I don't have cancer. I hope I don't ever get cancer. At the same time, we know about cancer. We know that if we want to maximize our chances of survival, we need to discover and treat cancer early. Really early. Earlier than we personally could detect that it exists in us. Since cancer is relatively well known, and ugly, billions of dollars have been spent to detect and treat it. We don't know everything, but we know enough to know we have to find it and nail it early. Global warming is like the first case of cancer. No one has seen it before. Even the term is a catchall. It might even sound comforting to someone in Minnesota in January. The term began decades ago when it was discovered that the earth's temperature was climbing. Slowly. Steadily. No one really understood then what this term meant. Warming seemed a good enough description.

It's not. Because we haven't had millions of cases of global warming, like we have had millions of cases of cancer, we have no idea what this phenomena is. The first case of cancer probably killed the person who had it. Maybe the first 1000 people. Doctors and researchers had to figure out what was going on and try things. Since they had plenty of people to try things on, they have become way way better at detecting and defeating cancer. By contrast, we as a global community have never faced global warming before. We are going to have to try things, but the "things" we are going to try appear to be unpleasant, just like chemo and radiation and surgery. We know those cancer treatments work, mostly. We don't know about the treatments for global warming. What will they cost? Will they be effective? How much will we suffer? What if we ignore it? Maybe it will go away?

We just don't know. That could be a prescription for inaction. Let's wait to see what happens. However, we know that if we take that attitude about cancer, it won't be pretty. Cancer just doesn't go away. It gets worse and untreated it will generally kill you, often painfully. Scientists are the doctor equivalents for Patient Earth. They may not know exactly how the Patient will do, but they know well enough that untreated, the Patient will alter life forms to adjust to new temperatures. She's already doing that. In that "shift to a new reality", She will do things in response to the heat. Just like steadily growing heat under a boiling pot will cause the water to boil over and spew scalding water all over the stove, that extra earth heat will take the form of bigger storms, wild fluctuations in weather patterns, floods, droughts, derechos, tornados. Things move much more when they are hot. That's not anger. That's physics. That's the principle behind a bullet and a bomb.

What the earth doctors are saying about Patient Earth is that she is heating up faster than everyone thought. Since physics rules, that means weather patterns will get worse. Other things happen too, like ocean acidification. None of this might mean anything to you unless you like to eat and not dodge falling trees on a daily basis. The heat is merely a symptom of the problem. Patient Earth's response to it is the consequence of the problem.

The problem has been triggered by an unprecedented rise in the quantity of what has come to be called greenhouse gases. Those gases, which include carbon dioxide and methane, are invisible, odorless, soundless, tasteless. The gases are lighter than air, so they rise and form a blanket over

the earth. The gases come from burning fossil fuels: oil, coal, natural gas. Anyone who doesn't know this by now has been living in a cave.

Heat is a symptom, Patient Earth's response is the consequence, and green house gases are the cause, but what's the *real* problem? Think lung cancer. Coughing is a symptom, feeling bad and maybe dying is a consequence, and smoking is the cause. But what is the problem? For lung cancer, it's addiction. For humans, it's an obsolete mythology.

The physics are simple and, because physics is just a term for fundamental laws of the universe, the laws are as immutable as the nuclear reaction in stars. Just because we can't see carbon dioxide doesn't mean it isn't there. Just because we don't like the idea of having to change our behavior (whether cancer or those Patient Earth consequences) doesn't mean we get a pass.

For the last half million years, based on uncontroversial ice core data, the relationship between carbon dioxide and temperature has been in lock step. Just type "vostok ice core graph" into your browser. During this period, CO2 has peaked around 280 parts per million (ppm); when it did, Patient Earth's bounty was similar to what we knew in the middle of the 20th Century because temperatures met the Goldilocks standard. Not too hot, not too cold. When the CO2 was much lower, so was the temperature, and there was an ice age.

Because of the unprecedented increase in burning fossil fuel to move humanity up what might have been called the progress ladder, the global ppm has now climbed to 390 and change. Patient Earth doctors have seen Her temperature rise, as if she had the beginnings of a fever. She's not doing so well. Having an off day. Really the beginnings of an off millennium. Taking a wild guess based on almost no prior experience, the doctors came to a preliminary consensus that if the global ppm did not exceed 450, the resulting fever that Patient Earth would have would be tolerable. She'd only (probably) have a 2° fever. Not great but probably not life threatening.

But life threatening to whom? To Patient Earth? No. It's just physics. Stars form and burn out and die. Planets form and have life, or not, and that life adjusts to the conditions of the planet, or not. If the conditions change just a tiny bit, "life" might not change all that much. Look at the Vostock chart. You'll see 4 ice ages. Those ice ages were chilly for sure but life could work with that temp range.

390 ppm is way off the chart. No one knows what the temp will be, and thus no one knows how well life forms will adapt to that temp. Far more to the point, we are not stuck at 390. We're well on our way past 450 to maybe 550 or more. Now. It's in the pipeline. It just hasn't "hit" the meters, and like the descent of a fever, it has a multi-century and some say irreversible trajectory. Patient Earth is on it. We are on Patient Earth. She makes our food. She makes 100°+F days for weeks or months in a row. She's got a fever. We are giving it to her. Do the math.

Constant and severe weather disruptions affect plants, animals and bugs. As those species die off or don't function like we want or expect them to, the bounty that they used to provide drops off

fast. That bounty isn't cute Disney Bambi scenes: it is your food, from the sea or the land. It's not just the food. It's also the systems. In the Northwest, humans (west of the Cascades) don't need air conditioning . Everywhere else in America we do (even if it didn't exist 40 years ago). A/C needs power and as a nation our national grid is maxed out. Power needs water. Since water evaporates faster in a warmer world, water shrinks from rivers to become airborne. Power plants use humongous quantities of water. They can't work if there is warmer water or no water. (http://news.nationalgeographic.com/news/energy/2013/01/130130-water-demand-for-energy-to-double-by-2035/)

There is only one question that needs to be asked, regardless of your age or occupation. Whether you are a school teacher or administrator, an employee, a parent or grandparent, a voter, retired or a student, whether you work for a corporation or a non-profit, whether you are religious or an atheist, regardless of the color of your skin or the language you speak or your sexual orientation, whether you are in the military or a civilian, there is only one question: what are you doing to prepare yourself, your workmates, your children, your home/community/city/county for a 4D to 6D habitat?

Huh? The "D" here stands for degree and the degrees are in Centigrade. They reference an average global temperature 4 to 6 degrees C warmer than what the founding fathers experienced. The term comes from the IEA (google it). They use the term "4DS" to mean 4 Degree Scenario. So far no one wants to pencil out what a 4DS or a 6DS world will actually look and feel like. That's because they don't know. Haven't been there before. The docs can tell you what an Ice Age will pencil out like. They can't tell you what a 6DS Patient Earth will be.

Dan Kammen, a Nobel Prize winning member of the IPCC, said recently: "while scientists rightly talk about the 2° line, the path the world is currently on, namely 4 – 6°C will be catastrophic."

http://www.greatenergychallengeblog.com/2012/12/18/after-disappointment-at-doha-time-for-action-on-climate-change/

The closest way to imagine a 4 -6°C world is to imagine how you would feel if your body temperature were elevated by 4-6° F (***permanently***). If you're up a degree, you don't feel well. Up 2 degrees and you definitely have a fever. Up 3 degrees, (101 something) and you don't go to work. Up 4 degrees (102 something) and you are calling the doctor. Up 5 degrees and you are heading for an ICU if you are still alive. This is a rough gauge of how Patient Earth will work. Greater and greater devastating storms. Whole swaths of the American Bread basket toast. Summer temps that are triple digit for weeks or months. Rolling blackouts. More coal fire power plants you say to run those o so needed air conditioners? More CO2 means even hotter temps. That's not going to fly. And then there is that pesky water problem. Nuclear plants need water too.

Kammen isn't joking. You, and really your currently-living descendants, will be eating catastrophe for breakfast every day.

Unless... you get that Patient Earth health checkup fast and then do the Patient Earth cancer equivalent: major chemo, major surgery, major radiation. Fast. *She* gets hot: *you* get sick. Does she care? No.

A way of imagining how Patient Earth works is to compare it to the internet. From something that didn't exist in the 1950's and didn't get popular until the late 1980's, the internet is now global with hundreds of millions of servers and billions of users. Everyone is connected to everyone. A disturbance (think virus or malware) that originates in someone's bedroom can disrupt information on millions of computers anywhere on the planet, not over the timeframe of a year but of a day. Depending on the infection vectors and the payload of the virus, millions could lose lifetimes of creative work. We are now developing the internet of Things. Instead of just your laptop and maybe your cellphone, you'll also have half the items in your house (refrigerator, thermostat, dryer, automobile) and body parts (insulin dispensers, on-board heart monitors and pacemakers, drug monitors and dispensers, etc.) on the net. This growing ecosystem only works if everyone pretty much stays in their lane. If a rule-breaking disruption occurs, the system will degrade. If the rule-breaking disruption is severe enough, the system will fail.

Patient Earth's biosphere is a net. Some of it is connected wirelessly. Much is connected biologically at a level of size and scale that is entirely incomprehensible. It is a net that has been constructed over millions of years. It is robust enough as long as the fundamental physics doesn't change. The PE biosphere net has resilience boundaries. Exceed the boundaries, the net will start to fail. How fast? How deep? How permanently? No one knows. What we do know is that once an organism is dead, it's dead. What we don't know is how much wiggle room we have at the edge. We have experience with cancer. We have zero experience with Patient Earth fevers.

One of the most famous lines uttered by Harry Callahan, of Dirty Harry fame, was ...here's Wikipedia's take:

> While in a local diner, Callahan sees a bank robbery in progress and, alone with his revolver, he kills two of the robbers and wounds a third, challenging the man lying near a loaded shotgun:
>
> I know what you're thinking: "Did he fire six shots, or only five?" Well, to tell you the truth, in all this excitement, I've kinda lost track myself. But being this is a .44 Magnum, the most powerful handgun in the world, and would blow your head clean off, you've got to ask yourself one question: "Do I feel lucky?" Well do ya, punk? (http://en.wikipedia.org/wiki/Dirty_Harry)

So, in all our excitement to burn fossil fuels, knowing full well that we alone are causing Patient Earth's fever, and it is getting worse, and it will run it's thousand year course (no antibiotics, no homeopathic remedies), and we've never seen Patient Earth this sick before, we have to ask ourselves, "Do We feel Lucky?"

The mythology I referenced earlier was one of subdue the earth. Since we've been surprisingly good at this, we've moved from gratitude for the bounty of the earth to an entitlement to the resources of the earth. Earth was there for us. For centuries there was no pushback. Earth seemed limitless and the consequences of taking were either unknown or minimal or manageable. That this mythology was immature was trumped by it's apparent success. We were our own crack dealers supplying to ourselves. Unsupervised kids in the candy store. Like the robber in Dirty Harry, a fossil-fuel driven technology will get you almost anything. That is, until our failure to understand physics causes Patient Earth to get sick enough to change the food, weather and comfort game.

Kids don't vote. Kids don't have the wisdom or knowledge or experience base of adults. They are dependent and relatively speaking powerless in the terms of the current mythology. We developed-nation adults are not walking whatever talk we imagine about the need to downsize our carbon addiction anywhere fast and deep enough to alter Patient Earth's accumulating and descending fever. Since Her fever will take decades to manifest it's full portrait—what we see today is a mere black and white sketch at the edges of the canvas—we are committing genocide on our descendants. Since this is a time-based homicide, it is as if we were shooting very very slow bullets at them from our automatic weapons. Those bullets will take 20 to 30 years to reach their targets. That is too long for us to experience sensorily. We have to experience our pulling the trigger today and sending those bullets out today as seriously as we experience the words of the doctor pointing to the MRI and the X rays and the blood tests and telling us we waited too long.

Joe Symons
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