Destiny Studies

A plausible element of the new Climate Futures Initiative at Princeton University

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***Introduction*:**

For several years I have ended guest talks at universities with a particular flourish:

> In my lifetime our understanding of every aspect of our past has been transformed. Patient scholarship has yielded a qualitatively better understanding of the history of our Universe, our Earth, and life. Geological periods with names like "Cretaceous" now are identified with specific dates – in this case, from 145 to 66 million years ago. From Mendel and Darwin we have moved to DNA and beyond.
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> It is the task of the next decades to discipline our understanding of our collective future. Traditional religions dwell on what happens to us as *individuals* long-term – in heaven or hell, for example, – but not on what happens to humankind collectively, here on earth long-term. A new academic discipline will develop as scholars pursue the art and science of looking ahead. It may be called Destiny Studies. It may be able to provide qualitatively new answers to the question: "What are we on Earth to do?" In academia, every university will have a Program in Destiny Studies. Are you going to be the ones to create your university's Program in Destiny Studies?

People hearing me know that I'm serious, and often a few come up to me to ask for more. I have generally said something evasive like that this is a job for all of us. I have not had anything programmatic to offer. I've decided to use this talk to push myself, and you, to take some steps forward. I have tried, for example, to imagine the syllabus for the introductory course required of those pursuing a Certificate in Destiny Studies. The scope of such a course is the subject of these remarks.

This is an appropriate moment, as we launch a new university enterprise, the Climate Futures Initiative. We are building on the just completed, three-year project housed in the Princeton Institute for International and Regional Studies, which we called: "Communicating Uncertainty: Science, Institutions, and Ethics in the Politics of Global Climate Change." The Communicating Uncertainty Project created, as was intended, a new community of scholars from several parts of the university, and we are eager to expand this community in the coming year. Our working assumption is that the study of the future will be enhanced by deliberately combining disciplinary perspectives, and that it will be fun to do so.

Destiny studies became part of my consciousness when it rode in with environmentalism in the 60s and 70s, in the guise of a new activity within applied economics called scenario-making. Scenarios were nominally self-consistent descriptions of global or national economies out to 2100 (if done by non-profits) but out to 2050 or

earlier (if done by businesses, like Shell, a pioneer in this work). A famous example was *Limits to Growth,* done by modelers at MIT for the Club of Rome, which showed the conditions leading to global collapse well before its end date of 2100. At the same time, a parallel activity within earth-systems science began, which projects the features of a modified earth, such as sea level, that result from modifications of the atmosphere and land by human beings.

Of course, there were historical antecedents to this work. Last spring, the Communicating Uncertainty Project ran a workshop called "Historicizing Climate Change," where one strand, the study of risk and emergence of the insurance industry, was reported on by our own Jonathan Levy. But the history of this element of destiny studies, I think, remains to be written.

Destiny studies must work out the implications of one critical big, counterintuitive, new idea: *Human beings are able to change the planet at global scale.* This observation is familiar to all of us, and it animates environmentalism, but it is novel. Only recently have forests have been cleared and fisheries depleted on a global scale. Only recently can it be said that most of the low-cost oil has been found and that the surface oceans are noticeably more acidic. One of the first philosophers to note the novelty of the scale of human intervention and its importance for ethics was Hans Jonas, in a prescient book published in 1979 called (in English): *The Imperative of Responsibility: In Search of an Ethics for the Technological Age.* Jonas describes the "proximate range of action" (p. 5) and the "noncumulative behavior" (p.7) in earlier times, for which "neighbor ethics" was sufficient (p. 6). He contrasts those times with the current world where "modern technology has introduced actions of such novel scale … and consequences that the framework of former ethics can no longer contain them" (p. 6). We are confronted by "a growing realm of collective action where doer, deed, and effect are no longer the same as they were in the proximate sphere, and which by the enormity of its powers forces upon ethics a new dimension of responsibility never dreamed of before" (p.6).

Destiny Studies has applied domains. It addresses all decisions with long time horizons, say 50 years or more. One set of decisions bears on infrastructure and thereby determines future socio-economic environments: decisions affecting city planning, buildings, roads, water and waste management. Other decisions determine landscapes, such as decisions that establish parks and forests. Still others bear on the long-term viability of institutions, such as decisions about university endowments.

The veil of intergenerational ignorance

A central objective of Destiny Studies will be to distinguish a few timeframes from one another. Consider the timeframes of 500, 50, and 5 years. We could call 500 years our long-term destiny and 50 years our near-term destiny. I think this distinction is vital. I think an introductory course, for example, might be half about one and half about the other. At 500 years our ignorance dominates; we have almost no idea what people will value and what skills they will have. Were we making a map and were time the analog of space, the territory at 500 years would be the terra incognita of old maps, featuring dragons breathing fire and cherubs with full cheeks blowing winds. By contrast, the territory at 50 years seems discernable, so much so that I think the timeframe of 5 years is when we can develop the tools needed to navigate the timeframe of 50 years.

Is 50 years roughly the right boundary between the knowable and the unknowable? One exercise within Destiny Studies, evidently, is to consider the extent to which the collective preferences and capacities of human beings

are discernable at various future times. Those with more vivid imaginations than mine sometimes warn me that in 50 years the human experience will be unrecognizable and that trying to figure it now is futile: we can't begin to guess its features. The end of life will be transformed, robots will be in charge of us, we will have learned that there is life elsewhere in the universe, and so on. Studying the efforts of past societies to see 50 years ahead is only of limited use, they say, because the current pace of change is unprecedented. In spite of these warnings I will persevere here, choosing 50 years as the location of the veil of intergenerational ignorance. I believe that Rawls has written about this veil, but I don't know if he has been troubled by how its features depend on how far out it lies.

500 years

With this preamble, let's speculate briefly on the content of the two halves of this putative introductory course on Destiny Studies. First, 500 years; then, 50 years.

One might guess, from the centrality of future generations in environmental analysis, that reasoning about distant future time in the environmental domain would by now be sophisticated and nuanced. Alas, that is not the case. Consider the regulatory regime for nuclear waste disposal. It embodies a deep concern for human beings many millennia from now. In a quest for ethically responsible nuclear waste disposal, policy-makers soon after World War Two drew on the half-lives of isotopes to establish the operative time frames – notably, the half-life of plutonium-239, 24,100 years. There are very few other domains of current life where our actions are circumscribed by obligations of such durability. Does that make nuclear waste management an ethical orphan? If so, it may soon be joined in the orphanage by regulations related to the leakage of carbon dioxide from licensed geological storage sites, where similar restlessness and, I would say, incoherence, are on display as policymakers seek an appropriate ethics for the long-term. What rate of leakage of sequestered CO_2 into the atmosphere is too fast? How about 0.1%/year? Nearly all the CO2 that we bury would then be back in the atmosphere well before one half-life of plutonium-239. How can we find our bearings, where very long term impacts have the potential either to thwart or to foster current options?

Not yet embodied in regulation, but sure to be even more vexing, is sea level rise. Most of the public discussion concerns the rise by 2100, which the latest IPCC report reports could be as much as a meter, encroaching on seacoasts everywhere and worsening the flooding accompanying storms. But the same report suggests, admittedly with less confidence, that the rise could be as much as 6 meters by 2500, which wipes out much of southern Florida.

How much do we care, and should we care, about 6 meters in 2500 versus a meter in 2100? If in 500 years our successors will have unknowable appetites and capabilities, what is the ethical content of their being behind the veil? Ought we to care more about current actions of ours that will menace some future generation if we believe that this future generation will be exactly like us? If we can be quite sure that some future generation will not be at all like us, then, in order to act in ways that largely dismiss its needs, must we also know that it will be more capable?

You all understand that "500 years" is a stand-in for a host of long timeframes: 1000, 10,000 years, and longer. Surely, these time frames deserve their own discriminating analysis. But very long time frames have important

features in common, notably issues related to our collective immortality. We must first value the continuity of the human enterprise, before we can value sustainability.

Many of you will remember Sam Scheffler, professor of Philosophy at NYU and author of *Death and the Afterlife*, who gave a lecture here last December within the Communicating Uncertainty Project. In his book, Scheffler observes that humanity places a high value on sustainability, even though we don't usually notice that we do. Scheffler notes that human life derives much of its meaning from being embedded in a "thriving ongoing exercise" (p. 59) and that "humanity itself as an ongoing project provides the implicit frame of reference for most of our judgments about what matters" (p 60). Our connectedness to future generations "staves off nihilism" (p. 69). In a world where it is known that there is no collective afterlife, Scheffler conjectures, "people would lose confidence in the value of many sorts of activities, would cease to see reason to engage in many familiar pursuits, and would become emotionally detached from many of those activities and pursuits" (p 44). The antidote to such angst is provided by collective survival. With connectedness comes calm, and even joy. We do not want to live forever; but it is important to us that the human project of which we are a part will long endure.

Our own George Kateb writes in *Human Dignity* (p. 188): "For all its crimes against humanity itself and all its destruction of nature, we should not want the human species to become extinct, as some radical environmentalists say they want. There is sufficient reason for willing human preservation, if there is no other: as far as we know, only the human species can record, know, and admire nature – the earth and the universe." Of central importance to Kateb, and to me, is that a durable collective afterlife enables the perpetuation of a scientific enterprise that is revealing the story of our existence. Human science is producing a level of self-consciousness that perhaps hitherto has never been achieved in our universe. I thank Harold Shapiro for calling my attention to Kateb's book.

The plot thickens. Scheffler poses the question: Would our collective afterlife become less important to us if we were to create highly intelligent robots that could then function without us, or if we were to find highly intelligent life elsewhere in the universe? In both cases, imagine that we humans become convinced that the robots or the space aliens are much smarter than we are. I think that, yes, we would value our collective afterlife less. We would need other reasons to reject the prospect of humanity becoming extinct.

A final thought about the far-future: If a future generation is not like us, we cannot expect to know how it will perceive its obligations to generations that are in *its* future. How will those living 100 years from now value those who live 200 years from now? One can conjecture that the more a particular generation considers catastrophe to be imminent, the weaker will be its commitment to future human beings.

I thank Peter Singer for forcing me to think about why there is value to human continuity. I have a long way to go.

50 years

When we turn to the 50-year timeframe, our short-term destiny, the landscape seems completely different. Most of our current students will be alive and this building (Prospect House) will be only 30% older than it is right now. Many of us believe we know which of the actions that we are taking now will matter then. This leads

us to convince ourselves that it is possible to create tools to govern behavior now that will increase happiness fifty years from now.

In many instances, the tools available today are inadequate. Indeed, the devotion to current tools within the disciplines or subdisciplines that have created them has become part of the problem. The first program of our Climate Futures Initiative, led by Marc Fleurbaey, seeks to improve one of the most influential of the current tools.

This tool is called "Integrated Assessment." Integrated Assessment adds an environmental constraint to an economic growth model in order to examine a global economy that is subject to damage from climate change. The time frame is almost always one hundred years. The output is a least-cost technological response that reduces damage to a specified level: specific technologies implemented in specific countries at specific times, in response to a specific price trajectory for greenhouse gases created by policy.

Marc is intrepid. The embedded normative assumptions of Integrated Assessment have received little attention; thousands of papers have been written without going there. Marc and the group he is assembling right now will add flexibility to current growth models so that normative judgments, such as the way inequality is weighted, are transparent.

As Francis Dennig notes, integrated assessment modeling is deficient in so many ways that it is hard to decide what to leave alone in order to accomplish something. Two of the issues that I would most like to see addressed may not get onto the agenda this year, because they are difficult to fix and not directly related to Marc's normative agenda: 1) *The absence of iteration*. Assuming perfect foresight, integrated assessment prescribes an optimal path starting now and followed for a century without deviation. The assignment ahead of us, however, is *iterative* risk management. Some variants on the standard models explore paths with intermediate decision points and branches, and more along these lines needs to be done. 2) *The absence of humility*. Integrated assessments usually generate highly priced externalities late in this century, but ignore how these prices would transform current competitions across technologies. In fact, no one has any idea how technologies would compete, for example, were carbon dioxide emissions to be priced at $1000/ton.

In all likelihood the deficiencies of integrated assessment are mirrored in many other tools available today. In the remainder of this paper, I will identify three areas of near-term destiny studies where better tools are needed. These areas are: 1) the challenge of prosperity, 2) the risks of "solutions," and 3) the overmanaged world.

The challenge of prosperity

The Earth is small, relative to the demands we put upon it. Our demands are large primarily because our societies exalt two values: self-realization and equal opportunity. Self-realization is achieved through a variety and an abundance of direct experiences – in today's parlance, by a large bucket list. Filling the bucket before kicking it means living well. President Obama visited Stonehenge last month and declared that he could now remove it from his bucket list. The "bucket list" entered the English language only in 2007, through a movie of that title starring Jack Nicholson and Morgan Freeman, who in the film are dying of cancer.

I am deliberately identifying the driving force that complicates planetary sustainability as the search for an abundance of experiences, rather than as the search for an abundance of acquisitions. The latter is easier to caricature, and it is easier to persuade oneself of its evanescence. I am not throwing stones here: I have been zestfully filling a capacious bucket all my life, seeing the good life in these terms as much as anyone.

As for equal opportunity, even when poorly approximated it assures that large numbers of people consume many goods and many services – as opposed to the pattern in feudal societies, where consumption is a privilege. Both self-realization and equal opportunity are relative newcomers to human values. They became widespread only in the past two centuries. In essence, the earth is being stressed by prosperity – by the success of the modern agenda. The richer the world becomes and the more broadly its wealth is dispersed, the greater the urgency to engage with sustainability. War and pestilence reduce the urgency.

Driving the world economy away from sustainability is the nearly ubiquitous desire to climb what is perceived to be a single ladder leading from poverty to wealth. The ladder operates within and across countries. In particular, the legacy of colonialism confounds the quest for sustainability. The 1992 United Nations Framework Convention on Climate Change (UNFCCC) is one of many post-colonial international institutions that expresses the guilt of the former colonizers and the sense of entitlement of the former colonized by creating a two-tier structure for compliance, with nearly all obligations falling on the former colonizers. Such institutions deny the reality that all of humanity is in the same boat.

It is time for *post-post-colonial* institutions that embody cosmopolitan ethics. Some of these institutions could contend with the reality that exuberant lifestyles are found in every country, albeit in differing proportions of the total population. 0ther such institutions could enable the ending of abject poverty everywhere, a task which can be accomplished without adding significantly to any global environmental task. (See Chakravarty et al., "One billion high emitters," *PNAS*, 2009.) The design of effective international institutions based on well-crafted incentives is the cup of tea of a stalwart of our past and present project, Robert Keohane. Bob used a bully pulpit this past summer when he delivered the James Madison Lecture for the American Political Science Association. He called his talk: "The Global Politics of Climate Change: Challenge for Political Science."

Most of you know that Melissa Lane, in *Ecotopia*, examined what Plato might have said about sustainability. Melissa notes that Plato, exercising what she calls "political imagination," (p. 15) urged his society to harmonize its collective needs and its individual wants – in Melissa's words, to connect "the city and the soul." Melissa believes that Plato can help us reimagine individual and collective well-being, so that our individual choices are consistent with achieving a sustainable world.

My guess is that Plato would not have approved of bucket lists. Plato extols moderation. Melissa hopes that, the help of Plato, "the current Western social model can be saved from itself (p. 43)" by working out the meaning of "collective moderation. (p.45)" Generalizing, within destiny studies, the needed tools for coming to terms with the collision between prosperity and sustainability will be found where moral philosophy confronts collective moderation.

The risks of "solutions"

Although the arguments here generalize, I will confine my comments to climate change.

What happens when an irresistible force meets an immovable object? Ten-year-olds love this paradox! The irresistible force: fossil fuels, which are as vital as ever. The immovable object: climate change, which looms ominously. The exhaustion of fossil fuels that are now ground will not occur quickly enough to alleviate climate change. In order to reduce global greenhouse gas emissions, industrial societies are being asked to trade in an energy system that has prevailed over its alternatives for more than a century.

A critical issue is "pace" – how quickly change can occur. Modeling of the displacement of one technology by another today is primitive. What can scholarship teach us about the technological and institutional lock-in associated with infrastructure and facilities, which will inhibit their replacement? Can history be useful? How quickly did automobiles displace horses, and why neither faster nor slower? How is pace affected when transitions include an intermediate stage featuring hybrid strategies that integrate the old and the new – in this case systems that involve combinations of renewable and non-renewable energy? Pace is critical elsewhere in the system as well: How quickly will climate science increase our understanding of how the earth works? (Steve Pacala and Michael Oppenheimer devote lots of their time to this question.) How quickly can human behaviors change, such as those related to diet?

A two-sided view of risk and uncertainty is required – one that encompasses both the risks of inaction and the risks that come with "solutions." The lowest conceivable greenhouse targets, achievable only by casting caution to the winds, are not optimal. Mitigation is not risk-free. Every "solution" has a dark side:

> With conservation comes the risk of excessive regimentation and state control.
>
> Strategies to extract the energy from fossil fuels while preventing the byproduct carbon dioxide from reaching the atmosphere (nominally, having one's cake and eating it too) prolong the environmental and social ills that have long accompanied fossil fuels, such as mining accidents and land despoliation.
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> Global nuclear power requires strong institutions for the management of "dual-use" technology to minimize the risks of regional nuclear wars enabled by the diversion of plutonium and enriched uranium from civilian to military purposes. (See Glaser and Socolow, *Daedalus*, 2009.)
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> Geoengineering (the newcomer on this list) has the potential to cede excessive authority to technocrats. I say more about geoengineering in the final section below.

Conflicts over the use of land to slow the onset of climate change can be expected. Beneficial traditional uses of the same land may be providing food and fodder or may be fostering biodiversity. Three distinct "biocarbon" strategies compete with traditional uses and with one another: transferring carbon from the atmosphere to forests and soils (a growing tree does this), making electricity, and making synthetic fuels. New tools are needed to work out the profound societal consequences of a uniform carbon tax on both biocarbon and fossil carbon that is high enough to shift energy-sector investments away from fossil fuels. Everything that grows will be seen as a tax-free fuel, and traditional uses will be in jeopardy.

A modern version of the Hippocratic Oath captures this two-sided assignment, which doctors and patients confront whenever a poorly tested drug may offer a cure: "I will apply, for the benefit of the sick, all measures

that are required, avoiding those twin traps of overtreatment and therapeutic nihilism." (Louis Lasagna, 1964, http://www.pbs.org/wgbh/nova/doctors/oath_modern.html).

A recent introduction to climate discussions is the concept of a global carbon "budget": a total quantity of carbon in fossil fuel that will be extracted *ever.* Fossil fuels are so abundant that, for even a weak climate target, *attractive* fossil fuel will be left in the ground. Are budgets workable? What can be learned from historical precedents where consumption has been restricted? The budget concept leads inexorably to nasty choices: How quickly should fossil energy be extracted? From which countries should resources be extracted and in which countries should they be used? For what purposes should fossil energy resources be used? Which fuels should be extracted preferentially? In each case, who judges?

The overmanaged world

Within the 50-year time frame, probably much sooner, those developing Destiny Studies will confront geoengineering, which I will define as the deliberate manipulation of the earth at planetary scale for human benefit. The best known versions of geoengineering entail solar radiation management (SRM) to cool the earth and thereby to counter the warming effect of greenhouse gases. One scheme would inject particles into the stratosphere, where they would reflect incoming sunlight. The largest volcanic eruptions produce global cooling in this way, but only for a year or two. The idea here is to mimic a perpetual volcano.

On first hearing, and on second hearing, many laypeople find the proposal ludicrous and recoil from it. The current scrimmage line for public policy is whether to allow *any* geoengineering research and development, and, if so, with what constraints. Much frontier climate science will inevitably illuminate geoengineering (research on clouds, for example), thereby constituting dual-use R&D, but the question here is whether to allow research which is balanced the other way: primarily to scope out geoengineering and, only secondarily, to understand more deeply how the planet functions on its own.

The proposal to geoengineer the earth is issuing from a dynamic corner of science and engineering, whose leaders are asking the rest of academia to take geoengineering seriously. Philosophers and political scientists are beginning to engage. One can expect conflict over objectives across countries: Whose hand is on the thermostat? This is familiar territory for the international relations specialist. Bob Keohane, in his Madison Lecture, had this to say about solar radiation management:

> The likelihood that Solar Radiation Management (SRM) will be used by some powerful states, or a set of such states, during the 21st century should not be discounted… Governments will be tempted to turn to SRM as "the magic bullet" and to rationalize it as a strategy for buying time… Political science has a great reservoir of expertise relevant to issues of an international regime to manage Solar Radiation Management: sixty years of work on arms control. Here I pass on a suggestion from David Victor, perhaps the leading political scientist working on climate change issues: "For all the arms controllers in the audience who are lamenting the lack of serious new regimes to study, why not spend some time learning about SRM?"

Geoengineering can be viewed as an extension of civil defense, a new way of coping with disasters, some familiar (like floods and droughts) and some more sinister than any we have ever encountered (like extreme

heat waves that severely reduce the habitability of portions of the earth). Disasters differ in how recognizable they are: some are clear and some are ambiguous. It is not at all obvious how the world would mobilize in response to an ambiguous disaster.

A dominant preference for retrieving climates of yore can be anticipated. After all, human beings planted crops where the rain fell and built our cities near rivers and coasts. Sea-level rise means moving cities inland (just as sea-level fall means reshaping cities which have lost access to the sea). Only a partial retrieval will be possible. To aim to retrieve just one component of our environment would be misguided, because it would entail neglecting the damage done to other components. The current social movement, 350.org, puts nearly exclusive priority on retrieving the pre-industrial atmosphere, while blithely neglecting what could happen to the land in the process. A more subtle strategy is needed to deal with the potential, as discussed earlier, for the management of biocarbon to become the workhorse for retrieving an earlier atmosphere.

Even where there are no international disagreements, we humans will need to be saved from our dislike of extremes. One can expect humanity's goal to be to produce warmer winters in cold climates, cooler summers in warm climates, and less severe storms and droughts. As in the Messiah text: to exalt the valleys and make the rough places plane. A problem here is that the health of many ecosystems depends on extreme events to sustain their evolutionary niches. Serious risks to humans result when the well-being of every non-human species is subordinated to our needs.

Finally, much as genetic engineering now allows enhancement of the human species (prettier, taller, smarter), geoengineering will allow the enhancement of the planet. Michael Sandel, in *The Case Against Perfection,* discusses what is lost when genetic engineering is pursued to excess, and his conclusions would seem to apply to geoengineering as well. The ability to savor the life we have been "gifted" can be lost, as well as the random, the "unbidden." How much should we care if the entire world becomes our zoo?