The Elephant in the Room

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Is There a Problem?

To me, it's been painfully obvious for decades that continuous population growth is probably not a great idea. I never really thought about it at all growing up with three siblings, a nice rounded family of six seemed quite natural. I was actually pretty clueless about the environment in general as I was growing up, probably because it wasn't as concerning as it was a decade later. My husband, Hilary, also grew up in a family with four children. Our original half-baked plan was to have four kids. We didn't even think about how we would support them, that part seemed like it would somehow work out.

But then, sometime in my late 20's, when I first began to awaken to our environmental problems on this planet, I began to realize that endless uncontrolled population growth would make things worse, if not impossible to fix. I was positive that there would be no way to get in balance with our planet if we kept growing our population, and it felt hypocritical to even consider having more than two kids. So, we stopped at two. And, it was easy. I simply took birth control pills until our kids were around 5 – 7 years old, and then Hilary had a vasectomy so that I could stop using birth control.

And, looking back, I'm sure glad we stopped at two. Why? Well, in addition to not making our planet's problems worse, we also saved a ton of money that now allows us to have a nice, enjoyable, flexible retirement. Not only that, we also have the means to help our two sons financially when they need it, particularly for important things like education and helping them buy their own homes, in a time when it's increasingly difficult for young middle class workers to break free of tenancy, and the whims of sometimes greedy landlords. I believe that we were better able to tend to our children and raise them with only two, giving them the individual attention that they needed and deserved.

It was about 1990 when we chose to stop at two. At that time, global population was 5.3 billion. Now, after another 30 plus years, we're at 8.2 billion. And it continues to astonish me that, while it was so obvious to me, that I could easily see this coming, how this basic problem could be essentially ignored all this time by the general public. We whine about the constant construction, traffic jams, the annoyance of too many people everywhere we go, we fight over water and other resources, we worry in passing about the decline of the monarch butterfly and the whales, without thinking about the absolute fact that continuous population growth is at the bottom of it all. And, the more conservative factions among us are so clueless that they even go so far as to make it difficult, if not impossible, for women who want to control their family sizes to do so. Does that seem absolutely fucking ludicrous to you? It does to me. Just saying.

> "There are two ways to be fooled. One is to believe what isn't true; the other is to refuse to believe what is true." Soren Kierkegaard (1813 – 1855).

Population growth is our biggest environmental problem. Every time we add another human to the planet, our carbon emissions increase by 5.26 metric tonnes per year. For every 1% increase in global population, our numbers increase by 80 million and global emissions increase by more than 400 million metric tonnes. Does that sound like a lot? It is. Yet, nobody wants to talk about human population. Well, that's not completely true. Over the past hundred plus years a few brave souls have addressed the issue pro-actively, from Thomas Malthus to John Seager and Lee S. Polansky [1,2,3,4,5], beginning in 1798, with Malthus's "An Essay on the Principle of Population" up to current. There's probably something before 1798 that I don't know about.

There are even a few non-profits dedicated to population control on our planet. Population Connection, which started out as Zero Population Growth in 1968, then morphed into Population Connection[6], in order to emphasize the link between runaway human population growth and pretty much every environmental problem on this planet.

There's also Planned Parenthood[7], dedicated to providing women with the health care they need, and the resources to control their family sizes, including birth control, contraception and education. The Center for Biological Diversity is an activist organization that promotes action that supports maintaining surviving wildlife and plant species, while promoting sensible control of human population[8]. These organizations work globally, because runaway population growth isn't just an American problem. It's a global problem.

Actually, the U.S. has managed to rein in our population growth rate a bit in the past 50 years, but we continue to grow, increasing by 0.5% from 2023 to 2024. And, 0.5% might seem really low, but it means we added 2 million people, which is a lot. It's amazing that we've reduced the growth rate at all, given the inconsistent government support due to policies such as the Global Gag Rule,[9] to name one example, which takes effect whenever a conservative President takes office, and then is immediately rescinded when a progressive President takes over,

Per Chapter 3, we need to get to an annual *reduction* of about 1%/year globally to have any chance at all of getting in balance with our precious planet. In 2023 global population increased by slightly less than 1%, or 75 million. As we continue to increase our population, we reduce yet more wildlife, take over yet more land, and continue to increase CO_2 output and reduce CO_2 absorption sinks from forests and other wild lands, as we require yet more food, water, general consumption of goods, and increased construction to provide homes, schools, utilities, factories, stores and roads to handle the extra demands of the additional population.

The Math

The math in Chapter 3 tells us what we need to do. We need to reverse the population growth into a kind and gentle population decline. If, that is, we want to save some semblance of the life on our planet. And, this is nothing new. Unless you avoid all forms of communication, media, education, say no to science, have failed to notice constant growth and construction, more buildings, more roads, wider roads, urban sprawl, and more crowds in national parks, to name a few examples, and are blind, deaf and dumb, or just returned from Mars, you must have heard at some point in your life that human

population continues to grow at alarming rates. And, I guess even that would be easy to ignore or blow off, as most of us do, if we weren't living on a finite planet with finite resources.

Now, you ask, what do I mean by finite resources? After all, even in this day and age, there's still plenty of open space around, and we are able to feed and house everybody. Right? Actually, sorry, but nope. Not true. Problem is, we're actually *not* able to feed everybody. At this time about 10% of people on this planet face acute food insecurity, which works out to 864 million people, including 36 million children under 5 years of age.[10] Also, we're experiencing more and more problems with water scarcity, which is an obvious problem, since we need that not only for basic survival, but also to grow our food.

As for land, there might seem to be lots and lots of land around, but the sad truth is, that endless as it seems, we humans have already taken far more land than we should from the other life on this planet, basically driving wildlife to the brink of extinction, taking out 73% of wildlife in just the past 50 years.[11] If we keep it up, and grow our population to 10 billion, like the UN predicts could happen, we'll drive our wildlife down pretty much to zero, as shown in Figure 1. The blue line is our increasing population in billions, and the red line is the wildlife population, which is decreasing, and will be driven to zero soon after 2040.

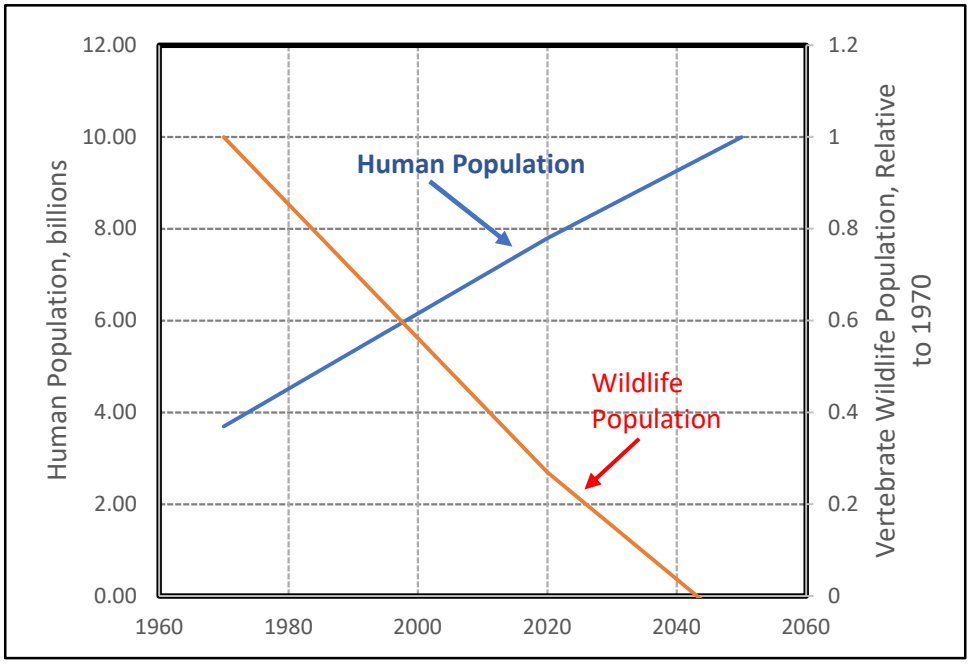


Figure 1 - Increasing Human Population is Driving Wildlife to Extinction.

To be specific, we humans have taken over most of the arable land, so when I talk about driving wildlife to extinction, I'm talking about arable land, which can serve some sort of purpose for humans, and for wildlife, the "good" land, like farmable land, forests, and even semi-arid land, which would in a completely natural world, not really qualify as "farmable", but since we've taken over more of the "good" land, we've extended our farming and even livestock into crappier land that can barely support agriculture, bringing in water from often great distances in order to satisfy the continuously increasing endless wants and needs of our continuously growing population.

In the U.S., about 37% of the land is desert, 29% is grassland and the remaining 34% is forest. Almost all of it, about 95%, is managed by humans in one way or another, for natural resources like wood products, mined resources and fossil fuel, as well as for agriculture and grasslands to graze

livestock or grow feed for livestock.[13] If you think about it, that doesn't seem to leave much for wildlife, does it? Maybe 5% or so?

Actually, managed land doesn't necessarily mean that the wildlife can't live there. For instance, in a grassland where cattle graze, there is some wildlife there too, however their lives are definitely stressed because of our activities. Deer have to jump fences and hope they don't get stuck in barbed wire when they're migrating, any animal takes a chance of getting run over if they dare cross any of the 3.9 million miles of total road that cross this country everywhere, impossible to avoid if you think about it. And, if you happen to be some sort of predator, you stand a great chance of getting shot if a rancher sees you, whether or not you've dared to hunt their livestock, which displaced the "legal for predators" deer and elk that used to live there. Too bad the predators can't read the signs or understand our laws that we imposed when we occupied their land.

We've not only taken all the arable land from wildlife, we've also taken over most of the desert, since we ran out of arable land. This is why we have such large western cities like Phoenix, Las Vegas and Las Angeles in arid deserts, that depend on water supplies from other states for domestic use and farming. It also explains why we have so much fussing and fighting over water in the west. There are way too many people for the limited water available, by a long shot. When you have cities fighting over water for people with farmers who grow our food, that's when you know it's bad. Technically, about 5% of U.S. land is actually considered "settled", meaning that there are actual towns and cities with buildings on it, but we're exploiting the rest and impacting wildlife in the process.

> "Whiskey is for drinking, and water is for fighting over." Mark Twain

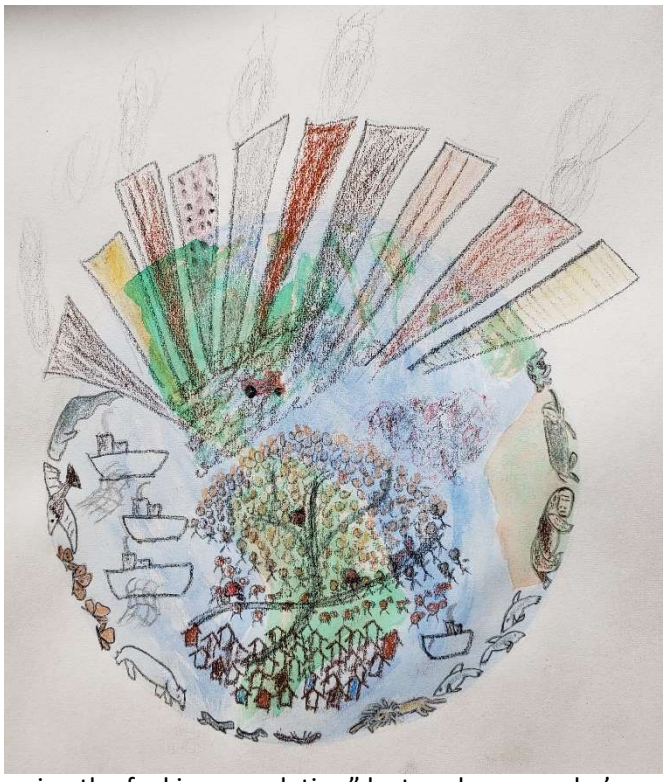
As if our dominance on land wasn't bad enough, we've also pretty much overfished the ocean. Even worse, the CO_2 that we're spewing into the atmosphere is also dissolving in the ocean, making it more acidic, which weakens and dissolves the shells of shellfish. So far, we've driven at least 2270 terrestrial and aquatic species to extinction or nearly to extinction, meaning they'll probably be mostly gone in the next human generation.[12] This is a very approximate number because we haven't even defined 10% of the estimated number of species on our planet. This is 1,000 to 10,000 times the natural extinction rate for the past several million years, as species gradually adapt to gradual changes in their environment. What does that tell you? I hope it scares you. It scares me.

I Know! Let's Get Another Earth!

One way to view our global overuse of resources is to consider how many earth's worth of resources we're consuming every year. Sort of like spending more money than you make every year. Eventually it will catch up with you, and you'll end up homeless and starving. It turns out that, at this point, globally humanity is consuming a quantity of natural resources that is equivalent to 1.7 earths every year. This means that humanity is using natural resources 1.7 times faster than the planet's biocapacity can regenerate.

Even worse, if we all lived like Americans we would be consuming 5.1 earths per year. Does that sound like a slightly unrealistic way to live? A bit over budget? I mean, should we maybe back down from our mansions into apartments, so to speak?[14] Obviously, we can't live like this forever. Eventually

our credit card will get cancelled and we'll have to declare bankruptcy. Like our former President Donald Trump had to do six times. Um, you must be wondering how we can blow our planetary budget by 1.7 times? Seriously, we have just one planet, here we are, the planet's not gone, and we're here too, so how can that be? And, if you're a small-minded thinker, you might call bullshit, based on the size of your apartment, or your house, or your yard, and even divide it by how many people live in your house. Good for you.



Next time, you might want to think about this, and consider all the land needed to grow your food, given that land for agriculture is 44% of habitable land,[15] a helluva lot more than the land occupied for settlements, where we live, which is about 5% in the U.S.[16] Think about the resources that are extracted from that land to make your gas and coal to get you your electricity, and all the mines and quarries that pull yet more resources that are then processed by industry to make all the shit you buy. And don't forget about the oil that's extracted and the refineries that refine it so that you can drive or fly wherever you want, or to make that wonderful plastic that shrouds pretty much everything you buy.

We're continuing to decimate wildlife as we keep taking yet more land to satisfy our ever-growing population. I had a family member recently asked what we have to do to stop all the construction. I spared her my "stop growing the fucking population" lecture because she's a hard-right evangelical Christian and it was a family event that I didn't want to ruin with my tude. My husband probably would have killed me, which would have at least reduced our population by one. Anyway.

By the way, at our current population, to get in balance with our planet, we'd all have to live a lifestyle similar to that in North Korea or Ghana, or similar kinds of less-developed countries. Sound fun? I don't think so, but that's just me. Hell, we already have people doing that right here in Colorado. In addition to the homeless in Denver, there are people working in the mountain towns, including the gentrified town of Breckenridge, right here in Colorado, who live in tents because they can't find a place to live that they can afford. A guy from the neighborhood where I grew up died of hypothermia doing that. I ran into a waiter at a local restaurant who said he was doing that.

By the way, that national forest land doesn't count as "settled" land technically, but humans are definitely impacting wildlife. In Breckenridge, a moose was grazing nonchalantly on willows by Blue River as crowds of people stood around and took selfies. They're getting used to us, too. That can't be good for them come hunting season. My point is, we don't have to be necessarily settled on land with a

house to mess up the wildlife, our mere presence messes them up, so managed land is still land that we've taken from wildlife where they can no longer live their original wild existence. Just saying.

Back to the multiple planets, yet another way we're overextending our reach is by using fossil fuels. These fuels have built up in ancient rock formations over millions of years, and now we've managed to consume almost 70% of the original fossil fuel resources in just the past century.[17] Think about that. That's worse than a Thanksgiving dinner that takes all day to cook and is consumed in less than a half hour. It literally took millions of times longer to produce than to consume. Wow.

At this point, we're dependent on fossil fuels for pretty much everything we do, except maybe breathe and take a walk, though technically to do either of these things, we need food and water at the very least, and those definitely depend on fossil fuel, from treating the water and pumping it to the farms or our homes, to applying petrochemicals to the land to grow more food on a given amount of land, to transporting the cows to the slaughterhouse, then grinding them up into hamburgers, to refrigeration of our food, to cooking it, and to transporting it from far, far away where it can be grown, say, in South America in winter, to the nearest grocery store, which also had to be constructed with metal, plastic, glass and wood, and then heated with, you guessed it (I hope) - fossil fuels.

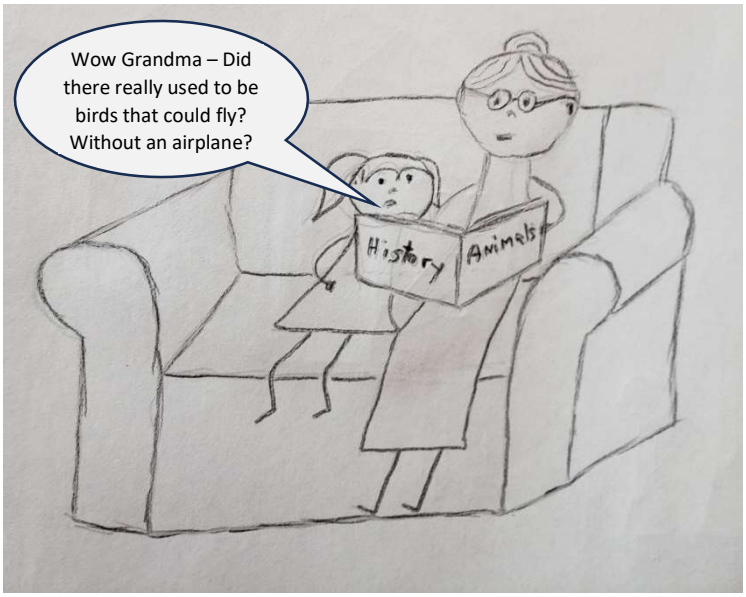
Basically, we're stealing from future generations, by squandering millions of years of biodegraded ancient life in just 100 years, leaving the next generations with less than 30 years' worth of fossil fuels. Specifically, we've burned enough of the original reserves to release 2.5 trillion tonnes of CO_2 into the atmosphere, with about 1.3 trillion of the original 3.8 trillion metric tonnes still in the ground left to burn. This would be like taking the enormous wealth that your father built into a legacy, and pissing it away in just a single lifetime. Much like our embarrassing demented President Trump has done. Now that you know, are you cool with that? Do you still want to just keep on burning it until it's completely gone? Are you sure you want to be that shortsighted moron? Think about that.

> "There is one thing stronger than all the armies in the world, and that is an idea whose time has come." Victor Hugo

If we keep on burning away until it's gone, not only will we have to figure out another resource to suck to oblivion from our planet, the planet will be even hotter than it is now, and the ocean will be so acidic that no life will survive there. Wouldn't it make a bit more sense to put forth some rudimentary level of effort now to mitigate this devastation to the extent possible now that we know what we've done? For our families? For our people? For humanity? For wildlife? If so, then how would we do that without reducing our population? Think about that. If you have any ideas, bring em on!

A Price to Pay

So, now, do you get the picture? If you've been clueless until now, are you waking up at least a little? I sure hope so. If not, our species and our planet are doomed. And, to be clear, the planet won't really be doomed. It will likely be better off without us. It will probably heat up to an unlivable rock, something like Venus, for a billion years or so, and then it may or may not gradually begin to form life, as it did to begin with, 3.5 billion years ago, with single-celled organisms that took 3 billion years to multiply into rudimentary life forms, then another 300 million years to develop into the walking, roaring life that was the dinosaurs, 65 million years ago.[18]



The point is, if we fuck up this planet for good, it will take a helluva long time to recover, and even longer, if ever, to be habitable for any of the kinds of life forms that are here now. And our children will definitely have to deal with some serious crap because of us, if we don't turn this around. They will lose the freedom and flexibility that we currently enjoy, they'll deal with increasing restrictions and shortages and violence, because of poor decisions we are making and what we are doing right now. And, a huge piece of the problem is our population growth. We really do have to knock it off. If we truly want to get in balance with our planet, and the other life that lives here.

How Did We Get Here?

At this point, a brief review of how us humans managed to wiggled our way into the position of the most dangerous force on the planet might be useful. Beginning at the beginning, primates, our earliest ancestors, appeared around 34 million years ago, and it took another 32 million years before the earliest human-like creatures, Homo habilis, came into the picture, about 2 million years ago.[19] By around one million years ago, global human population is estimated at around 2.5 million people,[3] less than the current population of the metro Denver area. Think about that.

Figure 2 is a rather strange-looking graph of human population from one million years ago to 2020, that illustrates how fast our population has grown in the past couple hundred years. The blue line at the bottom of the graph is the human population, which was miniscule and barely detectable until around 8,000 years ago, when it began to slowly and perceptibly rise. The population in 1860 and 2020 are marked on the graph and it's obvious how quickly we've grown, and how extreme our numbers have become in just the past two hundred years. This is what I mean by horrifying. Do ya think?

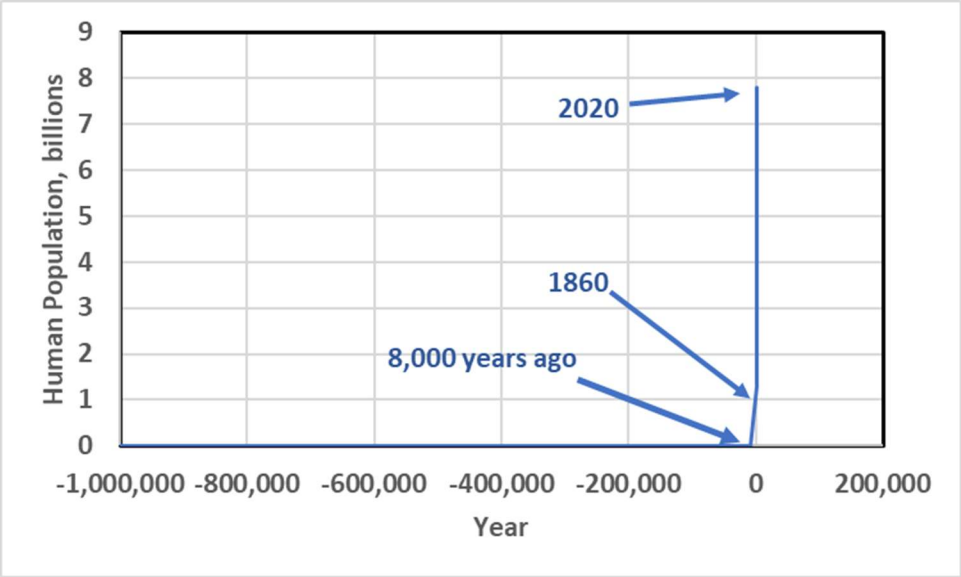


Figure 2 - Historical Human Population Growth

From one million years ago, we began to grow our population, as we figured out how to talk, make fire and weapons, and grow food. We started out in Africa, but it didn't take long for us to sufficiently overpopulate that vast continent to the point where we felt the need to migrate, and by around 16,000 BCE we had reached the North American continent, filling both North and South America with our species in just a few thousand years as we continued to run out of resources in one region, which compelled us to move to the next. In North America, it didn't take us long to drive the Wooley Mammoth and other great beasts to extinction with overhunting.

We eventually settled into a sort of equilibrium, with various tribes and cultures in relative balance with their local environment, fighting as necessary over territory, with a small percentage of goods traded from outside the region, things like jewelry, spices and salt. Local population growth was controlled by famine, war, infanticide, suicide and disease when it would grow to the point of getting out of control.

It is estimated that by around 8,000 years ago, our population had reached around 5 million people, doubling in about 1 million years. That's where the blue line in Figure 2 barely tips up from the bottom of the graph. Then our big brains aided by opposable thumbs figured out how to do things better and faster, and we became astonishingly adept at leveraging resources in our environment. Not only did we get really good at utilizing human resources, we also figured out how to use animals like horses to do the really hard work of converting natural resources into food, shelter and other necessities.

By 1860, our population had reached 1.3 billion, basically doubling eight times in a mere 8,000 years. That should have been horrifying to anybody who was paying attention at the time, but nobody

was. Actually, that's not completely true. One person who actually noticed and saw that it might be a potential problem was Thomas Malthus[1] and perhaps a few other prescient humans who actually read his book and got his point. At that time, we were already clear-cutting entire forests to make way for agriculture and to provide materials for construction and wood for heating, indications that we were already overrunning the planet. Then we figured out how to cure diseases, extending life expectancy. Which was great, and would have been a good time to start thinking about controlling the number of births since we were living longer, but we didn't.

In 1873, the U.S. Congress passed the Comstock law, which made all forms of contraception illegal, a misguided response to Christians who saw contraceptives as evil and encouraging lewd behavior. Yeesh. Sadly, many in the world today still seem to follow that misguided and dangerous mindset as they continue to push abstinence as a valid means of birth control, even though it hasn't worked in literally the past 2 million years. It seems that we never learn.

In 1879, Thomas Edison finally got that incandescent light bulb invented, leading to the first electrical utility plant a few years later. And then, just a few short years after that, German engineer Gottlieb Daimler invented the first practical internal combustion engine. Then, in 1902, American engineer Willis Carrier invented the first air conditioning unit, which eventually led to population migration to southern states.

So, can you see where this is going? Like I said, our big brains were developing all kinds of technology that not only made our lives easier, but totally depended on fossil fuels. So, naturally, we embraced all of that, and even began to occupy previously uncomfortably hot regions when we overran the cooler ones with our growing population and inability, at least in the U.S., to control it with contraception.

By 1902, global population had reached 1.7 billion, and we started having trouble feeding everybody. The food problem was solved, at least for the short term, in 1908, when German chemist, Fritz Haber, discovered how to use nitrogen to make ammonia fertilizer, enabling a revolution in agriculture that enabled us to feed millions more on arable land that was getting more and more scarce. However, the actual reality is that ammonia is made with methane, so this was yet another technology that was completely dependent on fossil fuels that enabled yet more population growth. Keep in mind that we'll be running out of fossil fuels in the relatively near-term, as discussed above, with methane, or natural gas, going first.

Luckily, we can actually produce methane biologically, with septic tanks, wastewater treatment plants, and cattle's asses, but probably not in the quantities needed to provide enough electricity, heat and fertilizer for all of us. Also, capital costs are pretty significant to collect methane from wastewater plants and septic tanks, so you can definitely expect your wastewater treatment costs to increase. By a lot. Of course, we probably won't really notice, since the costs of all the resources we need to survive will increase by a lot as they become less and less available as our numbers and demands increase beyond earth's capacity to provide them, even with petrochemicals. Which will be long gone by then anyway.

We started fighting over territory on a global scale in 1914, with World War 1, which resulted in the deaths of more than 16 million. This was followed by the global Spanish Flu epidemic in 1918, which killed over 50 million people worldwide and infected an estimated one-third of the world's population.

All this loss had a modest impact on population growth, which still grew to 1.9 billion in 1918. Since we never learn, we experienced yet another global pandemic, known as Covid, that we were ill-prepared for in 2019, that killed 7 million people globally, due basically to excessive interaction between wildlife and humans in China.

Our population demonstrated our incredible ability for sheer stupidity during the Covid pandemic, when we let the internet, Russia and our clueless President Trump fuel conspiracy theories that the pandemic was a left wing conspiracy and the pandemic wasn't real, so it wasn't necessary to isolate or vaccinate, once vaccines were developed. After all, we have rights as humans, and we can do whatever we want, including ignore a global pandemic, say "NO" to vaccines and run around spewing virus smarm on everybody around us. For crike sake. Seriously? In our family we lost an uncle to Covid who bought into that bullshit. As Vonnegut's Tralfamadore liked to say in "Slaughterhouse Five", "so it goes". Going forward we're gonna have to be smarter than that if we want to survive. When, not if, the next pandemic comes along.

In 1929 the great depression in the U.S. led to a "baby bust" or decrease in birth rates for several years, basically because people were starving, mothers were unable to carry babies to term, and when they did they wouldn't be able to feed them, so they died. Fun stuff. But even in the face of all this in the U.S., global population continued to grow, to 2.3 billion by the end of the 1930's.

The 30's and 40's saw the beginning of petrochemical poisons to grow our food, as heavy chemical pesticides were used to increase efficiency of agricultural, as well as development of antibiotics, which transformed medicine globally and increased life expectancy. Naturally, these heavy pesticides also poisoned wildlife, not only targeted pests, but any contacted wildlife, including those that depended on the "pests" for food, and those species that resided in waterways that were poisoned by runoff from farms.

World War II, the deadliest global conflict in history, resulted in more than 60 million deaths. When the war ended in 1945, global population was 2.4 billion. The post-war "Baby Boom" in the U.S. and Europe, during which me and my sisters were born, increased the population to 3.3 billion by 1964, an increase of nearly 1 billion in just 20 years. Think about how huge this is, a 50% increase in global population in just 20 years, compared to 1 million years to double the population in prehistoric times.

Does it seem like we're growing faster and faster? Yep, we are. It's called exponential growth, which is the scariest kind of growth of all. It's basically the way that a couple cells of SARS-coV-2 virus sneezed on us in a grocery store can develop into full-blown COVID-19 in 2 – 14 days.[20] Exponential growth is indeed a powerful thing that is seldom seen in our world, other than with viruses, humans and runaway nuclear reactions.

In the 50's and 60's, some level of common sense in the U.S. government managed to take hold, with approval of birth control pills, and elimination of the absurd Comstock law that banned contraception. The U.S. Supreme Court also established a woman's right to terminate a pregnancy in the Roe vs Wade decision. In this period, more vaccines became available that improved survival worldwide, particularly for children, for polio and measles, and U.S. population reached 200 million as world population growth rate finally peaked in 1963. In 1980, Smallpox, one of the world's deadliest diseases, was officially eradicated.

In the 60's, Rachel Carson's book, *Silent Spring*[21] brought awareness to the impact of chemical pesticides on the environment and human health, igniting the environmental movement. Also, American biologist, Paul R. Ehrlich, warned of the dangers of exponential population growth in his bestselling book, *The Population Bomb*.[3] This finally motivated government and nonprofit organizations to advocate family planning and reproductive health worldwide. However, we continued to grow. In a big way.

Since *The Population Bomb* was written just 60 years ago, the population has more than doubled, from 3 billion to 8 billion. Yeesh. It kills me to think of how lovely things would be in this world with all the awesome technology and comfortable lives we have, with only 3 billion people. We'd be able to feed everybody. We'd have enough water. The weather probably wouldn't be all screwed up. I'd still be able climb Quandary without a permit, or visit Grand Canyon without having to plan a year and a half in advance. We wouldn't have killed off 73% of our wildlife. Think about it.

In the 60's, American agronomist, Norman Borlaug, developed high-yield crops that helped increase the world's food supply, known today as the "Green Revolution", which reduced hunger and saved millions of lives in developing countries. At this point, global population stood at 3.7 billion, and this would have been a great time to stop growing our population, but we humans apparently didn't see it that way, and we just kept right on growing, despite the enormous efforts of the dedicated non-profits.

By 1980, China's population reached one billion and the government established a "one-child" population policy to limit growth. Of course, China's government got away with that draconian approach, since communism can be like that; this kind of policy would be completely unacceptable in most other countries, and the sad truth is that it resulted in infanticide when women had more children, particularly if they were girls, since male children were preferred as better able to take care of aging parents.

China's story is an example of the ugliness that we can expect if we don't get our population growth under wraps kindly and gently, by simply making birth control easily available. Do you really want your grandkids in a position to feel like they must murder their children to survive in a future world that is even more populated than it is now? I mean, how ugly is that? Please do me a favor and don't delude yourself into thinking that we in the U.S. and other developed countries are immune to this kind of horror. At the end of the day, desperate times call for desperate measures, and us humans can get as nasty as any other beast on the planet when it comes to our own survival.

In the 1980's the Earth's ecological footprint, which is the amount of resources humans use, began to exceed the Earth's biocapacity, or ability to provide resources and absorb waste. This is the multiple Earth concept described above. We just kept on growing and kept on consuming, our sheer numbers beginning to take out entire ecosystems. In the 1990's, the cod fish stock off the coast of eastern Canada collapsed due to overfishing, and deforestation increased in the Amazon in order to accommodate our massive demand for meat, reaching a record 11,216 square miles in a single year, larger than the state of Massachusetts, in 1995. Given the massive amounts of fossil fuels needed to huck all that beef up to the McDonalds here in the U.S., the carbon footprint would be lower if we just scraped the state of Massachusetts and raised the cattle there. Oh, is that offensive? Try thinking about how they feel in the Amazon.

By the mid-90's, we had also created the Great Pacific Garbage Patch with our waste, a floating island of plastic that covers hundreds of square miles in the north Pacific Ocean. Further study revealed that not only was this disgusting, it was also killing off fish fry in massive numbers, leading to unprecedented loss of fish stocks. It turns out that the fry tend to use the plastic cover for shelter, and they eat the microplastics, mistaking them for food and choking to death in the process. Oops. Turns out that our microplastic waste is worse for fish fry than natural marine predators, which we are also killing with plastic.

I imagine by now we've all seen a picture of a sea turtle with a plastic ring around its neck. Yet today, even though most of us know this, we continue to consume single-use plastic at unprecedented rates, while recycling rates for plastic remain at less than 6% of the plastic produced. And, by the way, we even pay double for all the packaging on the products we buy, as we wine and moan about high prices. Now, how stupid is that? Does it feel like we're not trying very hard? Or that we just don't give a shit? Or both?

<u>As The Century Turns</u>

As the turn of the century approached, coral bleaching from high sea surface temperatures destroyed 16% of the world's coral reefs in a single year and 50% of the reefs in the Indian Ocean, which is too bad, since the reefs are home to thousands of species of fish and marine life at the edges of continents. Which also happens to be a major source of food that many civilizations depend on.

India's population reached 1 billion in 2000, and the U.S. population reached 300 million, making it 5% of global population, which had reached a whopping 6 billion, while consuming 25% of global resources. Does that seem like we might be getting a bit excessive? From 2005 until now, we've seen increasingly hot average global temperatures, almost entirely from human use of fossil fuels, and 25% of that is because of our excessive consumption right here in the U.S.A.

By 2009, world hunger had reached a historic high of 1 billion. So, while the Green Revolution helped to feed millions, it's not a magic potion that can let us grow population in perpetuity on a globe with a finite surface and finite resources. Also, the need for toxic pesticides to ostensibly grow food more efficiently in limited arable space is killing off non-human life, e.g., wildlife, in unprecedented numbers, leading to the 6th mass extinction. And these pesticides and fertilizers are made from fossil fuels that we're running low on. Do ya think we might be between a rock and a hard place here? Hello? When, not if, we run out of fossil fuels and the planet is essentially unrecoverable in terms of human occupancy and current life, what are we going to do then? Wing it? Hope for the best? Pray? Deal? Seriously?

We figured out how to extract fossil fuels from beneath the surface of the planet, and convert it into energy, greatly enhancing our quality of life and ability to travel the world. That seemed like a good idea at the time. But now we're warming the planet in the process, by releasing vast amounts of carbon that were accumulated over millions of years, in just a century. By

> "Live in the Now, plan for the future. Appropriate planning means you'll have the resources you need down the road. Planning is bringing the future into the present so that you can do something about it now." Alan Lakein

consuming these fuels at the pace we are currently going, we are squandering it, so it won't be available for future generations, while heating the planet so it won't be livable either, for humans or non-humans.

As our population grows, we're taking land that the wildlife, the vast connected network of non-human life on our planet, requires to survive into the future. Not only is this unethical, it won't work. All life on this planet has evolved together over billions of years, from the tiniest microbe to the biggest whale. To rip this apart in just a few generations is asking for a disastrous collapse, similar to the extinction of dinosaurs 60 million years ago, only without the comet. This time, we're the comet responsible for the destruction of our planet. Think about that.

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