotal, the deterministic body versus the free mind.[333]

As an advocate of the new field of fetal microbiology, a former professor of medical ethics commented that the womb "is a dark and dangerous place, a hazardous environment. We should want our potential children to be where they can be watched and protected as much as possible."[334] That is, "our" fetuses should be grown in laboratory light, in artificial wombs invented and supervised by males, where genetic modifications can be freely made![335] The natural womb is hazardous to *sperm*, however, not to the eggs within it. "Our potential children" is a slip referring to the male gamete, still reflecting Aristotle's bias toward the father as the active progenitor. The natural womb, like the feminine principle, remains a threat to male control.

Only relatively recently have ideals of genderless identity gained widespread acceptance, perhaps beginning with the Christian ideal of heaven, where there is neither male nor female. Genderless concepts of soul, person, and human being have led to humanism and universal human rights, on the one hand, but also to the invasion of gendered tradition by commercialism in industrial society, where the individual is a sexless unit of production and consumption. Only with the Industrial Revolution was a genderless worker conceived, along with genderless labor, tools, processes and materials. The new science which paved the way for industrialization introduced a neutral, quality-less, abstract matter at the disposal of industrious Man—no longer *men* in distinction to the moiety of women, but another abstraction: the observer, experimenter, inventor, laborer, merchant, entrepreneur, etc. These roles were nonetheless *masculine* roles, representing a monopolar force, unbal-

anced and unrestrained by a complement. Changes in the meaning of materials, tasks, and agents expressed an ultimate triumph, through mechanism, over the feminine. These changes coincided with the first intellectual appropriations of the commons by moneyed interests, the first infringements of modernism on what Illich calls *vernacular values* —the traditional ways of subsistence, oriented toward communal satisfaction rather than the exploitation of one segment of society by another.

By and large, *work*, until then, had always consisted of gender-specific tasks performed with gender-specific tools and materials, accompanied by taboos protecting these arrangements. In pre-industrial societies all over the world, even tools intended for communal use could nevertheless only be used by one gender or the other.[336] Gender arrangements not only functioned to maintain ordered relationships between men and women in traditional cultures, but also served the characteristic male need for separation and dominance. Illich makes the point that the mutual dependence of men and women upon each other set limits to the battle of the sexes in traditional societies—a truce which, however unfavorable to women, was broken by industrialization.[337] Subsistence and vernacular values pertain, above all, to peasant or tribal society where the genders, and people in general, were relatively equalized in their shared poverty; aristocracies may have upheld similar arrangements within their own ranks.

Subsistence culture was the order throughout all of human history before the Industrial Revolution, which dissolved gender in favor of the neutered producer and consumer. The point is not that women were better off in pre-industrial society, but that in modernity the collective ways of humanity have been sacrificed to private purposes without compensating social responsibility. Even the great robber barons of the Industrial Revolution, like Carnegie, had their own version of *noblesse oblige,* which modern transnational capitalism tends to lack. In the consumer society, the truce broken is both between the genders and the classes.

Whether factory employee, office worker, consumer, or corporate shareholder, the significance of the unisex individual is that the society of mass production and consumption requires standard components and procedures. Consumerism and the unisex society follow together from industrialization. Moreover, all individuals must be essentially alike as governable social atoms. They must be functioning parts of the political-economic machine, reachable segments of the market whose

vote, with the ballot and the dollar, must be cultivated by a universal media mill in which commercial and political propaganda merge. The tastes of men and women must alike be turned toward consumption and investment. Since love cannot easily be commodified, it must be trivialized as sex. Since family and local governance resist this structure of control, they must be dissolved. Society must be atomized to yield the maximum number of consumers, and centralized to maximize control over them. In many North American cities, the same magnificent old houses that were once supported by a single white-collar income are now subdivided into several apartments or suites, each of which can scarcely be supported by *two* incomes. The ideal of consumer society would have everyone living in isolation, devoting all of their leisure time to spending or in activities which lead to spending, such as television watching and internet shopping. At the same time, consumers are encouraged to invest their savings as well as to spend them. Isolated, we may labor not to express individuality or pursue creative purposes, but to have access to standard consumer ideals: car, house, entertainment center, new computer, second car and second house, boat, vacation package, etc. These are the off-the-shelf, clichéd goals and life plan of modernity. The vernacular values of homemade entertainment—whether making love or music or conversation together —are subversive in the consumer society because they are not commercial products, do not enter into the economy, and generate no profit or taxes. He or she who is marginal, an economic dropout, is a traitor to the system.

One works to justify one's slice of the economic pie, up for grabs; and honest work itself in the global economy must be a scarce commodity to be competed for. In a subsistence economy, in contrast, work is not dependent on a boss or a corporation to supply but self-generated in cooperation with others; not a market commodity over which to haggle but a direct engagement with the environment for survival. In some cases, it is a labor of love. In traditional societies with their segregated tasks, by definition there could be no competition between men and women over work. In such cooperative societies, there might be differentiation of tasks, but no struggle over who gets to work: *everyone* does, and everyone has their say as well as their responsibility. In industrialized society, in contrast, the economic machine is not *their* collective enterprise or property, nor under their control.

Industrial society and consumerism have transformed work and play, marriage and the household, individualism and sexuality into functional parts of a global economic machine. In the process, gender

is obliterated and reduced to sex.[338] The obsession of Western media with sex is in direct proportion to the disappearance of gender as a profound *cognitive* division of labor. Just as consumer choice is the trivialized version of individual expression and real political choice, so is sex in consumer society the trivialized version of access to the perceptions of the other gender. But in patriarchal culture, this is a one-sided affair. Women have gained free access to masculine ways, while deeply feminine perceptions are discouraged in both men and women.

The unisex mind is in essence the *masculine* mind, which has deliberately neutered society. Grounded in the genderless, though masculine, soul and the genderless Creation by a masculine god, the Western mind found in the Renaissance cosmos a new plaything suitable to masculine interests: the universe no longer a garden but a machine to tinker with and harness to profit. Just as neutral matter and energy moved through abstract space and time, so neutral capital flows through economic channels and neutral libido animates the genderless body.[339] What is lost in this eager rush to so-called objectivity is the perspective of "female intentionality," which carries "the atmosphere of that unbounded, shadowy presence toward which all our needs were originally directed," and which is permeated also with "the rampant and limitless, the alien and unknowable."[340] It might be putting the cart before the horse to assume that cosmic mystery is modeled on the early relationship of infant to mother; but in a masculine world it is unques-tionably the feminine which embodies and conserves that mystery. The feminine bears the values considered humane and civic, in opposition to the rapacity of an economic warrior elite, who run the global society of mobile capital and a world arms industry on our behalf. The mascu-line world is frankly too much with us. The unknowable and the limitless are attributes of a much-needed attitude that is the opposite of the modernist hubris to control and exploit absolutely everything.

6.5 A Balance of Heaven and Earth

While the whole human world may be described as playing out the quest for a self-made identity, males have played a dominant part in this quest and in transforming the planet. The role of females in creat-ing culture and the human identity has been overshadowed and over-looked. We have yet to imagine what a world made by women would look like.

The story of Man's relationship to nature, moreover, is really the

story of men's relationship to the feminine. Characteristic solutions to the masculine identity crisis are what we know as "ego satisfactions": power, status, dominance, recognition, accomplishment, etc. Perhaps these reflect the extent to which social values have been defined by dominant men. On the other hand, the great dreamers, contemplatives, saints and idealists, who have been relatively in touch with the feminine principle, have been lumped together with the great conquerors, doers and troublemakers of history, not only by gender but also in their shared masculine idealism. In short, the conquest of nature, of civilizations, and also of intellectual and spiritual space, have been largely male enterprises, and culture ostensibly a masculine accomplishment. This is first of all because men have created and ruled the world while women remained, perforce or by choice, in supportive roles at home. In addition, it is because the efforts of women to make their marks in a male-dominated world have been systematically ignored, thwarted or appropriated by men. Just as importantly, because a certain *type* of man has been able and driven to impose his leadership on society, the voice of the feminine has been muted in the patriarchal era and the masculine idealism that dominates it has acquired its particular tone. Male and female alike have been conscripted into the masculine ethos, and men too have been seduced by masculine concepts and values (progress, power, success, consumerism) that are against common sense and the common good. The repression of the feminine has served to keep in their place not only women but also the majority of men. If we have not witnessed a world defined by women, neither have we seen one produced by a positive masculinity: one that is not defined *against* women, the body, and nature, nor one that is not controlled by an elite of other men.

It is hardly my intention to suggest that women are the innocents of history, nor to vilify men. Human nature and history are collaborations, often collusions, between male and female, between the aggressive and the meek, leaders and followers, haves and have-nots. Collusion, however, does not imply equal or symmetrical partnership, only that the dominant and the dominated both have a stake in maintaining the status quo.

The supportive role of women in creating the drama of history has the consequence that credit for attainments judged positive by history does not go to them. It also has the advantage that women avoid blame for history's parade of moral and social catastrophes. By keeping a low profile, so to speak, women have remained outside the fray of historical process at the price of often becoming its victims. They have sometimes

remained immune to evils suffered regularly by men—combat, violent or stressful competition, assassination, hard labor, the rigors of adventure—at the price, perhaps, of infantalizing themselves through keeping the company of children and becoming the sort of docile company many men prefer. To be sure, they have played their part behind the scenes, occasionally coming to the fore to reveal characters as ruthless as the most aggressive males. Think of Lady Macbeth and Queen Elizabeth I; or of the bloodthirsty Maori women who, though they may not have partaken directly of cannibal feasts or clubbed enemies into slavery, heartily encouraged and profited by the savageness of their men. Think of the matrons of societies involved in ethnic feuds the world over and in every time, calling for revenge of their slain husbands, sons and brothers. And think of the cliché of the upwardly mobile housewife who lives through her husband's career, presses him for ever more luxuries, and grooms her sons to follow in his footsteps. Just as the masculine mentality has a positive and a negative side, so the feminine has its dark aspects along with its potential. My intention here is to point to this potential as a resource as yet untapped within *both* the male and female psyches: the feminine as a positive quality of being, accessible to men and women alike.

Just as the present world economic and political order can only function with the tacit cooperation of consumers and shareholders, so the system of male dominance can only function with the consent of women. These systems are, of course, one and the same: oligarchic patriarchy. The cooperation of middle class consumers with its purposes is secured by offering them the benefits of technology and a share in the affluence the West is able to leverage from the rest of the world. Most people in consumer society are attached to the fruits of industrial technology and its promises of ease and comfort. They may value hand-crafted items and personal care as luxuries; but they dismiss as romantic the notion of an alternative to industrial production that would be at once labor-intensive, self-reliant, and technologically contemporary.[341]

Similarly, the cooperation of women in all societies has been secured through a combination of blatant force, indoctrination about their "proper" role, exclusion from education and from knowledge about their own history, policies of divide and conquer, sexual control and male definition of deviance and respectability, economic discrimination and exclusion from political office, and through a system of class privilege which binds women to the status quo through a share, if

unequal, in the benefits of the system.[342] Globalism, in which the free reign of capitalism is supposed to benefit every class, attempts to insure that each layer of society has a vested interest in maintaining those relations. There may therefore be a general reluctance, even among liberal women, to bite the providing hands, demonstrating the extent to which people already owe their souls to the company store and are quite willing to support it without coercion.

Women embrace the system in which they share unequal benefits for the same reasons men do: for the rewards conferred, obviously, but also because it relieves them of responsibility to re-create society and redefine the world according to a better vision. Such a responsibility would force women to allocate their energies outside the home without being co-opted into the male system. This reluctance to rock the boat instead of the cradle, and the compromises women have accepted over the ages, stem from the original division of labor in which woman's focus is her children and the hearth, while man's focus is the dangerous world beyond, first of nature and then of other males and their ambitious schemes, from which women continue to benefit on the sidelines. But all are bound together in a pecking order, to the lottery system of capitalism, whereby anyone supposedly can rise to the top, though obviously not *everyone*. The fact that there can be moderate winnings for many, and extreme winnings for some, induces most to support the system on the gamble of success, even those who by any rational calculation stand to lose. The price paid for subscribing to the myth of social mobility is to tolerate the disproportionate wealth and power of the top layer at the expense of the whole of society.

While the classical zero-sum game of scarcity and competition is essentially antisocial, it is not nearly as divisive as one might expect. What holds overdeveloped societies together is the common interest of all sectors to maintain their global position with respect to other societies they exploit. While capitalism propounds "freedom," "democracy," and "consent of the governed" to appease the masses both at home and overseas, in truth it is parasitic rule by the rich, with tongue-biting assent of the would-be rich. The peripheral awareness of this double social truth, which can never be directly confronted without appearing seditious, is no doubt in part responsible for the widespread cynicism in America with regard to politics. Which, of course, only aids those who hold actual power.

While the status of men is determined by their economic relations, the status of women through history has been determined by their sexual relations.[343] Both genders have been conditioned under patri-

archy to accept these arrangements, which represent an uneasy truce in the battle of the sexes. Deep down, even liberal men believe in their male right to rule the world, and women seem willing enough to let them.[344] But the social cost of women's exclusion from culture-making enterprises can scarcely be counted because there is no alternative course for comparison. In history we have known only the fruits of this exclusion, in which women too have played their part by accepting the compromise.

It is far too easy for women to ignore their complicity in maintaining a recessive position within a repressive society. For one thing, the struggle for "equality" is a motherhood issue—forgive the expression. It is a mythical catchword and a diversion from real issues. *Sexual equality within patriarchal society can only mean the right to be a functional male*. Women who seek parity in the male-dominated system are chasing the same chimera as governments and social policies that seek economic success by embracing modernization and consumerism without succumbing to cultural imperialism. One feminist has claimed —naively, I think—that women, like other underdogs, are in a privileged position to hold a view unbiased by vested interest.[345] I suspect, rather, that the failure of feminist critique to propose significant alternatives to faulty masculine rule reflects more than a lack of imagination. For, it is far safer to demand equality and strive for recognition within the male system, and continue to reap its ill-gotten benefits, than to propose a radical rebuilding of society, which would be based on entirely different principles and which might preclude the lifestyles to which women too have grown accustomed. No one, male or female, wants to rock the boat enough to sink it; and that it is sinking anyway is not a thought we care to dwell on.

Possibly one reason why women attained the vote so late in Western society, however, was because men did fear female interference in their projects. While suffrage was a great victory for women, perhaps it was only once women had been sufficiently corrupted by masculine values, conscripted into the masculine thought system, and finally brainwashed by consumerism, that they could be trusted by men with political participation. Otherwise, their influence might have put a lid on faustian masculine enterprises, polluting society with the "weakness" of feminine values, and putting it at risk of stagnation and conquest by more virile societies. Then too, perhaps women did not particularly *wish* to question the masculine order in which many of them were kept well enough. Aristocratic hunters had the ritual custom of presenting to their noble ladies a knife with which to cut the stag's throat as it lay

"helpless, trembling, and weeping."[346] In this symbolic act, the leisured predecessors of the modern housewife were invited to endorse a sensibility they might by temperament have abhorred, and which kept them, for better and worse, in a subservient position. Through such rituals they were co-opted into the male-defined world whose luxuries they enjoyed.

The cancerous growth of human civilization on the planet is a joint venture of men and women. The ecological footprint of the human species lies in its capacity to transform the environment, multiplied by its sheer numbers. It is a co-product, in other words, of the usual male excess of culture-making, career, and acquisitiveness combined with the usual female excess of fecundity, domesticity, and acquiescence. If the male has wandered too far from nature, perhaps the female has not wandered far enough. Perhaps her failure is as grave as his, not only because together they have overpopulated the world; but also because her silent approval of male enterprise has empowered his excesses and failed to provide an alternative model. Even Simone de Beauvoir could write: "It is not in giving life but in risking life that man is raised above the animal: that is why superiority has been accorded in humanity not to the sex that brings forth but to that which kills."[347] Feminist philosopher Sandra Harding calls such a statement perverse because it inverts the "the proper order of things."[348] But in nature, bringing forth is but half the evolutionary process. The other half *is* the destruction involved in selection. Evolution depends on fecundity *and* death; birthing and killing are both all too natural. If we seek the ideal of an unnaturally peaceful world, we must support it with unnaturally conscious self-control.

The limits of the planet to support further increases in population render the reproductive role of men and women no longer relevant as the central plan of life. And the limits of the planet to support further ecological stress from overproduction render the role of career and "getting ahead" no longer credible as the self-evident social ideal. Moreover, potential parents cannot simply be diverted to the work force, adding to the burden of strained resources and pollution from overdevelopment. *We must begin to consider alternative life goals to both making money and making babies*. Men and women alike must define and choose goals more appropriate to the state of the world than the current excesses of production and reproduction. Imagination is required to conceive lives and social arrangements that do not simply aggravate the world's condition. Something far beyond sexual libera-

tion and equality is called for. It will not do for women to become functional men in the economy; nor simply for men and women to change places, with women moving out into the world of male pursuits and with men staying at home to care for children and domestic responsibilities. While that is a way to begin exploring each other's sensibilities, in the present circumstance it is little more than trading dysfunctions. Moreover, going unisex hardly guarantees an integration of masculine and feminine principles. Women are not men who do mothering; femininity is not simply the role of nurturance in the home, a tour of biological duty in an otherwise masculine world. It is rather a worldview and a principle for defining reality that has been forced into recession in the historical era. The feminine is a sensibility, a mode of thinking, being, perceiving, acting—or not acting. It is as easily overpowered by masculinity, however, as silence is by talking, as nature is by civilization. Unless we consciously intend otherwise, the feminine will always be overshadowed by the masculine; just as the world will always be dominated by men who are ruthlessly good at imposing their will, and nature will continue to be overrun by civilization. I am not arguing that the feminine is better or worse, stronger or weaker than the masculine; but that there is a built-in imbalance between them because of their *utterly different natures*. We ignore this imbalance at increasing peril. And because of this difference, women can no more advance the feminine principle by masculine political means than one can advance the cause of silence by shouting it from the rooftops. It may be necessary for women to fight for equal rights and "feminist issues" in a male-dominated world. But it is not sufficient. Today, more than ever, *all* issues must be considered feminist issues!

There have always been women attracted to movements and circumstances that promised them freedom from the bonds of patriarchy and their biological role. The androgynous ideal of the early Christian ascetics, the convents of the Middle Ages, celibacy, Women's Lib, and lesbianism have all offered women escape from the prison of femininity under patriarchy and the possibility of a social space beyond family and marriage.[349] Men, of course, have always reserved to themselves such a space in the cultural realms they created. Escape for women, however, meant escape into the preexisting larger world of men and freedom meant the ability to move there as a man. We have yet to see a realization in culture of feminine ideals, a wider world defined by women in which they could simply be themselves.

Women have pursued two strategies in the battle of the sexes,

especially in America where, at the dawn of the consumer culture, men too began to see advantages in defecting from the traditional patriarchal family.[350] Probably one reason for the persistence of discrimination is that women have not presented a united front against it, but have split between feminist and antifeminist factions. In reaction to the collapsing family wage system, women chose either to fight for equality in the workplace or to better secure their position at home. While both these strategies involve fighting for the cause of women, both are *defensive* reactions to male dominance, whose terms they unwittingly accept, and which is so pervasive that it determines the very ground on which women seek either independence or security. This divide among women only strengthens male dominance, as we saw in the defeat of the ERA. It is a conflict between economic identity as producer/consumer and biological identity as mother/nourisher. Feminists fight for equality of rights and opportunities within the marketplace, while other women fight to maintain their traditional place in the patriarchal system, which frees them from marketplace activity in order to pursue their role as nurturers. Only by embracing a larger picture can these groups rejoin to implement a feminine vision beyond both economy and biology.

Because men have defined cultural norms, androgyny tends to masculinize women far more than it feminizes men. Men *do* attempt to assimilate the powers of women, but in their highly masculine ways, through technology and bureaucratic structures of power. They do seek access to the feminine, but in the objectified bodies of women.

In order for men to achieve a balance within themselves between action and passion, between exteriority and interiority, between world-making and surrender to the mysteries of life, femininity must first be distinguished from woman and sex. It must be understood as a mode of human being, a sensibility, a stance in regard to reality, nature, the Unknown, the Other. The masculine and the feminine are forces in the human psyche, apart from changing sexual and social arrangements between males and females; and this is how they ought to be honored rather than projecting them onto the persons of men and women. While individuals participate in the dialogue between masculine and feminine principles by communicating with each across gender lines, there remains the task of an alchemical synthesis within the individual. Men have envied women for their mysterious abilities and otherness, not quite understanding that the essence of femininity lies within them too. They have tried to access feminine subjectivity through their wives and

lovers, sisters and daughters, and through homosexuality. Or they have avoided it altogether because the external-oriented mind sees only objects to affect and resists surrender to *being* affected. Having differentiated themselves as masculine, men have feared woman's otherness as alien, inscrutable, threatening. Accordingly, they have defended their hard-won identity through exclusions and actions against women —who, on the contrary, have been more motivated to adopt the winning masculine ways that predominate in culture. He resists the feminine and she is all too willing to assimilate the masculine.

Men must embrace the feminine sensibility itself, along with the woman, for their own benefit and the world's benefit, as well as for political correctness and the needs of women. Falling in love is how men traditionally embrace the feminine: by idolizing the person of a beloved woman. This reflects the exteriorizing masculine mind, which sees only "out there," which can only acknowledge the robe of the feminine worn upon a female body. I do not suggest that we men avoid falling in love, with its wondrous magical projections; only that we recall that the mantle of gentility worn by the beloved is our own, chivalrously lent to her.

Above all, men must listen to actual women, as oracles and conservators of the feminine, and heed them while we are groping to find the feminine voice within ourselves. Women could help in that, not only by tuning in to the "goddess within," but more importantly perhaps, by tuning out the corrupting elements of the consumer culture, which blinker men and women alike. By channeling a feminine as well as a feminist vision for the future.

In the system of nature, sexuality, desire and pleasure of orgasm refer ultimately to reproduction. In the system of men, they refer inevitably to the use by males of females as a reproductive resource, as well as a labor resource and now a market resource. Romance and marriage are working compromises established between the genders in the battle of the sexes. Within the masculine psyche, they involve balancing the need for nurturance, companionship, and surrender with the drive for control over society, nature, and women. The man idealizes the woman, commanding her to stay frozen, even in time, on the pedestal where he knows he has put her; he defers to her only in the larger context of this control. Should women refuse these relations, what would men do? What will be the partnership between genders if it is not oriented toward reproduction, economic dependency, and the contract that allows men to pay homage to the feminine while retaining

power? What would it be like to have a conscious partnership between two truly equal moieties?

An aspect of the natural condition against which men rebel is the sexual asymmetry between male and female interests and even between their apparent *levels* of interest in sex. The male ideal would have women pursue sex in the same ways and to the same degree as men, as though the two mentalities were somehow mirror images. But this is hardly the case, owing originally to the diverging genetic interests of males and females in the system of nature. One reason why men and women find it so difficult to comprehend each other is that they are not simply identical particles with opposite charge. Psychologically, women are not men with cavities, any more than men are women with protuberances. The two represent wholly complementary mentalities, not to be trivialized as mere sexual roles. However, the drift of modern society is toward *one* mentality, ideologically neuter but implicitly masculine. While the natural tendency of desire is toward the other as a complement, the constructed ideal of the consumer culture views the feminine as a simulacrum of the masculine. This may help to explain why lesbian and gay sexual attitudes can be every bit as materialistic as the renowned macho male's.

Far from being an equal partner in a mutually respectful merger, the feminine has been forced into the masculine mold even in sexuality. Women have been "sold a bill of goods" by the detached male model of sexuality purveyed in the media today, which brainwashes men and women alike into degrading sex as a consumer commodity rather than revering it as a profound opening. The sexual materialist, of whatever persuasion, regards both the experience and the partner from a consumer point of view. The emphasis is on body parts, sensation, goals, techniques, and units of experience. Orgasm and even ejaculation are standard unisex products, quantitatively measurable. Paradoxically, all these strategies objectify sex by bracketing the sexual experience as subjective and thereby distancing the other. They preserve the self as separate and manage the flow of experience, whether one's own or the other's, according to familiar agendas.

We could contrast to this approach an attitude that focuses on the mystery of union and on the other as emissary of Otherness. The emphasis is then on feeling and relationship more than sensation. The intention is to open and to join, overcoming separation. The attitude is one of surrender; of being overcome by experience grander than the limited palette of the self-protective ego; of merging with the non-self,

the beloved. It is for this reason that love is celebrated as a spiritual metaphor by the Romantic poets, in the Biblical Song of Solomon, in the poems of Rumi, Hafiz, Tagore. Because the finite worlds created by thought are too claustrophobic, the mundane world too much with us, surrender to love and to the Unknown are approaches to the transcendence we name infinite or absolute. Yet, the mind seeks to lay claim to the Absolute, domesticate it, and treat it as negotiable like other objects, mental or physical. Religion venerates it while attempting to control it and contain it, first by naming it and trying to engulf it in thought; then, by relating to it in personalistic terms, as a god with whom one can bargain. This reflects the archetypal wish of the child for an all-loving, all-wise, all-powerful parent at one's beck and call, who can be wheedled to provide for all our wants.

Man has applied all the same self-defensive stratagems in regard to woman as to the divine; for, in the modern world, the feminine is equally the Unknown. Here, again, the key is the man's attitude and not the woman as object. Nor should one's own bodily pleasure and orgasm be the focus of sexual desire, any more than one's personal salvation should be the aim of worship. Desire is a natural expression of the *outward* reach of awareness. Subjective consciousness poses the conundrum that experience can be bracketed as referring *inward*, so that the phenomena of sexual experience may be interpreted as mere sensation in the body. In the same way, religious experience may be trivialized as referring to one's personal state or salvation. In love, however, as in mystical experience, the distinction between self and other blurs but also deepens in meaning.

It is in lovemaking that we overcome dualism experientially; we are reconciled with our own body and with the minds and bodies of others. Sexual desire is at once an animal force overtaking us and an intention toward an interpersonal goal.[351] The two variables of the Equation of Experience operate together harmoniously. Perhaps this is why sex and woman are universally rejected by idealist traditions invested in the split with nature and body: mind seeks to retain an isolated supremacy.

But the sexual organs are not muscled organs of doing like hands, or directable organs of perception like eyes. Their pleasure is not an expression of will but something that happens to us in letting go. The physical proximity and association of sexual organs with those of elimination, whatever its evolutionary explanation, has a profound psychological significance. For they are all functions over which one has but partial control.[352] In part, this is what makes lovemaking different from other cooperative ventures. One cannot control sexual

responses in quite the way that one can the voluntary movements involved, say, in social dancing. But even in dancing, as in lovemaking, we depend crucially on the partner's responses. And to reverse the metaphor, what is mystical about dancing together is the moment in which conscious control and cooperation seem to disappear and it is "all just happening."

The modern attitude toward sexuality has flattened and subjectified it as controllable private sensation, a tool kit of techniques designed to maximize pleasure. What narrowly distinguishes the consumer attitude toward sex from prostitution is reciprocity: one contracts to be the means for the other's pleasure in return, bartering services in kind rather than cash. Each manipulates the other's body to create a parallel, but implicitly private, entertainment. Perhaps the male, especially, is tempted to delight in the woman's pleasure as a sign of his own skillfulness, playing her like an instrument. Her body is then the medium of his virtuosity, her orgasms a trophy. He remains in control, his mission to transport *her* beyond self-control. The sexual materialist is either an artist-technician or a connoisseur, or both. He or she focuses on playing out sexual roles and images rather than communion or a raw journey into the unknown. The sexual materialist encourages and rewards a similar attitude in his or her lover. But true intimacy is inhibited when sexuality is used collusively as a hiding place.

By genetic heritage, men are the more likely sexual materialists. The male's genetic advantage in casting his seed indiscriminately predisposes him to an impersonal attitude. The female's natural selectivity predisposes her to a more discerning stance. But given their long domination under patriarchy, it is understandable that women seek the freedoms and privileges of men. The general trend toward sexual materialism reflects the acceptance by women of male cultural hegemony, their seduction even sexually by consumerism. It is not Eve who corrupted Adam, but the other way around! The more women embrace masculine values, however, the less chance there is for *anyone* to escape the materialist paradigm, even in bed! Women may be duped to embrace sexual materialism as natural when in fact it is male, especially when it is endorsed by pseudoscientific research, such as the various surveys that spawn a genre of self-help literature. Every generation has its "reports," which propose to be descriptive and are inevitably normative as well. Sex manuals often take a distanced technical approach toward sexuality as a phenomenon standing on its own between the lovers. They are dominated by mechanics, detached attitudes, and the latest techniques in order to live up to the mystique of scientific objec-

tivity.

The world can ill afford any longer for life to be devoted to production and reproduction. There are too many people and there is too much stuff. The blindness of these goals may in part be traced to a lack of profound dialogue between the genders, muted by the monologue of patriarchy. On the heels of sexual liberation, a next step for our society could be to embrace the fully undefended meeting of the masculine and the feminine. Neither family life nor Hollywood clichés of romance, neither celibacy nor promiscuity, particularly foster this meeting. What's needed is an earnest desire for sexual and existential truth, and the love sweet love that there's just too little of in the modern world.

Efforts to solve the problem of human suffering through spiritual, technological, and political ideals have usually been subverted by greed of one sort or another. We have learned to distract ourselves from fundamental issues of equity and justice through the mythologies of the market place and the delights of consumption. Patriarchy and power are wrecking the planet, killing off species by the hundreds of thousands, creating exaggerated disparities of wealth and well-being, motivating terrorism and reducing democratic institutions to a farce, and threatening to replace life itself by artifice. This is in addition to the ongoing threats of nuclear or biological holocaust, climate change, or other human-induced disasters to which we become inured as the price of "progress." Smooth-talking advocates of development wheel and deal to get a piece of the action while it lasts, despite the costs to future generations. None of this will change significantly through the economic parity of women within the masculine system, any more than it will through global trickle-down. A central obstacle to change in a system whose measure of all value is money, and whose solution to all problems is economic growth, is that it has always been possible to buy off potential malcontents by corrupting them further into the system. Deep change can only take place if the system itself is rejected, along with the values underlying it.

The revolution needed is profounder than any of the social experiments so far conducted by men. The problem is deeper than the issue of capitalism versus socialism, Christianity versus Islam, democracy versus terrorism, or of one patriarchal regime versus another. Marxism theoretically redistributed wealth and power, but inevitably degenerated into another version of the Old Boys' Club. Christianity and Islam have each become their own nemesis. Nor can the revolution that is needed

be violent, for that is simply another masculine exercise of power. What is needed calls for an end to male rule of the world. There must be an end to the dominance of masculine over feminine values in determining the *human* reality. Woman must come forth to carry the torch, and man must let her.

Masculinity itself must be redefined. Because men have assumed power in the world, they have established for themselves the right to disregard the feminine and women's points of view. This has encouraged in them a kind of moral indolence, stunting the empathic and emotional capabilities associated with the feminine.[353] I have characterized the imbalances in the world as an effect of male domination and an eclipse of feminine values, in which women have played their tacit part. It could equally well be described as a failure of masculinity to bring forth an inspired vision for the future, a crisis in masculinity itself and in the leadership that men have taken upon themselves. The great irony is that men have inadvertently followed the dictates of their genes even in rebelling against them. The drives toward idealism, objectivity, transcendence, and transformation—and against nature, the body, and woman—have coincided too readily with the genetically driven role of the male as aggressive, competitive, controlling, hard, emotionally steeled and distant, sexually impersonal, and so forth.

The consumer culture has opportunistically profited from this coincidence by promoting softer values that are a caricature of femininity: self-indulgence, hedonism, passive and "oral" fascination with the new and exciting. If women were the consumers toward whom advertising had been directed in the postwar period, the Playboy of the sixties and the new "sensitive man" of the seventies promised to be far better consumers than the old-guard stoic male, whose generation scrimped and saved until they could pay for everything in full and in cash.[354] The human potential movement faltered in narcissistic self-expression and emotional release, becoming ultimately another consumer product. The idealistic optimism of the '60s and '70s must be put in the perspective of the sinister rise of international capitalism during that period. Far from collapsing, or being moderated by feminists, patriarchy is rapidly expanding as a power system. It has rendered gender nearly irrelevant, since so many women in developed societies have been co-opted within it. While the women's movement set their goal too low (mere parity in a male world), the men's movement wallowed in grief for their lost fathers and the lost vitality of "wildness," failing to meaningfully articulate what men need to be liberated *from* or vital *for* or wild *about*. None defined a profound

vision for society, nor an ethical and dignified role for men in a post-patriarchal world. While each of these movements may have been fun and exciting, none dared to rock society to its foundations. Instead, masculinity and femininity were both trivialized in a society retreating ever further into materialistic cynicism, born-again corporate patriarchy, or New Age mumbo-jumbo.

Unisex consumers have colluded in Western society to minimize their own significance and power both as individuals and as gender collectives. We have sold out for the ill-gotten comforts of a lifestyle we now take for granted, in spite of the fact that it can never be the birthright of most of humanity, and cannot continue even for those who presently enjoy it, without utter ecological collapse. Instrumental in this collusion has been the silent truce between the genders, maintained so as not to disturb capitalism's ever-laying magic golden hen. In contrast to the state censorship of top-down dictatorships, the key to understanding the self-serving nature of Western ideology is *self-censorship*. Neither the media nor their audience, in America in particular, will bite the corporate hands that feed them, but will believe and promulgate whatever illusions are necessary to maintain the privileged position of their society in the world.[355] The gender dimension of this conspiracy has revealed itself in the failure of both the women's movement and the men's movement to conceive a significant alternative to the globalist program, a gender dialogue out of which that might emerge, or any political platform for systemic change.

Men have ever fancied themselves heroes, visionaries, leaders, saviors, doers of great things. Every man is a closet hero, a Walter Mitty. The question for this generation is what should heroism and masculinity look like *now*? What does it mean in the 21st century to be a Prometheus, a culture-bringer, a mensch, a real man? What are the masculine qualities needed to save *this* day?

In a sense, the masculine has never had an identity or a program of its own consciously forged, but has always consisted of unconscious acting out, either of genetically-determined impulses or of unconscious rebellion against the feminine. This is highly ironic, given the masculine identification with consciousness, initiative, and self-generation; the very essence of the solar, yang energy is proactive. Surely a new type of advocate and protector is needed and possible, with a new vision of masculinity to embody. Men must cease to define themselves as the opposite of women. The culture they create must cease to be a denial of mortality, finitude, and embodiment. They must refuse the conventional attractions of money, power, sex, and violence, to become more

original in their definitions of masculinity and success.

A truly equalitarian society would hold the masculine and the feminine in balance as essential principles. The hegemony of the masculine worldview must be counterbalanced by a deliberate effort to pursue wisdom, social progress, spiritual clarity and self-mastery in place of technical knowledge, commercialism, and mastery of the external environment. Research would then be directed toward redefining technology to work in balance with nature and to pursue social ideals of global equality and well-being rather than individualistic, corporate, and nationalist economic ends. Life goals would look beyond consumption and family to make a truly united and sustainable world. There would be dialogue among religions and philosophies to define a unified human perspective and a plan for the future that reflects root ideals people have held in common all along. Religious studies and ecumenical symposia could go to the intentional core of religious beliefs, in such a way as to encourage depth of ethical thought, while downplaying theological dogma.

There must be a general slowing down and turning of interests inward—that is, away from technological and economic growth and toward social equilibrium and spiritual or ethical, as opposed to religious, growth. Rather than rush to a new frontier in space, or to some cutting edge of technology, we ought to pause to reestablish the kind of social equilibrium that might have existed in the ancestral environment, when change was very slow. It is the outward focus and restless drive of expansionist energies that continually create differentials of wealth and well-being—and perpetual social upheaval. "Growth" must halt, not only to regain equilibrium, but also because it is not at all what it purports to be. Far from the early idealism of Bacon and other humanists, progress is now merely a catchword like "democracy" and "freedom," which jingoistically allows the few to manipulate the many for their own advantage.

The technological potential to develop ever greater wealth promises social justice and equilibrium, while actually destroying them. Humanism, in its multiple dimensions, has only superficially borne out hopes for a general boon to mankind; there is far less reason to think that one-dimensional globalism or transhumanism, let alone religion, will lead us anywhere but further into dystopia. The worldwide advance of capitalism and nominal democracy in nation states has entrained a very uneven social progress, to say the least. The actual locus of power is increasingly elusive and abstract, concentrated and economic rather

than widespread and political. Nations, let alone communities, are no longer forums for self-determination. Even as some nations are still emerging from tribal units, others are dissolving as quickly back into tribalism or chaos. Large-scale power is relocating beyond civic control. Shareholders in transnational corporations may have an official vote, but chances are the only issues that will ever be brought before them are ones affecting the internal structure and revenues of the corporation: election of officers, mergers, etc. In this way, running the world is left to economic technocrats whose loyalties are to completely artificial groups (shareholders) united only in the abstract goal of growth and in their common absentee participation in artificial systems for accomplishing it. Since neither shareholders nor money managers contribute any real productive effort, such money is necessarily "made" at the expense of increasing disparities of wealth while depressing the quality of life of the species as a whole. In terms of the original dreams of humanism, it is a system gone mad and out of control.

Masculine and *feminine* are appropriate designations for styles of thought and action, which must be brought into balance if we are to survive. It is something of a paradox, however, to speak of balance between the genders, for it is the essence of one to be more aggressive than the other. It is no coincidence that the domination of nature and of nations and classes has coincided with the domination of women in patriarchal culture. The imbalances that define our world could not have been created without the suppression of the feminine, which in concrete terms has meant the oppression of women. But my point is less the injustice done to women than that done to the human potential. This means, quite plainly, that we men have not, as it were, honored our campaign promises. We have not *become* the conscious gods we set out unconsciously to be, but have been content to invent them as imaginary companions—father and mother figures, caricatures and laughingstocks —so we could remain unaccountable and free from the responsibilities of species adulthood. We have dabbled at godlike creative power, making of ourselves token gods by implication; lacking wisdom, we remain as children with dangerous toys. Far from transcending embroilment in nature's web, many of our actions ironically reflect her darker workings. Though we glory in subduing external nature, the nature at our core yet has the upper hand. The world men created is ideal as an ordered extension of thought, but hardly in the normative sense, as the best of all worlds. Our civilization is rather a makeshift and regimented encampment in the campaign against nature. In spite of our

pretensions as culture bringers and space travelers, we remain earth-bound pawns of our genes. We have taken Woman to be the symbol of life, as an enemy to conquer; but to overcome life can only mean to court death. We men still have the opportunity to engage the feminine, and so life itself, in the living presence of women, as well as in abstract thought and in what is left of nature. If we listen, life can speak through us before it is too late.

Chapter 7: PROLEGOMENA TO ANY FUTURE

Each generation has to make sure that things do not slip back to the bad old days.—David Suzuki 356

7.1 I Shop, Therefore I Am

Whole nations can be dedicated to false values, to keeping a privileged position gained at the expense of others. Western society, and America in particular, attempts to build heaven on earth. The sad irony is that this paradise, with all its religious and humanistic ideals, remains profoundly self-serving. As the West retreats into private entertainments, from the unsavory realities it has created, its new feudal order condemns millions to virtual peasantry in the name of an ideal world for a new aristocracy, this time without the reciprocal obligations of nobility.

The unreflective pursuit of mechanism has led to dangerously irresponsible attitudes toward technology, nature, and society, and also to a pervasive emptiness at the core of modern life. The prejudice of modernity takes hard technology as evidence of progress and cultural superiority. Abundance triumphs over morality especially when it supplies better weapons along with more industrial consumer goods and conveniences. But a nation that lives by the double-edge of technology may perish by it. The more technology empowers a civilization, the more self-indulgent and paranoid it may become, polluted in its institutions as well as its soils.

The emptiness of the modern solipsism, alienated from body, nature, and social reality, results from suppressing the feminine, emotional connectedness, the immediacy of the body's sensual experience.[357] Consumer bliss is a schizoid withdrawal into willful ignorance. To compensate for its emptiness, the West lapses variously into ironic and self-congratulatory sophistication or into simple-minded heroic nationalism and fundamentalism; into sheer materialism or New Age mysticism; into designer drugs or virtual reality. These are not, of course, mutually exclusive. A universal subjectivism levels everything as entertainment of one sort or another. It is understandable to feel empty and "alienated" in such circumstances—or rather to avoid feeling altogether. For, numbness and depression are the inevitable outcomes of retreat from a deep relationship with experience and reality, whether the realities of our natural being or the political and social realities of the world. We live as prisoners in our man-made realm. This creates a

vicious cycle, in which drugs and intensity are sought to compensate the inherent meaninglessness and triviality of consumer life and the stress of urban living, but which only succeed in further dulling the mind and entrenching escapism. The malaise derives at once from over-subjectivism and from the excessive outward focus that leaves modern Man with a deficient sense of being. The emptiness infects the very objects that are supposed in the materialistic society to be the source of all satisfaction. Industrial "goods" lack the interior life of handmade things, so that the modern environment is a constant re-minder of the vapidity of consumer values. We seek in luxuries and conveniences compensation for the loss of nature and vitality, and for the essential poverty of the Ideal manifest in urban landscapes.

The general retreat into subjectivism at the core of consumerism is a failure of imagination and nerve, with deep roots in the Western mentality. In such retreat one can choose only among options designed by someone else; even morality is a question of obedience more than initiative.[358] In our cool, postmodern detachment, we are often rightly suspicious of idealists, of high morals, of axes to grind, and of utopian visions. But moral disengagement forfeits the power to work original good. What characterizes the emerging global culture is just this loss of local initiative: consumer society has emasculated itself by trading self-reliance for convenience and imagined security. And what characterizes the emerging anti-globalist movement is a search to recover this local autonomy, to forge alternative visions to the self-serving schemes of ruling elites. The perennial dilemma facing the meek—domination by the aggressive—is a personal moral dilemma as well as political. For, those who rise to power unfairly must do so with the unwitting help of those they rule, who are vulnerable to manipulation through their own cupidity, passivity, and lack of imagination.

The prospect of living equitably and within our planetary means can hardly be well received by a society addicted to overindulgence and brainwashed by commercial values. Until we see the virtues of a non-materialistic lifestyle, we can only view a reduction in our habits of consumption as a harsh deprivation, an unthinkable return to the life of the peasant. Indeed, one could perhaps not expect more than that if wealth were divided equitably.[359]

Economists balk at the idea of assigning monetary value to the air, water, and other species we take for granted, or to the contributions that natural systems make to our survival. This is largely because of the astronomical costs of replenishing them, but perhaps also because it is

impossible to catalogue everything nature does for us. Even so, such figures have been attempted. Putting a dollar value on the yearly goods and services provided by nature, one estimate of the replacement value in equivalent human effort is of the order of twice the world's Gross Domestic Product.[360] Another estimate arrived at the figure of $33 trillion/year.[361] If Man assumes the Herculean labors of nature, he will surely pay Olympian bills!

When consumers see the cost they will have to foot for artificial organisms and the services they are proposed to render, let alone repairing the damages they may cause, there may be more appreciation for things nature has always done for free. The replacement cost of natural ecosystems and the services they perform has been termed *living capital*. Some years ago, the City of New York was faced with potential major costs to correct the effects of pollution in its environmentally compromised water supply. It would have required $6 billion capital outlay plus $300 million/year to operate a high-tech artificial water purifying system. However, the City found that, with a *total* outlay of $1 billion, the natural watershed could be restored as a self-maintaining purification system.[362]

While there are diverse ways to value elements of the environment, the overarching consideration is the value to us of the environment as a whole. What price would we put on the survival of humanity? The renewability of resources is nothing other than the ability of the biosphere to recuperate, with or without human assistance, from damages we inflict. Nature tolerates a lot of abuse, but surely there is a minimum functioning of global ecosystems that must remain intact if the planet is to continue to support human life. There is therefore a critical balance between Man and nature, which may be quantifiable. For example, it seems that local ecologically devastated areas can recover through re-seeding, *if* they are distributed in a mosaic pattern rather than all in one massive area, and *if* the total intact area is at least a third of the original.[363] Instead of asking what is the minimum extent of an ecosystem that must be preserved, we could ask what is the maximum footprint of civilization that can coexist with nature? Surely we are dangerously close to it. Human presence can never be the wall-to-wall city-machine that science fiction writers conceive, and toward which we bumble through urban sprawl.

Do we overlook common sense in the rush to a technological future? Ivan Illich made a celebrated calculation regarding the average speed of travel by car in America. If you take into account time spent

behind the wheel (moving or not), and the time involved in paying for its cost and maintenance, insurance, traffic fines, etc., it appears that the typical North American driver invests 1600 hours a year to travel an average of 6000 miles. This comes to 4 miles per hour! A pedestrian can walk that fast, and bicycle travel is far faster![364] Largely to move their own bodies about, 250 million Americans use more fuel than a billion and a half Chinese and Indians use for all purposes combined. If the Chinese were to drive as many miles per year as Americans, all the earth's known fuel reserves would be used up within five years.[365] Most of this energy is consumed merely *accelerating* the mass of cars. [366] The idea that faster is better is part of the addiction to "growth." We've become like heroin addicts who will pay more and more to feed a habit that satisfies less and less.[367]

Most people find contact with nature a relaxing and aesthetic experience. Our attachment to natural beauty is the reason we have parks in cities, take holidays in island paradises, and prefer to live in neighborhoods with tree-lined avenues. In fact, the entire basis of our sense of beauty refers ultimately back to natural patterns, proportions, and harmonies. The reason, of course, is that humans spent the great bulk of their existence in nature and our aesthetic sensibilities, like our moral ones, developed long ago in more natural settings.

While Man's obsession has always been to transform wild into cityscape, something is lost to us in our over-tamed world. The whole focus for millennia was to escape the confines of nature and substitute for it a human world. Now, within our claustrophobic urban environments and artificial routines, we pine nostalgically for unspoiled expanses and natural ways that are no more. Nature no longer contains us, but we have contained her by the very extent of our presence. At this point, threats to us come less from nature than from ourselves. It is one thing to view the cosmos in mechanistic terms; it is quite another to rebuild it literally as machine. We are now confronted by our own stultifying limits, engulfed by machines in increasingly sterile and prison-like environments.

We marvel at how a mother appears to selflessly absorb her young child's aggressive energies and how at-home the child is permitted to feel in invading the body just beyond its own.[368] This invasive relationship may have been the model for Man's relationship with Mother Nature, who appears similarly forgiving. The real woman who plays the role of mother has her limits, though, and so does the Earth. Like the infant, we must begin to recognize nature as a separate being

with her own rights, not merely as our sandbox or backyard, there to indulge our sense of entitlement. The resistance of matter to our manipulations, intellectual or physical, and its genetic impositions on human being, simply reflect nature's own reality. We acquire collective selfhood through pushing off from nature in the way that the child does from its mother, by creating an individuated identity separate from her. But this is a two-way street; the subject and object emerge together in consciousness. Before her patience runs out, nature too must be fully recognized as an independent being, vulnerable and limited, with whom we must coexist on a small planet.

The logical conclusion of humanism, like transhumanism, is the conscious direction of human evolution. Far from compelling technological advance, however, this means we are not *obliged* to embrace technology wholesale or be swept along by some fated "progress." We can pick and choose what suits us best. We can, in fact, *slow down*. The Renaissance was but a first pass at reclaiming responsibility, and a male initiative. Now we see that, under the continuing aegis of patriarchy, we have made an idol of technology, a religion of consumerism, speed, and growth, a fetish of convenience, and a secular faith of profit. The ongoing result everywhere is a loss of autonomy and of local economy, a loss of control over one's own affairs and of choice about how to live; a loss of community and quality of life; a loss of diversity in both the human and natural worlds. The institutions of globalism are quickly becoming as hegemonous and stultifying as the medieval Church. This calls for a new Renaissance, a reformation based on wisdom and balance and rooted in local community.

The idealism behind culture, technology, religion, and the domination of nature is a *masculine mystery*, which begins with the primacy of spirit and looks upon the reality of the phenomenal world as the creation of mind. There once were feminine mysteries, and hopefully there will be again. But just as masculine religion is a distraction from the intentionality required in the present age, so the feminine mystery that is needed now will not be a return to goddess religions or to mystifications that cannot take hold in the modern mind. It will be something new and far more powerful. Like the ancient feminine mysteries, though, it will begin with the material reality of nature (*mater*=mother), from which mind or spirit is born.[369] While the masculine mystery concerns the struggle of ego to become distinct, the feminine mystery concerns the self-regenerating matrix from which ego seeks to emerge and to which it must return. Ultimately that is the Other, the Unknown, the independent being of nature. Some may

choose to call it God.

The pre-hellenic antecedents of what has come down to us as Greek mythology are also pre-patriarchal. They are fragments of goddess myths, and evidence of the matriarchal culture displaced by barbarian invaders. These are not really myths at all in the modern sense inherited from classical Greek literature, which is largely a male production. More character sketch than story, they lack the elements of action and dramatic tension—conflict, intrigue, plot and character development— which define the modern sensibility.[370]   And that is the whole point! To the masculine mind they appear static and even boring, reflecting the prehistory of matriarchy as a million years of little happening but the passing of seasons. They do not appeal to the male sense of drama and action. Even the modern descendants of mother religions (Taoism, Vedanta, Buddhism) are relatively foreign to masculine thought. Concerned with overcoming the problem of separation and conflict, they aim at mystic union and peace. The father religions, in contrast, are dualistic, moralistic, agonistic, concerned with the dramatic struggles of gods and humans as distinct heroic personalities. Masculine idealism has veered off into space, both conceptual and literal. It must be brought back into sober relation to the earth in the gravity of the present crisis. It must be reinterpreted as part of a cycle of regeneration that includes the feminine.

7.2 Wise (not smart) Technology

If many "labor-saving" devices do not in the end save labor but multiply it, or simply change its form or shift its burden to others, this may be because saving labor or time is not their true purpose, only their rationale in an economy where every claim must be understood in the context of marketing and sales. Truth in the consumer society is what sells, and the practical usefulness of a product or service is secondary to its sales capacity. This is the context in which technology as a whole evolves in our society. Any approach to the wise and selective use of technology cannot ignore this general commitment to the values, lifestyle, and economy of consumerism and the distribution of power which technology serves. Neither technics nor the notion of progress can be understood apart from the growth of the global economic machine, in which society becomes ever more a ghost of its former self.

If we are to survive, technology must be evaluated according to whether it supports a humane and sustainable lifestyle, maximizing

freedom and well-being for all.[5/1] It would be comforting to believe that science and technology are merely neutral means to positive ends. In our age, however, the very ideal of pure science is under siege from the general corporate takeover of society. Only in the measure that society as a whole embraces responsibility for its goals will it find freedom of choice over the means toward them. Otherwise technology becomes by default the tool of commercial interests and socially dubious ends.

Technology is only as good or as bad as the intentions behind it. The question of foresight is directly related to intention, for one can intend to be circumspect or to throw caution to the winds. If the best laid plans may fail, certainly the worst laid plans will not fare better. Hence, technology cannot be excused from its "unforeseeable" consequences. If we have not arrived at a sustainable utopian lifestyle, with appropriate technologies to support it, it may be less for lack of ingenuity than because the real intention has been so very different all along. We must admit that what captures the imagination of this culture and generation is less a vision of a just and equitable world, in harmonious balance with nature, than heady visions of sugarplums.

In a society devoted to the marketplace, all value is dollar value and the enthusiasm of society is harnessed to private ends rather than the common good. While the ideology of technology appears democratic, promising everyone abundance and leisure through progress and growth, it is the wealthier strata of society who are the actual consumers and beneficiaries of the latest technologies. Biotechnology and the pharmaceutical industries, for instance, are oriented toward diseases of the affluent and toward future services to them such as genetic enhancement and replacement of body parts. The underlying motivation is profit more than humanitarian aid. These industries maintain a vigilant and powerful lobby to insure that their products and services remain priced at "market" value, rather than reflecting the true cost of production. No matter that the mass of poor who most need the benefits of research cannot afford to pay and therefore are excluded from treatment of less profitable diseases. The benefits of many of these drugs, moreover, are questionable, often involving side effects as debilitating as the original complaint. In some cases the disease itself is invented by industry propaganda in order to sell the cure. This same lobby attempts to gain proprietary rights over wild medicinal resources, traditionally available for the gathering as natural remedies. The commons is appropriated through the patenting process, the brainwash of consumer

advertising, pressure on doctors to prescribe their expensive products rather than inexpensive natural counterparts, and legal actions to inhibit the availability of natural or traditional cures.

Part of the failure of the drug industry to provide a genuine contribution to health care is due to the fact that modern drugs and treatments, like the proverbial snake oil, are designed and packaged primarily to make money and only incidentally to cure disease or promote health. They may do what is claimed, which is most often symptomatic relief rather than cure; but they may also do what is *dis*claimed in the contraindications and label warnings in fine print. The same tradeoffs and mercenary interest apply in many sophisticated and costly medical procedures, which gain glory and wealth for specialists and surgeons in the name of medical science. An aging and relatively wealthy population is held hostage to the fear of dying and disability, by an obliging medical establishment which promises delay of the inevitable unraveling of life that has been compounded by the debilitating effects of the lifestyle it implicitly condones. Fear of unhealth and death are good business.

The delusions of transhumanists, who promise eternal life through serial re-embodiment, are merely the lunatic fringe of a blind faith in medical science and technology, an unfounded optimism covering the deep insecurities of modernity, spoiled by affluence and brainwashed by commercial propaganda. The underside of this ebullience is the depressing fact, for example, that a retired middle-class American's entire life savings may be eaten up by private medical "care." In other countries, too, public health insurance is steadily being eroded as governments scramble to reduce public debt, in part incurred through subsidies to large corporations.

Whatever gain in average life expectancy modern Western populations have enjoyed is far more a result of improved sanitation, diet, working conditions, and hygiene than it is of medicine. And these are community accomplishments intertwined with living standard, education, and quality of environment.[372] The spin doctors who vaunt globalism would have us believe that the health and prosperity of the world depend on the operation of large corporations being unhampered by public control. In truth, economic health depends far more on physical health, which is steadily eroded by corporate practices. The medical establishment, and the pharmaceutical puppeteers behind it, would have the public believe our wellness and very life are at the mercy of the ransoms they demand. In truth, responsibility for our health and quality of life remains in *our* hands, where it has always

been. And if we seem to have lost control over our lives, it can only be because we have allowed power over the common good to pass into private and often distant hands. Public well-being lies less in experts, technology, or large organizations—medical, state, or economic—than in local political will.

Big business now literally sells water by the river. As more and more of the world's aquifers are contaminated by industrial pollution, bottled, purified, or "natural spring" water and water rights have become mega-business. The cost of drinking water rivals that of gasoline, and some prognosticators believe that future wars will be fought over water rather than oil. But water is only the most obvious resource, traditionally assumed to be in the public domain, but now ecologically threatened, privatized, or both.

The commons is all of nature taken for granted as belonging to no one in particular, there for general use. This includes the air we breathe, the oceans, the water table, and species of animals and plants. It includes practically whatever resists containment in legal boundaries. The notion of the commons, however, depends on being commonplace. As nature began to shrink in relation to human habitat, a situation of scarcity developed. It is the relative scarcity of a resource that defines it as a *commodity*, along with control of the means to access it and make use of it. When water was naturally abundant and a readily available resource, it could not be considered a commodity, whereas oil could right from the beginning, because it could only be accessed by those with the technology to pump it from the ground, refine it, and build engines to burn it. Where water must be pumped and purified to be useful, or imported from somewhere else, it too can be commodified and pass from the public to the private domain. In some places, perversely, water monopolies have been enforced through laws against collecting your own natural water, even from the sky!

The same applies to the pharmaceutical industry and the new biotechnologies. Synthesized versions of natural remedies are offered at high cost in the measure that availability of their natural counterparts, formerly free for the gathering, diminishes because of shrinking natural reserves and burgeoning demand, but also because availability is deliberately hindered through legal manipulations. The genomes of plants and creatures, used for centuries through conventional breeding techniques, are only now "directly" accessible through new and patentable technologies. This creates an ambiguity in their status, which commercial interests have seized upon to have them legally defined as

their private property.

As a result of policies evolved by the U.S. Patent Office, the genes of plants and animals are no longer considered a common resource of humanity, but are "inventions" which may be claimed as patentable intellectual property. Useful properties of the atom and many chemical processes were never patentable, while many properties of the gene are. The difference lies less in the kind of knowledge involved than in the changing attitudes of successive generations. Perhaps the properties of atoms may yet be patented in the developing field of nanotechnology, where atoms are manipulated directly in a way parallel to how genes are.

Many people will agree that inventors have the right to profit from their inventions, and yet it was not always so and need not be so now. What has changed, really, are motivations and notions of incentive, ownership and reward. In ages past, it might have been enough for an anonymous person to improve the tool they were using. They benefited directly from its greater usefulness, and if others of the tribe could similarly benefit by copying the innovation, so much the better for everyone. Even in our age, there have been examples of this unassuming generosity. Jonas Salk deliberately kept his polio vaccine in the public domain, though he could have made millions from it if he had chosen to claim it as personal property.

The biotech industry is booming not because of its possible benefits to humanity, which we may question, but because of the huge fortunes it is anticipated to generate. Many researchers are drawn to private industry because that's where the money lies, while much of basic research in universities is funded by industry. But there is a more insidious reason: patent law is such that even if researchers work for altruistic goals, their findings, published in academic journals in the public domain, may nevertheless be appropriated by private industry. This happened with the Human Genome Project, financed largely by public funding and published as academic research in the public domain. The results of this research are available for free to private entrepreneurs, who have used them with only slight modification to obtain patents making them private property. If a well-intentioned researcher or institution doesn't cash in on the benefits from their own efforts, someone else will anyway, so why bother with altruism?

The appropriation of the human genome is thus symptomatic of the whole movement in our time toward commercialization and privatization. Mechanism comes home to roost as even our bodies are considered inventions whose blueprints belong to corporations! Resources

formerly considered abundant or in the public domain are redefined as scarce and staked out for private gain. In an economy no longer based on manufacturing, and in a world of dwindling resources, we are suffering a crisis that reflects the diminishing production of real wealth. Knowledge, and even our own cells, have been redefined as patentable commodities because we are desperately looking for new ways to make money.[373]

To fight for the right of society to regulate the development of biotechnology, nanotechnology, and other dangerous new enterprises, is one front on which to resist the privatization of the world in disregard of public welfare. This assumes, however, that we even believe these technologies are a good enough thing to allow at all, and that we are committed to technological growth. But if technology is a mark of advancement, so is voluntary restraint.[374] No other creature has the circumspection to consciously limit its effects upon the environment, nor to decide for itself what that environment will be. Perhaps history will prove that ultimately humans do not either. But it is still possible for most of mankind to bypass high industrialization, to focus on local low-tech appropriate production and thereby to avoid the painful retreats to more workable practices which hyper-developed societies will be forced to face eventually.[375] It is still possible for overdeveloped societies to lead the way toward a simpler life. We are not obliged to embrace technology wholesale; and if we are wary of a particular technology or product, one way to resist its proliferation is by refusing to buy it or invest in it—no matter how profitable, cheap, or conveniently available it may be. The law of demand is foiled if in fact the public *doesn't* demand such things, or doesn't want them to be produced and distributed through a profiteering system, and refuses to consume them or invest in the companies that produce them. We do not *have* to support big business nor live in a consumer society at all!

It is not unthinkable that, along with public transport, utilities, and museums, there could be *public* consumption in place of universal private consumption. There might continue to be great public projects such as space exploration, particle accelerators, concert halls and sports arenas. More of what is now spent individually in the consumer society could go towards grand public undertakings. It could also go to *collective* enjoyment of industrial icons, to be treated as museum-housed works of art, rather than being spent on mass-produced commodities for individual consumption. A *few* of each industrial design could be created, instead of millions, and placed in an Industrial Ark. If the

Eames tubular chair can find its way into art museums, and the great and awesome engines of the 19th century into museums of technology, then why could not many of our current technological productions be enshrined in such places? Perhaps it would be enough to make *one* Ferrari or Ford, or a limited edition of them to put on display worldwide as celebrated works of art, perhaps to be ritually driven on special occasions. Otherwise, we would use public transportation. Such ideas will appear ridiculous to a mentality brainwashed by materialism, consumer values, and "individualism," but they are not beyond imagining. Industry once scoffed at the notion of the personal computer (who would want such a thing?) In those days, the computer was understood as a mainframe for serious use, not as a personal toy for home entertainment. It could be thought of in that way again. For better or worse, it is possible that the degree of computational power would by now be vastly beyond its present level if society had not been distracted by the mass production of PCs. In any case (and though we love our computers), it is a decision that could have been made by a less materialistic public, with stronger values and political will, and with a different economic organization.

Technological optimists assume that whatever ills specific technologies beset us with can be cured by further technology, and that the way to human fulfillment lies in indefinite and unrestrained technological development. Economic optimists assume unlimited, even exponential growth as the way to universal human satisfaction. In these pages I have challenged both these assumptions. The first assumption is false because there are limits to which nature can be formalized or exploited; the second is false because economic progress is inherently undemocratic. Fixing the ills of technology with more technology seems absurd when the problems might be avoided initially with more care; like thrashing about in quicksand, one sinks deeper with every effort. Similarly, misguided effort to save the world through economic development simply makes the rich richer and the poor poorer. At present, the assumptions of both optimists and pessimists are nebulous intuitions, which could be more seriously studied, tested and debated— were not time running out. A concrete science of the overall direction of human destiny could seek a firm grasp of the connections between technology, power, and idealism, as well as their impacts on nature. In that spirit, we could ask whether "progress" consists in advancing technology or social well-being? How can the former be made to serve the latter? The question of control over technology, and of political

power in supposedly democratic society, are one and the same. The link has always been economic.

The advance of technology seems to require increasing energy consumption, along with increasing centralization and decreasing autonomy of the individual. Ivan Illich has argued that a low-energy policy actually allows for a wider choice of lifestyles and diversity of cultures than higher energy consumption. Control in the high-energy, high-tech civilization seems inevitably turned over to a technocracy with narrow goals. He speculates that technocracy prevails when a certain ratio of mechanized power over muscle is achieved. North America, including Mexico, where he lived, has certainly exceeded this ratio, which he never precisely specifies except to comment that a lifestyle over-dependent on energy can be as poisoning as an over-rich diet (they go hand in hand).[376] A celebrated economist, however, calculated that only between 12 and 20 per cent of the improved labor output that is the key to the success of industrialization could be credited to "capital," which includes technological hardware. The rest, named after him the *Solow residual*, is apparently due not to more machines but to better use of better machines. This is what another economist calls *ingenuity*.[377]

I believe there are not only more efficient uses of machines but also more *proper* uses, which *can* support a socially equitable and environmentally wiser society. We are not obliged to swallow technology whole, but are free to discriminate when there is a guiding idea of its proper use. This is why discussion of values is indispensable, however unscientific it might seem. The key to defining and insisting upon a proper use of technology is *clarity of intent*. This begins with each of us clarifying our own values, goals, and priorities in life.

So how *would* technology be used in a clearer-thinking world? My own brief answer is: sparingly, selectively, appropriately, for general satisfaction of human need rather than for frivolity or individual profit. Technology can be used to narrow life through specialization, institutionalization, and centralization; or it can be used to expand the individual's competence, creativity, and self-reliance.[378] In the one case, machines control us; in the other, we control them. We turn to machines as a replacement for slaves. But perhaps what we need is tools to work *with* rather than tools that work *for* us.[379] This would be far healthier for our overly sedentary civilization.

The notion of progress must be redefined as the search for satisfying sustainable ways of life, rather than as the indefinite increase of gross national product, the private accumulation of goods and services, the listless ease of a leisure society, or the progressive transformation of the planet into an artificial environment. Such a search could only be earnestly conducted in a society where cooperative altruism is valued over individual aggrandizement, active fulfillment over passive consumption. Technology would then be tailored to satisfy basic needs and free people from brute drudgery, while facilitating productive lives. Consumer society has paid lip service to this mandate, while expanding technology to build a world economic machine. In an ideal world, neither technology nor economy would necessarily expand. Rather, they would *refine*. They would get better at fulfilling their mandates. Since the ideal society would be a world society—not in the homogenized texture of a monoculture, but in its commonly ratified ethical principles—this would mean meeting the basic needs of *all* persons instead of creating a grotesquely luxurious lifestyle for a few at the expense of the rest. And this would imply a society that is non-materialistic and egalitarian in its aims and values. Such may appear to be the stuff of dreams, but if we are indeed the free creatures we fancy ourselves to be, then all things must be deemed possible.

In the ideal world I am sketching, technology and enterprise in general would aim at *productive lives* rather than production. Inventiveness, science, and scholarly research would aim at creativity and understanding, on the model of dance or pure mathematics more than engineering and business or consumer goods.[380] Such things would be possible where basic survival needs have been met. And it should be possible for a society with a stable population to meet its truly basic needs (food, shelter, community, love, education...?) without being driven to indefinite production of material commodities. The rest of one's time would be available for gratuitous cultural invention, independent of commercial value. Business as we know it would be meaningless or laughed upon as merely crass.

There were numerous examples of such societies in pre-industrial times. In many cultures even today people have far more free time than in our so-called leisure society. Admittedly, the ease of life of some was in part due to the abundance of nature in regions not overpopulated; in some it was also due to the use of slaves captured in war. Mostly, however, such societies owed their abundance of time to *not* being driven by consumption. Technology *should* be used to compensate the greater difficulty of survival in harsher environments and to eliminate

slavery and the need for war. Far from eliminating slavery and drudgery, though, Western society has rendered them more subtle and widespread. It has used both military and economic war to do so.

By defining everything in terms of economic value, we have converted play and the gratuitous to new forms of work and created an ethos of perpetual struggle for survival—the very thing technology is supposed to alleviate! There can be no security, either actual or psychological, in a society that has privatized even community itself; for, the commonweal has always been the mainstay of collective security. We have spoiled our leisure by creating a driven and isolating urban lifestyle in which we can only find relaxation by spending more money, which requires more driven work, which makes us more desperate to purchase escape at any cost! From the rest of the world we exact tribute to maintain the absurdities of this treadmill, which we vaunt over the airwaves as salvation for all.

What a different world it would be if production would respond to society's real needs rather than aim at creating new markets! Ingenuity could be applied to public transport, for example, rather than a new model every year to boost sales of conventional cars. In an unharried post-commercial society, in which time is *not* money, there would be less demand for speed. Heavily polluting travel by jetliner might be replaced by a return to the adventure of travel at slower speeds. Much sophisticated technology has gone into recreational sail boats, which could be applied and developed further for serious transport. In parts of the world, such as Indonesia, much shipping does still take place under sail. The modern shipping industry is based on the idea that the whole world should be a unified system with interchangeable parts, in which materials and commodities are shuffled quickly between the cheapest labor and the highest markets in order to maximize profit. But does it really make sense to burn fossil fuels importing cookies from the other side of the world, when they can be freshly baked at home or in one's community, with ingredients produced in one's own countryside? The more production is local and oriented toward essentials, the less real need for trade or shipping. The philosophy of globalism makes of the entire world a virtual assembly line, distribution house, and marketplace combined, where the increased cost due to transport between one place and another is vastly offset by access to cheap labor. This simply tells us just how unfairly paid that labor is! In Bangladesh, for instance, women and children are hired as garment workers to produce clothing for the West at *fifty times* less than the wage paid to their North American counterparts, and for only a trivial fraction of the

retail sales price.[581]　This is not an isolated practice, but the very foundation of the world consumer marketplace.

Technology should serve not only the general welfare of current generations, but also the long-term security of the human race. Except for the warnings of a few futurists, present society has no such far-reaching concern. You will not likely go to a city council meeting, or a congressional or parliamentary session, and find politicians preparing for the inevitable return of an Ice Age, let alone to avert collision with an asteroid, or radiation from a supernova. Loss of coastal living areas due to melting polar ice caps would mean unprecedented social up-heaval and wars over dwindling space and resources. Collapse of agriculture, because of unstable weather patterns and depleted soils, would mean starvation for millions. Large-scale technological projects should undertake defense against such eventualities, rather than be squandered on military budgets and in wars, which cause more pollu-tion, which causes more climate change and political disruption.

The planet has been seriously affected by major cataclysms in the past. Human life continues to be vulnerable to cosmic events, as well as to the litany of familiar hazards of nature and civilization. Whatever the attitude toward nature, and however short-sighted the political philoso-phy, few people today would disagree that advanced technology should be used to avert natural disaster. For the first time in the history of life, it may be possible to do something effective to prevent or cope with such catastrophes as collision with an asteroid or comet, the return of an ice age, or massive flooding due to global warming. One natural disaster, of course, is inevitable: the natural mortality of the earth. Advanced technology, and particularly space travel, may be the only hope of life persisting somewhere after the end of the sun's stability in a few billion years. This, of course, is very long-range planning, hardly within the scope of present-day thought; but not beyond imagination. While private, recreational space flight may be a grotesque indulgence, the space program at large could be an essential step, if hardly urgent, toward the capability to relocate life in the distant future. Space tech-nology should prepare the human species for migration, not for petty aims such as claiming real estate for future resorts of the ultra-rich, nor even for adventure. It should be used to complement a far-sighted plan to achieve an ideal world here on earth.

The Russian astronomer Kardashev devised a hypothetical classifica-tion of extraterrestrial civilizations with which we might expect to make contact one day, based on level of technological development. Consid-er, then, a *moral* classification of civilizations analogous to

Kardashev's. The scale would measure relative degrees of advance from animal origins that limit the objectivity of thought and intention. While this means freedom from the constraints of the evolutionary past and genetic conditioning, so that truth is no longer bound to utility, in another sense such increased objectivity can be measured in terms of its higher-level utility for survival. Only civilizations that mature to a certain wisdom would be capable of the self-management and cohesion that would enable them to survive a technological phase. Only moral progress would permit a technological civilization to insure the continuance of life or intelligence into the far future without destroying itself through that same technology. A high civilization would be one that could find the resources of intelligence, along all its dimensions, required to survive the long haul.

7.3 Healing the Body Politick: the Limits of Consumer Individualism

Humanist values favored the individual over the collective, and competition over cooperation. Personal satisfaction is central to individualism, and is now so taken for granted in the West that it is difficult to view human institutions as having any other goal than furthering individual happiness. Cooperation is ideologically suspect as a limit upon individual enterprise. Ironically, the rhetoric of individualism underwrites an undemocratic, inegalitarian class structure that is highly satisfying to a few, moderately satisfying to some, but decidedly unsatisfying to many others. Individual satisfaction, when it does not coincide with *general* fulfillment, can only mean parasitism. It is to avoid the inconvenient realization of this simple truth that society accepts ideas of class, racial superiority, and the myth that anyone—but not everyone, of course—can strike it rich. In contrast, traditional societies were more naturally cooperative and egalitarian, with property held in common. While individualism may have instigated movements for equality in modern history, it is not in itself a stable force for equality. Hence, the interests of the individual often appear to be opposed to those of the collective, and egalitarianism has come to be associated with a strong collectivity disfavoring individual rights. It is as though the only way to insure equality is by suppressing the individual's desire to rise above others! But this may simply speak for modernity's obsession with material things, and its blindness to expressions of individuality that do not involve struggling to have more than one's fellows.

There is a balance of interests within society as within the physical body. The general problem of civilization is analogous to that solved by the soma in achieving the cooperation needed for higher levels of organization: how to overcome rogue individualism. In the case of society, this project must begin with an assumption of individual worth not applicable to cancer cells. The body, on the other hand, achieves its integrity by a ruthless disregard of individuals and by virtue of the fact that it is a tool of the germ line right from the start; the individual is a means and not an end. The contemporary society of globalism, like the communist dictatorships it successfully displaces, resembles this aspect of organism far more than it resembles classical models of democratic society. It is simply capitalist dictatorship, masquerading as democracy; plutocracy, buying votes with a token share in ownership and benefits of the body politick. Similarly, the master genes allow the somatic cells a life, albeit brief and subordinate.

The current threat to the West lies less in terrorism than in its own failure to achieve a universal standard of life that respects nature and allows *all* people, the world over, a happy and sustainable place within it (what globalism *should* mean). This failure manifests in growing class extremes, political divisiveness, alienation in overdeveloped as well as in underdeveloped countries, and violation of human rights. To focus on terrorism puts the cart before the horse.

A very recent accomplishment, the universal code of human rights is far from secure or universally respected. In practice, rights have historically been relative to class, race, religion, and gender. The battle for human rights has always been largely waged by middle classes, as a battle for *their* rights, and the current shrinking of middle classes around the world does not bode well for human rights at large. How can general human rights be upheld in a world where less than ten percent of people control more than ninety percent of resources? The great disparities of wealth are in themselves a sign of disregard for the rights of others and of natural and social limits. The rich are not interested in the rights of the poor, let alone those of nature, and in many cases have acquired their advantage by trampling on them. Rights depend on respect for law, and are disregarded by the powerful as often as they can get away with it.

From our cosmopolitan perspective in the postmodern monoculture, we may regret the disappearance of ethnic ways, as we do the disappearance of species. Apart from nostalgia, there is a real loss of variety and of alternative models analogous to the loss of genetic diversity. On

the other hand, humans *must* achieve a world culture if there is to be a collective human will. This requires not the imposition of cultural uniformity, but the eradication of disparities of health, wealth and education. It is conceivable to have diversity *and* equality, individuality *with* equity. It is possible to find individual identity and distinction through unique interests and through the pursuit of quality, rather than through winning the bigger prize. The global monoculture, in contrast, ironically achieves its uniformity and ubiquity at the cost of enormous class disparities and loss of cultural ways. It flaunts individualism and democracy while actually destroying them. This follows from the actual intent behind it, which is to create a monolithic engine of profit. The appeal of this monoculture to liberal-minded thinkers trades on a confusion between uniformity and unity; it confuses individual expression with having more than others and promotes self-interest in the name of "freedom." The brute fact is that the interests of power, in a world with enormous differences of living standard, militate against both unity and democratic freedom. It might be possible for educated middle-class Moslems to sit down with their Jewish or Christian counterparts, leaving their guns at the door, and calmly discuss their doctrinal differences; but until the rich are willing to sit down with the poor, with another aim than further exploiting them, there will be no basis for lasting peace. Religion will only serve to amplify sensitivity to injustice.

In tribal society, taboo was objective and externally visible to everyone because of its unequivocal laws, which regarded violation as palpable damage to the social order. In individualist society, the same destructive intentions are celebrated as expressions of individual will and success. Moreover, they remain out of focus to the degree that Western civil law regards personal transgressions not as a breach of spiritual law affecting the whole community and the cosmos, but only as material damage to isolated parties. In the secular individualist society, crimes against the social (or cosmic) order remain unrecognized for what they are. The function of the scapegoat in archaic society allowed for the displacement of anger whose cause cannot be identified or is somehow untouchable.[382] In a culture where crimes against society are idealized as expressions of personal liberty and condoned as ways of getting ahead, their perpetrators are indeed untouchable, and they understandably generate a response of anger and frustration which must find an indirect object and outlet. I believe that the general random violence of American society masks systemic evils in just this way, unrecognized because of the ideology of personal fulfillment.

"Terrorism," whether random and domestic or political and imported, is now a catchword to distract attention from the realities of the global economic system both at home and abroad. Now, as a thousand years ago, having an apparently external enemy masks the complicity of nominal Christendom in exploiting the poorer world, as well as its own growing exploitation by corporate power. This mechanism of scapegoating, and distraction by irrelevant and trivial pseudo-issues that dominate American media (bread and circuses), are symptoms of the mentality that Dewart calls deficient, and which I underline as masculine. Such a mentality sees neither its own subtle manipulations nor the way it is controlled by others through fear and greed. It does not focus on intention but simply views existing social structures as the self-evident way things are and should be.

Tribal life relied on space between tribes and upon autonomous resourcefulness to solve the problems of survival. There is now little space for urban people, who are perilously dependent upon artificial lines of supply over which they have little control. I believe it is urgent for society to reorganize itself again toward local self-sufficiency. Decentralized local production, with mutual agreement to assist other areas in case of disaster, is a far safer and more stable arrangement than the present system of industrial agriculture and luxury trade, neither of which is sustainable in the long term. Rather than routinely moving export goods around the globe for profit, the overall security of humanity would be better served by local self-sufficiency, retaining a global surplus and capacity to transport food and necessities to meet *emergency* needs. There is evidence that the most common cause of war has been fear of deprivation, inspired more by unexpected disasters than by chronic shortages.[383]

It may be argued that massive industrial production is necessary to accommodate the orders of population we have today. But I doubt this is true even of food production. There is evidence that small-scale farming is actually more efficient, overall and in the long run, than industrial agriculture.[384] It is not "profitable," of course; it does not lend itself to being an integral part of an economic empire. The true significance of industrialized agriculture lies less in the technology involved than in its organization and the intention behind it, which is to raise profits, not food. This can be seen in the fact that modern agriculture does not preserve the soils for future generations, but poisons and depletes them while consuming vast quantities of diminishing water and nonrenewable fossil fuels—a system morally and ecologically

bankrupt.

What characterized the economy of tribal society was not only its communalism, but the subtler fact that it was not materialistic in the modern sense. Consumerism is fast becoming the world's dominant religion. It comes complete with high priests and missionaries, proselytizing through a jihad of advertising and entertainment, while Christianity retains the veneer of moral rectitude to justify it. Consumerism is the ecumenical basis of a world culture, aspiring to unite all factions in a global shopping mall instead of the village church. Against this trend stands the blatant evidence of fracturing ethnic and religious minorities, waging their own jihads of resistance, which are as much holy wars *against* the abomination of Western materialism as *for* local self-determination and ethnic identity.

Personal wealth above a certain level can only serve symbolic needs. A prince's real personal needs are no greater than a pauper's. Beyond the satisfaction of those needs, his or her wealth will either be tied up in possessions that cannot be enjoyed by society at large, until or unless they are bequeathed back to the community, or will circulate as capital only within a restricted investment environment, moving essentially between the pockets of the rich. The classical argument that this flow will eventually reach the masses in some significant way is at best a myth, contradicted by common sense and statistical fact: wealth trickles relentlessly *up*.

The renowned economist, Herman Daly, has frankly stated that the whole point of economic growth is to avoid the problem of equitable distribution, which is glaring in a static economy.[385] An expanding economy hides inequities because the promise of wealth for the poor lies in the future, in the creation of new wealth rather than the thorny issue of redistribution *now*. But of course what little new wealth is created suffers the same fate as the old, diverted into hands that already control its flow. Subsistence, on the other hand, is in principle static and allows little accumulation of capital with which to create a false investment economy. If there is growth, it can only reflect a real investment of labor and the favor of environment and weather. Economic expansion is usually measured by the volume of transactions in the marketplace, regardless of their social value. Transactions beyond simple barter, however, merely facilitate the siphoning of liquid assets in the trickle upward, and do not in many cases reflect the creation of real wealth. Of the trillion-dollar daily global foreign exchange, for instance, only fifteen per cent consists of an actual flow of commodities

and "working" capital.[386]

As the jobs available in the modern investment economy become more abstract and further removed from direct subsistence or real productivity, their function becomes increasingly symbolic: to justify one's slice of the economic pie. Salaries do not particularly reflect an objective contribution to society's well-being, nor employees' real productiveness, but rather usefulness to an employer for leveraging a bigger portion of the pie. At the same time, self-sufficiency is discouraged on all fronts. Building standards and bylaws, for instance, were instituted to protect unwary buyers from unscrupulous professional house builders. But they implicitly serve a market economy for housing and real estate, the cost of which is beyond many people. Those who want to build their own dwelling on a shoestring and live out their life in it are hardly permitted to do so.[387] Those who would grow their own food cheaply are increasingly thwarted by proprietary seed companies, as well as by crowded urban conditions and inflated land prices and taxes. Work in general becomes a tool of dubious purposes and not directly gratifying as right livelihood or as an original contribution to a meaningful life in the collectivity. At the same time, the "goods" produced by this system, which are both the reason for work and the enticement to increase one's share of the pie, are themselves of dubious value. They only need be *purchased* to fulfill their true purpose; hence the gimmickry and gadgetry of luxury items and consumer trivia. Economic progress is neither the provision of meaningful work nor of useful and durable goods, but a refinement in the efficiency of the economy as a profit mill and a distraction from real concerns.

There are few fully automated factories of any kind, simply because it is still cheaper to pay slave wages to sweat shop workers in the Third World than to fully automate. Nor is there a will in society to care for a work force displaced by machines. The great bulk of imports to the West are produced through misery and exploitation. Moreover, they are produced at the expense of the consumer as well, who pays far more than is reflected in the cost of production. The consumer gets cheaper wares, but only marginally, while the middlemen are the real beneficiaries. Wal-Mart may offer the cheapest wares in town, but by some coincidence the Walton family is one of the very richest in the world!

If the West were distinguished by moral accountability rather than by consumer greed, we would buy only things whose human story and whose implications for the environment could be verified and

approved. This already happens on a limited scale through boycotts, consumer reports, "ethical investment," and "fair trade" arrangements such as coffee brokers who guarantee a better wage to field workers overseas. In this information age, it is feasible to know the detailed history of a product or the activities of a corporation. There exist watchdog agencies which report on them, such as *transnationale.org*. As consumers, we should consider it a basic *right* to know the whole story of the production and distribution of what we buy, with its ecological and humanitarian implications, just as we demand to know the ingredients of food products. We could also consider it a basic responsibility to spend and invest our money accordingly.

Capitalist society has been successful by offering, so to speak, a profit-sharing plan to its subscribers. It is an offer that few can refuse, but for which everyone pays a price in dignity and self-determination. And, increasingly: in dollars and time.

To begin with, one must accept money as the measure of all value and the goal of life. This alone is an insult to human intelligence, to which is added the injury of having to do meaningless work in a false economy and to lie to oneself concerning its significance. True, the individual in tribal society is also submerged in a social order. But there is a difference. The tribal member, if he or she is not a slave, is no one's tool and no one's fool. Their station may be lower than some other member such as the chief, but both together serve the common welfare of the tribe. In the modern economy, we have been liberated from subservience to nature only to become subservient to other people, most of whom we do not know or even know about.

Even if the majority should adopt a non-materialistic, cooperative, and non-dominating attitude toward life, society will still be faced with the problem of how to deal with the minority who do persist in seeking inordinate power, status, and wealth. Ultimately, the only defense of the dominated is to *refuse to participate in the games defined by the dominant*. These must be collectively disallowed, by refusing to support them, along with such mechanisms as were used to garner power in the first place. Primary among such mechanisms today are the private corporation, the credit system, and the centralized state. Those who rail against Big Government are often voicing the cause of Big Business. Those who rail against the welfare state often benefit from welfare capitalism. Those who rail against taxes often pay what amounts to huge private taxes for use of their credit cards and other conveniences such as packaging, and in health costs associated with processed or fast

foods.

Let us be clear that consumer society *is* a form of welfare state. Investors are *subsidized*, for very little effort on their part, with regular handouts from their portfolios. Whether or not we are investors, we all are passively provisioned, if not equally, by corporate paternalism, instead of directly providing for our own subsistence through dignified real work. Contrast this with the situation in North America before the twentieth century, when society was far more self-reliant. Not only was food produced locally, so was charity, public welfare, entertainment, and education. The latter relied heavily on local volunteers within benevolent institutions to induct poor immigrants successfully into middle class literacy and culture.[388] Such grass root organizations and efforts were an alternative not only to the welfare state but also to consumerism and corporate capitalism; they represent local autonomy and the ability of people to provide for themselves and one another without massive bureaucracy.

The state *and* the corporation are oversized leviathans. Debates over government control of the economy *versus* a free marketplace are false issues; for, the market today is neither free nor diverse when it is dominated by a few huge monopolies that are supported by government. The top five international firms control 70 per cent of the global market for "consumer durables." In automotive, airline, aerospace, electronic components, and steel industries, the top five control 50 per cent. In oil, personal computer, and media industries, the top five control 40 per cent.[389] The *real* alternative is decentralized local self-determination and self-sufficient production: small local government *and* small local business.

We are living inside a very complex machine, increasingly vulnerable to external disruption and internal failure. As with our complicated automobiles, we can do little as individuals to fix the global economy when it breaks down or improve the design of governance when still running. In tribal societies, the focus was very much on the past and on continuity, as though it were unconsciously realized that a collective will must be exerted to hold society together and prevent a future out of control. And such a will was possible on that scale. I do not suggest that we should or can return to pre-industrial times, let alone to the timelessness of the Stone Age tribe. But I do believe we can free ourselves from the mythological compulsions of "progress" and return to a human political scale. The real question is how to strike a synthesis of the need for global unity with the equally urgent needs for equality and local autonomy. Present rule by big government and big business,

which are increasingly indistinguishable, takes us in the wrong direction. Far from being contradictory, global unity and local autonomy are mutually necessary; both imply relative equality. The problem is one of political will. For, the very nature of modern society undermines collective will, and is even tailored to do so by well-organized and powerful interests.

Collective will begins with individual clarity of purpose. To have an ideal world we must first have personal ideals. Then we must make it impossible for those with socially and environmentally destructive intentions to capture or retain direction of society. The best way to insure this is to decentralize society, both in production and governance, so that there no longer exist social mechanisms that may be hijacked as large-scale tools of power. Practically speaking, this would mean emasculating governments above the level of the village and empowering local governments instead; abolishing corporations and credit; and dissolving the military or restructuring it along Swiss lines. There would be no nationalism because there would be no nations as we know them. Instead of a World Trade Organization, there would be a world environmental agency.[390] Government and taxation would be administered at the level of the township or neighborhood. In a sustainable world, the mega-projects that presently require national or international-level coordination would be few and selective. Most could be administered by non-governmental, nonprofit agencies, as is presently done in the case of some scientific research and medical aid. Large-scale social enterprises would involve ad hoc coalitions rather than permanent bureaucratic institutions. Neither such projects nor technology in general would involve profit, or even production as understood in consumer society.

True democracy has yet to be achieved on the planet, and probably there has never been a truly egalitarian society. We live with the myth of equality and equal opportunity, while players in economic games simply are *not* equal or equally motivated to maximize their winnings. Even if they were, and began on an equal footing, there is evidence that the very nature of the game inevitably produces inequalities. In one simulation, society is modeled by a betting game in which all players begin with equal assets. After 50 rounds of betting, 10% of the players held 50% of the assets! This is probably because an early edge tends to amplify itself: those who are winning are in a better position to take profitable risks and so they are willing to bet more aggressively; small initial differences are magnified with repeated trials.[391]

To regard economies as zero-sum games already presumes a com-

petitive rather than cooperative ethos. While admitting limited resources, it already suggests that "winning" consists not of creative productivity, altruism, or cooperation, but of taking from others. The blanket assumption of "rationality" in economic theory implies that all players should be equally and simply motivated, which is psychologically doubtful. The very nature of a Darwinian scenario is that the more aggressive will come to dominate the population; small initial differences include the genetic draw of temperament. One way or another, sooner or later, the less aggressive, or those less interested in competition or economic goals at all, become the disadvantaged and are forced to cope with more aggressive players with bigger assets, who come to dominate and even define the game.

Irrationality can be turned to advantage, however, in neutralizing some of the advantages of the dominant. Against a superior opponent, playing *randomly* helps to level the playing field, insuring a relatively equalized outcome in zero-sum games. This may be the source of female capriciousness, earning women the reputation, in men's eyes, of irrationality. In the battle of the sexes, in situations where men hold the power, it is to women's advantage to be *perceived,* at least, as irrational players. The same is true of political games. The disadvantaged gain some leverage by breaking the rules, acting unpredictably, even randomly. This may be the significance of terrorism as an emerging international political force and of random violence as a domestic institution of the frustrated.

The outcome of a tournament of computer programs, to compete in a "Prisoner's Dilemma" type game, suggests than the best overall strategy for *any* player in the long run is a policy of doing unto others as they do to you—with a measure of good faith thrown in. The winner of the tournament was also the simplest program: be friendly on the initial move and after that respond in kind.[392] This sort of gaming assumes players with equal influence over each other. It is not so clear how to apply the "tit for tat" approach to the actions of corporations, governments, dictators, or other players who occupy a very different footing than the individual citizen, other than by forming coalitions to match their power. The general question remains: how can the "little guy" hold his own? How can society act as a whole, or in significant coalitions, to oppose or dismantle the undemocratic power of elites?

A quarter-century ago, CEO's of large corporations in America were paid on average forty times the rate of their average employee. By now that factor has grown to nearly two hundred times![393] Of all

industrial nations, the U.S. ranks *last* in economic equality.[394]   This inequity reflects the notion that some parts of the economic machine are more crucial to profit than others. It also expresses the myth that anyone can rise to the top with sufficient effort, skill and luck. People believe strongly in this system, accepting its inequities, for the same reasons they gamble or buy lottery tickets: because they want the chance to win the sweepstakes, to rise above their fellows. As long as they *believe* they have a chance, they will always reject a level playing field in favor of the opportunity to win out over others, even if a level playing field means a more likely improvement in their condition than the remote odds of a windfall. This will only change, it seems, when we reject economic machines and realize the game is fixed.

The developed countries, of course, have already won the luck of the draw. The world lottery *is* fixed so as to maintain the advantage of the wealthier nations. The overall trend of globalism, however, is to create a world class of poor without borders and a dominating elite who recognize no national loyalties. In 1960, the richest fifth of the world's population received a slice of the economic pie thirty times that of the poorest fifth. By 2000 this ratio had doubled to sixty times.[395] Already, most of the world's one hundred largest economies are not nations but private corporations. Mitsubishi is bigger than Denmark; Toyota, bigger than Norway; Exxon, bigger than Finland, and Wal-Mart than Poland. The two hundred largest corporations have sales equal to one quarter of total global economic activity, yet employ less than *one-third of one percent* of the world's workforce![396]

Corporate power tries always to "externalize" its costs, by getting its resources for free from the public domain, or subsidized at public expense, and by getting society to pay for its waste and pollution. Such costs born by the public in the U.S. alone amount to more than $2.6 trillion per year![397]   National debt comes less from overspending on social programs than from public giveaway to corporations and under-taxation of corporations and wealthy individuals. Undeclared income in the U.S. is estimated to be equivalent to the U.S. budget deficit itself! [398]   Most of the activities contributing to environmental destruction are heavily subsidized by public funding—first through subsidies to corporations and then through tax dollars spent on fixing the damages they cause.[399]   Ironically, all of these expenditures are counted in the Gross Domestic Product as a measure of "growth." Governments and government agencies align themselves increasingly with private inter-ests over public, reflecting the power of lobbies and "experts" favoring the ideology of growth.

While there may exist relatively ethical companies, and generously philanthropic billionaires, business per se rarely puts itself at risk financially because of ideals. The bottom line and reason-for-being of a company is profit. And because profit is sacred, corporations cannot be trusted to serve the general good of society, to protect people and environment, or to behave morally. The global corporate world cannot be trusted to regulate itself, nor to support the civil institutions needed to regulate it from without if it is to survive its own rapaciousness.[400]

The idealistic optimism of the 1960s must be put in the perspective of the sinister development of economic globalism arising in the same period, which has since been rapidly eating away civil institutions at public expense. Far from being mollified by feminism, patriarchy is expanding as a power system that obliterates gender, as so many women in developed societies are co-opted within it. Hollywood films routinely celebrate the increasing participation of women in business, police, and the military, and their unthinking embrace of masculine ways. Heroic media campaigns (Watergate, Vietnam) have been succeeded by journalists "embedded" with the military, and Western media have generally been co-opted as propaganda outlets, as in Iraq. The warning in mid-twentieth century of General Eisenhower against the growing power of the military-industrial complex is all the more relevant today, as American military might knows itself to be uncontested in the world. No doubt many Americans still believe their country's heroic role in the world is to bring democracy and freedom to all. If this were only true, America's role as world policeman might be morally laudable even if militarily hopeless. But the political track record of the United States in the last hundred years, of which many Americans seem to remain blissfully ignorant, reveals quite another story. Whatever delusions Americans choose to believe, the people in the places dominated by American military, betrayed by American political double-dealing, and abused by American corporations do not forget or forgive easily. Many Americans are out of touch not only with the causes of their own domestic social horrors, and the danger of losing control completely over their own government, but also with the reasons for the world's ambivalence toward them. Yet the problem is not specifically American. The United States takes the brunt of criticism because it asserts its military and economic might. But behind that power, using it and motivating it, while ironically threatening to displace it, lies the global economic empire.

Corporate interests based in the United States perhaps still hope that

the world monoculture will in time be embraced by millions of new Muslim consumers and eventually prevail throughout the Middle East. But Islam continues to represent the only organized resistance to the march of the global monoculture and corporate capitalism. (The middle classes of China and India are all too eager to embrace Western consumerism.) Islam is outspoken in its opposition to the worldly values of the consumer culture, which it rightly perceives as destructive not only to religion and nature, but to the very fabric of society and community.[401] Instinctively, and whether hypocritically or not, many Muslims resent the West for its flaunted opulence, are wary of its technological ethos, and are contemptuous of its flagrant and immoral materialism.[402]

If Islam appears to be the nemesis of the West, it is partly because Westerners have been swallowed up by their own blind faith in progress and modernity, seen by them as inevitable developments of an evolutionary destiny rather than as self-serving cultural choices. History is not a causal process like natural history, but a moral drama of conflicting intentions and values. *Both* globalism and jihad are masculine enterprises, now facing off in a showdown; if the one is driven by outright hatred, the other is driven by a thoughtless and heartless commercialism. One creates dangerous identities by dividing tribe from tribe; the other divides class from class within an artificial unity, at once dissolving national borders and erasing local autonomy. Both run on fear and undermine the cosmopolitan humanism and democratic civil institutions of the nation-state.[403] While Western subjectivism leads to an ironic culture of calculating cynicism, perhaps overvaluing the individual, Islamic earnestness leads to a fanatical tribal absolutism in which the individual is proudly expendable. If Westerners abhor the impassioned evil represented by the suicide bomber, they would do well to ponder the cold-blooded evil to which it may be a reaction, represented by the corporate executive and the high-tech bomber.

I do believe a *sincere* spirituality or idealism can yet arise in the West, but not before the moral implications of our indulgent lifestyle are honestly faced. Until then, religion here will remain a sham, because the hearts of so-called believers have hardened themselves in a materialist wilderness. More than ever, there is a need for a non-materialistic perspective on life; but any such idealism will be viewed askance by a society which remains cynically attached to its golden nest eggs. As long as religion and spirituality serve this essential denial at the core of Western civilization, they will appear to rationalist minds as fanatical, delusive, and dangerous. Until the idealism of Westerners can disen-

gage itself from its vested interests, it will remain imprisoned either in a hypocritical fundamentalism, as in America, or in an unctuous intellectualism, as in Europe.

The ultimate promise of technology should be to *liberate* us from the compulsive need for accumulation. The ultimate promise of sexual liberation should be to eliminate the compulsive sexuality resulting in overpopulation. And yet these continue to be the standard twin obsessions of people even in affluent societies. Men are programmed to "win," thereby gaining sexual access to women and social approbation for their masculinity. Women are programmed to "nurture," conscripting men as economic adjuncts to child rearing. Children learn early to master these games, boys playing at war and domination, girls playing first with dolls and then making themselves *into* dolls to manipulate men. These gender obsessions are rolled together into the creatively and morally bankrupt goals of consumer society.

If patriarchal domination expresses male genetic conditioning, women have played a role in this by sexually selecting a certain type of man. Violence and aggression have been bred into human genes through the greater sexual success of aggressive men. Women make the world a place where power and wealth are coveted when these are attractive to them, when male aggressiveness pays off in sexual and genetic rewards.

Of course, power has also been selected-for culturally, as a meme, through the rise of the dominant in society, who become the emulated social models of success. And violence, power, and greed have been endorsed by popular demand, as themes in Western media and entertainment programming. Here too, women play a significant role who have cultivated themselves and their daughters as images and objects rather than cultivating their subjectivity; who have tolerated the presence of television, guns, and war toys in the home and violence in society; who have encouraged their boys to be boys, their men to be ready for war and ruthless in business; and who have not encouraged their girls to be strong advocates of the feminine and have failed to be strong leaders themselves. No doubt, in earlier phases of human history, only the aggressive tribe thrived, and women rendered a positive social service by encouraging fierceness in males and by embodying their own versions of it. While we have scarcely left that dark era, there has been a slow evolution of ideals toward a different mode of human being. Now that it is clear that much of our genetic heritage no longer provides a sound basis for human conduct and

relationship, such ideals must be carried through to realization. The nurturing and receptive aspects of the feminine mentality constitute a vast untapped resource for the realization of a new social order. Heretofore, this resource has been locked up in raising children and serving men, or else in playing men's games. It *must* now be liberated to work on society at large, which urgently needs an alternative to the masculine model.

Both men and women must cease projecting onto women either an effeminated or a masculinized image. Both must abandon the default goal of reproduction as the ultimate goal of relationship and consumerism as the ultimate fulfillment of life. Women must come out of hiding in the company of children, which they might understandably prefer, to remake the world not in a masculine image. Both male and female must discover the meaning of hidden potentials within their own gendered being: the higher masculine and the higher feminine. Men must look beyond their careers and pocketbooks toward the salvation of humanity and a humane, just, equitable way of life for *all* people, not only their kin and intimates. Women must confront the hidden advantages of their subordination, looking to the broader meaning of femininity. The battle of the sexes (a distraction which consumes so much of human energy) must give way to an alliance of rebels, no longer pitted against each other but united against an unjust and dangerous social order.[404] In this, we could take example from the "chaste mingling of the sexes" of the early Christian communities.

Youth have always tended to see the world in a new light and bring to it an unjaded idealism, recognizing in the banal heroics of keeping up with the Joneses the same illogic as waging wars in the name of peace.[405] Old age is positioned similarly, but on the other threshold of life. Those who have not yet been fully drawn into the socially approved games, and those who have survived them to acquire wisdom, are alike able to offer an outlook liberated from the premises of consumerism. Add to them aboriginal peoples with a moral claim to a more harmonious relationship with nature. Unfortunately, against the idealism of youth stand the promises of the malls and fashion magazines, peer pressure, and the seductive goals of the consumer society. Against the wisdom of old age stand its insecurities: the fears of poverty and ill-health, of the violence of society that leads to walled retirement communities, and the fact that retirement as an institution is an integral part of the investment economy. Against the wisdom of native ways stands the temptation of the white man's wealth and corrupting attitude toward land and nature as "resources." People who have spent a lifetime in the

system may not be inclined to suddenly turn against it. Yet many find themselves called upon to defend local autonomy and self-determination against the attacks of globalism; to defend nature and civil society against the onslaught of corporate power and the unthinking misuse of technology; to defend reality against the distortions of mass media.

If there is a single institution that is the essence of modern economy, it is *credit*—and the debt it creates. The total debt of developing countries increased *thirty-two fold* between 1970 and 1996, from $62 billion to $2 trillion in a quarter-century.[406] Individuals and whole nations, rich and poor alike, overnight have adopted credit as a way of life. While personal debt is (so far) not used directly as a tool of political control, it nevertheless ties debtors to the treadmill of repayment that keeps them working for the system. The debt of nations, on the other hand, *is* regularly used to blackmail governments into following policies prescribed by creditor institutions.

Many conflicts around the world, often apparently political or ethnic, have been triggered by economic crisis induced by intervention of the International Monetary Fund.[407] In the euphemistic name of "structural adjustment," the assets of indebted countries are taken over through an enforced program of privatization as well as debt collection. The IMF assumes control of an indebted economy in order to "stabilize" it; in theory this is supposed to help such countries generate a trade surplus so they can repay their external debts.[408] But this regime usually backfires, because the policy of belt-tightening actually undermines economic recovery.[409] The same policies applied in the Third World are also applied at home in developed countries, also in the name of reducing debt and with the same result: a giveaway of public resources and control to the private sector, such that the debt of large corporations is transferred to the public. The great irony is that much of public debt was incurred in the first place by subsidizing the private sector; furthermore, most of the creditor countries are themselves deeply in debt. State loans and grants to debtor countries are made to enable them to repay debts to private financial institutions, which only transfers private debt to the public of the helping country. National debt derives not only from government inability to live within its means but also typically from assuming the debts of private companies under threat of their collapse and the unemployment that would ensue.[410]

A stable economy, based on real production, would at every moment balance its books. But this would preclude the nonproductive

banking and credit "industry" which is the very foundation of our society. Credit is the basis of modern economies, which seek returns from investment rather than work: your money works *for* you. In tandem with the debt crisis there is a communication crisis, owing to the fact that nothing can be called by its proper name, or be seen for what it is. The financial world is as technical as the engineering world, as impenetrable as the legal, and as deliberately euphemized as the military world. Nevertheless, the simple truth is that usury has always been the basis of capitalism, at least in the form of investor credit. *Consumer* credit, however, is a post-World War II refinement, as some folks will remember. And so is the policy of massive loans to poor countries, which they can never hope to repay. Probably the single most important factor in establishing the consumer credit economy around the world has been television, also a postwar development. Television advertising and programming, which flaunt the Good Life as conceived in America, have primed aspiring middle classes around the world to literally buy into the monoculture. They can have it all now and pay later—and keep paying and paying.

Sometimes governments attempt to impose laws designed to protect their countries' natural environments. Under "free trade" arrangements, however, such national jurisdiction is nullified and can be challenged at the level of the World Trade Organization. Every time an environmental regulation has come before the WTO it has been struck down, largely because the people who comprise that agency ignore environmental and health issues in their commitment to the ideology of trade liberalization.[411] We ought to bear in mind, however, that the WTO enforces its decisions through trade sanctions. A self-sufficient country with balanced books could be immune from such bribery. But autonomy is contrary to the whole movement toward globalism, "progress," and an interdependency often among very unequal partners.

It is not only in Third World countries that international financial pressures are brought to bear to force governments to knuckle under to the globalist regime. Political elites in the developed countries too are in collusion with corporate power, seduced by the ideology of globalism. The promise of financial reward for a community cannot be separated from the promise of reward to individual politicians, who are mostly business types. In electing its leaders from the business sector, a community or nation may institutionalize a form of systemic but usually legal corruption.

In America, a new coalition of business and the religious right against environmentalism justifies continued rape of the earth with the

millenarian assumption that it is all going to end soon anyway. A dangerous diplomatic recklessness may follow from the same thinking. Besides the obvious payoff to those who stand to profit from an anti-environmental heyday, as from arms sales, the broader significance is to disown responsibility for the fearful consequences of overdevelopment that are already upon us: in effect, the doom of the world is God's business and not Man's. This idealist denial places the imminent demise of the earth, or of civilization, safely outside the rules of cause and effect where it might be interpreted as due to human mismanagement.

We have grown accustomed to think of technology as a neutral objective presence like nature, indeed as a second nature. A tool's use depends on the intentions of the one who holds and wields it. This simple fact is obscured when the entire environment is technological and cannot be held in hand. Similarly, we have grown accustomed to the consumer monoculture as simply the way the modern world is, forgetting it is a moral choice *we* make every day. Leaving such choices to experts in finance can only produce the same ambivalent result it does in technology: cleverness without wisdom. Leaving them to the religious right can only hasten doom.

While the heroic has always been channeled by society into conventional paths, ironically heroism *means* the courage to break from convention. It is a call to a visionary rather than escapist idealism, one which goes beyond simple denial of our animal place in nature, in the resolve to make a better world for all, not only ourselves. It is tempting to retreat either into despair regarding an inevitable dark future, or into a wishful complacency that hopes against all odds for a storybook ending. But life is not a story, and events in the human realm are not determined in advance except as self-fulfilling prophecies. Only if we know this, and act accordingly, will destiny lie in our hands.

Epilogue: TAKING BACK REALITY

The covers of this book are too far apart —Ambrose Bierce

When I was growing up, saving the world was a romantic figure of speech. Now it seems an imperative, a civic duty. Consciousness of what is happening to us through mechanism is only now emerging to re-inhabit the world machine set in motion in the Renaissance. To apply political consciousness in appropriate action is now a responsibility of a leisure society.

We in the West have been obsessed with *things*—with *nouns*, as it were. Even self-inquiry has been a quest to know *what* one is in scientific terms more than *who,* or than what it means to *be.* Thus, thirty years ago, I recall finding twenty pages of entries in *Psychological Extracts* under the heading of "rats," but only a short paragraph under "consciousness." Focus is shifting from the noun to the verb, from the "objective" nature of the world to the responsibilities of selfhood, and to the selfhood of nature. All this has been sadly missing in the unbalanced mentality that has come to dominate the modern world. With all our dangerous toys, this evasion is no longer an option. At this point, neither God nor science will save us from ourselves.

I have presented my arguments with a descriptively materialist bias, while advocating a normative idealism. The spirituality and idealism I endorse, however, are not matters of theology but of common sense and of heart. It is not a question of what exists or does not exist, nor of the self's one-sided creative power, but a question of attitude. It is not a masculine idealism, though possibly it is a feminine one.

A formula for the future may work briefly, but can never match the enormity and complexity of the world in flux. Thought must therefore be ever self-renewing; for the essence of consciousness is to perpetually update itself and thus transcend fixed formulas. And if all ideas are provisional, then history itself should be regarded as a series of trial efforts. We ought to feel free to reject any experiment and return to earlier arrangements, or turn to others never tried or yet to be imagined. The entire human experience could be regarded as a wild brainstorming session, which we may now conscientiously begin to sift for elements that work toward general human satisfaction. Rather than judge older cultures by the aspects of them we may rightfully reject (like cannibalism or stone-age technology), we could take them seriously for what seem better or more useful ways than our own (like communal lifestyle, accountability to the collective, a sense of belong-

ing, a more humble attitude). Above all, we must cease to regard them as the warm-up act for our own starring civilization. Instead, we must realize that entirely different dramas have been lived out on this planet, among which ours is one that cannot endure.[412] And rather than be intimidated by the collapse for which our civilization is headed, thoughtful people everywhere must come forward to embrace alternatives to consumerism and the industrial mode of production. They must rise to the occasion to present a clear vision of an equitable society in balance with nature, one using appropriate technology.

The concept of progress as growth must be finally abandoned. At heart, what many people long for in its place is a just and humane world. Beyond what is required to satisfy basic needs, creativity must aim at productive *lives* rather than industrial production for lives of consumption. Whatever hardware we embrace ought to reflect an attitude of embellishing the natural world, as opposed to reforming it. Technology should orient equitably toward actual human need and freedom from drudgery. It should protect the safety of future generations and their right to meaningful work and enjoyment of nature.

Production must emulate the model of nature: *total* recycling, *zero* waste and pollution! Some countries in northern Europe have already taken steps toward this ideal, requiring manufacturers to assume responsibility for their products from beginning to end. To take back packaging, dead cars, refrigerators and computers, for example, or to recycle industrial emissions and effluents. All that is required is to bend our ingenuity toward *these* goals rather than toward clever gimmicks for increasing sales.[413] In order for this to come about, we must free ourselves from the myths of progress, modernity, and "the good life" of consumerism, which the corporate world flaunts before us to align us with its aims. These must cease to be *our* aims, and hence the reason for being of the corporate world.

Economic globalism and the monoculture are cumulative choices, not preordained destinies. A politically and spiritually unified world society is possible and necessary, but it must be *locally* autonomous. Whatever else we do, we must start in our own back yards, with a return to common sense. The first step in taking back reality is to call things as they are, in plain language.[414] Control over the quality and means of life must be reclaimed from the hands of bureaucrats and "experts." Society must decentralize, for the sake of diversity and self-determination, yet must proceed under the aegis of universal law, justice, and ethical intent. Whatever *can* be produced locally *should* be

produced locally. Trade must be based, as it once was, on lack of local availability rather than on the unethical fact that something can be produced on the other side of the world at a hundredth the cost, even counting shipping and distribution. While "free" trade may be convenient for consumers, we must choose right over convenience.

The corporation must be disenfranchised as a legal entity, banned along with investment as currently understood. As it once was, *usury* must be "taboo" and *capital* must be viewed as a means to facilitate dignified work and collective projects, not as a tool that "works" in our stead.[415] Large-scale ventures must be civic and nonprofit, for general good and not for private gain.

If society were to fully embrace the doctrine of the free flow of information, rather than free trade, there would be no such thing as intellectual property and no justification to make fortunes from what should be public domain. There would be no information empires, and no hackers trying to lay them low. There would be no patenting of genetic knowledge, no exploitation of the commons for commercial gain, no corruption of science by business. We would finally realize that profit is the wrong motive to do anything at all. Time, after all, is *not* money, but *life*.

The ghost of civil society must re-inhabit the world machine, making peace with nature. Whatever role we choose for automation in the postindustrial era, society itself can only be handmade if it is to be humane. While this may entail rejecting particular technologies, it does not mean rejecting technology as a whole. It does mean rejecting the idea that society can be run by formula, from the top down.

The ideal of world government recedes in the face of corporate rule and rogue nations. At the same time that we add layers of governance and legal jurisdiction to supersede the nation state, the top-heavy state must itself be redesigned from the bottom up. Selling or giving the State to corporations, however, or allowing it to be stolen or dismantled in the name of globalism, goes in the wrong direction. Localism is the key to any real democracy or freedom, and the only promise of any future at all. While receding on the global horizon, democracy is still within reach in every community. The alternative to the commercial monoculture is local community, local government, and local economy created in our own neighborhoods.

The United States, Canada, and Great Britain are celebrated as models of democracy. It is ironic that these three nations, unlike the

majority of modern democracies, still operate under the "single member plurality," or "first past the post," system of electing representatives. This is the winner-take-all system of electing but one representative per electoral district. And this means, at best, that minorities in each area are systematically unrepresented. At worst, when opposing votes are divided, a minority may capture the seat for that district, leaving the *majority* unrepresented. This type of electoral system lends itself to gerrymandering, dominance by moneyed interests, and other forms of corruption. It encourages a two party system where the two parties are barely distinguishable, and discourages focus on real issues because the pressure to win a plurality means being all things to all voters.[416] It is a major factor in the under-representation of women, because the political pressure is to run the safest candidate; women do hold a bigger percentage of parliamentary seats in proportional representation systems around the world.[417]

The fact that the poor greatly outnumber the rich suggests that in a true democracy their vote would act to equalize the distribution of wealth. The fact that this does not happen suggests that the systems concerned are *not* in fact true democracies. One structural factor inhibiting a more genuine democracy is the persistence of this outdated electoral system. An effective move toward social justice, in the above-mentioned nations, at least, would be the inauguration of a voting system that guarantees proportional representation. Even better, though, would be direct participatory democracy, of the "town hall meeting" type, where everyone who wishes has a voice in all decisions. The fact that we have settled on the national scale for a system of corporate rule, which we have agreed to celebrate as "democracy," is a measure of our brainwashing in the West, and of the extent to which we have traded our birthright for a pot of message.

What I have called normative idealism must come to be preferred over the unimaginative crassness of economic materialism. Personal success must be redefined as contribution to the general welfare and the cause of life. On pain of extinction, we must outgrow the hedonism, solipsism, and subjective individualism rampant in consumer society, in favor of an *objective consciousness*, one that makes full use of the unique perspectives and talents of individuals to address the world's real problems. This is not the objectivism that denies experience as "merely" subjective. True objectivity comes of fully embracing experience in all its embodied varieties, thereby taking responsibility for the self and its obligations to truth, reality, and the community of others.

A new understanding of individuality is required, then, and of the goals of the individual in society. The models we have seen in history are inadequate to the future. Individual consciousness simply remained undeveloped in tribal societies, which in any case succumbed to the greater technological power of Europe. Nor could the Marxist experiment overcome the greed and corruption shared with the capitalist world, apparently endemic to patriarchal culture. The meaning of individualism even in consumer society is imperiled when the rights and freedoms of citizens play second fiddle to their role as units of the political-economic machine. The Western ideal of fulfillment has been subverted, so that the individual has no greater vision than to personally consume as much as possible of everything. Hence, it is personal identity itself that must be reconsidered.

Civilization should get better, not bigger. It must be redefined as the project of creating an optimal way of life in balance with natural limits, a way that works for all life on the planet. It can no longer be the vengeful transformation of nature and rebellion against limitation we have known in the patriarchal era, the dangerously pretentious creation of an artificial world, nor the indefinite expansion of selective wealth and power. Idealism, mechanism, consumerism, and now globalism, have been ironic flights from natural, existential, and social truths. A new civilization with a more feminine flavor would redefine heroic idealism for men and women alike. Perhaps it will reconcile at last the estrangement of masculine and feminine.[418]

Above all, the redefinition of civilization and individuality is a call to live life genuinely, and for worthwhile ends. Let us be called out of passivity and delusion to wakefulness, no longer abhorring death, embodiment, and reality, but fully embracing conscious life.

Appendix: SMALL STEPS TO A BETTER WORLD

This book has been a long-winded discussion of ideas, possibilities and limits. Conspicuously missing are more tangible suggestions regarding steps one could take to create a better world. You may not agree with my vision of an ideal world or you may not consider the following measures "practical." For this reason, I offer them simply as suggestions, as examples of ways to apply a normative idealism, as completely legal forms of civil resistance to the totalitarianism of our age. Everyone must find their own path, their acceptable level of action, and the specific actions that make sense to them. The reality of the world remains to be found and shaped by all of us, together.

1. *Don't* watch commercial TV or fear-mongering "Hollywood" films, or subscribe to newspapers and magazines produced by a chain or owned by large corporations, or which distort the truth. *Do* search the Internet for alternative news sources, read independent newspapers and journals, watch films by independent filmmakers in independent cinemas. Support independent and public TV, and small publishers and bookstores rather than conglomerates and chains.

2. *Don't* buy fast food. Resist imported food items, genetically modified or over-processed food. Don't use chemical fertilizers or pesticides. *Do* buy local organic produce; plant an organic vegetable garden in your back yard (or, even better, in your *front* yard!); maintain a compost system; seek out non-hybridized, non-patented seeds to plant; trade and share food and clothing with your neighbors. Do recycle; bring your own reusable containers to market; ask your local produce manager to supply organic, non-genetically-modified, locally produced food items. Start a food cooperative, seed bank, or recycling center.

3. *Don't* buy anything you don't really need. Don't shop at the mall. Don't buy from chain stores or franchises, or from companies with hundreds of employees. Don't pay with a credit card. *Do* shop locally and support local small independent businesses. *Do* barter or start a local currency.

4. *Don't* slave to keep up with the Joneses, work for a big corporation, buy the latest technology just because it is new or trendy, or measure your worth by your income. *Do* start your own business, doing some-

thing you love. Search your soul to see who you are and what you have to offer the world. Use your retirement to contribute from a place of new freedom.

5. *Don't* drive your car any more than you have to. *Do* ride-share, join a car coop, take the bus, bicycle, walk, have things delivered. Sell your car and use the money to start a creative project or to do volunteer service work.

6. *Don't* invest in the stock market, mutual funds, RRSPs. If you have savings, *do* invest them in local small business, in your own community. Start your own enterprise, or help someone you know to do so, or to own their home.

7. *Don't* vote for candidates from the established political parties just because they are the familiar options. *Do* attend party caucuses, circulate a petition for electoral reform, support a movement for proportional representation, vote for someone you personally know and have confidence in, run for office yourself on an independent ticket, encourage well-motivated women you know to seek office, go to town hall meetings, participate in your local government, work toward direct participatory democracy in your community and its organizations, support increased autonomy of your community in any way you can.

8. *Don't* use pharmaceutical drugs thoughtlessly; nor seek unnecessary hospitalization or medical intervention; nor take the advice or prescriptions of your physician without first informing yourself of the side effects, possible consequences, and natural alternatives. *Do* inform yourself of alternative and home remedies and local herbs; grow them yourself. Read lay health books and encyclopedias, get second opinions, improve your diet and exercise, eat less, walk or ride your bicycle instead of driving, start a support group for autonomous healthful living.

9. *Don't* support military spending or aggressive military actions; don't join the army or encourage your child to. Don't keep a gun or buy a war toy. *Do* support your civil liberties union, oppose military recruitment in high schools, go on a personal mission of good will to a Third World country and take your children with you. Inform yourself about the social history of what you buy and avoid imports in general; buy only "fair trade" coffee, tea, or other import products.

10. *Don't* support or tolerate selling off public utilities, resources, or facilities. *Do* vote out of office governments and leaders who do so or propose to. *Do* support alternative energy sources and local ecological initiatives; go off the grid yourself; start or join a neighborhood emergency preparedness movement; get to know your neighbors. Find ways to make tax dollars stay in your community.

Good luck and best wishes in creating a new world!

Reference Notes

1. Starhawk *Walking to Mercury* Bantam 1997, p375
2. J. D. Bernal *The World, the Flesh, and the Devil: an inquiry into the future of the three enemies of the rational soul* Indiana UP 1969, quoted in David F. Noble *The Religion of Technology,* p175
3. John A. Livingston *The Rogue Primate* Key Porter books 1994. p72 and p82
4. Daniel Quinn *Ishmael* Bantam 1992/1993,p244
5. David F. Noble *The Religion of Technology: the divinity of man and the spirit of invention* Knopf 1997, Penguin 1999, p3
6. Sally Hacker "The Culture of engineering: Women, Workplace and Machine" *Women's Studies International Quarterly* [now *Women's Studies International Forum*], vol4 #3 1981, p341-43, cited in Noble ibid, p223
7. A statement made in television interview by singer-songwriter Bruce Coburn, December, 2002
8. Dan Bruiger *The Rise and Fall of Reality* 1998 (electronic)
9. Neil Postman *Amusing Ourselves to Death: public discourse in the age of show business* Viking, 1985
10. Thomas Homer-Dixon *The Ingenuity Gap* Alfred A. Knopf 2000
11. Homer-Dixon, op cit
12. Viviane Forrester *The Economic Horror* Polity Press 1999, p2 (originally, *L'horreur Economique* Librairie Artheme Fayard 1996)
13. See, for instance, Lee Smolin *The Life of the Cosmos* Oxford UP 1997
14. Thomas Kuhn *The Structure of Scientific Revolutions* U.of Chicago Press 1962, 1970
15. Orrin E. Klapp *Opening and Closing: strategies of information adaptation in society* Cambridge UP 1978; see, in particular, chapter 2
16. Ernest Becker *The Denial of Death* The Free Press 1973, p189
17. Karl Popper *Objective Knowledge*, revised ed. Clarendon Press, Oxford 1979, p106
18. Daniel Dennett *Consciousness Explained* 1991; *The Intentional Stance* 1989
19. Neil Postman *The Disappearance of Childhood* Delacorte Press, NY 1982, p48
20. Bernadette Roberts *The Experience of No Self: a contemplative journey* Shambala 1984
21. Becker op cit , p76
22. Bruiger op cit
23. Bruiger op cit and Dennett op cit
24. Bruiger op cit; see chp 16: "The Problem of Cognitive Domains"
25. Matt Ridley *The Red Queen: sex and the evolution of human nature* Penguin 1993, p66-87
26. Becker op cit, p53-4
27. Bruiger, op cit; sec 8 "The "Reality Principle"
28. Lyall Watson *Dark Nature: a natural history of evil* Hodder & Stoughton 1995 p255
29. Becker op cit, p87
30. Becker op cit, p164
31. Becker op cit, p96
32. Becker op cit, p5
33. Illich *Tools for Conviviality,* Harper and Row, 1973 p109; also widely available on web

34. Becker op cit, p5
35. Humberto Maturana and Francisco Varela *Autopoiesis and Cognition* D.Reidel, 1980. The concept of 'autopoieis' includes self-maintenance and also self-definition as essential attributes of the organism.
36. Livingston op cit, p10
37. Becker op cit, p36
38. Becker op cit p116
39. Claude Jumarie *Synthese pour une Cybernetique Relativiste* Montreal 1980, p56-58
40. Jeremy Rifkin *The Biotech Century* Tarcher Putnam (Penguin) 1998, p157, 181
41. Livingston op cit, p20
42. ibid, p12
43. ibid, p12
44. ibid, p17
45. Barbara Ehrenreich *Blood Rites: origins and history of the passion of war* Metropolitan Books 1997
46. Erich Neumann *The Origin and History of Consciousness* Bollingen/Princeton UP1954/1970, p317
47. Thomas Kuhn op cit
48. Murat Yagan, author of *Behind Kath Mountain*. Private communication
49. Livingston op cit, p70
50. Illich *Tools* , p96-7
51. Leslie Dewart *Evolution and Consciousness: the role of speech in the origin and dvelopment of human nature* U. of Toronto Press 1989, p277-78
52. Dewart ibid, p309-11
53. Gerald Holton *Introduction to Concepts and Theories in Physical Science* Addison-Wesley 1952, p280
54. Quinn *Ishmael*, p128-9
55. Daniel Quinn *Beyond Civilization* Harmony Books (Random House) 1999, p82
56. Quinn *Ishmael* , p204-05
57. ibid, p145
58. Jared Diamond "The Worst Mistake in the History of the Human Race" Discover Magazine May 1987, p64-66
59. Greg Wadley and Angus Martin, Univ. of Melbourne, "The Origins of Agriculture—a biological perspective and a new hypothesis" Australian Biologist 6: 96-105, June 1993
60. ibid
61. Quinn, *Beyond Civilization*, p44-46
62. Diamond, op cit
63. Quinn *Ishmael*
64. George Steiner "Nostalgia for the Absolute" CBC Massey Lectures 1974, p23
65. Neumann, op cit, p285
66. Steiner, op cit
67. Dorothy Dinnerstein *The Mermaid and the Minotaur* Harper, 1976
68. Neumann, op cit, p298
69. Neumann, op cit, p310
70. Jean Piaget *la Construction du Réel chez l'Enfant* Delachaux & Niestlé 1967, 1977, p10 and chapter 3
71. Ehrenreich op cit, p139
72. Ehrenreich op cit, p47
73. Becker, op cit
74. Becker op cit, p84-5
75. Nicholas Rescher *A System of Pragmatic Idealism Vol II: The Validity of Values* Princeton
76. Keith Thomas *Man and the Natural World* Pantheon Books 1983, p40-41
77. Annie Dillard *Pilgrim at Tinker Creek* Harper and Row, 1974
78. Roger Scruton *Sexual Desire* Weidenfield and Nicholson, London 1986, p268
79. Thomas op cit, p37
80. Thomas op cit, p38-9
81. Charles Darwin *The Descent of Man* vol 2, p340-47
82. W.M. Urban *Beyond Realism and Idealism* 1949 p26-7
83. Desmond Morris *The Human Zoo* Dell 1969, p27

84. Dewart, op cit, p323

85. Nicolas Humphrey "The Social Function of Intellect" in *Growing Points in Ethology* ed. by P.P.G. Bateson and R.A. Hinde Cambridge UP 1976

86. Derek Bickerton *Language and Species* U. of Chicago Press 1990, p255-56

87. Bickerton op cit, p39

88. Dewart op cit

89. Noble *Religion* op cit, p5

90. Sayyed Hossein Nasr *Religion and the Order of Nature*, Oxford UP 1996, p174

91. Sandra Harding *The Science Question in Feminism*, Cornell UP 1986, p39

92. ibid p39

93. Dewart op cit, p324-5

94. Thomas, op cit, p278

95. William Leiss *The Domination of Nature* Beacon Press 1974, p33-5

96. Benjamin Farrington *The Philosophy of Francis Bacon* Liverpool UP 1964, p29

97. Thomas, op cit, p91

98. Thomas, op cit, p17

99. Livingston, p186

100. Rifkin op cit, p197-99

101. Thomas, op cit, p243

102. Thomas op cit, p256-65, 300-01

103. Rifkin op cit, p177-78

104. Thomas, op cit, p301

105. Charlene Spretnak *The Resurgence of the Real: body, nature, and place in a hyper-modern world* Addison-Wesley 1997. See particularly the chapter on Ruskin and Morris.

106. Thomas, op cit, p266

107. Bill McKibben *The End of Nature* Random House NY 1989, p58 and p83-5

108. Livingston op cit, p7

109. quoted in Noble, op cit, p163

110. Linvingston op cit, p103

111. Frank J. Tipler *The Physics of Immortality* Anchor Doubleday 1994

112. Daniel Dennett *Darwins's Dangerous Idea* Simon & Schuster 1995, p449

113. Hans Moravec *Robot: mere machine to transcendent mind* Oxford UP

114. ibid

115. Tipler, op cit p207

116. Leo Szilard, and later Leon Brouillin

117. Robert Rosen *Life Itself* Columbia UP 1991, p244

118. ibid, p247

119. ibid p22

120. cf. Johan Huizinga *Homo Ludens* Beacon Press 1950, 1955

121. Gerda Lerner *The Creation of Patriarchy*, Oxford UP 1986,p200

122. ibid p77

123. Ehrenreich *Blood rites* op cit, p148

124. Lewis Mumford *Pentagon of Power* Harcourt Brace Javonovich 1970, p148-150

125. Illich *Tools,* p32

126. ibid, p30

127. ibid, p46-7

128. Mumford op cit, p177

129. Harding op cit, p228

130. Carolyn Merchant *The Death of Nature* Harper and Row 1983, p209

131. John Amos Comenius (1592-1670) *The Great Didactic* transl. by M.W. Keatinge, 1896, quoted in Mumford op cit, p103

132. Illich *Tools,* p66

133. Witold Rybczynski *Taming the Tiger: the Struggle to Control Technology* Penguin 1985, p11

134. Stanley Milgram *Obedience to Authority* Harper Colophon 1974

135. Arnold Pacey *Meaning in Technology* MIT Press 1999, p177-8

136. Pacey, op cit p197

137. Leiss op cit, p121-22

138. Noble *Religion* op cit, p199, quoting geneticist French Anderson

139. Max More *The Extropian Principles: A Transhumanist Declaration*, version 3.0 (electronic), 1999

140. Dr. Robert Sinsheimer, quoted in Rifkin op cit, p144

141. David Orr *The Nature of Design: ecology, culture, and human intention* Oxford UP 2002, p15

142. Max More op cit

143. Peter Brown *The Body in Society* Columbia UP, 1988, quoted in Noble, op cit, p17-18

144. Robert Wright *The Moral Animal: the new science of evolutionary psychology* Vintage 1994, p321

145. Ed Regis *Great Mambo Chicken and the Transhumanist Condition: science slightly over the edge* Addison-Wesley, 1990, p167-8, quoting Robert Ettinger *Man into Superman*

146. Becker op cit, p33-4

147. Becker op cit, p31-3

148. Richard Tarnas *The Passion of the Western Mind* Ballantine 1991, p492 footnote 10

149. Lee Silver *Remaking Eden: cloning and beyond in a brave new world* Avon Books 1977, p76

150. ibid p223

151. Rifkin op cit, p9

152. Rifkin op cit, p143

153. Lynn Margulis and Dorion Sagan *Mystery Dance: on the evolution of human sexuality* Summit Books 1991, p203

154. Regis op cit, p108

155. Hitler, quoted in quoted in Morris Berman *Coming to Our Senses* Simon & Schuster 1989, p253, p253

156. Dinnerstein op cit, p.121

157. Nick Bostrum et al *The Transhumanist FAQ*, May, 1999 (electronic)

158. McKibben op cit, p83

159. Bostrum op cit, quoting promotional material of the Cryonics Institute

160. Rifkin op cit, p31

161. Silver op cit, p107

162. Hans Moravec *Mind Children* Harvard UP 1988, cited in Regis op cit

163. cf. spiritual teachings of Andrew Cohen, founder of "What is Enlightenment?" Magazine

164. Tipler, op cit

165. W.D. Hamilton "Sex and Disease" in *The Evolution of Sex* ed. by Robert Bellig and George Stevens Harper & Row 1988, p70-71

166. Vernor Vinge, Dept. of Mathematics, San Diego State University, "The Coming Technological Singularity" 1993 (electronic)

167. Moravec *Robot* op cit, p147

168. Regis op cit, p185-6

169. Becker op cit, p267

170. Amory B. Lovins and L. Hunter Lovins *A Tale of Two Botanies* (www.rmi.org/biotechnology/twobotanies.html)

171. Moravec *Robot* op cit, p13

172. Mumford op cit, p176

173. Max More *Technological Self-Transformation: expanding personal extropy* Part 1 of 2, 1993 (electronic)

174. Bostrum, op cit

175. Bostrum, op cit

176. Moravec, *Robot* op cit, p166-7

177. Hans Moravec, electronic interview for RobotBooks.com by Carlo Bertocchini, Nov 28, 1998

178. Doyne Farmer and Alletta Berlin, in *Artificial Life II* Langton, Taylor, Farmer, and Rasmussen, eds., Addison-Wesley, Redwood City, CA 1991, p815, quoted in Peter Conway and Roger Highfield *Frontiers of Complexity* Ballantine, 1995, p240

179. Vinge op cit

180. Moravec *Robot* op cit, p139

181. Moravec *Robot* op cit, p171

182. Hans Moravec, electronic interview, op cit

183. Bostrum op cit

184. Moravec, electronic interview op cit

185. Bostrum, op cit

186. Kevin Kelly *Out of Control: the new biology of machines, social systems, and the economic world* Addison-Wesley 1994, p179-80]

187. Gonzalo Munévar *Evolution and the Naked Truth* Avebury 1998, p194-5

188. Regis op cit, p308

189. Eric Drexler *Engines of Creation* Anchor-Doubleday, 1986, p172-74

190. ibid, p176

191. Silver op cit, p74-5

192. Bostrum, op cit

193. David Pearce, from Introduction to *The Hedonistic Imperative* (electronic)

194. John F. Haught *God After Darwin* Westview Press 2000, p160

195. Pearce, op cit

196. Bostrum, op cit

197. Moravec *Robot* op cit, p164

198. Moravec *Robot* op cit, p165

199. Sartre *The Psychology of Imagination* Citadel N.Y. 1965

200. Tipler op cit, p225

201. Tipler op cit, p411

202. Moravec *Robot* op cit, p170-71

203. Tarnas op cit, p320-21

204. More *The Extropian Principles* ,op cit

205. More *Technological Self-Transformation* op cit

206. Genesis, 3:22-24

207. Leiss op cit, p41-2

208. Noble *Religion* op cit, p154, writing of Edward Fredkin in particular

209. David Suzuki and Holly Dressel *From Naked Ape to Superspecies* Stoddart Press 1999, p107-8

210. Rifkin op cit, p146

211. Suzuki op cit, p10

212. Suzuki op cit, p107

213. Rifkin op cit, p230

214. Dr. David Martin, Jr., School of Medicine of the Univ of Calif at San Francisco, quoted in Rifkin op cit, p101

215. Ray Kurzweil *The Age of Spiritual Machines* Penguin, 1999, p101

216. J.B. Haldane "Man's Destiny," in *Possible Worlds* Harper & Bros. 1928, p303, cited in George Dyson *Darwin Among the Machines* Addison Wesley, 1997, p226

217. Homer-Dixon op cit, p2

218. More *Technological Self-transformation* op cit

219. More *Technological Self-transformation* op cit

220. Mumford op cit, p72

221. Freeman Dyson *Origins of Life* Cambridge UP 1985

222. "Towards Evolvable Hardware: an international workshop," Oct 1995, sponsored by Swiss Federal Inst. of Technology, Lausanne

223. Vinge, op cit

224. Hans Moravec *Mind Children* op cit, p172

225. Vinge op cit

226. Peter Coveney and Roger Highfield *Frontiers of Complexity* Ballantine Books 1995, p252

227. Fred. I. Dretske *Knowledge and the Flow of Information* MIT Press 1981, in particular: p vii

228. Thomas Ray quoted in Coveney and Highfield op cit, p270

229. James Martin, quoted in "Computers Will Save Us" by Brad Lemley, Discover Magazine, June 2001, p54

230. Illich *Tools*, p28

231. Edward Tenner *Why Things Bite Back: technology and the revenge of unintended consequences* Alfred A Knopf NY 1996, p72

232. Bernard Rollin *The Frankenstein Syndrome* Cambridge UP 1995, p65

233. Homer-Dixon op cit, p29

234. Homer-Dixon op cit, p337

235. Thomas Homer-Dixon *Environment, Scarcity, and Violence* PrincetonUP 1999,p28

236. ibid p42

237. McKibben op cit, p173

238. Suzuki op cit, p162

239. Herman Daly, in Suzuki op cit, p163

240. John Horgan *The End of Science* Broadway Books 1996, p25; and Homer-Dixon *Environment* op cit, p124

241. Joel Cohen and David Tilman "Biosphere 2 and Biodiversity: the Lessons So Far" *Science* 274 (15 November 1996): 1150-51, quoted in Homer-Dixon *Ingenuity Gap* op cit, p136

242. Silver op cit, p224

243. Rifkin op cit, p9

244. Rifkin op cit, p212

245. Mumford op cit, p155

246. Illich *Tools*, p95ff

247. See the documentary film *The Corporation*

248. ibid, p74

249. Suzuki op cit, p206

250. Homer-Dixon *Ingenuity Gap* op cit,p175

251. Forrester op cit, p120

252. ibid, p98

253. Ivan Illich *Toward a History of Needs* Pantheon Books N.Y. 1977, 1978, p7

254. Forrester op cit p58

255. Suzuki op cit, p172

256. Benjamin R. Barber *Jihad vs. McWorld* Times Books 1995 p263

257. Barber op cit, p266

258. Lynne Margulis and Dorian Sagan *Origins of Sex* Yale UP 1986, p72

259. Tenner op cit, p80

260. Tenner op cit, p57

261. Tenner op cit, p56

262. Illich *Needs* op cit, p91

263. Illich *Needs* op cit, p94

264. Illich *Needs* op cit, p98

265. Thomas op cit, p29

266. Suzuki op cit, p115

267. James Burke *Connections* Little, Brown &Co, 1978, particularly p162ff

268. Homer-Dixon *Environment* op cit, p133

269. Suzuki op cit, p123

270. Rifkin op cit, p71-2

271. Rifkin op cit, p107

272. Rifkin op cit, p74

273. Rifkin op cit, p79

274. Tenner op cit, p42

275. Tenner op cit, p40

276. Tenner op cit, p90

277. Tenner op cit p86

278. Tenner op cit, p87

279. Tenner op cit p112

280. Tenner op cit, p110

281. Tenner op cit, p108

282. Tenner op cit, p39

283. Mumford op cit, p170

284. Barbara Ehrenreich *The Hearts of Men* Anchor 1983, p173-4

285. Illich *Needs* op cit, p11

286. Illich *Gender* Marion Boyars, London 1983,p45 footnote 30

287. Illich *Gender* op cit, p15-16, footnote 9

288. Rifkin op cit, p105

289. Tenner op cit, p109

290. Mumford op cit, p43

291. Simone de Beauvoir, cited in Dinnerstein op cit, p113

292. Dinnerstein op cit, p.50

293. Denis de Rougemont *Love in the Western World* Princeton UP 1940, 1983; p244

294. ibid p30

295. Dinnerstein, p66-7

296. Neumann op cit, p430

297. Wilhelm Koppers "On the Origin of the Mysteries in the Light of Ethnology and Indology" in *The Mystic Vision* Eranos Yearbooks, 6, 1969, quoted in Neumann op cit, p430

298. Koppers ibid, in Neumann, p431

299. Neumann op cit, p433

300. Noble *Religion* op cit, p210

301. Ehrenreich *Blood Rites* op cit, p101

302. Charles Darwin *The Descent of Man* John Murray, London 1871, vol2, p364

303. ibid, p366

304. ibid, p325-6

305. Ridley op cit, p304

306. Illich *Gender* op cit, p24-26

307. Merlin Stone *When God Was a Woman* Harcourt Brace Jovanovich 1976, p161

308. Lerner op cit, p9-10

309. Lerner op cit, p166

310. Lerner op cit, p159

311. Lerner op cit, p167

312. Stone op cit, p222

313. Lerner op cit, p196

314. Lynda Lange "Woman is not a rational animal" in *Discovering Reality* ed by S. Harding and M. B. Hintikka Reidel, 1983, p2

315. David F. Noble *A World Without Women* Alfred A. Knopf 1992, p71-2

316. ibid, p11-13

317. ibid, p70-2

318. ibid, p54-5

319. ibid, p133-34

320. Abbot Conrad of Marchtal, 12th cent. AD, quoted in Noble op cit, p136

321. Noble *World Without Women* op cit, p136-7

322. Walter Charleton, founding member of the Royal Society, 1659, quoted in Noble op cit, p230

323. Noble *World Without Women* op cit, p216-18

324. Becker op cit, p119

325. Nasr op cit, p176

326. Noble *World Without Women* opcit,p211

327. Noble *World Without Women* op cit, p46

328. Merchant op cit, p168

329. Watson op cit p223

330. Dinnerstein op cit, p169

331. Ehrenreich *Hearts of Men* op cit, p182

332. Harding op cit, p125

333. Evelyn Fox Keller "Gender and Science" in *Discovering Reality* ed. by Sandra Harding and Merrill B. Hintikka, Reidel, 1983, p202

334. Joseph Fletcher, quoted by Jeremy Rifkin op cit, p30

335. Rifkin op cit, p30

336. Illich *Gender* op cit, p90

337. Illich *Gender* op cit, p178

338. Illich *Gender* op cit p175

339. Illich *Gender* op cit, p176

340. Dinnerstein op cit, p164

341. Illich *Tools*, p47

342. Lerner op cit, p217

343. Lerner op cit, p106

344. Dinnerstein op cit, p160

345. Donna J. Haraway *Simians, Cyborgs, and Women: the re-invention of nature* Routledge, 1991, p80

346. Thomas op cit, p184, quoting Alexander Pope

347. Simone de Beauvoir *The Second Sex* transl. by H.M. Parshley, Knopf 1953, p58

348. Harding op cit, p148
349. Noble *World Without Women* op cit, p13
350. Ehrenreich *Hearts of Men* op cit, p151-2
351. Scruton op cit, p289
352. Scruton op cit, p150-1
353. Dinnerstein op cit, p236
354. Ehrenreich *Hearts of Men* op cit, p118-9; p170-1
355. Noam Chomsky *Necessary Illusions: thought control in democratic societies* CBC Enterprises 1989
356. Suzuki op cit
357. Dinnerstein op cit, p213
358. Dewart op cit, p348
359. Illich *Gender* op cit, p17
360. Suzuki op cit, p156
361. Talk by Dr. Geoffrey Scudder, entymologist and professor emeritus of zoology at Univ. of British Columbia, speaking on biodiversity and "living capital"
362. ibid
363. ibid
364. Ivan Illich, quoted in Tenner op cit, p264
365. Barber, op cit
366. Illich *Needs* op cit, p117
367. Illich *Tools*, p89
368. Walter J. Ong *Fighting for Life* U of Massachusetts Press 1989, p40
369. Erich Neumann *Amor and Psyche* Bollingen (Princeton UP) 1956, p149
370. Charlene Spretnak *Lost Goddesses of Early Greece* Beacon Press, 1981, p24-5
371. Illich *Tools* op cit, p84
372. Tenner op cit, p28-30
373. Suzuki op cit, p154
374. McKibben op cit, p214-15
375. Illich *Tools* op cit, p.ix
376. Illich *Needs* op cit, p112-114
377. Homer-Dixon *Ingenuity* op cit, p225
378. Illich *Tools* op cit, p.xii
379. ibid, p10
380. Harding op cit, p44
381. Michel Chossudovsky *The Globalisation of Poverty: impacts of IMF and World Bank reforms* Zed Books 1997, p88
382. René Girard *I Saw Satan Fall Like Lightning* Orbis Books 2001, p156
383. Michael Ghiglieri *The Dark Side of Man* Perseus 1999, p190
384. Suzuki op cit, p238
385. Herman Daly, quoted in Suzuki op cit, p183-4
386. Chossudovsky op cit, p20
387. Illich *Tools* op cit, p42
388. Christopher Chantrill *The Road to the Middle Class* (in publication—see website: www.road-tothemiddleclass.com)
389. Spretnak *Resurgence* op cit, p33, citing David C. Corten *When Corporations Rule the World* Kumarian Press and Barrett-Koehler 1995, p233
390. Elizabeth May, of Sierra Club of Canada, quoted in Suzuki op cit, p207
391. Morton Davis *Game Theory* Basic Books, 1970, p59
392. Robert Axelrod *The Evolution of Cooperation* Basic Books 1984, p31
393. Suzuki op cit, p17
394. Spretnak *Resurgence* op cit, p96
395. Suzuki op cit, p42-3, quoting UNESCO figures
396. Suzuki op cit 187-9
397. Suzuki op cit, p214
398. Suzuki op cit, p215-16
399. Suzuki op cit, p180
400. Barber op cit, p245

401. Barber op cit, p211
402. Barber op cit, p275
403. Barber op cit, p6
404. Ehrenreich *Hearts of Men* op cit, p182
405. Becker op cit, p7
406. Chossudovsky op cit, p45
407. Suzuki op cit, p200
408. Chossudovsky op cit, p63
409. Chossudovsky op cit, p68
410. Chossudovsky op cit, p21-2
411. Elizabeth May, of the Sierra Club of Canada, cited in Suzuki op cit, p207
412. Quinn *Ishmael* , p41-2
413. Suzuki op cit, p49
414. Illich *Tools* op cit, p114
415. ibid, p33
416. Douglas J. Amy *Real Choices/New Voices: the case for proportional representation elections in the United States* Columbia University Press, 1993, p79ff
417. ibid, p102ff
418. Tarnas op cit, p444