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## Lecture: Are We F\*\*ked by Climate Change?

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ARE WE F\*\*KED by CLIMATE CHANGE?  
A Last Lecture

I will soon be starting my thirty-sixth year of teaching political science at Westminster College, and I have been wondering since 1989, after hearing a “last lecture” by a young, popular economics professor, who was departing to teach at another school, what I would say, what crucial wisdom I would try to impart to my students, my colleagues, and perhaps the world at large if I were asked to give an honorary last lecture, based on the conceit or useful fiction that it would be my final talk ever, my last chance to make a difference before retiring from the scene “permanently.” On June 1<sup>st</sup> this abstract, philosophical question became an immediate, practical task when our Dean invited me to deliver a last lecture on the final morning of Westminster’s inaugural Summer Retreat for alumni, faculty and students.<sup>1</sup>

I thought a lot about what I might say. I like to think I have insights to share on a wide array of subjects, but eventually I concluded that I would speak about climate change and politics, especially after my family took a vacation in mid- July to California, which was and is suffering through the fifth year of the severest drought to have struck the state, the home of my brothers, in 1,200 years. Wildfires were burning out of control in various locations and motels from Laguna Beach to San Francisco displayed warning signs, announcing the drought and asking their patrons to conserve water. At the John Muir Woods, I asked a park ranger if the giant Redwoods in the area were threatened and she said they were suffering because climate change had reduced the fog from which they normally derive half the fifty-five gallons of water they need each day.

I have been teaching Environmental Policy and Politics for more than twenty years and I have become convinced that environmental degradation in general and climate change in particular pose the preeminent, existential threat to the survival and well- being of the human species and countless other species as well. Climate change not only creates serious ecological, economic and health problems by itself but also exacerbates a whole array of other vexing conditions from poverty and inequality to illegal immigration, civil and ethnic strife, interstate conflicts and ultimately, I believe, the threat of nuclear war. Without getting control of climate change, it is going to become increasingly difficult for us and particularly for future generations to lead decent, healthy, civilized lives. To put it more bluntly, I am now convinced that unless we drastically reduce the amount of CO<sub>2</sub> (and other greenhouse gases) that we now putting into the atmosphere, we are going to be royally, hellishly f\*\*ked by climate change and its cascading, catastrophic consequences. That’s the thrust of my last lecture.

Originally, I had a more sedate, more traditional academic title for my last lecture and I had decided that I would write out a dense outline of what I wanted to say so that my final talk would have more structure than my usual classroom lectures.

But, at a local bar on Thursday night, before the formal beginning of the Retreat on Friday, one of my former students thanked me for really challenging her and she and a number of other alumni said they had come to the Retreat specifically to hear me hold forth, to “pontificate,” to give a typical free-flowing, off-the-cuff, irreverent Langton lecture. And so that’s what you’re getting this morning, with the proviso that I will try to follow the major points in my outline, which was passed out to you a moment ago.

I decided to change the title of my lecture to make it more provocative, more memorable and thus to give my “final talk” a better chance to be published and disseminated to a wider audience. I don’t mean to offend people by using the term f\*\*ked. Rather I want to convey as graphically and effectively as possible that unless we stabilize climate change, we are going to be ruined, screwed, degraded, totally messed up, FUBARed, as American GIs in WWII used to say.

To give credit where credit is due, I derived the title of my lecture from the title of Brad Werner’s highly technical paper, “Is Earth F\*\*ked?” which he delivered in 2012 at the annual conference of the American Geophysical Union in San Francisco (where else?). Werner’s answer to his question was, more or less, “...as evidenced by widespread inability to meaningfully address such global challenges as climate change and soil degradation...within the dominant culture...” My answer to the question posed in the title of my last lecture, the wisdom I so desperately want to impart here, is that “we are probably f\*\*ked by climate change but not necessarily, not ineluctably.” We can save our planet and ourselves but it is going to take an incredible amount of sustained, intelligent work, large sacrifices, political leadership, systemic reforms, and, crucially, a massive, global “metanoia” or fundamental change of consciousness about the magnitude of the threat we face from climate change and what must be done to avoid being royally, hellishly f\*\*ked by it. I hope you will pardon my repetition of that phrase for rhetorical effect, but, damn it, if we don’t act decisively to mitigate the emission of greenhouse gases and thus anthropogenic climate change, we will be F\*\*ked royally and hellishly. And that’s the unvarnished truth, as I see it.

### My Thesis and Basic Argument

Plato defined wisdom in his Republic as “knowing what is good for the whole,” and the knowledge I would like to convey here is that although we are in all probability going to be royally, hellishly F\*\*ked by climate change, this does not have to be our fate. We still have the time, knowledge and technological resources to stabilize climate change at a point that avoids the worst scenarios, but we must recognize and treat climate change as the greatest existential threat, not just to American national security but to the security of the human species, and we must act on that realization immediately, decisively, and dramatically to ensure that the average global temperature of the planet does not go higher (for a number of years) than 2 ° Celsius or 3.6° Fahrenheit above the preindustrial baseline (1880-1910) average of 13.7° C or around 56.7° F. Concretely, to achieve this imperative, to have a sustainable future, four incredibly difficult steps must be taken: (1) we (the human species) must reduce the current 50

billion metric tons of CO<sub>2</sub> (and the billions of tons of other greenhouse gases like methane, nitrous oxide, and hydrofluorocarbons) we are currently emitting by burning coal, oil and natural gas by 80 percent by 2050 and then to near zero by 2100; (2) we must leave approximately 85 percent of the known fossil fuel reserves underground; (3) the United States, as the greatest emitter historically of the greenhouse gases currently in the atmosphere and as the most powerful and wealthiest nation on the planet, must lead this daunting project, but (4) we (Americans) can't do this without first "fixing our politics," as President Obama put it in his last State of the Union Address. Taking these steps would be, I firmly believe, "good for the whole," in the most expansive, necessary and crucial sense of the phrase.

A good argument, a good plan of action, a good political theory, I tell my classes, offers sound reasons for a conclusion and typically tries to answer three questions: (1) what is and will be the case empirically if current trends continue; (2) what ought to be the case, morally and practically (this is often referred to as the "vision" question); and (3) what should be done to go from here to there, to move from where we are to where we ought to be (this is the question about a feasible, effective transformation strategy). In the remainder of this lecture, I would like to sketch my answers to these questions with respect to the greatest challenge we face as a species: unmitigated climate change driven by the relentless, massive burning of fossil fuels. In thinking about these questions, I have been guided by Auguste Comte's incredibly astute observation that "we seek to know in order to foresee and to foresee in order to control."

### What Is and Will Be the Case?

What we know in general, according to physicist Myles Allen, is that "there is a simple and predictable relationship between the total amount of carbon injected into the atmosphere and peak projected warmings. Releasing a trillion metric tons of carbon [or 3 trillion tons of CO<sub>2</sub>] into the atmosphere may cause a most likely peak warming of two degrees Celsius or 3.6 degrees Fahrenheit, which many identify as a danger." What we know specifically, according to Bill McKibben and others, is that since the start of the industrial revolution in 1750, we have released 531 billion metric tons of carbon into the atmosphere by burning fossil fuels, primarily coal. At current rates of release, we will burn another 469 billion metric tons in the next 20 years or so and at this point we will have warmed the planet 2° C or more above the preindustrial level and an average global temperature of 61.5° F or higher will be the hellish, "new normal." At the beginning of the industrial revolution, there were 270-280 ppm of CO<sub>2</sub> in the atmosphere, then 315 in 1959, 379 in 2005, 386 in 2010, 396 in 2013, 401 in 2015 and 403-407 in 2016. We are now adding 2.25 ppm of CO<sub>2</sub> a year to our air and the average global temperature actually reached 61.52 F or 16.4° C in June, 2016, breaking the 2° C hotter threshold for the first time, according to the National Oceanic and Atmospheric Administration. If this trend continues, we will hit 450 ppm of CO<sub>2</sub> in less than twenty years, the average global temperature will be perhaps as much as 3 to 4° C hotter than baseline averages and we will be royally, hellishly f\*\*ked by climate change or rather the drastic, almost unimaginable consequences of that process.

According to reports that are readily available on the net by NASA, NOAA, Climate

Central, the EPA and similar agencies and organizations, over the last 50 years the average global temperature has increased at the fastest rate in recorded history. Every year for the last 40 years has been warmer than the average global temperature for the 20<sup>th</sup> century. Fifteen of the 16 hottest years on record have occurred since 2000. 2015 was by far the warmest year on record since 1880 and there is a 99 percent chance that 2016 will be warmer than 2015. The first 6 months of 2016 were the warmest six-month period on record and were 2.7° F warmer than the pre-industrial average. Each month in 2016 exceeded all previous average temperature records for that month. June 2016 was the 14<sup>th</sup> straight hottest month on record. For the first time in recorded history, the average global temperature of the earth in 2015 was 1° C above the preindustrial average. Another 1° C increase in average temperature or a sustained 2° C above the preindustrial average will produce catastrophic climate change. Previous forecasts that we will hit that by 2034 now seem wildly optimistic and if we continue to practice business as usual and these trends continue, we will have put close to 600 ppm of CO<sub>2</sub> in the atmosphere by the end of the century, the global average temperature will be 7 to 10° C hotter than the average temperature in which we evolved as a species, and our great grandchildren will be burning in a hellish, striated, Hobbesian world and cursing us for our incredibly immoral selfishness.

As the average global temperature moves permanently beyond roughly 16° C or 62° F, we can expect to see an even more rapid, unstoppable melting of the Greenland and West Antarctica ice sheets, an appreciable sea-level rise, destructive warming and acidification of the oceans, massive storm surges, the inundation of coastal cities around the world, the disappearance of small island states, increases in allergies, asthma and infectious diseases, drastic declines in potable water, food fish and agricultural production, the unabated mass extinction of other species, and the proliferation of extreme weather events, such as relentless, murderous heat waves, sustained droughts and frequent torrential rains, more powerful hurricanes and tornadoes, and all this will, I think you must quickly realize, exacerbate a plethora of other social and political problems. Eventually, if these trends continue deep into the next century, a kind of “end-of-days” apocalypse could occur in which world trade collapses, democratic governments start to disappear, nation states fragment, war and ethnic strife become endemic, and civilization, as we know it, disintegrates. Indeed, at some point in the foreseeable future, the disastrous direct and indirect consequences of unmitigated climate change will destroy the institutional capacity of the human species to respond coherently and effectively to climate change and then our progeny will really be royally and hellishly f\*\*ked.

In April global leaders met in New York to sign the Paris climate agreement, which had been approved on December 12, 2015 by 195 nations at the 21<sup>st</sup> meeting of the UN-sponsored Conference of Parties (concerned about climate change). The agreement committed virtually all the countries in the world to “holding the increase in global average temperature well below 2° C above preindustrial levels and pursuing efforts to limit the temperature increase to 1.5° C.” Unfortunately, the average global temperature of the first three months of this year has already almost hit that 1.5° C threshold, and it now appears that even if there is no free riding and each of the 195 countries meets its proposed emission-reduction goal, their collective total emissions of

CO<sub>2</sub> will continue to rise significantly and by 2050 the global average temperature will be at least 3° C higher than the preindustrial average. In other words, while the nations of the world were willing to sign a nonbinding agreement to do something meaningful about climate change, most were individually and practically unwilling to do enough work, to sacrifice enough for the common good, to accomplish the goal. This is simultaneously an example of the problem of collective action and “the environmental policy paradox,” described by Professor Zach Smith in his excellent textbook by that title.

Donald Trump has called climate change “bullshit” and a “hoax” perpetuated by the Chinese to weaken America and Fox News and recent polls indicate that 47 percent of Republicans basically agree with him. Thus it is no surprise that the platform just approved by the GOP at its convention explicitly rejects the imposition of a carbon tax and calls for rescinding Obama’s Clean Power Plan and withdrawing from the Paris Climate Accord, which the United States just signed in April. Trump, of course, did not mention climate change in his Nomination Speech at the Convention, and one editorial observed that the “GOP was fiddling while America burns.” In contrast, the Democratic platform characterized climate change as “an urgent threat and a defining challenge of our time,” and called for putting a tax on carbon. But alas, Hillary Clinton had only two tepid sentences about this “urgent threat” in her Nomination Speech: “I believe in science. I believe in climate change and I believe that we can save our planet while creating millions of clean energy jobs.” Someday, I think, conditions will force the presidential candidates of both major parties to talk at great length about their plans for dealing with climate change. I just hope that this happens before it is way too late, before water from the DC tidal basin is lapping at Jefferson’s feet in his Memorial.

### What Ought to Be the Case?

Ideally, the global economy will be substantially “decarbonized” by 2050 and certainly before 2100, emitting less than 20 billion metric tons of CO<sub>2</sub> per year and fueled primarily by wind, solar, water, geothermal and, although I hate to say it, a lot of nuclear power, generated by fast- fusion reactors. The concentration of CO<sub>2</sub> in the atmosphere, instead of hurtling toward 450 ppm and beyond as it currently is, will be moving back toward 350 ppm, as the great climatologist James Hansen has contended is necessary to have real sustainability. The population of the earth will be stabilized at less than 9 billion and we will have zero population growth in the future. People will lead much greener, less consumptive, more energy efficient lives. They will walk and bike more, play more tennis and other sports, watch a lot less TV, drive small, energy efficient cars, and eat little or no meat, whose production now contributes significantly to climate change. The United States, among many other things, will have an extensive high speed rail system and scores of new, small nuclear power plants.

The American political system will be fixed, so that it can actually get things done. It will no longer be what Francis Fukuyama now describes as a gridlocked “vetocracy,” suffering from “a problem of political decay in a more acute form than other democratic political systems.” Virtually all the nations in the world will be strong, robust democracies, the UN will

be strengthened, and there will be powerful regulatory agencies at the national, regional and international levels to control the emission of greenhouse gases, to deal with a myriad of other environmental problems, to administer a carbon tax and to direct a massive program to develop clean forms of energy, more efficient technologies and on and on.

Crucially, and I mean crucially, virtually everyone will realize that, like the earth revolving around the sun, anthropogenic climate change is not a hoax, but a scientifically established fact, that the burning of fossil fuels since the industrial revolution has contributed substantially to the growing concentration of CO<sub>2</sub> and other greenhouse gases in the atmosphere and thus to the warming of the planet, and that everything possible must be done to reverse this process, including paying a very stiff carbon tax.

Of course, it goes without saying that none of this may come to pass and that we will instead be living in an extremely hot, ugly, FUBARed world.

### What Should Be Done to Get There from Here?

To ensure that our nation and the world community has a decent, sustainable future, the United States should become the clear, unquestioned leader in the global effort to combat climate change, to stabilize the average global temperature at less than less 62° F or something less than 2° C above the preindustrial level. And to achieve this goal the United States should impose on itself a carbon tax of \$50 dollars per metric ton by 2020 and champion the creation of a global carbon tax, which will work to reduce the burning of fossil fuel, encourage the development and use of renewables and promote technological innovations to enhance energy efficiency and the attractiveness of alternative fuels. The funds collected through the carbon tax should be used in part to cushion the impact of the tax on the less advantaged members of society, to provide incentives for the development and deployment of green technologies and renewable energy, and to help developing countries transition to a decarbonized future.

For all this to happen, to stop just fiddling while we burn, at least two critical things must occur. First, the American political system must be fixed so that polices promoting decarbonization can be enacted. Big money must be taken out of our politics, the gerrymandering of our congressional districts must be reversed, and the filibuster rule in the Senate must be eliminated or reformed. Second, the ideological polarization about climate change must come to end. To put it simply, to avoid being royally and hellishly f\*\*ked by climate change, the preponderant majority of people in this country and indeed the world must come to accept, sooner rather than later, the wisdom and advice I have sought to distill and convey in my last lecture, which is, in a nutshell, that we are going to be royally, hellishly f\*\*ked by climate change unless we take all kinds of actions to drastically reduce and then virtually eliminate the burning of fossil fuels. And it occurs to me that one of those actions would be for more and more professors from the baby boom generation to give last lectures that dwell on the threat of climate change and what can be done to mitigate it. Millions and millions of voices in millions of venues must speak out to change the hearts and minds of billions and billions of people across the globe in order for us to achieve sustainability.

Finally, I want to say that my goal here has not been simply to entertain you, to give you something interesting to think about, to let you experience once again one of my lectures at a pleasant Summer Retreat. I don't want you to just passively accept my message; I don't want you to be free riders, hoping others will sacrifice for the common good, while you continue to live high on the hog of fossil fuels, driving an SUV, keeping the AC on high, refusing to vote for anyone who proposes a carbon tax that would initially raise the price of gas perhaps a buck or two a gallon. Instead, as Gandhi said, you must actually "be the change you want to see in the world," politically, economically, socially, and ecologically. If you want to alleviate the threat of climate change, you've got to live a life that helps alleviate the threat of climate change, you've got to walk the walk and so do I. As my wife often says to me, "if you're such a big environmentalist, turn off the lights and TV when you leave the room."

This is what I hoped I would be able to say in my last lecture, when I started to think about climate change as my topic. But I have to confess, it all sounds, even to me, farfetched, improbable, ridiculously idealistic, if not laughable. On such a nice day it is hard for me to believe, despite what the data say, that the planet has suffered from the hottest July on record and that things will get much, much worse, if the nations of the world don't cut their CO<sub>2</sub> emissions by 80 percent by 2050 and leave 85 percent of the known fossil fuel reserves in the ground forever. It's hard for me to believe we can do anything like that. It's hard for me to believe that we, the American people, will fix our politics in the foreseeable future, enact a stiff carbon tax and encourage China, India, the EU and the rest of the world to do the same. And that's why, in a nutshell, it's hard for me to believe that we will give up our addiction to oil, coal, and natural gas and avoid being royally, hellishly f\*\*ked by climate change. But again, as I said, that does not have to be our fate. Improbable does not mean impossible, necessary or ineluctable. We don't have to overdose on fossil fuels. We can get green and clean or at least a lot cleaner; we're not blind and we're not helpless. We know what is causing climate change; we can foresee its terrible consequences, and we know how to control, reduce and eventually eliminate the use of fossil fuels and to take measures to adapt to the level of warming that is now inevitable, given the CO<sub>2</sub> already in our air. We just have to do it. So turn out the lights when you leave the room, join an environmental group or two, and become a passionate advocate of a stiff carbon tax. Start living a much greener, more environmentally sustainable and ecologically moral life. In short, live what is the good life for the new millennium. Your kids and their kids will praise you for your wisdom and thank you for your sacrifices for their well-being. That's the final, practical piece of advice I'd like to give you in this my last lecture, at least for now.

1. This essay is a reconstruction of the "last lecture" I delivered on July 31, 2016 at the inaugural Summer Retreat for Westminster College alumni, faculty and students. It is based largely on a dense outline I prepared for the talk and distributed to the audience. The essay retains the title, overall structure, conversational style, and much of the substance of the lecture as delivered.

Tangential digressions and asides in the lecture have been eliminated and some additional information and observations have been incorporated into the essay.