
PROSPECTS FOR EXISTENCE: Morality and Genetic Engineering

By John Hartung

“Let us understand, once for all, that the ethical progress of society depends, not on imitating the cosmic process, still less in running away from it, but in combating it.” -- Thomas Henry Huxley, Evolution and Ethics

© 1996 **John Hartung, Ph.D.** Author’s note: I thank Freeman Dyson and Steven Frautschi for 10 years of insightful correspondence about issues raised in this manuscript, especially for convincing me that the second law of thermodynamics is an over-rated hurdle. I thank Frank Miele for epigraphic reciprocity, and Tony Miele for serving as consiglieri.

Eco-morality

A new lunatic fringe has developed. On one edge of the tapestry we have children of the rich and their hangers-on. They want to save our environment right down to the snail darters, and keep things as they are or, like the Unibomber, turn back the hands of time. Some people at the core of this movement were born with a large enough piece of the pie to feed themselves and their children, others were conspicuously fortunate. They used to be called conservatives, now they are called conservationists . . . no small triumph of propaganda.

On the other edge we have radio talk-show hosts who love spotted owls because they taste a lot like chicken. Again, the issue is the size of the pie and the distribution of its pieces. But for those of us between the fringes, the real threat does not lie in the Hudson River or the forests of the Northwest. It lies in the rain forests and the ozone layer. Here the fight is international, but the issue remains the same -- *who* is going to get *what* as we race toward a time when no one will get anything?

In broad outlines, the answers are as obvious as the problems, and those who work on ways and means of solving the dilemma of consumption are spawning a new morality (e.g., Ridley and Low, 1993). The light at the end of their tunnel is a sustainable population which thrives on renewable resources that are fairly distributed by fair laws. Realization of this objective would require individuals to extend in-group morality (Hartung, 1995) to a single, all-inclusive group that would give the highest return to each person's longest range self-interest. Much evidence indicates that people have been designed to defect from their in-group whenever a competing group offers them a better deal (Wilson 1978). And because our large brains have been naturally selected to facilitate "many person" cooperation and reciprocation over hundreds of thousands of interactions per lifetime (Hamilton, 1975), people have evolved foresight -- even the ability to perceive cross-generational self-interest through descendants. So eco-morality is, in principle, accomplishable.

Eco-morality is also, in principle, absolutely admirable . . . as far as it goes. But it does not go far enough. Even real conservationists spend too much time wringing their hands over the daunting power of human selfishness, somehow presuming that the steam which drives their engines cannot turn the flywheel of the masses. This is wrong. The problem with the masses is not that they are interminably selfish, it is that they are good philosophers. They can run an argument out to its logical end, for example, Friedrich Engels' 1886 forecast of doom:

Millions of years may elapse, hundreds of thousands of generations be born and die, but inexorably the time will come when the declining warmth of the sun will no longer suffice to melt the ice thrusting forward from the poles; when the human race, crowding more and more about the equator, will finally no longer find even there enough heat for life; when gradually even the last trace of organic

life will vanish; and the earth, an extinct frozen globe like the moon, will circle in deepest darkness and in an ever narrower orbit about the equally extinct sun, and at last fall into it.

Engels was wrong about the details (the sun will expand and burn the earth to a cinder), but the dilemma does not lie in the details. As put by Bertrand Russell (1927):

All the labours of the ages, all the devotion, all the inspiration, all the noonday brightness of human genius, are destined to extinction in the vast death of the solar system, and . . . the whole temple of man's achievement must inevitably be buried beneath the debris of a universe in ruins -- all these things, if not quite beyond dispute, are yet so nearly certain that no philosophy which rejects them can hope to stand.

And the proletariat's question remains the same: why sacrifice to save the snail darter, or even the ozone layer, in order to inflict the final disaster on generation Y instead of generation X? Religion is the opiate of the masses, but taking away their drug will not resolve the angst that drives them to addiction. Without an analogue to heaven, eco-morality will suffer the same fate as communism. Ways and means are not the issue. The question remains, ways and means to what?

Reason for Hope

Becoming a functional adult usually entails pushing this question far enough into the background to enable one's self to carry on. Most of us corrode our perception with religious belief, sidestep the issue by noting that its crux is a long way off, or arrange to be too busy with ways and means to let *why* impede progress. Some pre-adults and lapsed adults can afford to ponder why and have the strength to push the question while resisting the soul-corroding comfort of religion. They tend to offend us by rejecting the conventions that we use as substitutes for meaning, and we are intimidated when they develop a disregard for life -- a disregard for their own lives and a disregard for ours.

So we threaten them, we bribe them, we wean them and we isolate them -- hoping that desire and fear will motivate them to do as we have done. This usually works, but far too often, opiates become the religion of the godless. When short-term pharmacological illusions are substituted for long term religious delusions, all is lost sooner rather than later. This is bad because it cuts short the search for a valid answer to the overriding question: "why work to improve my lot, let alone work to resolve loftier concerns like the rising crime rate, racism,

epidemic disease, mass starvation, ethnic genocide and the spread of nuclear weapons ... if everything is going to turn into celestial crap no matter what I do?"

There is reason for hope. We now have enough perspective on our position in the universe to approach fundamental questions without resorting to sanctimonious versions of Santa Claus. For those who steadfastly refuse false hope, any amount of real hope can tip the balance.

An Argument for Existence

The most fundamental question is the question of existence, and the old conundrum about a sound in the forest that nobody hears, like the chicken and the egg, has lost its status because it can be answered. Rudimentary knowledge of evolution tells us that the egg came first and it was laid by a bird that was one mutation short of being a chicken. Basic physics tells us that the answer for the sound is even more simple. It exists for the reason that anything exists -- it has consequences that have consequences that continue to have consequences. Sound waves push molecules in directions which they would not otherwise have taken. Each of those molecules continues to reside in locations that they would not otherwise occupy, and they interact with molecules that they would otherwise not interact with, ad infinitum. The sound exists because its consequences continue to radiate forever.

That's nice for the sound, but what about us? We exist as combinations of matter and energy that can continue to have consequence. We exist like the sound, but that is not satisfying. We fancy ourselves to be alive -- an attribute which we identify as distinguishing ourselves from inanimate conglomerates of matter and energy. The difference between arrangements of matter and energy which only obey the laws of physics, as distinct from arrangements which are alive, is that only living organisms cause virtually impossible combinations which can be volitionally determined and thereby expected to occur. That is, living organisms have purpose. They have intent, and like action at a distance, their intent both precedes and causes subsequent arrangements and events. Consider Scarlet, a cat who became famous throughout New York (Kim 1996):

Phones were ringing off the hook at the North Shore Animal League yesterday as thousands of callers sought to adopt Scarlet, the brave Brooklyn feline who rescued her five kittens from a burning building . . . Named Scarlet because of red patches that can be seen through her singed fur, the cat . . . gained widespread fame last Friday after carrying her 4-week-old kittens one by one out of a burning, vacant building in the East New York section of Brooklyn, getting badly burned herself in the process . . .

"She ran in and out of that building five times, got them all out, then started moving them one by one across the street," said Giannelli ... one of the

firefighters on the scene ... Even though Scarlet's eyes were blistered shut and her paws burned, the cat made a head count of her young ones, touching each kitten with her nose to make sure they were all there, Giannelli said.

With humans, evidence of purpose is often less compelling, but can be even more astonishing. Crompton gave a good example (1935):

It was some time ago when I wrote to the secretary of Yale University agreeing to give a lecture on November 10 at 5 p.m. He had such faith in me that it was announced publicly that I would be there, and the audience had such confidence in his word that they came to the hall at the specified time. But consider the great physical improbability that their confidence was justified. In the meanwhile my work called me to the Rocky Mountains and across the ocean to sunny Italy. A phototropic organism (such as I happen to be) would not easily tear himself away from there to go to chilly New Haven. The possibilities of my being elsewhere at this moment were infinite in number. Considered as a physical event, the probability of meeting my engagement would have been fantastically small. Why then was the audience's belief justified? ... They knew my purpose, and it was my purpose which determined that I should be there.

Of course, Crompton showed up because he was paid to. Giving lectures was part of how he made a living. As such, his purpose was the same one that ultimately motivates the movements of all living organisms -- staying alive. The more interesting question is why the audience showed up -- at some cost and without being paid. I think that they were seeking and pursuing purpose, both to motivate and facilitate their ability to stay alive. This illustrates the synergism between purpose and life -- life is an attribute which causes organisms to behave purposively, and their first purpose is to stay alive.

We all agree that living matter is an organizational improvement over non-living matter. Being alive is evidence of this agreement, because being alive requires making an effort to stay alive . . . so it is not possible to be alive and genuinely disagree about the superiority of life. The argument for existence requires only this premise -- that life is better than the alternative.¹

What Do You Mean?

Given the premise that life is better than its alternative, the conclusion follows that staying alive is a satisfying objective, as distinct from a meaningless one. Or is it? An individual's life, as distinct from an individual's constituent parts, would need to have consequence forever to be as

meaningful as the existence of a stone. And to be more meaningful than a stone, an individual's life would need to have consequence on other lives, forever.

For example, consider the monkeys from whom we evolved. Are they gone? People who have spent a long time looking at monkeys see them every time they look in a mirror and whenever they look at someone else. They are right to do so. Many improvements have been made and attributes which would have caused extinction are gone. But the most viable information-carrying organizations of matter and energy that made those monkeys alive are still alive. In fact, the absolute volume of almost all of the information encoded by their genes, the number of physically existing copies, has increased considerably.

Those monkeys lives exist, at least tentatively, because the consequences of their behavior, the consequences of decisions that they made, continue to have living consequences. If life is good compared to the alternative, we can even advance the proposition that there has been an increase in the meaningfulness of their existence. The standard for meaning is simple: the lives nurtured by those monkeys -- their offspring, their relatives, their friends, and their friends' offspring -- have thus far increased the probability that they will continue to have descendants. And the potential meaningfulness of their existence will continue to increase if the consequences of their lives continue to reduce the probability that a time will come when there will be no living evidence that they were alive.

That is good for the monkeys and good for us. Like them, our lives meaningfully exist if they affect lives that affect lives that affect lives ... unless there evolves a generation which leaves no descendants. Just as an enlarging balloon seems to increase in meaning until the moment that it pops, if the consequences of our lives eventually affect only non-living matter, then our lives will become retroactively meaningless -- indeed, nonexistent. Evolution is a ways and means issue. Natural selection has no objective. "The thought of nonbeing terrifies" (Ruse, 1994), and the question about life remains: for what . . . if not forever?

Art

My friend John Pfeiffer used to come to town every six months or so to see an off-Broadway play. We often had dinner together, always at the same Indian restaurant. On one occasion in the Spring of 1983 he called from Pennsylvania with a special urgency about seeing me. He wanted to know what I thought about something.

John had just returned from France where he had been invited to examine the paleolithic art in a cave that was otherwise closed. After spending most of a day looking at conventional 22,000-year-old art, his guide gave careful instructions about how to proceed to the last viewing. They crouched and crawled through a quarter mile of narrow labyrinth, past many turnoffs that would have led them astray, until they came to an opening that was just large enough to accommodate one person. John's guide explained that he had to go this last 150 feet alone

because the only place wide enough to turn around was a small bulb at the very end -- so small that a second person could not squeeze past, would not be able to see the art, and would need to back all the way out.

The instructions were: get to the end, pull your knees up to your chest, squinch around until you are headed back out, then lie on your back and shine the light straight up. There, in a recess, was a perfectly outlined hand -- the kind of outline made by pressing your hand against a surface and blowing a spray of pigment from your mouth.

John was seriously agitated when he asked me "Why?" He had just published a book (1982) arguing that cave art was a sort of hook, or device, that paleolithic priest/artists used to impress potential followers. But here was an exquisite hand print that somebody went out of his or her way to put in a spot where it might never be seen. In fact, John felt certain that it was never seen by the artist who made it because "you could never keep a torch lit crawling through that tunnel."

I wish I had given my answer less quickly and in a less flippant tone of voice -- "That was the first 'Kilroy was here'" -- because it made John more agitated. "No, really, I'm serious. People want there to be evidence that they were here. Evidence that will last forever."

The existence dilemma is not some kind of highfalutin philosophical abstraction. It is intuitively realized, but sometimes we are repulsed by its explicit articulation because frank exposure embarrasses and festers a problem that we can only hope to address.

Art and Life Forever

A growing number of physicists are lending credence to the possibility that life could be caused to go on forever (e.g., Frautschi 1982, 1988; Page and McKee 1983; Linde 1988, 1994; Davies 1994)). The Pollyannaesque attributes of this notion were removed by Freeman Dyson in *Time without end: Physics and biology in an open universe*, in 1979:

[T]here are good scientific reasons for taking seriously the possibility that life and intelligence can succeed in molding this universe to their own purposes . . . Life and communication can continue for ever, utilizing a finite store of energy . . . the supply of free energy required for the indefinite survival of a society with the complexity of the present human species, starting from the present time and continuing forever, is about as much energy as the sun radiates in eight hours. The energy resources of a galaxy would be sufficient to support indefinitely a society with a complexity about 10 times greater than our own.

And as reinforced by Frautschi (1988):

The physical laws of entropy refer to the total system; the entropy of a *subsystem* is even permitted to decrease. When one puts ice in a drink, for example, the entropy of the drink temporarily decreases even though total entropy increases. So the laws of the subsystem that is genetic matter, with all their particularities and constraints, do not necessarily have to mimic the physical laws of the cosmos.

Nevertheless, there is a parallelism between the evolution of life on earth and the evolution of the expanding universe. Life on earth has a steady free energy source, so it need not come to equilibrium and may even evolve away from it. The expanding universe has not come to equilibrium and may even evolve away from it, apparently due to free energy transfers from the steady expansion of space. Thus it does not appear incredible that the same entropy plot might capture important aspects of both these evolving open systems, life and the universe.

Alternatively, the universe could expand forever and dissipate into, effectively, nothing -- or contract into a black hole such that all of the interactions between matter and energy that have ever occurred will have no effect upon whatever happens subsequently. For our purposes, a collapsed universe would be the same as nothing, because our lives would have no empirical consequence, and in that sense would not have existed, and so do not exist even now. That is, just as a thing cannot be said to exist if there is no evidence that it does, so a thing cannot be said to have existed in the past if there is no current evidence that it did. So as long as the collapse of the universe remains a possibility, all existence is contingent. But as put by Dyson (1979a):

Supposing that we discover the universe to be naturally closed and doomed to collapse, is it conceivable that by intelligent intervention, converting matter into radiation and causing energy to flow purposefully on a cosmic scale, we could break open a closed universe and change the topology of space-time so that only a part of it would collapse and another part of it would expand forever? ... If it turns out that the universe is closed, we shall still have about 10^{10} years to explore the possibility of a technological fix that would burst it open."

And Davies' recent update on these possibilities makes it clear that Engels' and Russell's pessimistic certitude was unwarranted (1994):

Cosmic heat death has been one of the abiding myths of our age. Bertrand Russell and others seized upon the seemingly inevitable degeneration of the universe as predicted by the second law of thermodynamics to support a

philosophy of atheism, nihilism, and despair. Today we can paint a somewhat different picture. The universe may be running down, but it is not running out . . . In Dyson's scenario, the beings of the far future would impact less and less on a universe coldly indifferent to their requirements, but by clever organization, they could still think an infinite number of thoughts and experience an infinite number of experiences ... [and] in fact, things may not even be as bad as Dyson's scenario. ... our descendants may themselves attempt to modify the large-scale organization of the cosmos so as to preserve their longevity ... by manipulating many stars, clusters of astronomical bodies could be created and managed for the benefit of the community. And because the effects amplify and accumulate, there is no limit to the size of systems that can be controlled in this way ... As time goes on intelligent beings can gain more and more control over a less and less resourceful universe, until all of nature is essentially "technologized," and the distinction between what is natural and what is artificial disappears.

We can certainly imagine our descendants, with such a vast amount of time at their disposal, developing space exploration and all manner of marvelous technologies. They will have plenty of time to leave Earth before the sun grills it to a crisp . . . Our descendants could colonize the galaxy in a small fraction of the time that life on Earth took to evolve into a technological society.

There may even be another way out of the open-versus-closed universe problem (Davies, 1994, on Guth's inflationary universe):

This may sound like the last word in fanciful speculation, but "baby universes" have been much discussed in recent years, and the argument for their existence has a serious side to it . . . some studies suggest that the creation of new universes may be possible by concentrating large amounts of energy in a carefully sculpted manner. In the very far future, when our own universe is becoming uninhabitable or approaching a big crunch, our descendants may decide to get out for good by initiating the budding process and then scrambling through the umbilical wormhole into the universe next door before it pinches off - the ultimate in emigration

The very possibility of baby universes opens up the prospect of genuine immortality - not just for our descendants but for universes too . . . Each individual universe would have a birth, evolution, and death, but the collection as a whole would exist eternally.

Fortunately, the prospect that our existence could be empirically real by leading to *something*, and even worthwhile by leading to something that is alive, has moved out of the arena of religion (where eternity was guaranteed), through the arena of what recently constituted modern physics (where cosmic heat death was deemed certain), and into the arena of assigning probabilities.

Gambling on Eternity

Even the least optimistic of our most prominent contemporary cosmologist do not assign eternal life a probability of zero -- and any finite probability is infinitely greater than zero. Across the spectrum, Steven Weinberg (1977, 1992) and Stephen Hawking (1988) stand as a counterbalance to Freeman Dyson and the hope that he has spawned. Nevertheless, in response to a direct query, Weinberg noted: "I don't take the view that life can't last forever, but only that it seems unlikely, and that you can't conclude from modern science that life will last forever" (personal communication). And Hawking, when asked by Frautschi about the possibility that some evolved form of life might be able to exist forever, replied: "Quite possible if the universe continues to expand forever" (personal communication).^{1a}

Still, a certain glamour attends sophisticated pessimism and Weinberg has become famous for his statement "the more the universe becomes comprehensible, the more it also seems pointless" (1977). When asked about this conclusion, Harvard astronomer Margaret Geller replied "Why should it have a point? What point? It's just a physical system" (Lightman & Brawer 1992). Geller is right, and Weinberg's statement only reveals an illusion about which he became disillusioned -- a nostalgia "for a world in which the heavens declared the glory of God" (Weinberg 1992).

When notions of a god who gives purpose to the universe are cleared away, it should become apparent that living organisms stand alone as the only source of purpose -- but people who have spent much of their lives in prison have a nagging attachment anxiety -- a reluctance to embrace freedom and the responsibilities that come with it. Blinded by the light from heavens that house no god, Weinberg takes solace in his disdain for optimism (1992):

I can see no scientific or logical reason not to seek consolation by adjustment of our beliefs -- only a moral one, a point of honor. What do we think of someone who has managed to convince himself that he is bound to win a lottery because he desperately needs the money? Some might envy him his brief great expectations, but many others would think that he is failing in his proper role as an adult and rational human being, of looking at things as they are. In the same way that each of us has had to learn in growing up to resist the temptation of wishful thinking about ordinary things like lotteries, so our species has had to learn in growing up that we are not playing a starring role in any sort of grand

cosmic drama. . . . The honor of resisting this temptation is only a thin substitute for the consolations of religion, but it is not entirely without satisfactions of its own.

What would we think of someone who refused to play a lottery even though he had no chance of surviving unless he won? “Looking at things as they are” requires comparing our probability of existing in the absence of a conscious effort to do so versus our probability of existing if we make existence our objective. The question is not whether optimism is justified -- whether we have enough resources to buy millions of lottery tickets or just one -- the question is whether to gamble. For those who understand evolution, gambling is the essence of life (Hamilton 1975, Dawkins 1976). You can’t win if you don’t play, and Weinberg, of all people, should know that we will not be saved if we decide to pray instead of play. There is honor in not praying, but we get no points for sitting on our hands. Davies falls into an analogously supercilious befuddlement (1994; cf. Kitcher, 1996):

If immortality is combined with progress, then we can imagine living in a state of perpetual novelty, always learning or doing something new and exciting. The trouble is, what for? When human beings embark on a project for a purpose, they have in mind a specific goal. If the goal is not achieved, the project will have failed (though the experience may not necessarily be valueless). On the other hand if the goal is attained, the project will be completed and the activity will then cease. Can there be true purpose in a project that is *never* completed? Can existence be meaningful if it consists of an unending journey toward a destination that is never reached?

If there is a purpose to the universe, and it achieves that purpose, then the universe must end, for its continued existence would be gratuitous and pointless. Conversely, if the universe endures forever, it is hard to imagine that there is any ultimate purpose to the universe at all.

Geller might say, “What purpose? The universe is just a physical system.” The universe has no purpose. Only living organisms have purpose, that purpose is to exist, and existence can only be meaningful if it is an unending journey. Leikind put this succinctly, pointing out the crucial difference between us and Scarlet the cat (1996):

Are we to fall into despair and nihilism? Or should we find our own purpose? The ability to create our own purposes is what sets us apart from all other creatures. And it is by our choices that our peers and descendants will judge us.

When Cosmology Gets Religion

Ironically, the most corrosive intellectual threat to our prospects for existence does not come from the nay-sayers, but comes from optimistic cosmologists who remain motivated by the dream that inspired Isaac Newton -- to discover the laws of nature in order to better understand the mind of god. The problem with assuming the existence of an anthropomorphic power that will determine the future according to its will is the same as the problem of assuming that the future is inexorably predetermined by the past. In both cases the future is relegated to unfolding along a trajectory that we can only have the illusion of influencing.

Like Capra (1975), Jastrow (1992), Polkinghorn (1994) and virtually all contemporary Judeo-Christian theologians (cf. Leikind, 1995), Tipler's recent conflation of religion and cosmology is an example of the argument that these mutually exclusive propositions are simultaneously viable -- i.e., that we have free will and are responsible for our future, even though the future will be determined, or has already been determined, by god (1994). Tipler insists that an omnipotent god and human free will are compatible, if not complimentary. The difficulty with Tipler's argument is not a compromised conceptualization of free will and the degree to which the future depends upon human effort, but is instead his bogus use of the word god. Weinberg has commented most usefully on this general subject (1992):

[I]t seems to me that if the word "God" is to be of any use, it should be taken to mean an interested God, a creator and lawgiver who has established not only the laws of nature and the universe but also standards of good and evil, some personality that is concerned with our actions, something in short that it is appropriate to worship. This is the God that has mattered to men and women throughout history. Scientists and others sometimes use the word "God" to mean something so abstract and unengaged that He is hardly to be distinguished from the laws of nature. Einstein once said that he believed in "Spinoza's God who reveals Himself in the orderly harmony of what exists, not in a God who concerns himself with fates and actions of human beings." But what possible difference does it make to anyone if we use the word "God" in place of "order" or "harmony," except perhaps to avoid the accusation of having no God? Of course, anyone is free to use the word "God" in that way, but it seems to me that it makes the concept of God not so much wrong as unimportant.

The more we refine our understanding of God to make the concept plausible, the more it seems pointless . . . Many religious liberals today seem to think that different people can believe in different mutually exclusive things without any of them being wrong, as long as their beliefs "work for them." This one believes in reincarnation, that one in heaven and hell; a third believes in the extinction of the soul at death, but no one can be said to be wrong as long as

everyone gets a satisfying spiritual rush from what they believe. To borrow a phrase from Susan Sontag, we are surrounded by “piety without content.”

Wolfgang Pauli was once asked whether he thought that a particularly ill-conceived physics paper was wrong. He replied that such a description would be too kind -- the paper was not even wrong. I happen to think that the religious conservatives are wrong in what they believe, but at least they have not forgotten what it means really to believe something. The religious liberals seem to me to be not even wrong.

Beneath wrong is a far way to go. Religious cosmologists weigh down their own aspirations by insisting that we can and must learn to swim . . . while simultaneously asserting that we are wearing a life jacket that we should not remove. That is, god is good, god is in control, but we will determine our own fate. The tragic aspect of this nonsense is that most of these deists have a good grasp on the nascent science of cosmology, such that they could usefully contribute to that field, but instead they use their expertise in physics and astronomy as a trump card to promote their antithetical superstitions.

It is important to realize that neither the tenuousness of their arguments, nor the tenuous aspects of any particular argument for a future which permits the continuation of life, provide legitimate grounds for dismissing the general proposition championed by cosmologists from Dyson to Tipler. That is, until and unless we have convincing reason and evidence to conclude that the far future cannot support forms of purposively organized matter that will be our living descendants, there is reason for hope.

From Meaning to Morality

The premise that life is good can be seen as granted in Singer’s paraphrase of Wilson’s argument for a definition of morality (Wilson 1978, Singer 1981, brackets added):

Premise: Our genes came from a common pool and will return to a common pool. [Assumed premise: Life is good.]

Conclusion: Therefore we ought not do anything which imperils the common gene pool.

Whether one grants the assumed premise as given or missing (as does Singer), this argument for passive morality also compels active morality, i.e., that we ought to do things which safeguard the future of the common gene pool. As put by Fetzer (1996, brackets added), “the intrinsic value of the reproduction and survival of the human species” . . . [and its taxonomic descendants] . . . is a “suitable foundation for an evolutionary theory of ethics.”

Indeed, and only the willful acts of an organism that is conscious of life by virtue of being conscious of death are capable of being, and are thus obligated to be, moral. The monkeys mentioned above, whose lives appear, thus far, to have contributed to the probability that life will continue, were not moral. Judging the morality of a human's behavior can be difficult in any given instance, but the standard for morality is the logical complement of the definition of immorality: behavior which imperils the probability that life will continue for ever is immoral; and behavior which enhances the probability that life will continue for ever is moral.

For example, some people think that abortion can never be justified, while others feel that it is fundamentally wrong but excusable under some circumstances -- perhaps when giving birth jeopardizes a mother's life, or in cases of rape or incest. Still others think that a pregnant woman's decision to have an abortion is sufficient justification. Perhaps this is such a controversial issue because so many people see that abortion would be wrong or right for them and they project their circumstances onto others. Morality based on the struggle for existence does not provide a resolution that is right for each circumstance over time. Instead, it stipulates the goal that ought to be sought, or the variable that should be maximized -- i.e., the probability that we will always have descendants.

Past Morality

Before there were written laws and governments to enforce them, abortion and infanticide were privately practiced in most, if not all, societies (Devereux 1976). A common reason for infanticide was the birth of twins. Most mothers in hunter-gatherer societies, especially those who already had children, could not obtain enough food to nurse two babies without losing more than one offspring. Accordingly, mothers who believed that it was right to kill one of two twins had more offspring to whom she could teach that belief. When such beliefs reach a critical threshold by a process analogous to natural selection, they become the stuff of cultural norms and religious convictions.

There are two issues here. One is the basis for decisions -- whether to go with a static conviction or to aim toward an objective that allows a range of behaviors ... a dynamic response over time. The second issue -- what is to be the objective? -- only arises if the dynamic basis is chosen. The argument here is that a dynamic basis should be chosen and the objective should be existence. With regard to infanticide, it follows that when increasing the absolute amount of intelligent life increases the probability of existence, and food is so scarce that mothers cannot raise twins, it is morally right to kill one twin. Concomitantly, when increasing the absolute amount of intelligent life increases the probability of existence and raising twins is feasible, infanticide is morally wrong. And under either circumstance, behaving on the basis of a static conviction would lead to moral harm when circumstances change.

Before applying this argument to abortion in a modern industrialized society, consider the seemingly trivial issue of eating in public. Today on the streets of New York, London, Sydney, Buenos Aires, Tokyo, etcetera, there are food stands and ice cream shops and vending machines and it would be strange to *not* see people eating while walking or sitting in full public view. Just fifty years ago, such behavior was rude.

This is not a matter of fashion. It can be understood and appreciated by spending time in a city where most people are hungry, or concerned about becoming hungry soon, most of the time. On the streets of Addis Ababba and tiny villages in western Ethiopia, where I used to live, as in Kingstown on the island of St. Vincent where my ex-wife grew up, children were scolded severely for taking food outside. If you were small, the food would be stolen. If you were big, it would cause hungry people, including hungry children, to turn a longing that they may have been successfully ignoring into a longing that was palpable, if not painful. Actually, rude is not the word for it. When most people are hungry, it is virtually cruel to eat in public.

Today, in the places where most readers live, most food envy comes from dieters. And it is a bit rude to eat ice cream in front of the overweight, but doing so does not break a moral code. So what was once immoral became rude, then impolite, and eventually became acceptable behavior. This is as it should be, and it is not “moral relativism” in some sense that implies a lack of moral sense. It is common sense. And it makes sense.

Here and Now Morality

The morality of abortion among hunter-gatherers who live in egalitarian societies (necessarily egalitarian because everybody is dirt-poor) is a relatively simple matter. Under the circumstance of uniform distribution of wealth with existing disparities tied closely to differences in accomplishment, mothers seldom face the prospect of raising a child who would have an unfair disadvantage. When they do, because of the birth of twins or on the rare occasion when prolonged nursing does not sufficiently delay subsequent conception, abortion is moral, even brave, behavior. In contrast, in most contemporary societies, great disparities in wealth make justifiable abortion commonplace. Even when poor people live well above the subsistence level, the mere fact of being relatively poor precludes equality of opportunity.

Almost all of us suffer diminished opportunity relative to Rockefellers, Forbeses² and Saudi Arabian princes, but it is clearly laughable for an upper middle class person to become dysfunctionally resentful over that fact. It is just as clearly understandable that a ghettoized youth of average potential who has only a slim chance of becoming middle class builds up a level of resentment that causes him or her to become self-destructive and other-destructive. For people across the economic spectrum and the spectrum of abilities, trying hard enough for long enough is a matter of attitude -- its just that if you're poor, your sense of optimism has to be

extraordinarily strong to succeed, while if you're rich, your resolve needs to be extraordinarily weak to enable you to fail.

Where do attitudes come from? Many sources, but first and foremost from one's family. And if one's family consists primarily of one's mother, then one's attitudes come primarily from one's mother. If a pregnant woman wants to have an abortion, I take that to be prima-facie evidence that the child she would have had is less likely than a wanted child to be imbued with a sufficiently positive attitude to use his or her intelligence to enhance our probability of existence. Under that circumstance the interests of both society and the woman in question are served by leaving the decision in the hands of the woman, because not having a child at that point in her life may facilitate her ability to have a wanted child later in life (Hrды, 1995).

Clearly, this argument could be flawed, and this kind of argument could be constructed or manipulated to justify any behavior. I could say that it would be morally right to kill anyone who I perceive as lowering the probability of existence. But just as clearly, even a dimly perceived understanding of reality indicates that if everybody had the right to kill anyone who they perceive as destructive to the ultimate objective, there would soon be few people to do the saving and fewer who would be worth saving. As it is, the facts on abortion today are not a matter of idle speculation (Marshall 1996):

New research by economists suggests that a reversal of Roe vs. Wade could produce 400,000 extra births each year to women who would otherwise have terminated their pregnancies.

Many of those births would be to adolescent mothers . . . That finding is of striking policy significance given that more than two-thirds of teen births are to unmarried girls -- and that unmarried teen mothers are more likely than any other groups to remain on welfare.

In an influential 1993 article . . . Charles Murray declared that "illegitimacy is the single most important social problem of our time -- more important than crime, drugs, poverty, illiteracy, welfare or homelessness because it drives everything else."

Extensive empirical evidence backs up this point. For example, Swedish children born to mothers whose application for an abortion was refused in 1960 have been compared to matched, same-sex, wanted children born in the same delivery wards to mothers of similar age, parity and social class. In addition to having a five-fold higher incidence of malformations at birth (Bloomberg 1980a), the children whose mothers wanted an abortion performed worse at school, displayed more psychosomatic symptoms, were more often registered with the social welfare authorities, and were more often in need of psychiatric treatment (Blomberg 1980b).

Are We Having Fun Yet?

The problem of determining which codes of behavior work toward an agreed upon objective is inherent to all dynamic moral systems, so all such systems are risky. Unfortunately, the alternative is a static system which will inevitably and inexorably fail. Better to have a system that needs constant tending and development, but has some probability of success, than a system which only needs to be enforced but has no chance of long term success.

As to the objective sought by a dynamic moral system, Hume (1751) and Bentham (1789) proposed happiness, with Hume arguing that reason can help people attain an objective but cannot help them determine what objective should be sought. Astoundingly, contemporary philosophers still discuss this happiness objective as if it were more than frivolous and vague, and the proposition that what is cannot determine what ought to be (“you cannot derive an ‘ought’ from an ‘is’”) still sells. In distinction, the struggle for existence is not vague, and unless life is a frivolous endeavor, the utilitarian meliorism that it compels is not frivolous. It derives from knowledge of what is -- knowledge about the evolution of the cosmos, the evolution of life, and the potential impact of life on the evolution of both. As a moral objective, everlasting life also has the attribute of satisfying, and even extending, Kant’s quest for universal applicability (1788), serving equally well for decisions regarding the treatment of other species³ and determining rules for colonizing outer space.

Of course, one could argue that the prospects for life as a permanent attribute of organized matter are too small to warrant making that our utilitarian objective. But again, the issue is relative probability, and our likelihood of making life go on forever only needs to be greater than the probability that there is a god who is causing the future to unfold according to his objectives.

The Struggle For Existence

Erasmus Darwin (1794) characterized Descartes’ “I think, therefore I am” as “not right reasoning.” Incomplete might be a better characterization -- i.e., thinking is a necessary but not sufficient activity. It is *what* we think that can cause us to exist -- what we think and what we do in consequence.

Erasmus’ grandson, Charles Darwin, did not write about the struggle for survival, he wrote about the struggle for existence (1859), and we are finally in a position to see “that there are good scientific reasons for taking seriously the possibility that life and intelligence can succeed in molding this universe of ours to their own purposes” (Dyson 1979a). Consciousness of the prospect of death, both cosmic and individual, has gotten the struggle for existence, as distinct from the struggle for survival, underway. Dyson’s vision assumes an attribute of consciousness which appears awkwardly vitalistic until one compares it to alternative explanations (1979b; for complementary arguments, see Penrose, 1990):

I think our consciousness is not just a passive epiphenomenon carried along by the chemical events in our brains, but is an active agent forcing the molecular complexes to make choices between one quantum state and another. In other words, mind is already inherent in every electron, and the processes of human consciousness differ only in degree but not in kind from the processes of choice between quantum states which we call “chance” when they are made by electrons.

And this most fundamental animism holds forth great possibilities according to Dyson (1979a):

Looking at the past history of life, we see that it takes about 10^6 years to evolve a new species, 10^7 years to evolve a genus, 10^8 years to evolve a class, 10^9 years to evolve a phylum, and less than 10^{10} years to evolve all the way from the primeval slime to Homo Sapiens. If life continues in this fashion in the future, it is impossible to set any limit to the variety of physical forms that life may assume.

But it is necessary to assume that a great variety of forms will be required for life to keep up with the inanimate universe, and that those forms would eventually have no resemblance to their ancestors, namely ourselves. So again, why bother? This objection is ultimately as silly as suggesting that we should not care about our children because they are not made of the same actual material that we are made of. Although it is literally true that our children’s arms are not our arms, and their legs are not our legs, in a less superficial sense they are potentially improved reincarnations of ourselves -- reincarnations because they are built upon information coded in the genes that enabled our matter and energy to be organized into our lives, and potentially improved because they are steps that might lead to descendants that can stay alive under conditions that we would not survive. Davies has a good grip on this issue (1994):

The important issue is surely not whether our species as such is immortal but whether our *descendants* can survive. And our descendants are unlikely to be human beings . . .

Imagine what could be achieved with thousands or even millions of years of science and technology . . . In just a few decades, humankind has been able to leave the planet and venture into near space. Over the eons, our descendants could spread beyond Earth into the wider solar system, and then to other star systems within the galaxy . . .

And Thomas Paine had it right in 1794 (italics not added):

If I have already died in this body, and am raised again in the same body in which I have lived, it is a presumptive evidence that I shall die again ... To believe, therefore, in immortality, I must have a more elevated idea than is contained in the gloomy doctrine of the resurrection.

Besides, as a matter of choice, as well as of hope, I had rather have a better body and a more convenient form than the present ... but all other arguments apart, the *consciousness of existence* is the only conceivable idea we can have of another life, and the continuance of that consciousness is immortality. The consciousness of existence, or the knowing that we exist, is not necessarily confined to the same form, nor to the same matter, even in this life.

Taking Control of Evolution

Two additional conclusions follow from accepting the premise that life is good compared to the alternative. One is that we ought to convert in-group morality into all-group morality. Without all-group morality, we will self-destruct (Hartung, 1995). With all-group morality, life will be worthy of being perpetuated, which will reinforce the premise that life is good, even without comparison to the alternative.

The second conclusion is that we have a moral obligation to purposefully direct evolution. It is not enough to not imperil the common gene pool. Without controlling evolution ourselves, the probability that life will continue is reduced to the chance that some other life form will survive the scourge of in-group morality and evolve by natural selection to the point of being able to control evolution itself, and will decide to do so -- and all of that will need to happen before the inanimate universe unfolds to an uncontrollable degree. With human control of evolution, we have a reason to be vastly more hopeful and reason to be moral -- reason for now and reason for forever, which reinforces both the premise that life is good and the argument that we should struggle for existence.

In an editorial in *Nature*, John Maddox (1993) broached the forbidden point of view (parenthetical words not added):

What if it were possible (as it is not, yet) to modify germ cells in the human reproductive system? Reference to Hitler is common at this stage, but is mistaken ... would it not be of great value if the frequency of the hemophilia gene in the human population could somehow be reduced? Even if (when a safe way of doing that has been found) by germ-cell manipulation? Geneticists are fond of saying they will “never touch the germline,” That is unwise.⁴

Unwise because leaving evolution to natural selection will bring about a time when no configuration of matter and energy will suggest, either by its location or state, that we were ever alive. And it is more than unwise. It is wrong. Wrong because it denies living matter's most obvious attribute -- purposeful behavior -- the endeavor of staying alive. For us, that means doing whatever we must do to get our primordial slime genes, and our fish genes, and our monkey genes, and our human genes into descendants who will do the same.

Four and a half billion years of evolution has culminated in a species that might be able to make life an eternal phenomenon. Would it not be the ultimate arrogance for that species to refuse to make the attempt? Dyson and others have calculated universes which are full of Crompton's virtually impossible arrangements. Perhaps the universe could be completely full of virtually impossible arrangements. If so, life may eventually involve all matter and energy. For those who share Dyson's appreciation of inanimate organizations of matter and energy, we are obligated not only to the life that gives us purpose, but to the very stuff that we are made of.

Genetic Engineering: the Technology of Control

Maddox's choice for heritable genetic engineering, the hemophilia gene, is wise. We could add the gene for cystic fibrosis, which is far more common, and outside of areas where malaria is endemic, the gene for sickle cell anemia. The less common genetic maladies, like Tay-Sachs disease, phenylketonuria, and Lesh-Nyhan syndrome, could also be vanquished, and the technology for doing that has been developed and put to use (New York Times 1/28/94):

In a medical first, laboratory screening of an eight-cell embryo for the deadly Tay-Sachs gene carried by both parents has led to the birth of a healthy baby, scientists said. The birth offers further evidence that doctors are able to select and implant fertilized eggs free of inherited diseases . . . Dr. Hodgen's team used a glass needle one-fifth as wide as a human hair to withdraw a single cell from each of four eggs [blastomeres] that had been fertilized in a test tube about three days earlier. Then they tested its genetic structure for the presence of Tay-Sachs. Three eggs [blastomeres] were free of the genetic defect and were implanted in Mrs. Abshire's uterus. One developed into Brittany.

Without this procedure Mrs. Abshire would have had a one-in-four chance of giving birth to a child who would have been a model of good health until it suddenly began to lose motor abilities -- first the ability to walk, then the ability to crawl, and eventually even the ability to sit. Soon after that the child would not be able to lift its head while lying down, and then a cherry-red spot would have developed on each retina before the child went blind, become generally

paralyzed, and died. Without the procedure the Abshires had a three-out-of-four chance of having a diseased child or a child who would carry the gene for Tay-Sachs to half of their grandchildren. Without the procedure, the Abshires would have had only a one-in-four chance of having a child who would be completely “free of the genetic defect.” With the procedure, their chances of that happy event were one out of one.

After disposing of genes that cause diseases, it would seem obvious to address gene combinations that cause deleterious conditions -- ranging from serious conditions like diabetes and epilepsy, to not-so-serious conditions, like poor vision and bad teeth. The point here is that there is no need to have a controversy about design. If each generation simply offers available correction of obvious disadvantages, individuals will make choices for change that will be gradual and careful (cf. Kitcher, 1996).

In the distant future, life will be confronted by challenges whose solutions will absolutely necessitate genetic engineering. To not meet those challenges through directed change would be the equivalent of self-destruction. Fortunately, solving those as yet unforeseen challenges will seem as obvious to our descendants as eliminating hemophilia seems to us, but if we accord less confidence to the wisdom of our distant descendants than we perceive in ourselves, we will not have any distant descendants.

Author’s Note: A few days prior to publication of this article, and many months subsequent to its submission and acceptance, the following two sections of the manuscript were pulled. They are restored here.

When Religion Gets Cosmology

Generating all-group morality and directing evolution would require many ways and means, but primary among them would be overcoming the will of the gods of the Torah (first five books of the Bible). *Gods* is not a typo here -- the creation and conquest stories told in the Bible are intermittently mistranslated and generally misunderstood, partly because the original text was “subjected to massive editing whose primary goal was to obscure the plain sense of the original” (Weisman 1991), and partly because translators, being Christian or Jewish, have shared the objective of the editors (cf. Hartung, 1995). One of those objectives has been to obscure the fact that Judaism went from being polytheistic, to being monolatrous (believing in many gods but championing one), and only gradually inserted and asserted monotheism subsequent to the fall of the Kingdom of Israel (Alt 1925, Noth 1960, Albright 1968,⁵ Cross 1973, Smith 1990, Weisman 1991).

For example, the first line of The Bible should be translated: “In the beginning **gods** created the heavens and the earth” (emphasis added). Isaac Asimov presented this correction delicately in his *Guide to The Bible* (1969, parentheses not added, cf. Weisman 1991, Smith 1990):

The Hebrew word, translated here [Genesis 1:1] as God, is “Elohim”⁶ and that is a plural form which would ordinarily (if tradition were defied) be translated “gods.” The firmly monotheistic Biblical writers would carefully have eliminated such polytheism, but could not perhaps do anything with the firmly ingrained term “Elohim.” It was too familiar to change.

Some hints of polytheism seem to have survived the editing. Thus, after the first created man disobeys God’s injunction not to eat of the tree of knowledge, God is quoted as saying:

Genesis 3:22 . . . *Behold, the man is become as one of us, to know good and evil .*

Actually, dozens of hints of polytheism survived the editing, and some Bibles come complete with a supercilious explanation for having solidified the politically correct interpretation by changing plurals to singulars, e.g.: “Use of any proper name for the one and only God, as though there were other gods from whom He had to be distinguished, was discontinued in Judaism before the Christian era and is entirely inappropriate for the universal faith of the Christian Church.” (Oxford Annotated RSV, p xii). This gratuitous effort to avoid confusing readers by slipping out the s’es and slipping in the capital G’s has been gradual -- compare, for example, the Revised Standard Version’s version of the serpent’s reassurance to Eve that she and Adam would not die (as the “LORD God” said they would -- Genesis 3:3) if they ate the fruit of the tree of the knowledge of good and evil (Genesis 3:4-5, underline added):

But the serpent said to the woman, "You will not die. For God knows that when you eat of it your eyes will be opened, and you will be like God, knowing good and evil."

with the older (by 341 years) King James Version:

And the serpent said unto the woman, Ye shall not surely die: For God doth know that in the day ye eat thereof, then your eyes shall be opened, and ye shall be as gods, knowing good and evil.

Most Jewish and Christian biblical scholars indulge in conceptual contortions, intellectual contrivances and machinations of interpretation on this point, but Islam has not been taken in,

and the Qur'an is less forgiving than Asimov, chastising both Judaism and Christianity for being hypocritically polytheistic.⁷ The case against Christianity's Holy Trinity is obvious (see Suras 3:55; 4:171 & 151; Commentary 68; 5:76; 9:30 and Commentary 139), but the case against Judaism requires a straightforward understanding of what Smith calls the "divine council" -- the group of gods that included the god of the Israelites (1990). The most central refrain against the Torah in the Qur'an refers to the sin which Islam says God will not forgive -- the sin committed by those who "join gods with God" (Sura 9:17; see also 4:48 & 116; 6:22-23, 88,106; 7:138; 9:17; 10:27, 34-35; 11:135; 16:86;28:62-64; 28:68-74; 30:40 and 41:6).

In addition to being polytheists and eventually monolatrous, the ancient Israelites were henotheists. As defined Asimov (p 359):

There was a rough kind of democracy among gods, each having its own territory within which it might ordinarily be supreme, until such time as one god might develop greater strength than another so that the human agents of one would then be able to invade the land and defeat the human agents of the other. This view, 'henotheism,' was that of the vast majority of ancient peoples.

That is, the Israelites viewed themselves as their god's agent in god-competition, as he was their agent in nation-competition -- thus the primacy and importance of the first commandment (Deuteronomy 5:7): "You shall have no other gods before me." Yahweh was a god without a people for a people without a god, but with each others' help, Yahweh and his people would each reign supreme. This entire major theme of The Bible, i.e., what the Israelites' god got out of The Covenant (or The Deal), is obscured by editors' and translators' efforts to retrofit monotheism right back through Genesis.

A Darkness Unto The Nations

As we teeter on the cusp of purposefully directing evolution, the god championed by the originally polytheistic Hebrews (usually translated "the LORD God") warned his god colleagues about what human knowledge of good and evil might lead to (Genesis 3:22-24; RSV):

Then the LORD God said, "Behold, the man has become like one of us, knowing good and evil; and now, lest he put forth his hand and take also of the tree of life, and eat, and live for ever" -- therefore the LORD God sent him forth from the garden of Eden, to till the ground from which he was taken. He drove out the man; and at the east of the garden of Eden he placed the cherubim, and a flaming sword which turned every way, to guard the way to the tree of life.

Despite this defense, armed with the fruit of the Tree of Knowledge and the ability to communicate knowledge, the potential deification of humans threatened the gods again, and the lord god came to their rescue again (Genesis 11:6-7, RSV):

The LORD said, "Behold, they are one people, and they have all one language; and this is only the beginning of what they will do; and nothing that they propose to do will now be impossible for them. Come, let us go down, and there confuse their language, that they may not understand one another's speech."

So the gods of the Torah do not want us to live forever. Or at least one of them doesn't, and the others are not known to have intervened on our behalf. For those who believe that the lord god is misrepresented in this interpretation of Genesis, or who otherwise assign a non-zero probability to the conjecture that there is a beneficent god who will cause his followers to have consequence forever, the struggle for existence is less urgent. The rest of us can only hope that the believers will not make their belief our problem. Charles Darwin had a sense of this (1876):

Believing as I do that man in the distant future will be a far more perfect creature than he now is, it is an intolerable thought that he and all other sentient beings are doomed to complete annihilation after such long continued slow progress. To those who fully admit the immortality of the human soul, the destruction of our world will not appear so dreadful.

And his grandfather, Erasmus Darwin, had the right question (1794):

Would it be too bold to imagine that, in the great length of time since the world began to exist, perhaps millions of ages before the commencement of the history of mankind -- would it be too bold to imagine that all warm-blooded animals have arisen from one living filament, which the great First Cause endued with animality, with the power of acquiring new parts, attended with new propensities, directed by irritations, sensations, volitions, and associations, and thus possessing the faculty of continuing to improve by its own inherent activity and of delivering down these improvements by generation to its posterity, world without end?

Too bold? The alternative is to abandon the struggle for existence.

Notes:

1. Nihilists who reject that premise are free to demonstrate their conviction by converting the matter and energy of which they are comprised into a non-living state, but in the instant that they do, the stuff that they were made of becomes incapable of having an opinion.

1a. For an update on cosmology, please visit: http://map.gsfc.nasa.gov/m_uni/uni_101fate.html and links under "Cosmology 101." For an update in print, I recommend Michio Kaku's *Parallel Worlds*, available at Amazon.com (Note added 1/18/07).

2. It is best to be wary of those who say that poor people are poor because they don't have any money. Institutionalized poverty is a product of inequality of opportunity, and inherited wealth is a cause. Today, in the United States, "40 percent of the nation's wealth is concentrated in only 1 percent of American households" (Boxer 1995), and the principle of equality of opportunity is being eroded because less than 5% of the population possesses, by virtue of inheritance, more than six times the amount of wealth distributed across the bottom 50% of the population. Accordingly, our average modern-day aristocrat possesses, independent of contribution to the economy, more than 63 times the amount of wealth possessed by the average person who is not on the top half of the economic ladder, and this disparity is increasing (cf. Hartung 1988, references therein, and Bradsher, 1995). It figures that Steve Forbes, as a presidential candidate, advocated the abolishment of inheritance tax. The entrenched rich, those who inherit and bequeath substantial wealth, generally prefer charity to justice as a means of dealing with the poor. For them, to give is to retain control. To cause the middle class to do the bulk of the giving via taxes retains even more control, while instituting economic justice would cause a loss of control. It is no coincidence that the welfare state, and emphasis on taxation of earned income over unearned income, serves the purposes of our nouveau aristocracy (cf. Hartung 1996).

3. The argument for existence addresses our rights and obligations toward other animals. In reference to eating animals and using them for laboratory research, if we eat and use animals to sustain ourselves and to gain knowledge that enables us to cause life to go on forever, those animals' lives gain meaning and their sacrifice is justified. However, if we fail to use animals to that end, taking their lives is wrong in the sense that it is wrong to squander any resource. The difference between sentient animals and other resources in that regard is a matter of degree -- i.e., we incur a vastly greater obligation to succeed when we use other animals to achieve our objective.

4. In fact, changing genes in cells which do not transfer those changes to offspring (somatic cell genetic engineering) imperils the common gene pool unless we pursue making those same changes in germ cells -- because individuals who carry genes that currently prevent them from reproducing will soon be having children, such that more and more people will inherit genes that will require somatic cell genetic engineering (cf. Hartung and Ellison, 1977).

5. Virtually all biblical scholars/archaeologists are Christians or Jews and their objective is to discover evidence which validates their religious beliefs. Holding conclusions in advance of gathering data is the antithesis of science, and when the evidence does not comport comfortably with predetermined conclusions, great feats of cognitive dissonance are required. Albright epitomizes this confluence of pseudo-science and religion -- consider his take on the genocide of the Canaanites (1957):

Strictly speaking this Semitic custom was no worse, from the humanitarian point of view, than the reciprocal massacres of Protestants and Catholics in the seventeenth century, or than the massacre of Armenians by Turks and of Kirghiz by Russians during the First World War, or than the recent slaughter of non-combatants in Spain . . . [Or] the starvation of helpless Germany after the armistice of 1918 or the bombing of Rotterdam in 1940 . . . [Or] extermination of scores of thousands of Indians in every corner of our great nation . . . From the impartial standpoint of a philosopher of history, it often seems necessary that a people of markedly inferior type should vanish before a people of superior potentialities, since there is a point beyond which racial mixture cannot go without disaster . . . It was fortunate for the future of monotheism that the Israelites of the Conquest were wild folk, endowed with primitive energy and ruthless will to exist, since the resulting decimation of the Canaanites prevented the complete fusion of the two kindred folk . . . Thus the Canaanites, with their orgiastic nature worship, their cult of fertility in the form of serpent symbols and sensuous nudity, and their gross mythology, were replaced by Israel, with its pastoral simplicity and purity of life, its lofty monotheism and its severe code of ethics . . . Real spiritual progress can only be achieved through catastrophe and suffering, reaching new levels after the profound catharsis which accompanies major upheavals. Every such period of mental and physical agony, while the old is being swept away and the new is still unborn, yields different social patterns and deeper spiritual insights . . . We need reawakening of faith in the God of the majestic theophany on Mount Sinai, in the God of Elijah's vision at Horeb, in the God of the Jewish exiles in Babylonia, in the God of the Agony of Gethsemane . .

Pol Pot undoubtedly agrees. But Whitlam does not (1996):

This justification, by one of the great icons of twentieth-century biblical scholarship, of the slaughter of the indigenous Palestinian population is remarkable . . . It is an outpouring of undisguised racism which is staggering . . . Albright's characterization of the sensuous, immoral Canaanite stands in a long line of Orientalist representations of the Other as the opposite of the Western, rational intellectual. It is a characterization which dehumanizes, allowing the extermination of native populations . . . Well after the full horrors of the Holocaust had been exposed, Albright felt no need to revise his opinion [first published in 1940] that 'superior' peoples had the right to exterminate 'inferior'. Nor did he acknowledge the startling paradox of his theology which fails to recognize the offensiveness of the idea that Israelite monotheism was saved in its 'lofty ethical monotheism' by the extermination of the indigenous population.

Put differently, genocide is commonplace in human history, but few perpetrators celebrate it as a cornerstone of their religion. Among those who do, however, we find perhaps the greatest feat of cognitive dissonance yet accomplished -- celebration of one's in-group's perpetration of genocide combined with horrification when one's in-group is the intended victim. [After reading the first six books of the Bible, compare, for example, Wiesel's *Night* (1960) with his portrait of Joshua (1981), which ends, "Poor Joshua, glorious Joshua. He was forced to win so many battles -- with no one around to say thank you. Except God."]

6. Actually, the word is either "elohim" or "ELOHIM" depending upon whether one thinks of the original as not containing capital letters or having been written in all caps. By translating the word to "Elohim", even Asimov errs by implying the plural of a proper noun. Weisman has shown in exhaustive detail that "In texts which are clearly pre-exilic [prior to the diaspora in Babylon], there is no other possible general understanding but that it [elohim or ELOHIM] is a common noun" (1991, brackets added).

The "God" versus "gods" translation of "elohim" in Genesis 1:1 is contested in the Babylonian Talmud (Sanhedrin 38b), the Palestinian Talmud (Barakhot 9:6) and The Midrash Rabbah (Deuteronomy 2:13-14). In each case it is argued that the singular noun "God" is implied by use of a singular verb, and for several other conspicuous verses -- e.g., Genesis 1:26 : "Let us make man in our image, after our likeness" -- a singular verb from an independent clause is held forth as evidence that the words do not mean what they appear to mean. In the Palestinian Talmud, when students challenge the Sages' grammatical arguments in response to questions from heretics as having "deflected their question with a straw (i.e., a weak argument)" [parenthetical clarification per translator], they are given fanciful, supercilious arguments to which they make no rejoinder. While the Sages grammatical argument for Genesis 1:1 is not

unreasonable, it is *ad hoc*, and the Sages prove themselves to be unreasonable by making clearly false grammatical arguments in reference to other verses that raise the same challenge. In reference to the verb/noun-singular/plural discrepancy, overall context makes it more reasonable to challenge the verb.

A novel bit of cleverness has been proffered by Everett Fox in this regard (1995). Citing “several medieval commentators, and most moderns” (*sans* actual references) over and against his mentors (Buber and Rosenzweig), Fox retains the capital G and the s by making a singular possessive and turning Genesis 1:1 into a clause rather than a sentence: “At the beginning of God’s creating of the heavens and the earth,” (p 11). It is unfortunate that nearly all Biblical exegetes, Asimov excepted, are or were persons of faith -- a status which disqualifies their pretense to objectivity.

7. The Qur’an borrows many of The Bible’s themes and characters and Islam is accordingly, though to a lesser degree than Christianity, a very Jewish religion (cf. Hartung 1995). Thus Islam reveres Abraham, Isaac, Jacob, Moses, (conspicuously not Joshua), Jesus, Mary and John the Baptist as prophets like Mohammed (see, for examples, Suras 2:136; 3:84; 5:72; all of 19, and 42:13), and the god worshipped by Jews and Christians (El-cum-Allah) is asserted by Islam to be the one and only god.

There are indications that Christian Pentecostalists also give “elohim” a straightforward reading. A favorite Pentecostal Hymn is clearly monolatrous:

There is none like unto you among the Gods.

There is none like unto you among the Gods.

In the counsel of the mighty you are greatly to be praised.

In the assembly of the Gods you are exalted.

Among Elohim, you judge, you rule, and you reign.

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Balls and Curves: Freedom Within Determinism

I was pleased to find John Hartung's prescient article, "Prospects for Existence," in the last Skeptic. He neatly expressed many of my thoughts on morality in the age of modern science. However, I believe that Hartung is wrong in his assertion that free will and determinism are mutually exclusive propositions. It's true that, in the usual sense, freedom and determinism are antonyms. But I have found that upon closer inspection, most apparent paradoxes can be seen to coexist peacefully on a higher level of abstraction. Like matter and antimatter, they can both exist at the same time as long as they stay in separate orbits, so to speak. The key is to realize that determinism and free will are located on opposite ends of the same logical continuum. Let me illustrate what I'm talking about by describing an epiphany from my youth. At the Seattle World's Fair in the 1950s I came across a mathematics exhibit. One display that particularly caught my eye was a dynamic demonstration of the statistical "Bell Curve" principle. It consisted of a large rectangular frame with glass on both sides about two inches apart. The lower space inside the glass was divided into several slots of the same height. Above the slots was a centered opening for ping-pong balls to fall into the slots. But, on their way down, the balls hit an array of pegs, and bounced around like a pinball machine. After hundreds of balls had followed completely random paths, they came to rest in the slots at the bottom. As expected, most of them landed in the slots directly below the drop chute. Yet each stack of balls was proportionately shorter as it was farther from the center, like the columns under a roller-coaster. On the face of the glass was painted a white line connecting the tops of each stack. And when the ball-dropping operation was performed over and over, the stacks of balls in the slots invariably matched the white line in the shape of a bell-curve. This happened every time, thus illustrating the mathematical principle of "normal distribution."

One of the balls, however, was painted red, and its location in the slots was different each time. Consequently, that specific ball seemed to violate the general rule that governed the other balls. Instead of falling into the same slot each time, its final resting place was "determined" by the chaotic, random bouncing in such a way that it was totally unpredictable. Although I only dimly understood it at the time, I was deeply impressed with this graphic image of freedom within determinism. Since then I have seen this principle corroborated again and again. The fate of the masses is determined by iron-clad natural laws of cause and effect, but the destiny of each individual is determined, at least in part, by his own choices and actions. As Hartung noted, every person chooses his own purpose. Likewise, each rational person is a "cause" of his own fate. Those who forecast the future (fortunetellers or pollsters) tacitly assume that life's events

are Predestined, either divinely or mathematically. However, the statistical laws that make the behavior of large groups so predictable are baffled by the eccentricities of the personal, human elements. On the other hand, the austere mathematical heuristics that create fractal graphics reveals the beautiful order within chaos. In each apparent dichotomy-order vs chaos-predictability vs mystery-freedom is to be found only toward the lower end of the numerical continuum, in the company of individuality, singularity, and unity. Therefore, I believe that our fate is mostly determined by forces outside of ourselves, but, insofar as we maintain our personal integrity and don't melt into the mob, we may be responsible for our own destiny. I also think that Mr. Hartung will agree with me that, in this narrow sense, personal freedom is compatible with general determinism. Whether this will alter his judgement of Mr. Tipler's extrapolation of immortality, I can't predict. -John Earwood, Birmingham, AL

That's the Way the Ball Bounces, Hartung Responds

If the red ball were alive and had "disturbing the universe"...oh, sorry... I mean ... "disturbing the distribution" as its purpose, I would buy the analogy to free will. As it is, however, the red ball, like every other ball in the display, lands where it lands as a strict cause-and-effect consequence of the mechanical forces that influence it on each trial. The fact that we cannot predict the outcome for any ball on any trial does not mean that its outcome is less than 100% determined. And the fact that several constants cause a bell curve to recur (the contraption could have been designed to cause a U-shaped distribution, or any other curve), is not more or less evidence of determinism than is the outcome for any single ball. The difference between the distribution and the individual outcome is that we can predict the one and not the other - which is strictly a function of having relevant information and being able to process it. Neither the distribution nor the individual ball has any free will. That's because neither is alive. If some of the balls were alive, and if they could communicate and agree upon a purpose, the bell curve would be in trouble. I plead not guilty to agreeing with Mr. Earwood's conclusion "that, in this narrow sense, personal freedom is compatible with general determinism." I see no sense here, narrow or otherwise. As to Tipler, his "extrapolation of immortality" is beneath wrong. I'd sooner get religion from Pat Robertson. At least Robertson will tell you when a leap of faith must be substituted for logic and empirical reality.

-John Hartung, Atlantic Beach, NY (from SKEPTIC Vol.4 No.3, 1996)