Abstract:
This is a reflective paper on the future of human life in the context of the finitude of our universe. A teleological approach is recommended and imagination is presumed to be the key to ushering in an advanced form of life that incorporates the advances of the new technological age we have begun to inhabit. The amazing possibilities of the coming posthuman age come with a great risk, however: we may be following seductive techno-visions that will bring an end to human life long before its natural demise. Reflecting on life along these lines leads one to a local and pragmatic perspective on human achievement and a more generalized understanding of consciousness.

Key words: C. S. Peirce, cyborg, finitude, form of life, future life, imagination, personhood, teleology.

1 Introduction
How can we see into the future? How are we able to wend our way through the maze of possibilities that lies before us? Imagination lights our way. Of course the journey from the present into the future is fraught with dangers, for we can never see fully ahead, but imagination is our only light and without it the future would be as dark as the blank night before the universe began. Imagination is fueled by experience—by what appears and by what is familiar and known. An important part of our increasingly common experience today is the remarkable advance in technology, especially computer technology, that has taken place during the last half century. Extrapolating from what we know about that advance, we can now begin to imagine possible worlds that promise incredible and wonderful new forms of life and intelligence—and opportunity. Yet some of us hesitate at the thought of what may be lost in the rush toward a radical unheard-of future, and we fear the as-of-yet-unimaginable horrors that our children and our children’s children may have to face in consequence of our choices. The techno-visions that now fuel our imaginations are not rooted in the successes and failures of our forebears; they have not been tried by the fire of that analogue of natural selection that undergirds whatever we have of instinct and intuition. Today’s visions may be guides to a new and better world, a posthuman word in which the lion lies down not only with the lamb, but with the human and the cyborg—or today’s visions may be deadly fancies.

Perhaps, in passing, we should consider briefly whether it is naïve or delusional to suppose that humankind has any future at all, or much of one. Is the form of life to come ours to mould under the guidance of imagination or is it more likely that we have too little time, cosmissarily speaking, to worry about making our dreams come true? Even if they do come true, for how long will they last? I believe we must admit that the ultimate future of humankind is to have no future. And, of course, that is also the future of the universe.

In more primitive times, when individual lives were imagined to be destined for eternal survival, this would have been an awful thought, one that could only arise from the depths of pessimism or, perhaps, from the sorry hope of an evil or diseased mind. But, today, I suppose that most sane and educated men and women hold little prospect, nor have much desire, for a history that will never come to an end. Imagination cannot prevent the death of our universe and it is unwise, and I believe unsound, to hold fast to imagined impossibilities.

If I may engage in just a little autobiography, I can tell you that these revelations first came to me during a dramatic personal moment in the mid-60s as I lay pensively regarding a shadeless light bulb hanging from the ceiling of the room I was renting in New York City’s Lower East Side. I was reading John Steinbeck’s The Winter of Our Discontent but had paused to settle my thoughts. Steinbeck had put me in a mood, and when my eyes fell on the barren
bulb overhead, somehow it brought to mind the tenuousness of human achievement. Two or three years earlier I had heard Harlow Shapley lecture on the Big Bang theory and was impressed with the idea that eventually there might be a catastrophic implosion of the universe, after a prolonged period of contraction, and that that would be the end of everything that had been. So much for human accomplishment. Even if a new universe were to burst forth, as may have happened many times before, it would truly be new—the starting point for a new history that would be radically discontinuous with the erased history of the preceding age. Our universe would have been “laundered” in an extreme way.

Should the universe have too little mass to reverse its race outward so that it will never implode to erase forever all of its past—and this is what current science endorses—it will not deal any more gently with us. Some relics of dead civilizations might persist for eons upon eons, traveling aimlessly through the vast frigid reaches of a dead and thinning universe, but really that would be of no account. In any meaningful sense, history will have come to an end. When I was first thinking about beginning on this dismal note, I wondered if I should bother to make such obvious remarks and decided that it is important to remind ourselves that the future is finite and that, ultimately, nature is massively beyond our control. The power we have to make history, to be the authors of the future, while remarkable within a local perspective, is next to nothing in the long run. What Shakespeare’s Macbeth said about human life applies just as well to all of human history: “Life’s but a walking shadow, a poor player that struts and frets his hour upon the stage, and then is heard no more.” The complete record of all human accomplishment, all that was and all that will be, is but a tale “full of sound and fury,” ultimately “signifying nothing” (Macbeth Act 5, Scene 5).

Gloomy as this may seem, we must confront the finitude of human endeavor and achievement. The fiction of eternity should be abandoned—that fiction which is sometimes cruelly dangled in front of us like a carrot on a stick, and sometimes, in a more sagely way, is hoisted as if on a banner over our undertakings to remind us that we should not limit our efforts to what can be achieved in one lifetime. Indeed, it is vital that we recognize that the greatest achievements are those that can only be carried out over generations by cooperating individuals whose personal goals are contributory to the achievement of a larger goal that can only be reached communally. I don’t doubt that the traditionally religious perspective on human life, that there is a cosmic purpose which makes a mockery of death, has been beneficial for the survival of the species. It has served as a substitute for a more authentic social consciousness and has been a motivator for advancement. But to suppose that our lives and our work should be carried out “under the aspect of eternity” is to court failure. A far more sane perspective, certainly a more pragmatic one, is, I believe, the one I have just indicated. There is a limit to what we, as a people, as well as individually, can do, and to how long we have to get it done, so we cannot wait for evolution to bring about more satisfactory circumstances or for alternate possibilities to work themselves out through the mere action of chance. Intelligent life and thoughtful achievement must be contextualized and carried out within a shorter span. This, I believe, puts a greater demand on imagination and on deliberate action to actualize our plans and dreams.

I suppose it is evident by now that I am using the word “imagination” in a loose sense to encompass the breadth of meanings it has in natural language. Traditionally imagination was supposed to be either reproductive or productive, meaning that it either reproduces past perceptions more or less faithfully and is thus really only memory stimulated into action by some associative process, or else it creatively reassembles elements of experience into new combinations. C. S. Peirce wrote that “when a man desires ardently to know the truth, his first effort will be to imagine what that truth can be. He cannot prosecute his pursuit long without finding that imagination unbridled is sure to carry him off the track. Yet . . . nothing but imagination that can ever supply him an inkling of the truth. He can stare stupidly at phenomena; but in the absence of imagination they will not connect themselves together in any rational way.”

1 So, as Peirce would have it, imagination is fundamental even to the proto-abductive underpinnings of perception. Imagination is often understood to be quite distinct from fancy, a mental activity characterized by playfulness with little concern for truthfulness or for its connections to past experiences; but “imagination,” as I am using it, includes fancifulness

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and playfulness. We must bear in mind, however, as Peirce indicated, that imagination should not be carelessly trusted.

Since this is a short paper, I have the advantage of being able to beg off giving an in-depth etiological account of the link between imagined outcomes, intentional acts, and future states. This is a good thing for me, because I’m not yet able to deliver a convincing argument for teleology except to the already convinced. Indeed, what I am claiming is that there is, or can be, a sort of final causation at work in the universe—a designed and engineered teleological current to history. According to Peirce, the control we can exert over future events, which are, as we know, only potential, is by means of general dispositions to act in certain ways under circumstances of certain kinds. Some readers will recognize this as Peirce’s account of belief. Now, on Peirce’s view, belief-habits do not necessarily have to be formed through the repetition of similar acts under similar conditions, but they may be formed in the imagination. Peirce says that “a belief-habit formed in the imagination . . . , as when [we] consider how [we] ought to act under imaginary circumstances, will equally affect [our] real action[s] should those circumstances be realized.” Today we recognize this as a kind of conditioning or, better, programming. This may at least provide a suggestion as to how one might begin to develop a causal account of the way imagination helps shape future events and outcomes.

Though believing, as I have confessed, in the finitude of man, of course I admit that, until catastrophe strikes, we do have a future. And I admit that prospects for our future extend far enough ahead to justify hope and perhaps even some mild exuberance. When I consider what this future may be like, I find that I cannot accept as a serious possibility that our form of life will evolve absent the guiding influence of human or extra human purposes. Not only can we influence, and to some extent direct, the march of history, of course we will. But there is certainly no guarantee that the power we have over the future will be spent to improve life in general, or that the form of life to come will even be an explicit issue of concern. This has rarely been the case in the past and it will doubtless be the same in the future. We will probably just let life develop as it will after the model of a market economy—guided willy-nilly by the invisible hand of competing forces. Probably those competing forces will mainly be multinational corporations or other giant institutions with visions of a future that will keep their coffers full. The form of life to come will then be a sideshow, at best. No doubt this is what we can expect—everything points in that direction. But maybe, just maybe, as the united peoples of the world, we can somehow find our way to a common guiding vision of the future, one that is more concerned with the conditions of life than with the bottom line. Maybe, though, we will be better off without these grand visions. History seems to bear out that grand visions generally result in terrible disasters. In any case, it will be imagination that will illuminate the path, or the various paths that are taken. By putting imagination into action we make history and exert real control, either directly or indirectly, over the form of life to come. To a great extent, the future will be shaped by how we conceive it.

How do we conceive of the future? Or, more to the point, what are the conceptions of worthwhile ends that we may suppose are likely to guide us into the future? On Sunday, 5 March 2000, while the composition of this paper was underway, I noticed this headline in the Indianapolis Star: “Robots get training to work in teams.” The subtitle predicted that “Programmed Platoons may one day search for distant planets or duel World Cup champions.” This is an indication of what we have come to expect and of what we are aiming for. Does any informed person really doubt the eventual success of the artificial intelligence research program that began in the imaginings of a few philosophers and computer scientists? Do you doubt that in the not too distant future there will be environment-sensitive robots with the computer analogues of central nervous systems—robots that can in some rather meaningful way really communicate with humans as well as with fellow robots? At any rate, this is what we have imagined and have set our sights on, and we have already come a long way toward bringing this castle in the air down to earth.

Are robots, then, one of the forms that life will take in the future, or do you think that robots are too mechanical to count as life? What if robots can be made to become independent? To be able to learn and perhaps even to make plans? What if robots can be taught to repair themselves by making use of resources in their environments? What if robots can learn to reproduce themselves by constructing new robots following their own patterns, or perhaps more

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2 Ibid., Volume 2, paragraph 148, p. 79.
creatively, or at least with intended or even random variations for the sake of difference? Would they then be living? What if robots were constructed with flesh-like bodies to have not only artificial intelligence but also artificial metabolisms? Would that make the crucial difference? Perhaps not. But, if not, I believe we should expect that one day there will be life-like processes that will serve all of the same purposes as life itself, and probably, in many cases, more efficiently and effectively. And I predict that eventually we will extend our conception of life to include such processes.

One reason for believing that our conception of life will have to widen is a change in the other direction that is under way and gaining momentum—what might be called the mechanization of the human body. We have begun to fill our bodies with mechanical parts and with regulating computers, and even with artificial organs. There is every reason to believe that this practice will accelerate and that the idea of the Six Million Dollar Man will become commonplace. Irony of ironies: as robots become more like humans, we become more like robots. If we cannot say that robots, as I imagine them, are alive, because they are too mechanical, must we say that at some point in the mechanization of the human body the person ceases to live—even though he or she continues to function in all of the relevant ways? Does a person whose brain survives alone in the proverbial vat continue to live? If so, then it must not matter how mechanical the rest of a body becomes as long as the brain survives and continues to function. But what if the brain is enhanced with computer memory chips; perhaps with some added programming? Surely this will happen—perhaps it already has on a small scale. So you see, the form of life to come must not be supposed to be simply the ways of naturally evolved creatures but something broader that includes the ways of extended, mechanically and computationally enhanced, creatively designed, and even altogether artificial life-like beings.

Let me get just a bit more fanciful with my speculations, although I believe not unduly so. I think we can assume that future persons will be sentient embodied minds, but I don’t think we can stipulate what sort of embodiments they will have, except to say that their embodiments will have a sufficient degree of durability, complexity, and so forth. Their minds will have to be self-programmable and modifiable and have a capacity for development (we might say growth). There will obviously have to be a pretty large capacity for information processing and for operational control of the relevant embodiments. Some future persons will have mechanical (must we say artificial) bodies and thus any kind of “reproduction” would essentially amount to program duplication, although I suppose some mechanically embodied minds might want to replicate their line or model of embodiment. For such persons there would be no reproductive reason to differentiate sexes so, presumably, there would be no gender and no artificial sexual apparatus; but I suppose something of that sort could be added were it desired for esthetic or recreational purposes.

There is a lot of excitement today over the prospect of being able to download human memory into computing devices which can then be accessed directly via a datajack implanted in one’s skull. But not just one’s own memory; might we not some day be able to have the same kind of direct access to stored information from external sources—information that derives from the experiences and knowledge of others. What’s more, why couldn’t we switch circuits between brains so that you can see with someone else’s eyes, hear with their ears, feel with their body, and have all of their sensations? And they yours. Perhaps two, or maybe three or four, of us could feel simultaneously with each other’s bodies.

This is a tiny sampling of what I believe to be our agenda for the future. These are some of the ideas that are motivating the powerful among us—those whose dreams we inevitably enter into and help fulfill. What if this all comes to pass, as I believe it will? Will these remarkable changes in our form of life, in what we count as a person, in how we access and transmit information, and so on—will these profound changes radically alter our senses of ourselves? Is our individuality seriously threatened? Although it may seem so, and may even be so, I am not so sure.

I used to have the honor and the pleasure of working next door to the office of the great Peirce scholar, Max H. Fisch, a man born in the final year of the 19th century. Sometimes I would walk into Professor Fisch’s office to ask what he thought about some pressing matter having to do with the Indianapolis edition of Peirce’s writings. Usually, on those occasions, he would look up at me, reflect for a moment, and then say, “Let me see.” Then he would push back from his desk, rise from his chair,
and walk to his filing cabinets and begin searching through files. Finally he would announce what he thought about the question at hand—he had found what he thought in his files. To remember, in this case, meant to look it up in his files.

I do not see any fundamental difference, beyond that having to do with the medium, between Professor Fisch’s procedure and my plugging a computer module into my brain to access my stored memory. Nor do I see a great difference in kind between access to the experiences and knowledge of others through the books they write or the lectures they give and having the same information digitally transmitted directly into one’s brain without the mediation of our usual sensory mechanisms. Of course the semiosis that connects the transmitted information (signs) with the received information (interpretants) in these different cases will be enacted by remarkably unlike means, but the logic of it, or the semiotic of it, is the same. You might think that the calculating power of a computer will so remarkably supplement an attached brain that the resulting “cooperative” reasoning will be of a wholly new order, or that super servo-sensory mechanisms will enable us to perceive in incredibly new ways, but are these possibilities really so distinct from the way our present thought interacts with calculators and computing devices, though less directly, or the way we enhance our perceptual powers by using reading glasses, or telescopes, or video cameras, or other instruments designed to let us perceive what we cannot perceive with our unaided senses?

Well, you might say, perhaps these technological developments that I predict do not offer such radically new kinds of thinking and perceiving after all. Maybe even cyborgs are not wholly new creatures; perhaps in a sense Max Fisch was a cyborg in that some of his memory was stored in data banks outside of his body—data banks he could access more or less on demand. But surely the likelihood that we will soon be living in a world with artificially intelligent machines, really conscious machines, will be a whole new ball game. What will that mean for humankind? Maybe I’m just stubborn, but frankly I cannot even accept on its face that even that would be such a different world. Those of you who are reading this paper are intelligent beings external to me and I cannot see why, logically speaking, I would find a room filled with intelligent machines (who might also read this paper) so radically different from a room filled with my human readers. Sure, there is the matter of common experiences, of similar ways of life, and so on. But in a room filled with human mortgage brokers I would probably feel far less comfortable, far less at home, than in a room full of robot philosophers.

It is not that I believe that nothing remarkable is happening; on the contrary, I think we may be on the threshold of a radically new world—maybe even a truly posthuman world. It would not surprise me if the computer revolution has a more profound impact on our form of life than the combined changes wrought by the cartographic revolution, the Protestant reformation, and the cosmological revolution as those great events moved us into the modern age. But it is important to recognize that today’s prophets of the new great paradigm shift are to some extent selling us old goods, however unrecognizable they may be in their new garb. Let’s face it, the computer revolution has come about in part because of the duplicity and gullibility of CEOs, politicians, university presidents, library directors, and so forth, and because so many of us are ready at a moment’s notice to jump on the latest bandwagon. The cost of moving into what is now called “the information age” is staggering, both in money and time, and it seems that for every step forward there is a corresponding step backwards. For example, as university libraries manage to put more of their resources on line, large segments of their budgets have to be diverted to computer infrastructure and software acquisition, and the research and development of new information resources takes a back seat. Information resources, however important, are coming to be ignored if they are not available on line. The entire management structures of organization after organization have been reconceived and revamped, often at astonishing cost, to accommodate the capabilities of computer programs. Often there is no longer any choice in the matter—the modern way of running an organization, of doing business, requires that we buy into “the information age”; by now, this goes without saying. Every manager and director who is forced by these circumstances to shift limited resources to computer infrastructure, endless software upgrades and licenses, archiving systems, salaries for data managers, systems analysts, and so on, can tell you that the costs have been astronomical. We have paid and are paying dearly to change our world to accommodate the visions of Steve Jobs, Bill Gates, et al. But there is now no turning back. We have
swallowed the bait, the hook has been set, and we are being reeled in by the masters of the future.

Fortunately, even though the price is high, the possibilities, as I have already indicated, are amazing. Are we, perhaps, attracted by the idea of real group consciousness, a sort of symphony of feeling—a feat to be achieved, I suppose, by interconnecting the brains of a group of individuals in the right way? Surely this will be possible. Perhaps we would like to have telepathic powers, at any rate something far nearer the real thing than we can now achieve by means of the telephone or email (which are, in themselves, pretty amazing as media for the almost instant transmission of thoughts across many miles from mind to mind)? I believe this could be brought about by training our brains to use implanted transmitters to emit appropriate signals which are automatically sent by satellite to designated receptor implants in targeted brains. Maybe you would like to integrate your thought processes with the inner workings of a computer by interfacing your brain with the computer? Probably this will come to pass. Instead of doing data searches and financial calculations by the old method of typing information into a computer system and reading results off a terminal screen, you could somehow attach the computer to your brain and access the computer directly. Perhaps your consciousness would extend to the computer itself. Maybe while you were attached you and your computer would feel as though you were one, a single-minded self, however temporary. The possibilities are only limited by our imaginations and the physical resources we have to work with. What we choose from our stock of imaginings will set our course into the future and determine the form of life to come.

What’s wrong with this picture? I don’t mean to be asking how I’ve gone wrong in characterizing the little I have of what can be achieved through computer and biotechnologies. If I’ve gone wrong here and there, I doubt that I’ve gone far wrong; and my guess is that far more remarkable and even astonishing developments are on the horizon than any I’ve previewed. What is wrong with the picture I’ve given is that the future I’ve tried to look into and reveal, even if not very attractive to some of us, is still too good to be true. For one thing, I may have led you to believe that I think that everyone will benefit more or less equally from the achievements to come. That’s very doubtful. John Dewey, for one, imagined a democratic world in which everyone would be well educated and a participant in public affairs. The great socialists have envisioned a world in which everyone shares more or less equally in material goods. These visions have had a great impact, and continue to, but they certainly have not won the day. Those who through their wealth or position have great power are generally not very supportive of visions of equality. The greatest benefits will, as always, go to the most advantaged in society. New life forms will probably have the worst of it. I would guess that there will be great pressure to deny personhood to robots, no matter how life-like and capable they become, in part because of their potential for cheap labor or even servitude.

A second thing that is wrong with my picture of the future is that I have ignored the great risk of disaster. It is commonplace that great successes often can be achieved only at the risk of great failures. I believe that is precisely our situation today. As I indicated at the start, the imaginings that are now leading us into the future derive from experiences and situations that are generally too new to have been tested either by the unforgiving demands of natural selection or even by the quicker test of pragmatic workability. It is likely that the secret of long-lived ecosystems is historical continuity. Open futures are attractive and probably essential for growth and progress but developments that do not derive from past successes are as likely as not to be deadly. When imagination works from past experiences, when the future grows out of the soil of the past, as it were, there is a certain control over the path taken by virtue of selection processes. But when history moves too quickly and imagination builds its castles, not from the building blocks of tested experience, but from the promises of new technologies and mere wishes, the light of imagination dims and we travel more blindly into the future. And when one of the constituents of that future is sure to be manufactured self-replicating systems with some level of intelligence, we are indeed rolling the dice. If we can beat the odds our success may be astounding. But if the fruits of our imagination are such that either we or they must be selected out of existence, then we may bring about our annihilation ahead of schedule.

Whatever happens, we are surely in for a marvelous ride. And there should be ample opportunity for rapid philosophical advances in consequence of our widespread experimentation with intelligent systems. The philosophy of mind has been an active field for many years, yet our
understanding of mind and consciousness leaves much to be desired. We may learn much in the coming years as we observe how consciousness arises in different kinds of sensory and information-processing systems and how consciousness changes in amalgamated intelligent systems (such as with group consciousness or with human-computer combinations)—and perhaps also as we notice the loss of self-consciousness as individual stable selves become less common. The nature of individuals and persons should take on a new interest. The extension of personhood to techno-devices and mechanisms should focus attention on integrated, interrelated systems and information networks instead of on the physically separate or on psychological histories. Peirce was adamant that we are in mind and that mind is not in us, and it is possible that such a conception of mind will gain respectability in consequence of reflections on the variety and flexibility of intelligent systems in the future. Philosophy of life is bound to be in for a great renewal. And clearly there will be difficult work ahead for philosophers who specialize in the theory of rationality or in ethics. It would be well to prepare for the future by directing even more philosophy students into ethics (I ignore the question of university employment) for there will be serious issues to contend with—like attempts to overcome the present inefficient and unpredictable system for programming new minds (i.e. schools) with more invasive programming methods (i.e. modular implants), and perhaps a new try at eugenics as we learn more about how to manipulate the human gene? We will have to be able to answer the questions: Why shouldn’t we manipulate gene strings to customizing new life? This is a vital question that calls for hard philosophical thought. And what about privacy? It seems inevitable that what we count as public will grow larger and larger and that the desire for privacy may one day be viewed as an old-fashioned phobia. Old fashioned though it may be, I rue the day. Yet I do see some advantages to living in full view. Pretense and deception, both of others and of one’s self, would probably become less prevalent, and in some ways it might be a relief to be an open book. But quite clearly there may be dire psychological and legal consequences to the loss of privacy. These and many other concerns will furnish ethics with an abundance of difficult and urgent problems in years to come. As for esthetics, I will merely point out that our entire future depends on the choices we make as to ends.

I have pointed out already that not many, if any, of these issues had to wait for the information age to make their appearance. Max Fisch’s filing cabinets or even Charles Peirce’s pen (for he said that sometimes he could not think without it) might have raised many of the same problems. But there is something about the pervasiveness (or invasiveness) of, and even the idea of, the computer revolution that gives urgency to these philosophical questions. In recent years, any number of philosophers from the field of Artificial Intelligence have tried to bring these issues into focus by constructing elaborate science fiction examples. Putnam and Dennett, for instance, have given us nice stories to help illustrate and resolve problems with our conception of mind, self, and personhood. Interest among philosophers soon flagged, but new circumstances will rekindle it. Consider the case of Cousin Bob, who is furious that Aunt Emma left her fortune to Jim the Robot. It does not matter to Cousin Bob that Jim is more intelligent, that he has a kinder disposition, or that Aunt Emma loved Jim as she never loved him. Nor does it matter that Jim really needs the money. All that matters to Cousin Bob is that Jim is a “machine” while he is flesh and blood—and the closest blood relative. You can be sure that Cousin Bob will mount a legal challenge to Aunt Emma’s will, and the courts will need expert witnesses. I think it will only be after life has evolved to a point where the techno-achievements I have previewed become commonplace, or until it is not unusual to confront ethical, legal, and practical issues of import arising from these developments, that philosophers will be compelled to sort out these issues and to work hard for consensus. Only then will interest become widespread outside of philosophy. This is what seems to have happened in biomedical ethics.

As I worked on this paper, I often thought of Sarte’s famous dictum: “existence precedes essence.” In one sense it might seem that I am claiming the reverse. We imagine possibilities, essences of a sort, and then do what we can to actualize them. But the crucial point is that we imagine the possibilities that will become our actualities; we decide what we will become, what kind of world we will live in. Not that we can have whatever we want. Of course there are limitations and unexpected consequences—possibly disastrous ones. But the form of life to come will be a consequence of choices we make from the futures we can imagine—or, more accurately, from the
choices someone makes from the futures they imagine.

As I said near the beginning of my talk, it is the larger-than-life goals, the plans and dreams that can only be achieved communally over the course of generations, that reveal so well our transcendence from a brute state of nature. But all too often we have fallen into lock-step behind dreamers whose grand visions have no strong bridges of continuity to the past, nor the authorization of rigorous esthetic investigation or of well-considered ethical judgment. Under those conditions, imagination can only see dimly into the future and it becomes an unsafe guide. I believe that is the state of things today and that the course we are taking into the future may translate us into forms of life we never asked for and should never have hoped for.

On the other hand, we may have good luck, and for the little time that will still be ours, our coming form of life may be the grandest achievement ever to grace the cosmos. Ultimately, though, no one will ever know

References