Boiling Frogs

Clark M. Thomas

Introduction

This essay is a brief meditation about something more profound than updating astrophysics.[1] Earth's biosphere is the most complex system of systems that astronomers have ever located, and we dwell in the middle of it. No telescope needed. Even though Earth's biosphere would look from a distance like water on a wet soccer ball, we experience our world as flat, vast, wet, and stable. It is not.

Carl Sagan got NASA's *Voyager 2* to look back at the inner solar system as that probe was leaving Neptune for interstellar space. In that poetic look-back image our Earth occupies just one tiny pixel. We are a "blue dot" surrounded by seemingly infinite dark space.

I will herein briefly examine the relatively near-term future for humanity, roughly a century or two hence. Significantly, two centuries is a very long time for social individuals, but a mere tick of the clock for geological time. Many spoiled Americans live in blessed La La Land, believing that what they wish for in their individual and collective futures will happen – and expecting divine grace to save us from the very bad stuff. A study of real human history tempers self-serving imagination.

Nevertheless, I am an extreme human-chauvinist. I awaken every morning astonished at how lucky I am to still be alive as an educated human being in our rapidly modernizing world. I don't want the beautiful possibilities for our species to soon be swept away by the ugly consequences of foolish and selfish actions and inactions.

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[1] http://astronomy-links.net/Solar.Corona.pdf

Human actions after the early 1600s have accidentally created a uniquely emerging geological era, the Anthropocene Era.[2] As a shocking part of this new era we are already entering a sixth mass extinction, possibly including our own species.[3] This level of species extinction has happened five times before within geological history. Less than one percent of all species ever alive are with us, for now.

Enlightened intentional actions, if taken soon enough, could help keep this emerging era working for us, not against us. To that end, as an optimist-realist, I have written this brief overview with quixotic hope for all species, and for the emerging human/AI singularity.

Boiling Frogs and a Boiling Climate

If we put an ordinary adult frog into an open pot with enough cool water to where it can sit and still keep its nose just above the water level, we have the setting for something amazing in a not-good way:

Its pot of cool water is sitting on a stove burner that is not turned on. The frog feels quite happy with nice pot walls around, and never a lid on it. Then we *slowly* heat that pot of water. The happy frog inside doesn't appear to notice the change in temperature as a mortal danger until it is too late. The frog soon cooks, even though it easily could have escaped earlier when the heat was just starting.

Humanity in 2017 is exactly like that initially happy frog in the pot. We live in an era of climate change denial even among people who should know better. A recent survey found that the more a Republican voter is educated, the more likely that person will conveniently deny human-caused global warming.[4] Here is a counterintuitive example of La La Land group-think obscuring scientific evidence. As my father said, "A man convinced against his will is unconvinced still."

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2 https://www.cnet.com/news/orbis-spike-in-1610-marks-date-when-humans-fundamentally-changed-the-planet/#ftag=YHF65cbda0

3 http://www.cnn.com/2017/07/11/world/sutter-mass-extinction-ceballos-study/index.html

4 https://www.nytimes.com/interactive/2017/11/14/upshot/climate-change-by-education.html

Our beautiful biosphere is undergoing a dialectical process whereby accumulating small increases in average temperatures will yield a major change in quality of life.[5] Challenging events (such as the California mega-fires, and more Atlantic/Gulf catastrophic hurricanes) are accumulating toward the usual, not just the unusual. Some of us myopically believe these bad climate-change phenomena are only fluctuating seasonal weather. Major climate changes will emerge anyway over a very few decades without extreme corrective measures.

Oven-like heat and expanding desertification will appear as real climate change occurs. Weather "events" we experience now are only hints of where the biosphere will trend inside the lives of our near descendants. Already, farmers in parts of hot southern India are being driven from their lands. The abnormal is becoming the new normal.

This "distant" trajectory makes the big picture easy to deny today. What will our world be like with "only" an increase of 4 degrees Celsius from today's global average? That small number seems today like a minor change.[6] Crank up the AC, we think. However, heating surges won't stop at 4℃. That's far below average global increases to follow.

A very recent survey of computer climate models shockingly reveals that those with the most alarming projections also most accurately reflect climate changes to date.[7] We all may be looking at global averages increasing more than 4℃ before the end of this century, within the lives of our grandchildren.

In a world "just" 4℃ warmer than 2017 there is still a substantial amount of ice left on Greenland and Antarctica. Ice helps moderate global climate by reflecting sunlight back into space. At plus 4℃ average sea levels are projected to first increase by six feet. However, if all the ice now on land were to melt, sea levels would rise another 200+ feet.[8] That happens not far above 4℃ – and much of the world's

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5 https://www.popsci.com/deadly-heatwave-climate-change

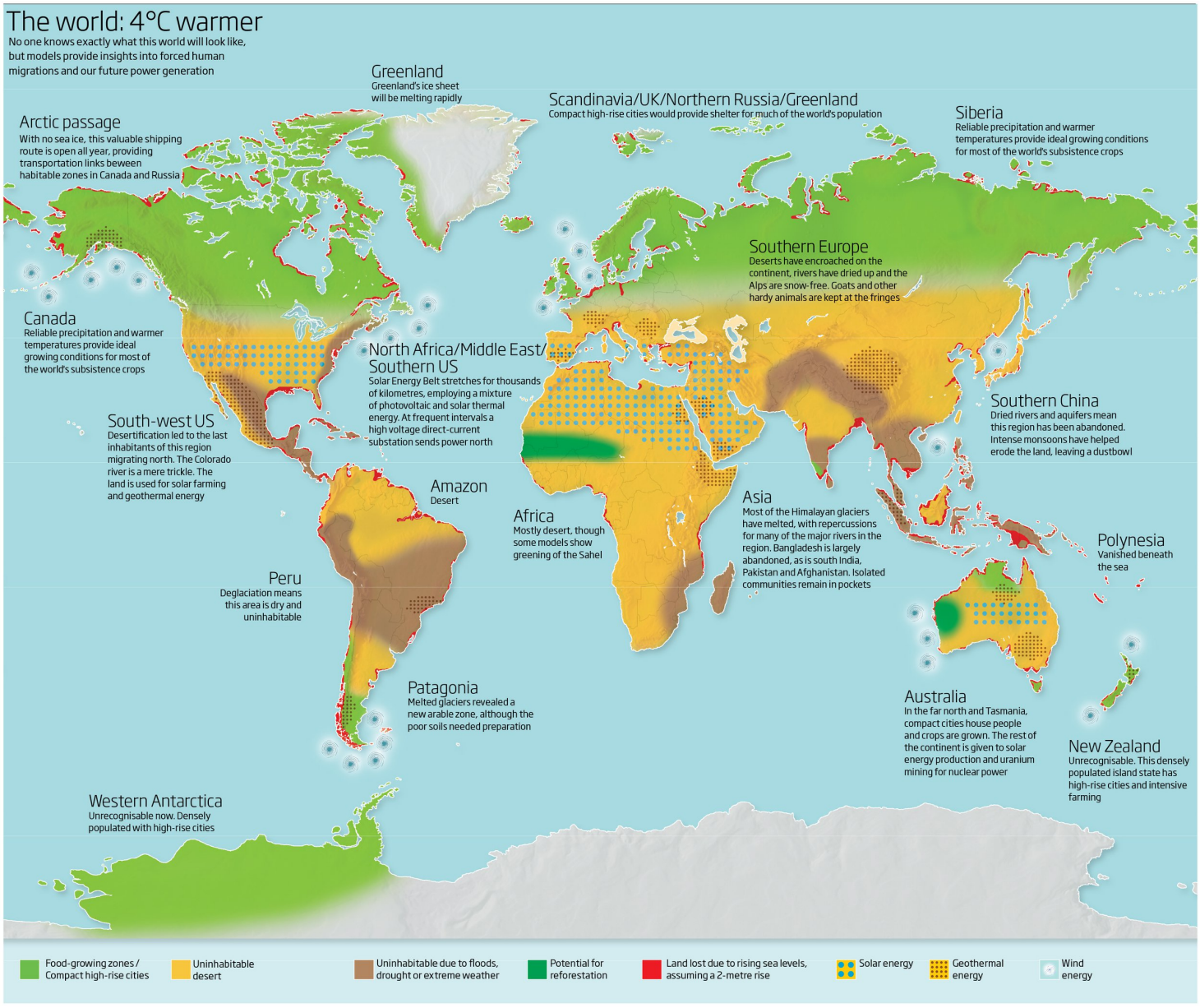
6 https://en.wikipedia.org/wiki/Conversion_of_units_of_temperature

7 https://www.washingtonpost.com/news/energy-environment/wp/2017/12/06/the-most-accurate-climate-change-models-predict-the-most-alarming-consequences-study-claims/

8 http://www.techtimes.com/articles/207191/20170512/what-if-all-ice-on-earth-melted-here-s-a-chilling-image-of-that-future.htm

population lives less than 200 feet above today's sea levels. Factor in more Category 5 hurricane storm surges on top of that extra 200 feet.

The following futuristic map below models just 4℃. Projecting the possibility within a hundred years of several hundred million, or more, deaths of vulnerable people, amid vast shifts in planetary population distribution, is the stuff of nightmares. Nevertheless, *there are some ways to ameliorate the trends*, as will be described later in this essay.



Take note of what happens to South Asia, and to much of South America, including Mexico. A very strong "Trump wall" will be built. Americans should have success relocating to Alaska and to Canada, just as China will occupy eastern Siberia. Western Antarctica will become a southern hemisphere refuge.

This shifting is somewhat manageable – at plus 4℃ – *as long as human population does not significantly increase.* The population of America is now two-and-a-half times what it was when I was a child. There are other and poorer areas growing faster, and most of these people can't easily relocate. Earth's biosphere now hosts 7.5 billion resource-greedy humans, and probably will host twice as many when serious climate change envelops our "blue dot." How will that new tonnage of crowded, hungry, desperate human flesh challenge long cherished ideals of frontier freedom and democracy?[9]

Earthlings could slow this future mischief even now, but sufficiently strong will is not there. It's easier to pontificate, equivocate, and deny. Problem is, denial is not a river in Africa. Thus the boiling frog analogy applies on a global scale for otherwise intelligent humans.

The map's far north and south lands are stretched to fit a spherical globe onto a flat rectangle, making them seem much larger zones of safety. To better read the fine print, just zoom your screen to 300%. You can also reference this map with additional text at:[10]

One excellent source explains:[11] "Scientists expect the amount of land affected by drought to grow by mid-century—and water resources in affected areas to decline as much as 30 percent. These changes occur partly because of an expanding atmospheric circulation pattern known as the *Hadley Cell*—in which warm air in the tropics rises, loses moisture to tropical thunderstorms, and descends in the subtropics as dry air. As jet streams continue to shift to higher latitudes, and storm patterns shift along with them, semi-arid and desert areas are expected to expand."

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9 http://astronomy-links.net/100+years.pdf

10 http://bigthink.com/strange-maps/what-the-world-will-look-like-4degc-warmer

11 http://www.climatehotmap.org/global-warming-effects/drought.html

The map on Page 4 projects changes later in our century, implying much worse is likely to come in the following hundred years as global ice vanishes and average temperatures soar. Semitropical dinosaurs used to roam near the South Pole. Are we heading back to that heat?

Lemmings and Rats

Beyond frogs, there are two mammal metaphors worth considering: The first involves cute Alaskan rodents called lemmings; and the second involves a laboratory rat swimming in clear tank water. Both of these mammals illuminate critical things about human psychology in societies facing severe ecological challenges. These three animal metaphors help to frame a major perspective of this essay.

The approaching geo-crisis has three synergistic elements:
(1) *booming populations,*
(2) *global climate heating, and*
(3) *the potential for multiple nuclear wars.*

MIGRATING LEMMINGS

In 1958 an awarded Disney film, *White Wilderness,* promoted the popular lemming mass-suicide myth involving waves of these small rodents plunging off cliffs, and then perishing from their fall, or just drowning out in the sea. This horribly bogus footage is not at all true, and indeed is a classic example of concocted fake news. Nobody asked the Disney company's mascot, Mickey Mouse, what he thought about how his fellow rodents were portrayed.[12]

Behind every fake news story there usually is a small element of specious truth. In this case, otherwise rather solitary lemmings do migrate in large numbers every four years or so. They are not at all suicidal, but their migrations may be triggered by increased population densities caused by rapid reproductive rates reaching a critical social mass. Surveys of feeding areas from where lemmings have just fled revealed normal amounts of food. Migratory patterns reflect problems of population density more than simple population pressure.

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[12] https://en.wikipedia.org/wiki/Lemming

By comparison, the history of some humans blindly following evil charismatic leaders to their deaths persists. The tendency to swallow and follow is a weakness in human psyches. There are real examples of humans doing this, unlike the allegedly less intelligent rodents. Recent ghastly examples include Nazi Germany, Stalin's Russia, Mao's China, Jonestown, Waco, and ISIS. The living biosphere has been sufficiently elastic to absorb our insanities, until now. We think of ourselves as logically and morally superior to the so-called lower animals, but are we?

SWIMMING RATS

Norway rats living among humans are given reluctant respect, as their fleas can bring us pestilence on a grand scale. They are larger and tougher than rural lemmings, and clever enough to outnumber humans in some cities. So, where's the lesson?

Start with a column of room-temperature water in a transparent cylindrical tank, the surface of which is a foot below the rim of the tank. The water should be sufficiently deep for a single adult rat to only swim constantly to breathe. Insert said rat into this environment, and it will swim furiously for a long time, always hoping to escape. Next, put an opaque lid on the tank, so the intelligent rat can see there is no hope for escape. It quickly quits swimming and drowns.

Rodents have prospered since the dinosaur era. Humans have been around for less than one million years. Would any brave human do better in this rat's place, inside an appropriately larger cylindrical death tank?

Where things get "interesting" is when we notice lemming and rat behavior potentials within normal, historical human societies. Double or triple the population pressures on today's resources-hungry areas will geometrically increase the potential for tragedy comparable to regional thermonuclear war, another increasing probability.

Venal politicians bought on the cheap by wealthy carbon polluters are today coldly orchestrating, through their actions and inactions, the future deaths of many millions. Stop and think about that. Deceptive political ogres only care about cronyism and today's votes, not about tomorrow's carnage. Such causes and effects are not immediately

obvious to all, but they are connected. Every cause has an effect. Every action has an effect. Every inaction also has an effect, sooner or later. To not do something right is often to do something wrong.

Where is today's effective human wisdom? Who in real power and leadership clearly foresees the real emerging future? Specious political lies falsely empower us, and thus we empower the liars with our votes. Don't expect a human/robot singularity to save us in time.

What Stops Runaway Global Warming?

Just as the momentum toward self-destruction on a global scale seems now to be inevitable – there are also a few options that *could* give us additional centuries within the biospherical "Garden of Eden" that we global citizens take for granted.

There are three paths to slowing down, or reversing, dangerous heat and population trends: The *first path* is the very, very bad path, which would "work" in near human time. The *second path* is less likely, but this desirable solution is still possible, namely, wisdom sufficiently applied in sufficient time. A *third path* may happen as a combination of the first two paths.

I wrote a relevant dissertation-quality book manuscript in 1974 when I was in my twenties. I had left two graduate schools at Harvard and The New School for Social Research to research and create this critical thesis advocating "negative population growth." It has over 300 footnoted, annotated references.

The book was of course rejected by stodgy academic publishers as too much like a trade book; and by trade book publishers as too much like an academic book. It was typewritten by me – yes, there was life before the Internet and word processors. Today good scholars can self-publish on the Internet without being hostage to willfully ignorant and myopic publishers. A .pdf photocopy of my original 1974 thesis, *The American Eutopia,* is available free here:[13]

[13] http://astronomy-links.net/TheAmericanEutopia.pdf

Path #1: Horribly Solving Global Warming

There is only one "solution" in this first path. It "solves" both the overpopulation and global heating at once – and it could happen as soon as it takes the lunatics to launch nuclear weapons in Korea.

If somehow the Korean peninsula can be restored to sanity before the nukes fly – there are still proliferating nuclear weapons in India and Pakistan, and also in the Middle East. Furthermore, suitcase nukes could be sold to rabid terrorists; or much larger bombs could be exploded from ships near American harbors – with any such trigger starting a nuclear war.

Beyond regional nuclear wars, the potential for global devastation if Russia and the West were to unleash all their destruction on each other and their allies, would be another dimension of horror. In that planetary thermonuclear scenario our entire species could perish.

Many other species would still survive and prosper: rats, scorpions, spiders, ants, termites, squid, and cuttlefish. Bacteria and viruses would always survive. Advanced life on Earth could be set back a billion years. So much for the global Garden of Eden experiment.

A regional thermonuclear event would directly kill off tens of millions of humans, which still is only a small portion of the world's population. Subsequent nuclear winters would do the real work of slashing population and cooling the planet.

Even if *two billion* people were to perish in a prolonged nuclear winter, along with thousands of marginal species, the net effect would be temporary, except for extinguished other species. Such is the power of human fecundity.

A regional nuclear war COULD be the shock that brings surviving humanity to its senses. If so, we could employ Path #3.

Path #2: Wisdom Applied in Sufficient Time

This second path is by far the best option we have at this critical point in human history. It is also the most difficult to execute with grace inside a narrow window of opportunity, because of the increasing velocity of the climate opponent. Looked at in the context of cultural velocities, it is also unlikely, but not impossible.

In many respects this Path #2 is equivalent to Path #3, in that corrective actions can reset life on Earth for the better. Path #2 does not require nuclear wars, but it does require unlikely wisdom in action, or something miraculous like the instant second coming of Jesus.

Before the modern era, societies were mostly traditional and cyclical. If there were a seeming path to divine power – either as supplicants to a celestial overlord; or as enlightened, self-emergent individuals – there would be plenty of time to seek a global critical mass of like minds, and to achieve a critical mass of sufficient mystical energy to more likely achieve global peace.

The key problem with any mystical solution in this modern era is the *accelerating velocity of bad biospheric change* – so much that the good will emanating from even a few million peace-loving people of coherent mind would likely be overwhelmed by the blowback force of rapidly approaching chaos.

It is also very dangerous to expect Jehovah, Jesus, Allah, or some other space savior to rescue us from ourselves. Nobody really knows the intentional mind of God. We could be approaching another Noah event, this time with fire, and not with water. The *Bible* has multiple references to punishment by fire. Fiery prophecy reads almost like a longing, rather than fear. I call this lazy theology, because the worst case is never the best case. As long as spiritually enlightened humans have collective free will there is hope. Do we now have enough time?

There is a vision circulating among space dreamers who don't like details: Humans escape the planet, fleeing to Mars or elsewhere, and thereby saving the species. This diversion of our energies is very foolish and will not work with the short time we have, among many

other reasons. I don't care if Elon Musk, Stephen Hawking, and others of like fame and mind promote the idea; it won't work.[14, 15, 16]

There is another idea for helping high-level consciousness survive: Transferring human thought into an advanced life form of our creation, and then we/it escape our doomed planet. A singularity fusion of human and artificial intelligence is envisioned within the enterprise to explore, and then colonize, Mars.[17] However, even if we don't try to survive on Mars ourselves, the appearance of high-level artificial intelligence, along with necessary AI support structures, will take too long to happen before dire changes overwhelm the technical nursery.[18]

As a human chauvinist, I don't want my "descendants" to be robots, however smart. Let's try other, benevolent solutions to the legendary Gordian knot. Short of Alexander the Great's cleaving sword, we must work cleverly and expeditiously. Chanting or praying to mystical laws and superior beings is always fine, just not likely sufficient to avert disaster in a pre-doomsday era. In the long run a world of Buddhist peaceniks could be the best outcome. We need to restore friendly homeostasis. Sooner is better than later, but later beats never.

Path #3: Wisdom After Local Wars

Individual humans cannot engineer the biosphere, but collective humans can. We are all living on a tiny blue dot, with nowhere else to turn within many light years of space. If we flee elsewhere, and don't learn the right lessons before we go, we will arrive as space-alien invaders (like Columbus and his followers), and quickly mess up our new home. By the way, if we only have enough time to set up an outpost on nearby Mars, one nasty nuke launched from Earth could eliminate all scrappy humans clinging to the Martian surface.

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[14] http://astronomy-links.net/Saving.Lives.pdf

[15] http://www.astronomy-links.net/MarsColonies.html

[16] http://www.independent.co.uk/news/science/stephen-hawking-just-moved-up-humanitys-deadline-for-escaping-earth-a7722181.html

[17] http://astronomy-links.net/CuriosityvsHumans.html

[18] http://astronomy-links.net/AI.and.HI.pdf

Let's assume that we make it another one or two hundred years, which is a blip in geological time. If our scientific infrastructure is not destroyed to where we fight Einstein's next world war with sticks and rocks, then we have something to build on. It is assumed that the higher temperatures will be here, but there will be safety zones near the poles. Human society could return to dynamic homeostasis, which would give the growing community of spiritual peaceniks time to help establish a benevolent, second "post-Noah" world. I trust this second time will work out better than the first post-Noah history.

There already is a modest trend away from using greenhouse gases. Solar, geothermal, wind, conservation, and other energy sources are helping. Again, alternate energy strategies vs. climbing third-world populations, are in net too little and too late for a serious change to the near term climate death spiral.

There is one thing that we could do short of war that would sharply slow down the rush to boil in our own frog pot. That option has two catches, and maybe this idea better belongs under Path #2:

We now have the technology to produce near-space planes and even balloons to send up sulfate aerosols into the stratosphere that will reflect enough solar energy to offset greenhouse gases. This clever strategy will give us some time to help prevent wars brought about by competition for shrinking resources.[19] The catch involves two elements:

First, we *MUST* control the Malthusian growth in global population, and very soon.[20]

Second, we cannot send up fleets of rocket planes with protective aerosols if we wait until after our flight technology has been destroyed. In other words, no launch capacity = no aerosol brake on the runaway greenhouse. If we start deploying this technology, but subsequent wars take it away, then the protective sunshade will dissipate.

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[19] http://onlinelibrary.wiley.com/doi/10.1002/wcc.423/full

[20] https://www.theguardian.com/commentisfree/2015/dec/04/climate-change-population-crisis-paris-summit

Humans surviving advanced climate heating and regional wars will appreciate that their primitive camp fires will not stimulate additional greenhouse gases, which is good. In that belated way carbon gas levels would very slowly decline through deposition onto ocean floors, and we would eventually be back toward today's levels.

However, there are now additional sources of methane and other greenhouse gases that will soon erupt from frozen tundra and ocean floor deposits, as both land and water heat up. It may take *many thousands of years* before our biosphere enjoys temperatures like it does today, even with a good version of Path #3.

The folks in Hiroshima on August 5, 1945 were living normal lives. What does the clock look like today for global civilization?

"Think globally, act locally." For centuries we have selfishly thought locally, and thereby indirectly acted globally in ways that could lead to humanity's destruction in every locality. In other words, what goes around comes around. This is all beyond irony.

There still is some time and opportunity to correct the course of global civilization – but how much more time do we have before corrective opportunity vanishes in a mushroom cloud?