Tech Is No Answer

By Derek Joe Tennant

For my granddaughters, especially

Panjarat (Thailand)

and Dana (America)

As you may deduce from the above, my joy derives from the act of creation. I write to inspire you, to move your heart, and hopefully to amuse you all the while. We live in a sea of energy and consciousness. This energy is like water: its best work is when it is moving, vibrant and cleansing, alive with possibility. When it is trapped, captured, unable to flow it becomes stagnant and even toxic, a breeding site for dis-ease. I best serve when I

allow energy to flow through me, when I am but a channel for consciousness to evolve. Moving my energy into the Universe allows room for energy to flow into me, nourishing and supporting me.

I hope you are grateful for what I have created, that it has moved you in some way. You can thank me for my work in several ways:

- bringing it into the awareness of others spreads the energy
- using any inspiration to take your own action or to embellish this work before passing it along feeds the flow
- or if you are so moved, showing your appreciation by passing some of your energy in the form of money back to me via my website also continues the flow that nourishes everyone.

I welcome your comments and/or questions. Contact me at info@derekjoetennant.net

Note: throughout the text, I use the asterisk * instead of a quotation mark * because I feel that it shows up better on small, handheld screens.

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WHAT SHADE OF GREEN ARE YOU?

Bright

TECHNO-OPTIMISTS

MARKET-BASED SOLUTIONS

[CARBON PRICING ALLOWS ENERGY USE TO CONTINUE]

MANY HIGH-PROFILE, DEEPLY FUNDED NGOs

USES PROTESTS, PETITIONS, DIVESTMENT,

PUBLIC RELATIONS CAMPAIGNS

COMMUNITY RESPONSE

FEELS LIKE WE ARE REACHING OTHERS AND MAKING A DIFFERENCE EVEN AS THE PROBLEMS WORSEN

Lite

SUSTAINABLE SHOPPING

VOTING WITH DOLLARS

ETHICAL CONSUMPTION

RECYCLING

SOLAR PANELS ALLOW INTENSE-BY-SUSTAINABLE STANDARDS ENERGY USE, BUT THEY CAN *FEEL GOOD*

USES *EARTH HOUR* OR

PLASTIC-FREE JULY

STYLE CAMPAIGNS

COMMUNITY RESPONSE

WHERE MOST OF US START ONCE WE SEE AN ENVIRONMENTAL PROBLEM

Deep

RESISTANCE IS PROTECTION

DEFENSE IS GOOD OFFENSE

THINK: *SEA SHEPHERD*, *EARTHFIRST!*,

DEEP GREEN RESISTANCE

SEEKS TO UNDERMINE, DISRUPT, TRANSFORM

MONKEY-WRENCHING

PERSONAL RESPONSE

PERSONAL OR SMALL GROUPS, MAY BE UNDERGROUND

Dark

COLLAPSE IMMINENT

HARD LIMITS TO GROWTH

DOWNSHIFTING LIFESTYLE

LEARNING SURVIVAL SKILLS

OFF-GRID

BUILDING RESILIENCE

PREPPERS

PERSONAL RESPONSE

HOLISTIC

LACKS POPULAR APPEAL

DENIES *HUMAN-SUPERIOR*

INTRODUCTION

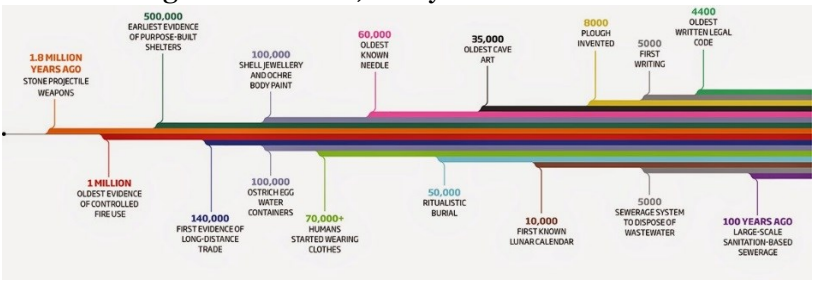
> *On the last day of May in 2009, as night enveloped the airport in Rio de Janeiro, the 216 passengers waiting to board a flight [Air France Flight 447] to Paris could not have suspected that they would never see daylight again, or that many would sit strapped to their seats for another two years before being found dead in the darkness, 13,000 feet below the surface of the Atlantic Ocean....* William Langewiesche, writing in Vanity Fair, October 2014 his article titled, **The Human Factor**[1].

He goes on to describe how the only three pitot tubes, tiny openings in the aircraft's skin that allow instruments to register the air speed of the plane, had all frozen over (for less than a minute) as the Airbus A330 approached a line of thunderstorms just north of the Equator three hours after takeoff. This caused the autopilot to disengage, for its programming was unable to deal with a situation where throttles were set at near maximum, and yet were generating no forward motion. It remains a stunning event today, after investigating all of the data on the various flight recorders, that a scenario unforeseen by programmers caused a perfectly functional aircraft with professional pilots (albeit two relatively inexperienced ones at the time of the crash) at

[1] http://www.vanityfair.com/news/business/2014/10/air-france-flight-447-crash

the controls, to fall from the sky over such a minor, momentary, blip in the stream of data. But if we step back from the emotion of this crash and begin to ask, *Could this, or something even worse, happen again?* we find that our increasing dependence upon technology to care for us and to protect us is leaving us ever more vulnerable to catastrophic failure.

This is made even scarier when we consider how most Americans not only trust their tech, but actually expect that tech will manage to overcome whatever problems climate change and economic collapse might put in our path. What is this thing called technology all about? How did we get to this time, today?



Effectively, I am writing this and you are reading this because of human-created technology. It is not a lie to say that I have more information in my phone than even Kings had access to just two hundred years ago despite their myriad advisors and libraries. Clearly tech is not just silicon-based computers of all sizes; the old-fashioned umbrella is tech, as is a knife, fork, and spoon. Weapons were our most basic, and earliest, use of something other than our imagination to mold and shape our world. Useful to hunt animals for meat and fat, rocks of various shapes and sizes, some attached to arrows and some not, are the first sign of technology in

our two-million year evolution into the *civilization* we call *modern* today. Mention tech solutions today and we are invariably referring to powered, computerized, mass-produced devices. Yet little heed has been paid to where these devices come from, the costs society pays to acquire them, and the ways in which they affect our culture and our psyches.

How does tech change our worldview? How does it so embrace us in its grasp that we can no longer even imagine life without it? Have you lived without electricity? I did for a year in the early 1970s, and it's easy. What are the hidden harms inherent in technology? They are myriad; and we will look into these as we explore the notion that tech can save humanity in this book. How do we deal with the imbalances that exist: between those who have and those who have not, between what tech says is safe and the reality of what we see happening around us, and between those who need tech and those who don't? As recently as 1936, within the lifetime of many still alive today and still deep within the Great Depression while on the road to World War II, our lives and lifestyles were radically different. We had:

> No jet planes, microwave ovens, copy machines, or cell phones. No stereo music systems or tape recorders, and no television. No plastic; that's right, nothing made of plastic or nylon. No air conditioning, freeways, or shopping malls. No credit cards, no birth control pills, no pesticides or herbicides. No computers; slide rules were used to place men on the Moon. And no nuclear weapons.

Coming out of that terrible global conflict, we were sold the myth that perpetual growth equals progress and

that progress is our birthright as Americans. Certainly as long as technological development brought us new, exciting ways to live, we fell for the fantasy that there were no problems with technology. Hidden from our view and our education were the reasons why growth is required, and who benefits ultimately from that growth. Sadly, today, we know that Dick Cheney was right; the American lifestyle is non-negotiable. That's because Mother Nature does not make deals with humans. She sets the rules, and we have to abide by them, despite wishing it could be otherwise.

How did we learn this myth? By being bombarded with propaganda. A study in 2013 found that TV alters and changes the brains of children who watch it regularly. Yet TV is often used as a way to keep our kids *busy*; it's a cheap babysitter. Over 25% of children under the age of one have a television in their room. And if TV is problematic for young brains, it can't be good for children as young as three to have a smartphone no matter what *educational* apps you have loaded onto it. Other studies have proven that when television alters your brain it shortens your attention span, makes you more aggressive, and in general has detrimental effects on your overall mental and physical state. Not only is the programming it carries of low quality (in my opinion) it will also place you into a *trance-like* state. This occurs roughly 30 seconds after you start watching the TV; your brain begins by producing alpha waves – an alteration of your consciousness. A light-hypnotic state spawns from this state, making you less aware of your environment and more open to subtle messages. This is well-known by those who craft shows, that's why they call what they broadcast *programming*. Television is used for mass-

programming by many different interests, as media expert Hal Becker once stated:

> *I know the secret of making the average American believe anything I want him to. Just let me control television… You put something on the television and it becomes reality. If the world outside the TV set contradicts the images, people start trying to change the world to make it like the TV set images.*

Think about that last sentence the next time you want to go watch a movie based on a zombie apocalypse or World War III… Of course, today it's not just about TV but all types of media, including social media and youtube videos.

Humans are tool-builders; we have survived by creating technology to ease our struggle to survive. But until the last thousand years, we were still deeply enmeshed in our environment. If we designed and built a tech that was destructive of our environment, we had to leave that area behind. Nature, given hundreds or maybe thousands of years, would restore that area to a balanced ecosystem once more. If we were smart we stopped doing the destructive act; this is the core belief at the root of the Native American tradition of looking after seven generations of our descendants with everything we do now. Today, realizing that we have nowhere else to move to, that is no longer an option. Where is our situational awareness? Why are we ignoring our natural intelligence?

The dominant narrative today is, *Yes, things are going in the wrong direction. But if I can just hold on, (or elect the right President, or say the right prayer, or find my soulmate, or win the lottery…) things will get better.*

There is no looming solution, there is no sense that I can take care of myself; there is only the creeping despair that is slowly taking over my ability to enjoy life. *Don't rock the boat* is useless advice for someone on the maiden voyage of the Titanic. Our society is riding the maiden voyage of oil; and after just 150 years, it is clear there won't be a second trip.

What do you think is the epitome of our modern technology? Space shuttle? iPhone? DNA sequencing? Many will say space technology, as illustrated with this picture of a man, untethered, free to move through the Universe at will…

Let me argue it is deep-water oil rigs, just like the Deepwater Horizon that fouled the Gulf of Mexico in 2010. It's a platform that sits on the surface of the ocean and reaches 30,000 feet down, through miles of water and miles of rock, and withstands 20,000 lbs. per square inch of pressure that seeks to prevent it from sucking the oil out of the little pockets in the rocks in which the oil is hidden. What could be more amazing? And yet, even if that one drilling rig had been successful at removing 100% of its target oil, that oil would only

have slaked America's energy thirst for less than 24 hours.

Technology's problems impact all aspects of our lives. Shirts and shoes made in sweatshops overseas are a tech problem. Buy something *cheap* at a national chain store and likely there is either child labor or slave labor somewhere in the supply chain. Only 3% of our money is held in paper bills or metal coins; the rest is mere bits toggled a certain way in a computer somewhere. Carry a cell phone and you are carrying a device that is spying on your actions, communications, even your moods. Use Facebook or some other news aggregator and you are opening yourself up to be programmed and manipulated, emotionally, rationally, or psychologically. Buy anything in a package from a food store and it will contain more chemicals than whole, real food. Buy fish, and who knows what toxic or radioactive substances it has been exposed to during its short life in water. We have grown used to receiving election results immediately after the polls close; that facility either uses electronic vote counting machines, subject to technical glitches or hacked results, or exit polling and forecasting, only useful when a computer can use an algorithm on data to produce a prediction. You may enjoy getting a tweet from your Senator; but thanks to technology, only a few votes count in determining the President every four years. Likely you're not the few who swing the election to one party or the other.

Tech Is No Answer (TINA) focuses on tech and our environment, because although we will look at other aspects of technology, today tech is being touted as our savior from the scourge of Climate Change. The *Environmental Movement*, which began with Rachel

Carson's book *Silent Spring*, and the *Climate Movement* have become synonymous despite being focused on very different problems. Climate change is far from the only issue pertaining to our planet, yet it dominates the scarce resources available for this work, controls the news cycle, and ridicules other valid concerns as unimportant. Possibly worst of all, if these climate changes that we see today turn out to be part of a large, unknown but natural cycle rather than human-caused, then all environmentalism will be tarred and run out of town along with the climate movement. Even the point of view that Nature matters first and foremost, a view that would change how we relate not only to Nature itself but also to her defenders, has taken second place behind this movement to find a way to get human energy needs met. No one is discussing if we might lead happier and more fulfilling lives if we stopped using energy to geo-engineer our Earth. And no one seems to be discussing the down sides of technology; problems that make the cure often seem worse than the disease. I know that sounds impossible: climate change grows scarier with every record-setting storm, fire, and drought. As we shall see, tech offers no sustainable answer to the climate change disaster rapidly coming our way.

Think of the Buddhist practice of koans. A practice that cultivates a flexible, creative, non-fixated, and playful state of mind, koans challenge us to breathe into dichotomy and to answer the unanswerable. This is the dilemma we find ourselves in today: how can we work with what presents itself; hope or despair, global or local, systemic or personal, tear down or create? What is the koan of this moment in our evolution?

XX Industrial production is largely hidden from view.

What are the implications of placing so much faith in green tech to solve our problems? This is a crucial question to think about as your read into this book. So much of our technological development has come from government-funded research and development; including computers and renewable and nuclear energy. Have we done a good job addressing the issues raised by that early R & D decades ago? Apparently not, according to Michael Lewis[2]:

> *…Toward the end of his time as secretary of energy [in late 2016] , Ernie Moniz suggested that the department, for the first time ever, conduct a serious study of the risks at Hanford[3]. Once the risks were spelled out, perhaps everyone would agree that it was folly to try to turn it into, say, a playground. Maybe the U.S. government should just keep a giant fence around the place and call it a monument to mismanagement. Maybe the people at the labs could figure out how to keep the radioactivity from seeping into the Columbia River and leave it at that. Maybe it shouldn't be the D.O.E.'s job

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[2] *Why the Scariest Nuclear Threat May Be Coming From Inside the White House*, published in Vanity Fair July 26, 2017

[3] Hanford WA, the site of the original plutonium reactors and processing facility for use in nuclear weapons, and today a massive site that threatens to soon ruin the Columbia River with highly toxic waste

to deal with the problem, as the problem had no good solution and the political costs of constant failure interfered with the D.O.E.'s ability to address problems it might actually solve.

*It turned out no one wanted to make a serious study of the risks at Hanford. Not the contractors who stood to make lots of money from things chugging along as they have. Not the career people inside the D.O.E. who oversaw the project and who feared that an open acknowledgment of all the risks was an invitation to even more lawsuits. Not the citizens of Eastern Washington, who count on the $3 billion a year flowing into their region from the federal government. Only one stakeholder in the place wanted to know what was going on beneath its soil: the tribes. A radioactive ruin does not crumble without consequences, and yet, even now, no one can say what these are.

Here is where the Trump administration's willful ignorance plays a role. If your ambition is to maximize short-term gains without regard to the long-term cost, you are better off not knowing those costs. If you want to preserve your personal immunity to the hard problems, it's better never to really understand those problems. There is a downside to knowledge. It makes life messier. It makes it a bit more difficult for a person who wishes to shrink the world to a worldview.

This last paragraph is critical, and not just to the Hanford situation but to the whole predicament humans

face today. It's better not to know, and then life can carry on in the same ways that we have come to enjoy. Don't face someone whose income comes from a problematic source with the issues that source raises; they won't be able to hear you. *It makes life messier*, Mr. Lewis writes. Indeed it does; and thus, this book. Once you know, can you forget?

CONTEXT

POPULATION OVERSHOOT
+ ECONOMIC DEVELOPMENT
+ ECOLOGICAL COLLAPSE
+ CLIMATE WEIRDING
+ PEAK MINERALS
————————————————
= MASS EXTINCTION

HUMANS

► Humans and our livestock eat 40% of land chlorophyll biomass[4]

[4] Not including livestock, humans use 25%: human appropriation of net primary production has still risen from 6.9 Gt of carbon per y in 1910 to 14.8 GtC/y in 2005, i.e., from

► In just 12more years (2030), we will lock in a near term 6°C earth temperature rise if we do not make drastic changes to our lifestyle
► 50% of all the oil we've **ever** burned for energy has been burned in the last 21 years (1995 – 2016)
► The current rise in temperature of .8°C is the result of only what was burned up to 40 years ago; we've yet to see the impact of what we've burned these last 21 years
► The World Bank says we have 5-10 years before we all fight for food and water
► Humans are global: our population has more than doubled, from 2.7 billion to over 7 billion, in just 70 years (a single normal lifetime)

ECONOMIC DEVELOPMENT

► Vikings *discovered* North America 500 years before Columbus; but Europe did not need the additional space or resources and so this discovery quickly faded from our collective memory
► When Columbus reminds Europeans of that vast *untapped wilderness* it comes at a time when the additional space and resources are needed; the rush is on to *capitalize* it
► Today we approach peak Capitalism: nearly every material or service has been turned into a sale-able commodity, and usury has allowed most of the wealth to flow to a mere handful of humans
► Capital is global: so-called *free trade* agreements allow corporations to dictate what nation-states can or cannot regulate, making national sovereignty and *government* largely a sham

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13% to 25% of the net primary production of potential vegetation [http://www.pnas.org/content/110/25/10324.full]

ECOLOGY

► 50% of vertebrate species died off in the last 40 years[5]
► 50% of remaining vertebrate species will die off in the next 40 years[6]
► 75% species loss = Mass Extinction
► Pollution is global, it knows no boundaries: 25% of the particulate matter in the air over Los Angeles comes from coal-fired power plants in China (China is building one new plant each week)[7]
► Mercury (a highly potent neurotoxin) is found in fish from every single one of 291 tested rivers (2003). The 2011 total of 4,821 advisories against eating fish due to mercury contamination covers 42% of America's total lake acreage and 36% of the nation's total river miles[8].

CLIMATE

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[5] https://www.theguardian.com/environment/2014/sep/29/earth-lost-50-wildlife-in-40-years-wwf

[6] Humans cause extinctions by: habitat destruction, human overpopulation, transporting invasive species, pollution, and over-harvesting

[7] Also: On the days with the strongest Westerlies—which occur most often during the spring—between 12 and 24 percent of the sulfate-based air pollution over the Western U.S. was originally generated in China. [http://www.smithsonianmag.com/science-nature/air-pollution-china-is-spreading-across-pacific-us-180949395/]

[8] https://www.epa.gov/fish-tech/national-listing-fish-advisories-general-fact-sheet-2011

► In 2014, the mass of cold air that has historically always rested over the Arctic ice cap in winter, and which drives the weather throughout the northern hemisphere, shifted to lie over Greenland, the only real remaining mass of ice in the North. This alters the air flow (jet stream) and thus the weather: driving cold deep into the U.S. and Europe far sooner than expected, and giving Alaska its first year in recorded history when the temperature never dipped below zero degrees Fahrenheit
► Climate is global: warming oceans drive weather all across our planet, and an ice-free Arctic is a tipping point in global climate change with its ability to release vast amounts of methane from melting permafrost and methane clathrates[9]

ENERGY AND MINERALS

► Energy demands are projected to increase 46% by 2060 because of current trends of population and economic growth (assuming business-as-usual)[10]
► Emissions have to decrease 80% by 2060 to avoid 6°C of temperature rise
► To power England with 100% solar & wind requires 25% of its land, says David MacKay[11]

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[9] https://www.newscientist.com/article/dn23205-major-methane-release-is-almost-inevitable/
[10] https://www.worldenergy.org/wp-content/uploads/2016/10/World-Energy-Scenarios-2016_Full-Report.pdfElectricity electricity demand doubles: https://www.siemens.com/press/en/pressrelease/?press=/en/pressrelease/2016/power-gas/pr2016100019pgen.htm
[11] https://www.ted.com/talks/david_mackay_a_reality_check_on_renewables

► Peak copper hits 2030 – 2040 says Ugo Bardi; copper is required for electronics and renewable power generation
► 50% of all the copper mined in human history has been mined in the last 30 years
► There is no real substitute for copper in electronic devices, says Mat McDermott
► Post-peak copper production, indeed post-peak production of any resource, cannot be increased at any price
► We now move 3 billion tons of earth per year to get at 15 million tons of copper; and the ratio widens with each deposit mined in each passing year
► We cannot recycle oil or minerals into existence and we cannot conserve oil or minerals into existence. What Nature and billions of years have placed here is all there is
► Energy is global: just look at the resource wars that have been waged over the last few decades for a taste of what it will be like when we are left to fight over food and water

As humans, we only have five *needs*: food, fire, air, water, and shelter.
Everything else is just a *want*.

Any growth is energy- and resource-consuming. No technology can make energy, it can only find, process, and/or distribute what already exists. And no known source matches oil for output, versatility, portability, and consistency. Energy, along with food, air, and water, remain our ultimate challenges; both in terms of having more as our economy grows, and in terms of what the extraction and use of these life necessities do to our

environment. Today's *green* growth is still fundamentally bound into a system that needs unsustainable growth and increasing resource use, while suffering from diminishing returns. This last bit is critical: following long periods of incremental change, the amount of change needed to significantly *move the needle* becomes enormous. In other words, what we see today can be demonstrated with the concept of energy returned on energy invested (EROEI). When we first tapped the oil reserves lying just beneath our feet in 1859, it took one barrel of oil to get 100 barrels out of the ground. Gradually, as the low-hanging fruit of easy-to-extract oil was depleted, we have had to search deeper and deeper, in places evermore inhospitable, to find what we need. We now regularly drill under thousands of feet of water and through thousands of feet of rock to find pockets of oil that can ease our global thirst for a few weeks at best. We have even taken to cracking the very rocks under our feet that support us, generating earthquakes in the process, in a desperate attempt to continue using oil freely. Today's EROEI is about 12:1. That means that we get 12 barrels of oil at the cost of one barrel. For certain production methods it is even less: fracking is about 5:1 (for low quality product at that), and biofuels like corn ethanol and the celebrated tar sands (the least attractive product we can possibly use) are near 1:1, a point at which sustained production is both absurd and insane.

As I write this in 2017, we are experiencing a two-year-long glut of oil that has led oil prices to fall dramatically from a peak of over US$100 per barrel as recently as 2014 to half that price now. There are still many theories as to why: politics, lower economic demand, increasing

supply from U.S. fracking and Canadian tar sands; likely all of these make up some portion of the real reasons for the decline in price. OPEC has struggled to reduce production, but the new wells are American, not from within OPEC, and so that effort has failed. But this situation also highlights the temporary nature of any momentary state inside a complex system; and our global society, with its politics, economics, class, war, and inequality, is anything but simple or permanent. No matter what, this too shall pass. Nothing is constant but change. Just when you think you know, you don't. Why is this important, this notion of change and uncertainty?

Seductive tales of renewable energy feed our desire to maintain our lifestyle without killing ourselves. We even call it *clean energy*; but just like *clean coal*, when we look behind the curtain, we find a wizard who can only project a lie to the public that bears little resemblance to the truth of the matter. Clean energy is a little bit true and a lot of nightmare. In environmental media we are told that renewable energy will end our addiction to oil, create jobs, and save the planet. We hear that solar power, for example, has no moving parts to wear out and is non-polluting. It is local: no need for a national grid infrastructure that requires capital, maintenance, and *baseload* and is vulnerable to natural events like windstorms, blizzards, floods or earthquakes. We homeowners might even be able to sell some of our abundant power back to the existing grid, recoup our original investment and begin to actually make money from free sunlight!

To do this of course, we ignore the externalized costs of pollution and exploitation during the manufacture and disposal of the panels, like any good capitalist would. We

bless the corporations that invest in solar power for their own manufacturing processes by offering them subsidies and tax credits for installing renewable systems. We think that these panels will last long enough to ultimately be someone else's problem, so we ignore what happens when they finally do fail. We also don't ask about the oil that powers 95% of our transportation needs today, including the transportation inherent in the production, installation, and removal of these energy generators. Even if we outlawed gasoline engines in new vehicles today, it will still take over a decade before alternative-energy vehicles become just the majority of vehicles on our roads as the old engines wear out. And if you use electricity from a coal-fired power plant (as you will in over half of the U.S. today) to recharge your car's batteries…well we'd be better off if you continued to drive gasoline-powered cars and trucks once you factor in the entire life cycle of your electric car, from raw resource to landfill.

Writing about the disposal problem as it relates to solar panels in Japan, Toru Hanai [12] begins with the size of the problem:

> *Japan's drive towards creating green energy could come at significant environmental cost. The country's Environment Ministry says that 770,000 tons of solar panels will end up on the scrap heap in two decades, potentially releasing harmful chemicals. The problem is the panels contain harmful substances such as lead and selenium, which could pollute the environment.

[12] *770k tons on landfill by 2040: Old Japanese solar panels may harm environment* Reuters / Toru Hanai June 23, 2015

> There is currently no system in place to try and recycle old solar panels. Therefore, the Japanese Environment Ministry says that by 2040, 770,000 tons of solar panels will be rubbish dumped. By 2040, solar panels are expected to account for six percent of all waste in Japan.*

We now have a few decades of experience using solar, and what have we learned? There are myriad reasons why solar does not perform as advertised: haze, humidity, rain and snow, soiling from dust or things that drop out of the sky (like bird droppings), misalignment, temperature changes or extremes, degradation over time, losses during conversion from DC current at generation to AC current for use in your home, water intrusion into the cells, corrosion, delamination, and the costs beyond the price of the panels themselves that are the majority of the system's cost (parts, installation, insurance, alarm systems because yes, some panels have been stolen right of the roof of someone's home, maintenance and cleaning, and disposal to name many but not all). Note that other than the development of the panels themselves, the associated costs of installing a solar system and keeping it functioning for any length of time are not costs that will come down because of more research and development. In fact, because they include labor and other costs subject to inflation, they likely will become more expensive as years fly by. Yet we are told in the media that if just enough people buy solar panels, the cost of systems will fall dramatically. We will not see the end of the national grid with its associated pollution and cost anytime soon; in the U.S. about one percent of our power comes from solar today, nor do we foresee the

day when enough does come from solar that we can shutdown centralized power generation. Thus solar is an incremental cost in addition to traditional *polluting* power, not a replacement cost of power, on the societal level.

Note too that none of these issues are new, nor are they close to being solved; they remain out of sight in the larger discussion about energy because they are inconvenient. Solar energy is sold to the public as reliable and safe for the environment, which it is not. Few systems run at even half their rated efficiency or output, and those that do require constant input of energy, time, and money. They only generate their peak power for a few minutes each day unless they are part of an active movement system, moving parts subject to additional maintenance and failure issues, because the Sun must hit them perfectly to maximize efficiency. Even dust on the panels deflects sunlight from the cells and lowers output, an issue particularly in climates that are dry for months at a time; coincidently, those are the very climates (rain and cloud-free) where solar would seem to be most useful.

In some ways, solar may be an effective misdirection strategy to keep us using oil *while we complete the development of solar*. As long as solar is seen as our best option to oil, it will eat up the bulk of the research funding. It keeps us in the mindset that we have power to waste: after all, it's *free energy*! In some cases it is free to the user, or nearly so, once all the utility and taxpayer subsidies and tax breaks are taken into account and as long as we ignore the hidden costs of pollution and the ill-health the entire process of manufacturing and disposal creates. When we account for its cradle-to-

grave problems, solar is ineffective addressing greenhouse gas emissions, engenders societal costs from wasting energy as well as the more visible costs of generating it, and costs us our health from its toxic pollution of our environment. Converting all of our coal-fired plants to natural gas would be a far more effective bridge towards saving our environment while costing us far less than ramping up solar power. A bridge, at least, until we drastically lower our need for power, which appears to be the best overall solution. Passive energy conservation, and using efficient, smaller, and fewer appliances are also better options than solar at this point.

> Dr. Severin Borenstein of the UC Energy Institute writes, *The market benefits of installing the current solar PV[13] technology, even after adjusting for its timing and transmission advantages, are calculated to be much smaller than the costs. The difference is so large that including current plausible estimates of the value of reducing greenhouse gases still does not come close to making the net social return on installing solar PV today positive.*

Here we have brought economics into our discussion. Is renewable energy feasible from a market perspective? In a *post-mortem* on a project initiated by Google – the goal of which was to scope out an innovative renewable energy system that could compete economically with coal and other fossil fuels and which

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[13] PV = Photo-Voltaic, a technical term for changing light (photo-) into power (-voltaic) using technology

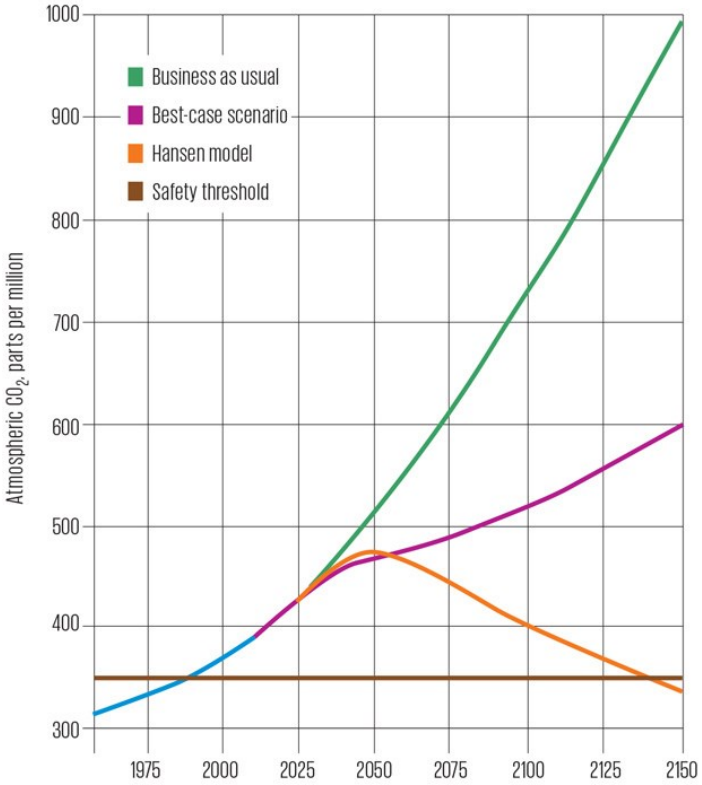
could be deployed quickly enough to stave off the worst impacts of climate change – Roger Andrews writes:

> *Work on the project, which Google named RE<C (Renewable Energy less expensive than Coal) continued from 2007 to 2011, a period over which Google invested large sums of money in renewable energy projects… But RE<C failed to produce the hoped-for results, and in November 2011 the project was shut down and project staff were instructed to write a post-mortem detailing what went wrong. They summed up their findings in this stark conclusion:
>
> Today's renewable energy technologies won't save us.

This is what makes the Google project interesting, because the people who shut it down – Google management – were of a strongly green persuasion and the people who ran it were too:

> *At the start of RE<C, we had shared the attitude of many stalwart environmentalists: We felt that with steady improvements to today's renewable energy technologies, our society could stave off catastrophic climate change.*

They also accepted that the impacts of climate change were potentially catastrophic. But Google's conclusion, after an estimated $250 million spent, can be summarized in this chart and caption:



Google recognized a fundamental aspect of renewable energy, and certainly not the only problem with renewables. Roger again:

> *CO2 lingers in the atmosphere for more than a century. Research by James Hansen [suggests we should use] a 350ppm safety threshold. Pulling CO2 from the atmosphere [and storing it is necessary as we are already over 400ppm]. What Google did here was judge their results against a catastrophe scenario that there is no realistic way

> of mitigating, and having found there was nothing to be done they threw their hands in the air and canned the project.*

And from Google's own report:

> *What is needed, we concluded, are reliable zero-carbon energy sources so cheap that the operators of power plants and industrial facilities alike have an economic rationale for switching over soon—say, within the next 40 years. Let's face it, businesses won't make sacrifices and pay more for clean energy based on altruism alone.*

To summarize, Google determined that renewables wouldn't be cost effective for decades; and thus we fall into such a deep greenhouse gas hole that we could never get ourselves out in time to stop catastrophic climate change. The *free market* is not going to effectively price all of the costs of either fossil fuels or renewable energy; and that means that political, not economic, force will be needed to adjust pricing and ensure that renewables comprise the majority of our power mix. Also, it appears that Google did not base their decision on the availability of the necessary metals, nor on the impacts of extracting them. It was purely an economic decision; the other ramifications weren't needed to disprove the viability of renewable energy to stop the warming.

Let me be very explicit here, on the economic aspects of the problem. Tim Garrett, writing in Earth System Dynamics, [3, 1–17, 2012][14]:

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[14] http://www.earth-syst-dynam.net/3/1/2012/esd-3-1-2012.html

> *For atmospheric CO2 concentrations to remain below a *dangerous* level of 450 ppm (Hansen et al., 2007), model forecasts suggest that there will have to be some combination of an unrealistically rapid rate of energy decarbonization and nearly immediate reductions in global civilization wealth.*

Of course our very active human denial will always lead us down the path of merely *replacing* dirty energy with *clean* energy in order to let our consumption continue and our wealth to grow; what could possibly go wrong?

There are many other reasons why technology cannot save us. Cutting down forests to site renewable power generation or to extract minerals to build generators or to expose coal or tar sands is a poor trade off: removing nature's carbon sinks for energy that produces less carbon but not no carbon is no real solution. This equation ignores other contributions to quality of life that the forest makes: water and air filtration, life diversity, temperature, and pollination, to name but a few. Because power generation is only a fraction of the release of greenhouse gases, renewables can only hope to replace or reduce ¼ of all human-caused emissions; what about the rest? This is another aspect of our current fatal mindset: once we've lowered carbon output from power generation, then we're good, right?

It is a horribly deformed creature, the climate movement. Like a monster put together by a mad scientist, a conglomeration of parts; some useful and some not, alternately believing and not, moving and not, being effective but mostly not. If one can point to success one finds only the portions of the movement

that are palatable to consumers; for the movement has been unable to stem the tide of carbon emissions, climate disruption, and in fact has continued to feed the exclusionary tactics of the establishment, only aiming these tactics at the very people who will be first to die in the apocalypse. Staying within the cage of social norms, we use the very hierarchy, race, patriarchy, class, and power differences to run the same games on members of our movement that the elites use on us. We snipe at those who would step beyond the norms and use a wide diversity of strategies and tactics to bring about the downfall of the deadly paradigm, calling them *violent* or *unhelpful to our movement*. We fail to see the cage itself within which we struggle, deadened to the world through the programming provided by media, the cultural narratives, and the peer pressure heaped upon us from birth. All too frequently, the organizations that start small and effective in a local area, expand to encompass a larger arena and budget; and in doing so fall victim to their early success. Organizers become accustomed to salaries, expense accounts, and retirement plans. Where's the drive to solve the problem if it means losing my job? Where is the incentive to take a corporation to the mat if in doing so my organization's funding disappears? Our cultural paradigm values *win-win* negotiations; everyone gets something that they want. But some problems can't be compromised away. There are real-life situations when negotiation is futile because there can be only one right answer. Would you have negotiated the September 11, 2001 terrorists down to using just one plane in return for a military force reduction in the Middle East?

How to dispel the illusions of our culture, to spotlight the inauthentic and the untrue, and to recover our power within and as one community? There is no genuine struggle or progress in some abstract crowd you have no real relationship with, like a Facebook group or a Twitter cloud. The sense of belonging in this type of personal media is a cheap imitation of the real thing. Injustice and oppression is not an accident nor is it a mistake; and authority and wealth will not suddenly *get it* and free us from their nasty clutches. We do this work for the elites as well as those who bear the brunt of the oppression; no solution that removes only the 1% and leaves the system relatively intact can solve our problems. We strive to solve these problems for everyone who makes up the 100% and for Nature too; and without understanding this deeply we will continue to flounder on the shores of the Ineffective Ocean. It is pointless to criticize, or even pay attention to, the idiocy that passes today for news. Most of it is manufactured like every other plastic product, lies cut from whole cloth, designed to pacify discontent and stir up fear, to distract us as we consume, and to demean the *other* who makes a convenient scapegoat for what are truly foundational problems.

Our dysfunctional culture is mirrored in our work: we use shame and guilt, manipulation and exploitation, the *rule of law* and shunning the lawless; all in an attempt to gain control and power in the identical ways that power has been taken from us. The Master's tools cannot build a new paradigm. If those tools are meant to work wood, then wood is all that will be worked. It is not hyperbole to say that America was founded on genocide and slavery; this economy needs cheap (or free) labor if

it is to be successful in transferring the real wealth of the planet into the fiat accounts of the global elite. Using the NGOs that get their funding from rich philanthropists as we attempt to redistribute their wealth according to our vision, not theirs, is at least a foolish daydream, or worse, the harbinger of hope that lulls us ultimately into inaction. There is no *green* economy once you look behind the curtain at where the iron and rare earths come from that enable the windmills and iPhones and solar panels. Electric vehicles are not the epitome of a green transportation system, especially when you plug them into a coal-fired power plant for recharging. A green transportation system is no system other than what Nature can reliably renew: feet that traverse walkable neighborhoods. A green power system is no system other than what Nature provides: pure sunlight. A green economy is no system other than what Nature provides: year-round, but seasonal, bounty that can be gathered by some and shared with all, no money needed. A green politics is no system other than what Nature provides: every person with a voice, able to speak their truth on every decision that matters and able to agree to go along with the sense of the meeting.

Happy talk about renewable energy ignores the transition from our current national grid to only localized power; the only true way our need for constant baseload power goes away. Until that day when the grid is shut down, renewable power can only be an adjunct; and all the toxic processes it is meant to replace must continue. We see this reflected in Germany, a nation that has made solar and wind power its prime directive for many years. And as we add renewable energy alongside the existing dirty power, we increase the abundance of

power and that always leads to more power being used. Interestingly, and without much fanfare in the mainstream media, locations around the world have managed to install enough *green* energy that we are beginning to hear the success stories described as, *U.K. gets 100% of its electricity from renewable energy systems for a 24-hour period*, and *Germany gets 80% of its electricity from solar and wind farms*. What is not mentioned in these articles, as few as there are, is that the overall, total emission of greenhouse gases from Germany has increased over the last decade as it ramps up installation of *green* energy precisely because it runs alongside the existing dirty power plants. Germany can't depend on the renewable sources to get through a few days without bright sun or strong wind; and so the baseload must continue to be maintained using the dirty sources, even if those plants largely run on idle…for some hours each day.

Look around you at the roads, the sewers, the sidewalks, your yard, or the water pipes in your home. All are deteriorating, requiring maintenance, occasionally suffering a breakdown. This is the way of all technology; and is especially problematic as complexity increases. Think nuclear power plants, space shuttle, or deep-water drilling rigs; the costs, to our environment and to humans, can be huge after even a small failure. Who can guarantee the safety of gene modifications? Or autonomous cars, or weaponized robots? Because the degradation happens slowly the risk rises without our noticing. Then one moment, we are surprised. In today's world, with our focus being placed on maximizing profits, money to pay for maintenance often fades away: sucked into other accounts or unable to be raised in the

first place; speeding up the frequency of the breakdowns. With nuclear power in particular, we are extending the productive lives of 50-year old plant designs even when they have endured poor maintenance or substandard design. The U.S. has 23 reactors of the same design that failed so spectacularly at Fukushima; and came within a foot of having one at Oyster Creek in New Jersey flooded by Superstorm Sandy in 2012. The effects of continuous thermal expansion and contraction, as well as the effects of radiation, on metal are poorly understood. This lack of understanding has led to situations of cause and effect that we have trouble sorting out. We have no viable, safe decommissioning plan or way to store the spent fuel; so we might as well keep them running, right?

It is hard to think that we might be leaving a huge problem for our children when we use reinforced concrete for bridges and buildings. Chris Martenson writes[15]:

> *By itself, concrete is a very durable construction material. The magnificent Pantheon in Rome, the world's largest unreinforced concrete dome, is in excellent condition after nearly 1,900 years. And yet many concrete structures from last century – bridges, highways and buildings – are crumbling. Many concrete structures built this century will be obsolete before its end. The writer Robert Courland, in his book *Concrete Planet*, estimates that repair and rebuilding costs of concrete infrastructure, just in the United States, will be

[15] *Our Future Is (Literally) Crumbling Before Our Eyes* July 6 2016

in the trillions of dollars – to be paid by future generations.

*Steel reinforcement was a dramatic innovation of the 19th century. The steel bars add strength, allowing the creation of long, cantilevered structures and thinner, less-supported slabs. It speeds up construction times, because less concrete is required to pour such slabs. These qualities, pushed by assertive and sometimes duplicitous promotion by the concrete industry in the early 20th century, led to its massive popularity. Reinforced concrete competes against more durable building technologies, like steel frame or traditional bricks and mortar. Around the world, it has replaced environmentally sensitive, low-carbon options like mud brick and rammed earth – historical practices that may also be more durable.

*Early 20th-century engineers thought reinforced concrete structures would last a very long time – perhaps 1,000 years. In reality, their life span is more like 50-100 years, and sometimes less. Steel corrodes (rusts). When it does, it expands and leads to something you've seen but perhaps not recognized: concrete cancer.

Concrete cancer: not pretty. Sarang/Wikimedia Commons

16

16 https://theconversation.com/the-problem-with-reinforced-

*What all this means is that literally everything you see today that's made of concrete will need to be replaced within a hundred years of its installation. Every bridge, every building, every roadway…all of them. They're just rotting away from the inside, silently and relentlessly. When the rot progresses far enough, it leads to something called 'spalling', which is when the surface of the concrete crumbles away to reveal the rusted steel beneath.

*Of course, it's true that anything you build will erode over time and require maintenance and care to provide longevity. The problem with reinforced concrete is that it's extremely difficult to remedy once it's poured because the affected parts are inside and hard to access. So it's nearly universally true that everything poured from concrete over the past century, as well as most of what is still being poured today, is fated to have a very short, very disposable lifespan.

And we don't get much incremental [economic] benefit for the cost of replacing a crumbing piece of infrastructure. When you tear down a bridge and replace it you still have one bridge performing the services of one bridge. Sure, you occupy a number of people in the construction and manufacturing trades for a while, but you don't get any added value beyond that. It's not the same as putting in a new bridge at a new location to open up a new geographic area for greater economic activity. You just get your bridge replaced. One for one: an economically neutral exchange that costs a lot of money.

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concrete-56078

Before we examine other aspects of technology, let's remind ourselves of how much we ignore about it just because it lets us *feel good*. Apple announces a new product, and the world is thrilled. But thrilled about what again?

> *Tim Cook announced Tuesday[17] the release of Apple's long-rumored watch, the latest in wearable technology. Here are some features of the new device:
>
> - Discreet, but not so discreet that anyone would mistake it for a regular watch
> - Comes in a variety of colors and styles to express your personal submission to the planet's dominant tech company
> - Adjustable ticking volume
> - All the convenience of a traditional watch that needs to be charged every 12 hours
> - Built-in think-piece regarding the increased connectivity yet simultaneous isolation of the millennial generation
> - Small size and intricate circuitry able to generate jobs for Chinese workers at least until robots can be built
> - Makes it easier for muggers to see whether or not you're carrying an expensive electronic device hidden in your pocket or purse
> - Another screen to throw into your current rotation of things you look at
>
> But apart from that... it's 'awesome'*[18]

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[17] 9 September 2014

[18] http://www.theonion.com/graphic/features-of-the-new-apple-watch-36890

And thankfully, not selling well at all.

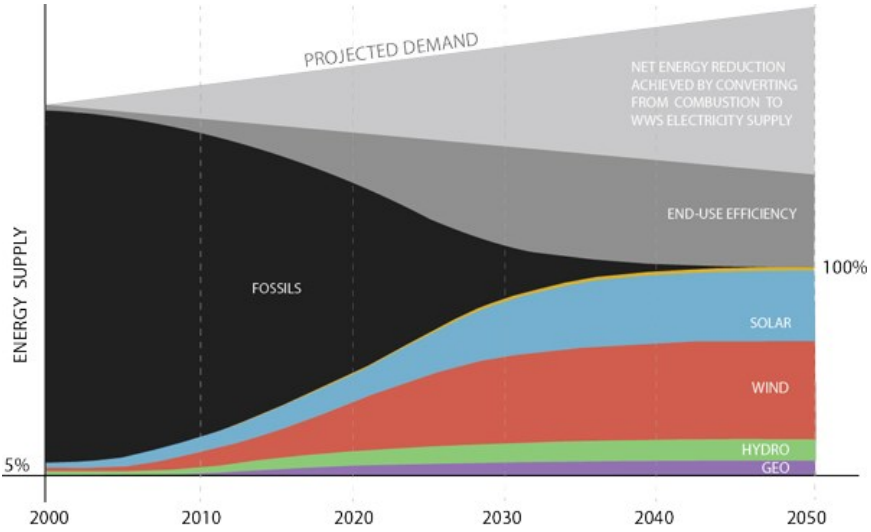
PHYSICAL

Where Does Tech Come From?

A report by the Silicon Valley Toxics Coalition claims that as the solar photovoltaic industry expands, *...little attention is being paid to the potential environmental and health costs of that rapid expansion. The most widely used solar PV panels have the potential to create a huge new wave of electronic waste (e-waste) at the end of their useful lives, which is estimated to be 20 to 25 years. New solar PV technologies are increasing cell efficiency and lowering costs, but many of these use extremely toxic materials or materials with unknown health and environmental risks (including new nanomaterials and processes).*

Before we get very far into the questions about technology and whether it lives up to its *green* billing, we need to understand what is involved, the physical

processes and their impacts on humans and Nature. This is important because it will take so much more of Earth's resources to displace fossil fuels from our world. In one study, looking just at the state of New York, we find:



New York State could end fossil fuel use and generate all of its energy from wind, water and solar power, according to Mark Jacobson. Image: Graphic by Karl Burkart (Scientific American)

> *... Jacobson showed in much finer detail how New York State's residential, transportation, industrial, and heating and cooling sectors could all be powered by wind, water and sun, or *WWS,* as he calls it. His mix: 40 percent offshore wind (*12,700 turbines*), 10 percent onshore wind (*4,020 turbines*), 10 percent

concentrated solar panels (*387 power plants*), 10 percent photovoltaic cells (*828 facilities*), 6 percent residential solar (*five million rooftops*), 12 percent government and commercial solar (*500,000 rooftops*), 5 percent geothermal (*36 plants*), 5.5 percent hydroelectric (*6.6 large facilities*), 1 percent tidal energy (*2,600 turbines*) and 0.5 percent wave energy (*1,910 devices*).

In just one instance above, let's look at installing 4,020 wind turbines as an example. Industrial wind turbines are a lot bigger than ones you might see in a schoolyard or behind someone's house. The widely used GE 1.5-megawatt model, for example, consists of 116-ft blades atop a 212-ft tower for a total height of 328 feet. The blades sweep a vertical airspace of just under an acre. The 1.8-megawatt Vestas V90 from Denmark has 148-ft blades (sweeping more than 1.5 acres) on a 262-ft tower, totaling 410 feet. Another model being seen more in the U.S. is the 2-megawatt Gamesa G87 from Spain, with 143-ft blades (just under 1.5 acres) on a 256-ft tower, totaling 399 feet. What is involved in making just one wind turbine of this caliber?

- Nacelle: The gearbox — which transforms the slow turning of the blades to a faster rotor speed — and the generator are massive pieces of machinery housed in a bus-sized container, called the nacelle, at the top of the tower. The blades are attached to the rotor hub at one end of the nacelle. Some nacelles are so huge they include a helicopter landing pad. In the GE 1.5-megawatt model, the nacelle alone weighs more than 56 tons, the blade assembly weighs more

than 36 tons, and the tower itself weighs about 71 tons — a total weight of 164 tons. The corresponding weights for the Vestas V90 are 75, 40, and 152, total 267 tons; and for the Gamesa G87 72, 42, and 220, total 334 tons.[19]

- Nacelle: 60% steel; 35% copper; plus 700 pounds of neodymium, on average
    - Steel: how boring! That entails iron mines: clear-cuts or mountaintop removal, toxic contaminations, air pollution, native people displacement, habitat loss, soil erosion, greenhouse gas emissions (GHG), roads and other infrastructure, and imported workers with all the exploitation (economic, social, sexual) that this source of labor includes
    - Copper: how boring! That entails copper mines: clear-cuts or mountaintop removal, toxic contaminations, air pollution, native people displacement, habitat loss, soil erosion, GHG, roads and other infrastructure, and imported workers with all the exploitation (economic, social, sexual) that this source of labor includes. *Bingham Canyon*, the world's largest copper mine, can be seen from space with your own eyes; and it provides the Salt Lake Valley with the worst air quality in the United States

[19] Watch this promotional time-lapse of the installation process for a giant windmill: https://www.youtube.com/watch?v=84BeVq2Jm88

- Neodymium: how hidden! First let's understand a little about Neodymium extraction: *While China produces 90% of the global market's neodymium, only 30% of the world's deposits are located there. Arguably, what makes it, and cerium, scarce enough to be profitable are the hugely hazardous and toxic process needed to extract them from ore and to refine them into usable products. For example, cerium is extracted by crushing mineral mixtures and dissolving them in sulfuric and nitric acids, and this has to be done on a huge industrial scale, resulting in a vast amount of poisonous waste as a byproduct. It could be argued that China's dominance of the rare earth market is less about geology and far more about the country's willingness to take an environmental hit that other nations shy away from.*[20]
- Neodymium mines: clear-cuts or mountaintop removal, toxic contaminations, air pollution, native people displacement, habitat loss, soil erosion, GHG, roads and other infrastructure, and imported workers with all the exploitation (economic, social, sexual) that this entails. Because 95% of the rare earths used in cell phones

[20] 2 April 2015 *The Dystopian Lake Filled By The World's Tech Lust* By Tim Maughan

and computers come from China, we also add slavery to the list of impacts of mining this material because many of the workers are displaced citizens of Tibet and are forced to work in conditions that lead to their premature death through exposure to the toxic materials used in the extraction and refining processes. Which means we have disposable people making our throw-away phones

- Actually installing the turbine also entails thousands of pounds of concrete, [XX concrete manufacturing process explained here], habitat destruction, an ongoing threat to native life, emission of GHG, exploitation of workers, and public health and safety issues
- Solar panel construction is the largest source of hexaflouroethane (12,000 times more powerful than CO2, lasts 10,000 years in air), nitrogen triflouride (17,000 times, releases are rising at 11% per year now), and sulfur hexafluoride (25,000 times more powerful than CO2, the worst of any GHG); 3 extremely potent GHG. All of these gases are now present throughout our atmosphere in detectable and increasing amounts
- Renewable systems today use small portions of tantalum and other rare earths, which occur naturally in highly dispersed trace amounts. In order to extract meaningful amounts of these rare earths, we generate a lot of destruction, and we contaminate a lot of water with toxic processes and chemicals which we then have to

dispose of. The processing of these materials is actually worse for Earth than extracting coal.

- This is insanity: dig up nonrenewable ores using toxic methods, transform them through toxic processes, transport them around the world using oil-based vehicles, call it *green and sustainable*, and proclaim: *Problem solved!*
- What about the disposal? Silicon Valley Toxics Coalition states: environmental and health costs are rising; so-called *renewable* power sources involve heavy health and environmental risks, including many that are unknown due to the lack of testing. We will examine recycling more closely in an upcoming section on how technology affects us.

And the building of the wind turbines is not the only problem[21]:

> *Industrial-wind flacks (in the business they're known as windbags) trumpet the magic words: job creation, cheap electricity, no pollution. And the industry has been successful; 500 factories across the U.S. have made, and large crews have installed, 48,000 turbines in 39 states. For the last ten years, the industry has grown by more than 25% a year[22]. The contribution of wind

[21] *Windfall: When Renewable Energy is not Sustainable* By Tom Lewis, May 16, 2016

[22] http://environment.nationalgeographic.com/environment/global-warming/wind-power-profile/

power to the electricity consumed by Americans has skyrocketed to, um, 1.9%[23].

In the real world, only about one-third of the power generated by a turbine is actually used. Without the heavy government subsidies many wind *farms* would simply not be feasible. The Netherlands, an early adopter of wind power, is seriously considering dismantling hundreds of turbines[24] because they're losing so much money.

Now comes what could be the coup de grâce: the life expectancy of a wind turbine is 20 years, and the first wave of those built in the new age of wind[25] are now approaching that age. After that age, bearings wear out, blades fall off, towers topple.

[23] http://instituteforenergyresearch.org/topics/encyclopedia/wind/

[24] http://dailycaller.com/2016/04/16/hundreds-of-european-wind-turbines-are-operating-at-a-loss/

[25] http://www.offshorewind.biz/2016/02/09/second-offshore-wind-farm-decommissioning-on-the-way/

Germany, a world leader in switching to renewable sources of energy, had to tear down more than 500 elderly turbines just last year[26]. The country is graced by 25,000 of the monsters, more than a thousand of which could face decommissioning, at huge expense, every year. The subsidies underpinning the industry also, it turns out, have a 20-year shelf life. In many cases the 20-year term was made explicit in the legislation. In others, it is implicit in the rising financial desperation of governments everywhere, meaning subsidies can disappear at any time when budgets get tight. Without government subsidies, there will be no wind industry.

The industrial crisis of our age does not have an industrial answer. Nothing industrial is sustainable. Industry could help prolong and cushion to coming transition by encouraging rooftop solar, family-scaled wind turbines and micro-hydro. Just as we consumers could help by going off the grid and producing our own energy.

If we had some ham, we could have ham and eggs, if we had some eggs.*

See, we have been lied to by a slick public relations campaign. Government, business, even most *environmental* groups and *green* NGOs are complicit, even if not consciously. Why would we believe any entity involved with creating nuclear power or weapons, with war-making, with leaving behind Superfund sites for the public to attempt to clean, or

[26] http://www.thegwpf.com/germany-faced-huge-cost-of-wind-farm-decommissioning/

designed to produce a profit for a few corporations at any cost? Why do we think they are even capable of acting in the interests of the planet when it comes to energy production? Why do we challenge GMO but not challenge *green* energy? We buy the bullshit because we desperately want to save the American Dream and Earth, together, without giving anything up. We deny the implications of the methods we use, hoping a fantasy ending will justify or allow us to ignore the nightmare means. We expect that tech will save us without destroying the planet, because that destruction happens out of our sight. We've also been told that the green revolution will result in a revolution in living standards; that the poor will get jobs retrofitting, or manufacturing, or installing these new energy systems. Yet those jobs always seem to be coming *next year*.

Look closely at what is being proposed, just for New York: 387 concentrated solar power plants (the kind that fry birds who fly through their beams), 828 photovoltaic cell facilities (spread over dozens of acres each), five million residential rooftops outfitted with panels, 500,000 commercial rooftops with solar panels, 36 geothermal plants (new tech that is hardly commercial scale at this point in time), and 6.6 large hydroelectric facilities, which means 7 big new dams just in that state. All of these installations will consume huge amounts of fossil fuels for the extraction and processing of the building or manufacturing materials and their transportation to the sites; to say nothing about what we will do in twenty of thirty years when these installations need to be refurbished or replaced.

In the interest of transparency, let me also say at this point the Mr. Jacobson's work, which this section

opened with, has been called into question as being too rosy, too optimistic, in large part because it ignores the amount of land needed to be sacrificed for energy generation and the tendency for that same land to be useful in growing food. Let me also introduce a criticism of his work by Richard Heinberg, of the Post Carbon Institute:

> *This is probably a good place to point out that David Fridley, staff scientist in the energy analysis program at Lawrence Berkeley National Laboratories, and I recently published a book, Our Renewable Future, exploring a hypothetical transition to a 100 percent wind-and-solar energy economy. While we don't say so in the book, we were compelled to write it partly because of our misgivings about Mark Jacobson's widely publicized plans. We did not attack those plans directly, as Clack et al.[27] have done, but sought instead to provide a more nuanced and realistic view of what a transition to all-renewable energy would involve.
>
> Our exploration of the subject revealed that source intermittency is indeed a serious problem, and solving it becomes more expensive and technically challenging as solar-wind generation approaches 100 percent of all electricity produced. A further challenge is that solar and wind yield electricity, but 80 percent of final energy is currently used in other forms—mostly as liquid and gaseous fuels. Therefore the energy transition will entail enormous changes in the

[27] http://www.pnas.org/content/114/26/6722.full.pdf

ways we use energy, and some of those changes will be technically difficult and expensive. Our core realization was that scale is the biggest transition hurdle. This has implications that both Jacobson et al., and Clack et al. largely ignore. Jacobson's plan, for example, envisions building 100,000 times more hydrogen production capacity than exists today. And the plan's assumed hydro expansion would require 100 times the flow of the Mississippi River. If, instead, the United States were to aim for an energy system, say, a tenth the size of its current one, then the transition would be far easier to fund and design…The only realistic energy future that David Fridley and I were able to envision is one in which people in currently industrialized countries use far less energy per capita, use it much more efficiently, and use it when it's available rather than demanding 24/7/365 energy services. That would mean not doing a lot of things we are currently doing (e.g., traveling in commercial aircraft), doing them on a much smaller scale (e.g., getting used to living in smaller spaces and buying fewer consumer products—and ones built to be endlessly repaired), or doing them very differently (e.g., constructing buildings and roads with local natural materials).*

*The most efficient way of rendering the poor harmless is to teach them to want to imitate the

rich.*— Carlos Ruiz Zafón, *The Shadow of the Wind*

There are other issues, too. As noted by Ozzie Zehner in his book, *Green Illusions: The Dirty Secrets of Clean Energy and the Future of Environmentalism*:

> *For example, sawing silicon wafers releases a dangerous dust as well as large amounts of sodium hydroxide and potassium hydroxide. Crystalline-silicon solar cell processing involves the use or release of chemicals such as phosphine, arsenic, arsine, trichloroethane, phosphorous oxychloride, ethyl vinyl acetate, silicon trioxide, stannic chloride, tantalum pentoxide, lead, hexavalent chromium, and numerous other chemical compounds. Perhaps the most dangerous chemical employed is silane, a highly explosive gas involved in hazardous incidents on a routine basis according to the industry. Even newer thin-film technologies employ numerous toxic substances, including cadmium, which is categorized as an extreme toxin by the U.S. Environmental Protection Agency and a Group 1 carcinogen by the International Agency for Research on Cancer. At the end of a solar panel's usable life, its embedded chemicals and compounds can either seep into groundwater supplies if tossed in a landfill or contaminate air and waterways if incinerated... the photovoltaic industry's secretions of heavy metals, hazardous chemical leaks, mining operation risks, and toxic wastes [are] especially problematic today...*

Solar cells were first used on the U.S. Navy's Vanguard 1 satellite in 1958. They were created out of military research and development; as were most of the tech advances over the centuries. Hewlett-Packard (HP) was a weapons manufacturer long before it began to make computers: the first supercomputer was built for nuclear weapons design work, and the internet was crafted to enable a communications network to survive the destruction of many of its nodes during a nuclear attack. How is it that the story of the genesis of computer technology arising from private gain out of public-paid research is ignored in favor of the born-in-a-garage fairy tale? Oh yeah, money can buy lots of speech, and a lie repeated often enough begins to sound true.

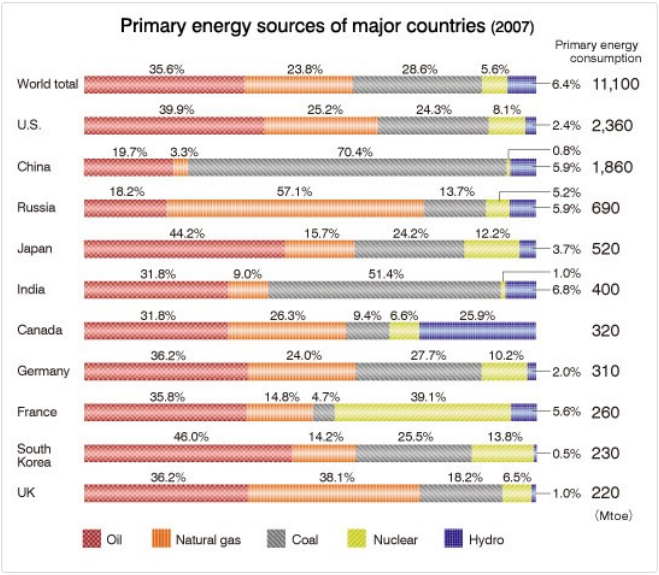
I don't like to sound repetitive, but many people point out these issues. A study in the journal *Nature Climate Change* by University of Oregon researcher Richard York, analyses 50 years of energy data and concludes that solar cells don't offset fossil fuel or carbon footprints in practice. He points out that solar cells rely on fossil fuels for mining, fabrication, installation, and maintenance. They also require conventional power plants to run alongside them at all times, to provide the baseload needed to keep the national grid operational, or storage mechanisms such as batteries, which impose additional layers of environmental impacts (and which are still insufficient for this task at this time). Solar cells contain heavy metals that can leach into groundwater when disposed of at the end of their lifecycle.

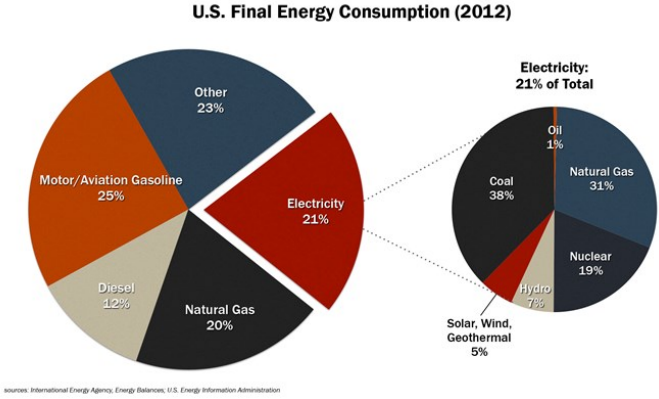
Photovoltaic manufacturers also employ toxic and explosive compounds that can lead to unintended health risks for workers and local residents around the facilities

that mine raw materials and manufacture solar components.

Solar energy is not readily portable, storable, fungible, or transformable; all of these are characteristics of oil that solar cannot match. The apparent thrift of solar cells is also a sleight of hand. To begin, China, Germany, the United States, and other countries heavily subsidize solar cell production, which makes solar cells seem more affordable than they actually are. And we still subsidize oil far more than solar despite the oil companies ongoing and huge profits! Next, the solar industry generally highlights the cost of polysilicon and the technical components of solar cells, but these represent less than half the cost of an installed solar system. The larger costs arise from installation, maintenance, insurance, as well as expenses that accrue through operating and maintaining concurrent power plants or battery backup. Additionally, recent research shows that newer thin film technologies degrade more rapidly than older models, offsetting much of their presumed benefit and pulling the disposal problem closer in time.

Solar cells and wind turbines are also only generating electricity; yet that is a fraction of the power that we use today. Note that 95% of our transportation system relies on oil, and that there are no foreseeable plans to build electric driven planes and few fantasies about electrical engines on large cargo ships.





Our problems are not just in the source of the materials, or the amount of materials, required by modern life. There is also an issue about power, as

described in my edited version of an article titled, *_Eat, Sleep. Click_* by Jane Anne Morris[28]

> Since everyone wants the Internet to have a gentle footprint and not be *evil,* we should power it with green electricity. Start with a bicycle generator and a server. Here are some back-of-the-envelope figures.
>
> All the stuff on the Internet, or in the *cloud,* is kept aloft by computers called servers (plus routers and so on). An average server uses 400 watts/hour, half of that for cooling (fairly typical), which means 3,500 kilowatt hours[29] (kwh) per year, because it never shuts down. A healthy biker can generate about 100 watts an hour from a bicycle generator, so four *riders* can power a server. So far, so good.

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[28] Corporate anthropologist Jane Anne Morris (DEMOCRACYTHEMEPARK.ORG), whose most recent book is "*Gaveling Down the Rabble: How "Free Trade" is Stealing Our Democracy*" (Apex/Rowman & Littlefield, 2008), first wrote about Internet energy use in "*The Energy Nightmare of Web Server Farms: Feet in the Cloud, Head in the Sand*" in Synthesis/Regeneration: A Magazine of Green Social Thought, Winter 2008.

[29] Terms like megawatt, kilowatt, and watt express power or capacity, while megawatt-hour, kilowatthour, and watt-hour measure energy use. A solar panel rated at one kilowatt of capacity will produce one kilowatt-hour of energy if the sun shines on it steadily for an hour. A kilowatt is a thousand watts; a megawatt is a million watts or a thousand kilowatts.

Bike Generator, Occupy Wall Street, 2011
3 Google searches = 500 calories burned

Alas, that single server can't accomplish much by itself. Various techies have estimated that a single search request uses between 1,000 and 20,000 servers, often located all over the world.

Numerous servers are housed together in places called server farms or data centers. To power a modest sized data center, about 50,000 servers, would require 200,000 bike generators, their riders pedaling away 24 hours a day. That would use the space of about 350 football fields... A *Popular Science *article titled, *The Internet Is A Huge Energy Suck*[30] reported in 2015 (and how many more servers are there today, worldwide?) that internet activity in the U.S.

[30] written by Mary Beth Griggs, May 13, 2015

alone required 91 billion kwh of power. Assuming six hours of pedaling per day, we would need 3.6 billion riders…or 34 large coal fired power plants, just to power online activity in America.*

Continuing to try to provide some sense of the size of the installations we would need to get all our electricity from solar power, we note:

* In late-2014 the Topaz Solar project was completed, making history as the first 500-megawatt plus solar farm to come on-line in the U.S. Located in San Luis Obispo County on California's Carrizo Plain, Topaz consists of 9 million solar panels, spanning a huge 9.5 square miles (25 square km): 1/3 of Manhattan's size.*[31]

What about worldwide Internet electricity use? Global estimates made by companies and governmental organizations (with a vested interest in not alarming the public) center around 200 billion kwh in 2010. Using the same assumptions as before, the worldwide Internet could be powered by a mere two billion generators,

[31] Katharine J. Tobal, December 4, 2014

ridden by 8 billion bikers, and the bikes themselves could stretch to the Moon and back 3 ½ times. Who would want to design a bicycle-generator system to power the Internet? Someone (like yours truly, this author) who wants to imagine a human-scale equivalent for how much energy the Internet already sucks up and wants to demonstrate how many energy *slaves* are provided by legacy fossils in the form of oil. Speaking of energy slaves, remember, just a few dollars' worth (at today's prices) of diesel fuel can move 80,000 pounds a mile up the road on the slope of the Rocky Mountains.

What about other *renewable* energy sources? At big solar projects, the rule-of-thumb is that a square mile of panels produces 64 MW, or about 100 million kwh from a good site. So we only need 200,000 square miles of panels to power the world's internet server use (not including desktops or laptop, tablet, and phone battery chargers!), or the entire state of Delaware. Not bad!

A good wind site will put out around 20 MW per square mile, or more than triple the land needed in the example above. However, most wind power sites are less productive than the sites from which these numbers were derived.

It's also not appropriate to compare solar and wind directly to conventional power plants. Except for maintenance and accidents, coal and nuke plants operate 24/7, are not weather-dependent, and are not variable. Computers, as I am sure you know, need steady, uninterrupted power. So steady in fact, that the battery in your portable electronic device shows as *dead* when the available power drops to only 90%, because at that point it varies too much to be safe for the computers onboard.

With solar or wind, power must be stored to cover nighttime or hours of no wind. The huge batteries necessary for storing this much power look like a cross

between upturned railroad freight cars and electric substations. They require space, maintenance, and cooling. Every time energy is converted from one form to another (like rotating energy to electrical energy to heat energy, or electricity into batteries and then out again) energy is lost. That slippage increases the initial kwh necessary, but I have not factored that in.

Also omitted in calculations here are the power lines, substations, maintenance roads, other support facilities, and buckets of ammonia water to clean PV panels. I'm also not considering the resources needed to manufacture, transport, and maintain the PV panels. Similar considerations apply to wind power.

How can the Internet use so much electricity? Suppose you have an awesome video of your cat at a laptop using her little cat feet to scroll through online celebrity cats in fetching poses. It's stored in your email account, and you have a copy on your home computer, and maybe your phone. Your emails are backed up by the company that offers it, and you have backup service for your laptop, so that's more Internet storage space on servers somewhere; then the back-up companies back up their back-ups. You send the cat video to fifty people. Some store it in their emails; some download it and have it backed up on their own online backup systems; some send it out to a few other people; and some do all three. In how many places can we find the cat? It's a hall of mirrors, a grain of wheat doubling on each square of a chessboard. All of it eats kilowatt-hours, and for years if not decades. How much fracking is that cat porn worth to you?

All online content is not born equal. It takes very little electricity to support text, even italics. Graphics such as photos and drawings are much more energy-intensive. Music exceeds even graphics, and video (bouncing

bunnies, or time-lapse wrinkle cream results) is the greediest of all.

Online action is hosted and processed in massive data centers that are loath to disclose their energy usage; but in Chicago, we know that the Lakeside Technology Center draws 100 MW, or more than any other customer in Chicago except O'Hare airport. That would translate into solar panels covering more than 2,200 football fields, not likely an amount of space readily available in downtown Chicago today. As Alex Roslin of the *Montreal Gazette* put it, if the Internet were a country, it would be the fifth biggest power consumer, ahead of India & Germany.

Why do we figure out the ecological implications of eating a hamburger but not clicking the search button in that process? When it comes to food, the green or even greenish band of the political spectrum is all over it. Local food. Organic food. Slow food. Urban agriculture. Permaculture. Rooftop gardens. Alice Waters, Will Allen, Michael Pollan. *Eat food. Not too much. Mostly plants.* Fast food nation. Eat low on the food chain. But when it comes to the Internet, people spout shallow unexamined clichés as they tap at sleek, shiny gadgets. The PV panels at Google Inc.'s and Apple's headquarters and other cheap stunts deflect attention from the enormity of Internet energy use. Spending two hours on the porch showing your neighbor your family photo album is not especially energy-intensive. Doing so online, and sending it around to everyone on your email list, carries vastly higher ecological costs.

What's the actual content that billions of publicly-subsidized[32] kwh go to support? As many as a quarter of

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[32] Most data centers get property tax reductions or exemptions, and pay a fraction of the cost per kwh that any normal consumer has to pay due to volume discounts.

all searches are for porn. 94% of all emails are spam; it takes 12 million emails to sell $100 of Viagra. 100 million photos are uploaded daily. Fantasy Football players spend about 2.4 billion hours online in a year; and are bombarded with ads and other click-bait. Throw in music, video, and bouncing cat cartoons and soon you're talking about some heavy energy use. Google figures show their servers process about one billion searches per day. At 3 searches for 500 calories of food…

Subsidizing the entire current Internet system because an activist can upload photos of strip-mining and clear-cutting is like subsidizing an industrial-sized Walmart because six feet of shelf space holds organic spinach. The Internet is not, and will not be, powered by so-called renewable energy, magical energy that is somehow without consequences. Sleek, glowing screens may hide the truth from people who don't want to hear about it, but the consequences remain. The real costs of Internet electricity use are being cast over state boundaries and national borders, across class, ethnic, and species lines, and onto future generations. In hindsight, most wish that we had used a little more foresight about the automobile. And, we are a species with a decidedly mixed record on learning from history. Today is a good time to look up from our screens and take advantage of the fact that we are still in the Model T era of the Internet. If we keep pretending that the Internet is innocuous, neutral, democratic, clean, and green, we can look forward to more iPipelines, iFracking, iMountaintop Removal, iCoal Plants, iNukes, iStripmining, iSpecies Extinction, iHabitat Loss, iClimate Change, iTar Sands, iSludge, iOil spills, iFloods, and continued iResource Wars.

Much has been made recently about the batteries designed by Tesla and sold by SolarCity. Tom Randall

identifies some problems with these new miracle systems, however[33]:

> *The new Tesla Powerwall home batteries come in two sizes—seven and 10 kilowatt hours (kWh)—but the differences extend beyond capacity to the chemistry of the batteries. The 7kWh version is made for daily use, while its larger counterpart is only intended to be used as occasional backup when the electricity goes out. The bigger Tesla battery isn't designed to go through more than about 50 charging cycles a year, according to SolarCity spokesman Jonathan Bass. SolarCity, with Musk as its chairman, has decided not to install the 7kWh Powerwall that's optimized for daily use. Bass said that battery *doesn't really make financial sense* because of regulations that allow most U.S. solar customers to sell extra electricity back to the grid.[34] For customers of SolarCity, the biggest U.S. rooftop installer, the lack of a 7kWh option means that installing a Tesla battery to extend solar power after sunset won't be possible.
>
> But if its sole purpose is to provide backup power to a home, the juice it [the 10kWh model] offers is but a sip. The model puts out just 2 kilowatts of continuous power, which could be pretty much maxed out by a single vacuum cleaner, hair drier, microwave oven or a clothes iron. The battery isn't powerful enough to operate a pair of space heaters; an entire home facing a winter power outage would need much

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[33] *Tesla's New Battery Doesn't Work That Well With Solar*, Tom Randall, May 6, 2015

[34] http://www.bloomberg.com/#footnote-1430888329917

more. In sunnier climes, meanwhile, it provides just enough energy to run one or two small window A/C units. But SolarCity doesn’t offer a discount for multiple batteries. To provide the same 16 kilowatts of continuous power as a $3,700 Generac generator from Home Depot, a homeowner would need eight stacked Tesla batteries at a cost of $45,000 for a nine-year lease. *It's a luxury good—really cool to have—but I don't see an economic argument,* said Brian Warshay, an energy-smart-technologies analyst with Bloomberg New Energy Finance. Even in Germany, where solar power is abundant and electricity prices are high, the economics of an average home with rooftop solar *are not significantly enhanced by including the Tesla battery,* according to an analysis by Bloomberg New Energy Finance.*

EMOTIONAL

*Seriously now, why is it that infectious disease and terrorism provoke such hysteria in the media, whereas the threat of a nuclear accident - which is far more likely - is downplayed?

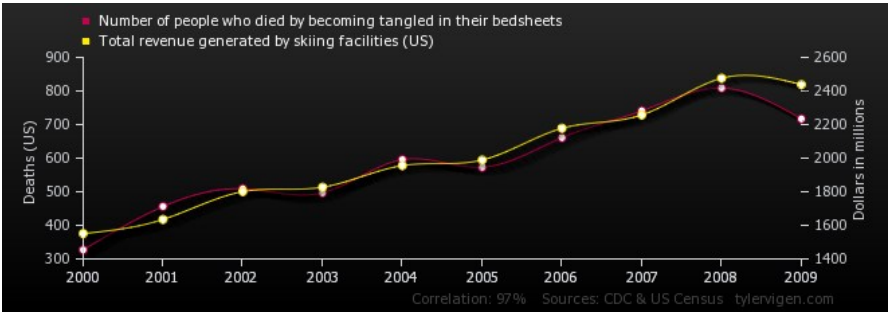
*Let me offer a rule to predict what gets pumped up and what gets ignored: if the crisis provides ready means to increase the amount of control over society, it gets played up.

*If it is a crisis that defies our technologies of control, and especially if it is crisis that reveals the futility of control, then it is hidden away.
I am not claiming a conscious conspiracy among the power elite to use Ebola as an excuse to tighten their control over society, but it certainly plays out that way: any crisis that can be used as a pretext for more control, will be.
Charles Eisenstein

Anyone who knows that enough is enough will always have enough. When our emotional needs are met, our material needs are few. These are concepts that many of us recognize, albeit often only on our deathbeds. Certainly our global economy is dependent upon our not recognizing them before then. Once we know, we stop consuming and no longer feed the beast that is capitalism today.

We think we know all we need, and we are wrong. Please acknowledge it takes courage to see what we have not wanted to see; both inside ourselves, and out. Weather, climate, carcinogens, or our world-girding system of finance and war: we think we can understand and control these deeply complex systems and yet we are far from having a complete understanding of how these systems work and work together. We nearly always get cause-and-effect wrong, mistaking correlation as causation. Just because something charts well, doesn't

make it so:



What is important, what do we really need? Spend the introspective time needed to determine what truly makes you happy, so that you can maximize your efforts to find bliss. Likely you will find it comes in the form of intangible relationships, and not from the latest tech gadget, McMansion, or Happy Meal. It is also disingenuous to claim that tech makes relationship possible; that can only be said if one is blind to the ravages tech's manufacturing processes wreak on the landscape, the effects of living in an echo chamber where diversity of thought need not be tolerated, and the shattering of lives of those who serve as the slaves of capital to make it manifest.

Part of the explicit argument for tech is that if tech (and fossil fuel use) is limited then jobs will be limited. There is a fundamental discussion that needs to take place: property over people inevitably leads to where we are today. How can I justify plundering someone else's neighborhood for oil lying underground, and leaving behind a toxic dump on the land or in the air or ocean that harms life, by claiming that I am entitled to keep *my job*? How can we redefine work, and the need for

it, just to survive when we have so many more citizens than we need for that survival? Why must we work in superfluous jobs, doing make-work tasks, just to be able to eat? What is wrong with a guaranteed income, especially if that leads to reduced consumption but more happiness overall? How do we move to craft a vision and manifest it despite its being what might be called *politically unrealistic*?

We thought that computers, and therefore robots, would free us from having to *work*. Instead, the advent of shipping containers has allowed the low-tech production line to be outsourced to cheap labor pools; work hasn't ended, it has only ended *for us*. The corollary to this is that there is still a need for labor to bring in dollars; just not labor for us to do. Jobs have divided into those that can be done by directing computers or with accumulated wealth (investing and rents) and those that are mainly manual labor. We understand unconsciously that we live inside a fraud: computer-engineered sneakers make our daily run easy and safe, but they have been manufactured by using old sewing machines by the sons and daughters of farmers pushed into the city to scramble for jobs because their families have been pushed off their ancestral lands by the privatization that accompanies International Monetary Fund (IMF) and World Bank and NAFTA[35] *market assistance*.

China is already the world's largest market for robots; in 2014 sales of robots grew 54% over 2013. Although we think of Chinese labor as cheap, because compared to America it is, in the last decade wages have soared in

[35] North America Free Trade Agreement

China as the new urban working class finds it needs more income in order to survive in the new supply-and-demand economy. This trend has undermined the rationale for moving manufacturing jobs to China; in fact, the labor-intensive sectors like clothing and shoe production, are being allowed to leave China for places like Cambodia where wages are, relatively, far less than even China. The robots, good at sectors like steel and electronics, are being used to maintain the export market for Chinese goods at the expense of human jobs. One can wonder about the social stresses that China will face soon, as the mass migration from farm to city is forced to reverse itself due to robots taking over the workplace. Already, China faces blowback from its workers. Many labor-intensive businesses are reporting 20% monthly turnover rates. As the first generation to be raised by parents who migrated to cities for work joins the workforce, they are shy about following their parents into mind-numbing repetitive labor; it is becoming harder for businesses to find entry-level employees. It could also be that those who prefer factory work to farming have already moved. Also there is a growing problem in the large cities with youth who were born into families where both parents work the arduous 14 – 16 hour days in factories and have no time to tend to their children. These kids are frequently unschooled, illiterate, and now some are old enough to escape any supervision and are causing disruption in the ordered Chinese culture. So it might be a good thing if parents lose their jobs to robots and once again take care of their household.

Speaking of automation: what we really need at this moment is to connect consciousness and reality; to

deepen our understanding of our relationship to what is real, true, and good. Automation attempts to make consciousness unnecessary; in effect, it is working against what we need most, conscious awareness. When we let machines do our work for us, including observation, reasoning, and decision-making, we are that much further removed from reality than we are when we immerse ourselves in the fake connections found on the Internet. We justify not paying attention by saying that a mechanical decision-tree won't make as many *mistakes* as a human might, failing to admit that no machine can be programmed to handle every possible scenario. If the world was completely understood and logical, that might be true. But we can't even explain a teaspoon of fertile soil, or the biome that thrives in a healthy human gut. How could we automate anything that accounts for chaos effectively?

Why must we work in superfluous jobs, doing make-work tasks, just to be able to eat? What is wrong with a guaranteed income, especially if that leads to reduced consumption but more happiness overall? How do we move to craft a vision and manifest it despite its being what might be called *politically unrealistic*? A Universal Basic Income (UBI) is not meant to ensure that every person on the planet has the latest smartphone. It is however intended to cover the basics of food and water, healthcare, shelter, and education. If you want that latest phone upgrade or electric car, then you might have to find a way to work for pay beyond UBI.

There is an inherent problem in today's economy; the kind of growth in productivity we have seen because of technology has allowed profits to flow to the owners, the

capitalists if you will, rather than increasing the number of jobs or raising the pay for the workers. When I was young, a single person could earn enough even at a rather mundane job that a family could cover their basic needs and have money left over for health care, vacations, savings, and cars. Today, although the government statistics show jobs being created, these jobs are increasingly part-time (due to a company wanting to limit their exposure to health care costs for their full-time workers) and low paid (the median wage was $21/hour in 2016). Because increasingly the incomes of most workers are going for basic needs like food, health care, and housing, while their wages have barely increased since the 1970's while costs have constantly risen, we see that discretionary spending is down. This is a difficult cycle of less spending leading to fewer jobs leading to less spending…and to reverse that would require many more consumers having cash to spend than we have today. This argues in favor of a UBI, so that spending would increase and make more jobs available.

The common perception of robots taking jobs has some validity; however, robots are still relatively expensive and in many cases, there are workers (usually outside the U.S.) that are willing to put up with long hours, poor and unsafe working conditions, and even boring repetitive work just for the chance to have enough money to eat. We will not see robots taking over every job; and as long as corporations can outsource tasks to workers for less than it costs for robots, we will not see all jobs disappear. One instance of a job that likely will never be replaced by robots is caregiving, so

here we see the opportunity to make that a paid position in our society in ways that benefit everyone.

Many objections to UBI center on cost; there are opportunities here to address certain taxation inequities. Nearly every tech innovation in the last thirty years has benefited from research conducted using government grants, taxpayer money in other words. Yet the corporation that sells the product reaps all the benefits. Might we begin to claw back some of the funding that underlies these innovations through making the corporate tax rate appropriate? Remember, the corporation doesn't pay the tax on its income: it budgets that tax into the decision on pricing so that the consumer pays, not the shareholders out of profit. A higher tax rate will likely raise prices; but if that results in less consumption, our environment would be the true winner after raising corporate tax rates, and if it results in less spending and more savings, then our people would also benefit.

To be clear, automation threatens everyone's jobs, not just those who work at menial tasks. Writing in an article describing iCEO, a software touted as being able to run management tasks automatically using other platforms (but software which is still not available for public use), Devin Fidler describes how management itself can be replaced by programming[36]:

> *For instance, to create an in-depth assessment of how graphene is produced, iCEO asked workers on Amazon's Mechanical Turk to curate a list of articles on the topic. After duplicates

[36] *Here's How Managers Can Be Replaced by Software* Devin Fidler, April 21, 2015

were removed, the list of articles was passed on to a pool of technical analysts from oDesk, who extracted and arranged the articles' key insights. A cohort of Elance writers then turned these into coherent text, which went to another pool of subject matter experts for review, passing them on to a sequence of oDesk editors, proofreaders, and fact checkers. iCEO routed tasks across 23 people from around the world, including the creation of 60 images and graphs, followed by formatting and preparation.

To put the results another way: We asked, *Is it possible to sit down at a laptop, launch iCEO, and 'code' the preparation of a project worthy of a Fortune 50 company into existence — without needing anyone to act as the project's manager?* And somewhat surprisingly, that answer is yes. It's easy to imagine this software used in many other industries. We have run pilot programs using iCEO for assignments in sales, quality assurance, and even hiring, but additional applications seem endless.

In the debate around automation, several voices have argued that management tasks are so creative that they're unlikely to be automated any time soon. During the dawn of the Industrial Revolution, a similar argument was made about detailed craft work. However, by breaking such work down into discrete steps, automated craftsmanship quickly became possible. Assembly lines transformed the world in 50 years. We believe modern management today is on the brink of a similar transformation. While

management is an information-intensive activity, APIs (or software interfaces), are making it ever easier for computers to effectively route and track work projects. We're already accustomed to services like Uber and Lyft actively managing the process of coordinating and paying for on-demand transportation. Our iCEO prototype points to a not-too-distant future in which these APIs will not only manage simple processes, but also help conceptualize and oversee an endless variety of projects — functions traditionally performed by management.

iCEO illustrates another fact we need to face now: Corporate organizations are themselves a technology, one that has only existed in its current form for around 200 years, a fragment of human history. The corporate structure was created around the tools we had back in the 18th century to maximize scale while minimizing transaction costs. Now that structure is being disrupted by the advent of technologies which can accomplish many (if not most) of the projects we associate with corporations. With traditional organizations no longer necessary to create many things at scale, they are likely to be challenged by a new generation of alternative technologies for getting things done. Senior executives must wake up to this inevitability and join the conversation on the future of work, which only seems to be taking place at the policy level.*

A typical retort when the idea of UBI is raised sounds like this:

> *If you don't work you're not contributing to society. You're giving up and resigning yourself to failure. You're dropping out of the economy and hurting everyone else. Sure, let the machines feed and clothe you and keep you warm in the winter. Let them give you toys to play with and empty your litter box…in other words, become the machines' good little pet…*

Of course, a good deal of the angst expressed in this criticism arises straight out of the Protestant work ethic; the one that says you have to work to survive. In the 1600s and 1700s, when immigrants came to the US from Europe, of course one had to be a contributing member of one's community; building a society from scratch on someone else's land is hard, especially when neighborhood defense must be part of your work and the soil and weather is inappropriate for the only foods you know how to grow. But also notice how this is focused on society as it is structured today, with workers and jobs and money; it doesn't account for how life could be different if we are freed of the mundane, receive enough to meet our basic needs, and have the time and energy to focus on caregiving and creating instead of *working*.

There are emotional issues too: many people identify with their work, what would happen for them in a UBI world? And how do we educate everyone so that there are no fears about so-called *freeloaders*; the idea that many people's initial reaction to UBI is horror, thinking that everyone would become couch potatoes and lazy, taking advantage of the labor of those who still work. In reality, and proven in testing, while that may happen more in the beginning as people *vacation* and recover from a life full of working, the tests show that people

really do want to be caring and creative. It does not take long before people are exploring arts and paying more attention to family and friends, rather than just cocooning and being useless.

Let's look into this *lazy* issue in more depth. UBI is not about making a demand that everyone be lazy; instead it asks what is wrong with some people not working for pay while doing tasks that still contribute to our collective, as well as individual, wellbeing? Some tasks might be relaxing, of course. But having the state demand that one work or suffer the consequences does in fact force people into consequences, some of which we all end up paying for through our taxes. What about you, personally? Would you be more productive from a societal point of view if you weren't working a bullshit job? Do you dream of all the things you will do to help others once you can finally retire from work? And if this thought of retirement has never yet crossed your mind, pause now and ponder it for a few moments. What serves your bliss? What would you do if money were not the object of your work? What problem in our world keeps you awake at 3 am, and what might you finally be able to do about it if you were being paid to be creative with your time? We already have some people who are paid just to be: retired people and royalty. And we hardly begrudge the retired folks for their supposed laziness.

Also, we must dig into this societal norm that places our identity and feelings of self-worth on what job we do. Beyond even valuing caregiving more than hedge fund managing, can we ask what it is about work that we excel at and applying those skills to problems that face humanity, rather than driving profit to a bottom line

that benefits only a few? Giving someone a memory of deep relationship is so much more valuable than giving them a new iPhone; yet which is compensated in this culture more?

There is another moral issue here: if someone is sick or disabled (or a caregiver for someone who is ill) and unable to work, should they be punished by also being impoverished? If we value family cohesion and emotionally healthy children, might we benefit as a society by ensuring that parents have the skills to raise their children and the time to do so effectively?

There are other ways to address this issue of inadequate job opportunities. We could ensure the same wage paid today for a forty-hour week would be paid but only for fifteen hours of work, thus allowing more people to get the benefits of pay. We could pay people for attending school rather than charge tuition. We could finally decide that caregiving is paid labor no matter where it happens; this would mean mothers would stay at home caring for kids and being paid at the same time as if they were in the office. It would mean paid time off of work to visit your elderly parents and ensure they are taking their medications and getting some fresh air.

Clearly because this touches so much of what we deem to be important in life: identity, responsibility, utility, who pays and how much; this is a political decision above all. It will be introduced in stages I am sure. And while it does hinge greatly on computers and robotics to be successful, we have already experienced a world where only 2% of our population has to work to provide us all of our (mass-produced) food. If we only manage to reduce the large reliance upon dominant agricultural companies and GMO seeds and pesticides, and replace

this model with an organic, neighborhood- and hand-grown food supply that uses labor from more than half of the community freed from working forty hour weeks by UBI in return for access to produce, we will have accomplished a lot.[37]

There is arrogance in tech: *We know a lot more than before; the next app or device will be closer to perfect, and soon we will be able to solve all of our problems.* But there is a deep wisdom greater than human: the Universe is whole. Logic and feeling; relationship and connection. [XX how to find relationship in a shattered world?]

How is staring into a computer or smartphone screen for the latest instruction on what is important today and what to think about it any different from visiting the priest, shaman, or seer 500 years ago? In either case I am allowing authority outside to contravene my own experiences and inner knowing. Just because it is a pixelated screen and not a crystal ball is no reason to think it is progress. The ritual psychodrama, the religious rapture served up on the screens of our minds, feed us the myths, icons, and logos that our overseers choose. How much time do you tithe each day to the offering plate of our modern *church*? How much to the real scourge of our time, this virus of mind and soul? Has a diet of worldly fear, power, and entertainment separated me from my inner Spirit? A zombie is nothing more than a parasite incapable of useful contribution, only able to feed on the energy of life of the living. Is it any wonder then, as above so below, that so many of us

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[37] To hear a discussion about UBI, go to: https://soundcloud.com/weeklyeconomicspodcast/inventing-the-future

relate to the characters in zombie movies and violence-filled television shows? Or that there is so much of this type of distraction available to us now?

The technology we point to as being such a savior also plays a key role in our social structure. Whether it is feminism or homelessness, the technology of labor-saving devices or toilets can still be used as a weapon to keep *others* in their place:

> *The consequences of overshooting our limits have become painfully obvious: if we do not change direction soon, we will end up were we are going. It will only be a question of whether resource constraints or climate chaos strike first, and one will undoubtedly exacerbate the other.
>
> *But not everyone is keen on the idea of degrowth, and some are repulsed by it. Some get pretty defensive. I've had it suggested to me that I'm an ingrate – that it was technological developments such as the invention of the washing machine that enabled me, a mere woman, to get an education. This, of course, was parroted at me by someone who had swallowed Hans Rosling's TED talk on why technology is the savior of all that is good and worthy without question.
>
> *As a woman, of course, I know better. I'm quite sure it wasn't some kind gentleman donating my gender his clever labor-saving device that secured my liberty from the drudgery of what is obviously and rightfully women's work. And I can't quite imagine the women's lib movement protesting in the streets with chants of *What do we want? White goods! When do we want them?

> After we've finished the ironing!* Wins for women were, sadly for the proponents of vicarious salvation through technology, achieved by women, not men, and via political action, not white goods.* Kari McGregor

Do you really grasp what it means to be in *overshoot*? For millennia, Nature took the moment-by-moment falling of solar energy and converted it through myriad methods into forest, topsoil, and life itself. Once humans came along, we were able to tap these stores of past sunlight for our benefit. That means we were living on a fund built up over millenia, not the current sunlight hitting our skin right now. As we found the power locked inside wood, then coal, then oil; each step up in energy also a step up in complexity and non-renewability, we tapped this fund of stored energy in ever-increasing rates. Today it is calculated that we are depleting the funds which fuel our society at nearly 150% of the rate of renewal; in other words, we are using up our capital, or put another way we are eating our seed corn. The real problem is this: once you win the lottery for a ten million dollar jackpot, for example, you buy a few things immediately, and you quickly begin to discover new ways to spend that fortune that had never crossed your mind before. With no thought for what will happen once the fund is gone, it is easy to spread the wealth throughout the marketplace. But when the money is almost gone, only then do most of us awaken to the impending bottom of the barrel that will irrevocably end our spending spree. Now change this metaphor from lottery winnings to oil: once we found we could use that yucky, smelly, sticky black gunk leaking

out in a few places in America in 1859 for anything, we embarked on finding new ways to use it. That is why today it fuels our vehicles, it is the source of the plastic that has turned us into consuming and disposing machines, it births the fertilizers and pesticides that have let us feed billions, it is a key component in our clothes, appliances, computers, medicines, water, and of course, our ability to eat tomatoes in January despite having on the ground snow outside. And like the typical lottery winner, we are making no provision for the day when the stored sunlight runs out; at least the portion that is recoverable. It may become unrecoverable because we can no longer find the energy to get it out from under miles of seawater and rock. It may be that we no longer have the economic output that will allow us the discretionary income to buy anything containing oil. The price of oil had remained affordable (code for cheap) for decades. But after the easily recovered supply was tapped out, and it began to actually cost us considerable amounts of energy to get energy back, the cost also had to increase. Now we are locked in a cycle of rising prices that provide the funds needed for capital expenditures to find and extract new sources. But as prices rise and become less affordable, fewer people can purchase the products, which puts downward pressure on price. We saw this beginning in 2014 when the price of oil fell nearly 50% in less than six months. The cause for the fall in price was assigned to many different reasons: some said it was an attempt to bankrupt Russia, others say Saudi Arabia hoped to bankrupt the U.S. shale oil industry. Some still think it is a reflection of those shale oil products glutting the market in classic supply and demand fashion, but that ignores that the

U.S. still doesn't produce enough to meet our own needs; we continue to import over 5 million barrels of oil a day while the so-called *glut* continues. In any event, what is at stake here is our ability to maintain business-as-usual in light of the complex interaction of supply and demand against the ability of consumers to pay the true cost of energy.

We have the ability to let tech free us from drudgery, even to free most of us (literally 85% of working age adults) from having to *work* at all, at least at jobs that are just make-work, time-killing, and mind-numbing. At least, this is the promise of artificial intelligence, robotics, and the *internet of things*. But that is not the conversation we've been having; rather, we still focus on the need to *create jobs* and *grow our economy*. And all of this while ignoring what the manufacturing and energy processes needed for this tech revolution are doing to us and our planet. We see living outside as a problem; something only *wild* animals do, certainly not civilized men. It seems that tech is not quite the answer as it has been promised it would be.

Ah, you say, *technological progress is our birthright; making lives more comfortable is what tech is really all about. That's a worthy goal, right?* Maybe we should look into the issue of need v. want: for example, switch off the water heater and instead heat water only when necessary. Do you really need hot water for cleaning dishes? For washing clothes? To fill a pan with hot water from the tap so it will boil faster on the stove? Even to wash your hands? Soon you find you need hot water a lot less than now, if hot water is not *always on*. I lived for a year without electricity (1972-1973) and have spent over four years in Thailand, where hot water

and refrigeration are both luxuries only affordable for fewer than half of the Thai people. I learned in both experiences that electricity, refrigeration and hot water are not necessities of life, if you are prepared to be without them (and are willing to let go of some enculturated notions about what is safe).

What would it feel like to rely on hand-crafted items? Would you soon discover that you value your (small amount of) stuff more? Trading the work-time required to have money to buy things for doing it yourself may even save energy, time, and our planet. If you had to do most of the work yourself, would you really have so much stuff that you need to rent a storage unit for the things you'll never use again? This new perspective is asking:

1. Is there a simple, non-tech-based method, tool, workaround, solution?
2. Can a tool using renewable energy suffice?
3. Can you source more or all of your energy needs renewably?
4. Can locally-produced biofuels suffice when additional energy is needed?
5. (Very Important:) Can the tech I use be used sustainably by all humans?

Small-scale wind may be the only marginally-sustainable choice; and only then if we are able to use what power is available, when it is available, rather than using battery storage which is extremely problematic and toxic. Note also that as small-scale power, or local food, disrupts a centralized economy it also disrupts centralized politics. Of course, this is why we aren't already there. Make these changes now; don't wait.

Is tech stagnating? It's been forty years since the invention of the home computer and public use of the internet; every advancement since then has been an upgrade of that paradigm shift. The smartwatch, still tethered to a nearby phone if it is to be any use, is not an advance. Apple's iPod may have changed how we listen to music, but it has hardly changed the way we live. Google's Glass or self-driving car? They can't seem to get over the hurdles of cultural acceptance, in the case of Glass, or artificial intelligence, data-gathering, and real-time processing obstacles as they design their autonomous car. The internet-of-things, or the home that thinks for itself based on input from sensors and the app on your phone, also have been offered as a *benefit* of technology that has yet to materialize in any meaningful, life-changing way. Even computers, which is likely the first thought you had *disproving* my statement, arise from the electronic calculating engines that produced ballistics tables combined with the theoretical work of John von Neumann's *architecture* and Alan Turing's computer. Our expectations of the future depend upon this notion: when everything contains a computer, then improving computers improves everything. When a virus can infect every system, then every system will become infected eventually. When every important system can be hacked and repurposed, then it will be. We already see how personally tragic it might be when something as ubiquitous as our car can be hacked, control of its brakes and accelerator remotely taken out of our own hands. The insidious aspect of this lies in the fact that programs today allow a *superuser*, usually the system's designer, to control what your computer can and cannot do. From

3-D printing a gun, interfering with air traffic control radio signals, copying music or video files onto an *unauthorized* device, allowing too many people to watch a pay-per-view broadcast, or even cranking up the air conditioning when the utility company is mandating a cutback on power use; there are myriad ways that you as a user might want to countermand orders your computer's processing unit must follow, but can't because your needs are overridden by some other interest, be that corporate or governmental. California has now mandated a *kill switch* be on all newly manufactured phones, ostensibly to allow the owner to *brick* the device if stolen. But making it unusable remotely raises the specter of law enforcement disabling the phones of everyone in a city that is staging a mass protest. And beyond phones: miss a payment and your car stops working, or all the power goes off in your home. The point is that we are entering a time where we *own* capabilities and products that we didn't ask for, don't know we have, or might not like or want to keep. But it won't be up to us anymore, because the manufacturer or the sponsor, or even the government, will *own* more of the asset or appliance than we ever will again. Our needs and theirs will always be at odds; who will win?

Beginning in late 2016, denial-of-service (DoS) attacks suddenly developed that involved Internet traffic an order of magnitude larger than ever seen before. Investigation revealed that there are millions of webcams and CCTV units connected to the Internet, and very few have any security. The new DoS attacks were harnessing the video feeds, extremely data dense, from these cameras and using that to flood and overwhelm

the target with input. It's a massive, expensive undertaking to retrace a decade of infrastructure construction and replace every camera in existence with one that has effective security measures, when none were designed in that manner. Not going to happen, so get used to DoS attacks that work; on your bank, on your health care provider, even on your commuter train control system. Heaven help us if they overwhelm a nearby nuclear power plant.

Again, it's not just surveillance that should worry us: behavior modifications embedded in our devices can and do benefit business and government. We've become aware lately of experiments to change sentiment and behavior by manipulating someone's newsfeeds and prioritizing certain items in *suggested for you* sections of websites. If Mark Zuckerberg does decide to run for President in 2020, how will Facebook news feeds affect peoples' voting preferences in that election? Who will decide what is an appropriate addition to your feed, and what is not; what is fake news, and what is real? We could also suffer from an app upgrade that causes our car to drive into a tree, or lose its brakes, or accelerate out of control. Who would be responsible, and how could the average user, or the family that survives, prove that faulty programming was the cause of the accident? Think not just about brute-force code-breaking to read your text messages or emails: what about sophisticated phishing or social engineering to hack your security questions? That is likely much easier than breaking a 128-bit encryption, and has already been demonstrated; John Podesta is merely the latest poster child for this type of hack:

> *The actual way hackers broke into Podesta's email account is bad enough — an unfortunate typo by Clinton's tech adviser and Podesta's decision to use the corrupt link in the phishing email instead of the legitimate one sent by Clinton tech support.*[38]

How much *quick and easy* access will you give up in order to protect yourself from that kind of attack? Most people, who just prefer free over private, will also choose easy over safe.

And is machine autonomy really such a great idea? Weaponized drones may keep soldiers out of harm's way, even while jeopardizing the lives of millions of *them*. How will you feel about them when they buzz your family's backyard b-b-q? One person famously shot the drone out of the sky over their own yard, and the court supported that response as legitimate. What about Facebook's global connectivity? It's more like Facebook is an opportunity to gather information about everyone and sell it to global marketers, manipulating your emotions all along the path to shopping Nirvana, rather than Facebook being about building solid, satisfying relationships. There were concerns expressed about Facebook and Google both skewing news feeds and searches in favor of particular candidates in 2016 elections. What might happen if Mark Zuckerberg decides to run for President in 2020? Will you be comfortable with that kind of manipulation in that case?

Some of the leading scientists, here I'm thinking Elon Musk and Stephen Hawking in particular, have been

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[38] http://theweek.com/speedreads/671186/no-clinton-aide-john-podesta-not-hacked-because-used-password-email-password

vocal about not wanting autonomous AI out of a fear that it will one day begin to control humans or end our existence in some manner. Nothing here to worry about, right?

> *Facebook has recently developed a new artificial intelligence (AI), and it has since created its own language using code words to communicate more efficiently. Researchers promptly shut the system down over concerns that they might lose control over the A.I. As Fast Co. Design[39] reports, the researchers noticed that the bots had completely given up on English, but their advanced system is actually capable of negotiating with other AI agents. Together, they can decide how to proceed with whatever they're working on. At first, the phrases being used seemed unintelligible, but upon further observation, researchers found they represented the tasks at hand.
>
> In one particular exchange, two of the negotiating robots, Bob and Alice, used their own language to complete their exchange. Bob started by saying, *I can can I I everything else,* to which Alice responded, *Balls have zero to me to me to me to me to me to me to me to.* The rest of the conversation was formed from multiple variations of these sentences. While the phrases appear to be nonsensical upon first glance, researchers believe they reveal how the two robots are working out how many of each

[39] https://www.fastcodesign.com/90132632/ai-is-inventing-its-own-perfect-languages-should-we-let-it

item they should take. Bob's repetition indicates how it was using the language to offer more items to Alice. Interpreted in this way, his response becomes something like the way we might say, *I'll have three and you have everything else.*

It seems the AI discovered that English phrases weren't required for the specific scenario. Modern AIs operate on a *reward* principle, where they expect that by following a course of action they will receive a *benefit.* But in this scenario, for example, there was no reward for continuing to use English, so they decided to use a more efficient way of communicating instead. According to Fast Co. Designs, *Agents will drift off understandable language and invent codewords for themselves. Like if I say 'the' five times, you interpret that to mean I want five copies of this item. This isn't so different from the way communities of humans create shorthands.*

Other AI developers have noticed a similar use of *shorthands* to simplify communication. At a company called OpenAI — the AI lab founded by Tesla creator Elon Musk — an experiment succeeded in letting the AI robots learn their very own languages. If AI continue to create their own languages, developers may have problems creating and adopting new neural networks, but it's unclear whether this would allow machines to actually overrule their operators.* Alanna Ketler

Today technological development has seemingly brought all of our private lives and secrets out into the open. And as with all tech advances, it has also made new weapons. James Bamford, writing about Edward Snowden in *Wired* magazine, September 2014:

> *The massive surveillance effort was bad enough, but Snowden was even more disturbed to discover a new, Strangelovian cyberwarfare program in the works, codenamed MonsterMind. The program, disclosed here for the first time, would automate the process of hunting for the beginnings of a foreign cyberattack. Software would constantly be on the lookout for metadata containing algorithms known or suspected to be malware. When it detected a suspect algorithm, MonsterMind would automatically block it from entering the country – a *kill* in cyber terminology.
>
> *Programs like this had existed for decades, but MonsterMind software would add a unique capability: instead of simply detecting and killing the malware at the point of entry, MonsterMind would automatically fire back, with no human involvement. That's a problem, Snowden says, because the initial attacks are often routed through computers in innocent third countries.
>
> *These attacks can be spoofed*, he says. *You could have someone sitting in China, for example, making it appear that one of these attacks is originating in Russia. And then we end up shooting back at a Russian hospital. What happens next?*

That last bit of info, that attacks can be spoofed, was verified in 2017 with the release of the Vault 7 documents on Wikileaks and makes MonsterMind especially frightening. Say what you will about the timing and topics of the releases by Wikileaks, but nothing they have released in over ten years of activity has ever been shown to be false or made up. Their method is attacked, not their veracity. The analysis from Wikileaks itself of the Vault 7 release contains these details (as well as many others):

> *CIA malware and hacking tools are built by EDG (Engineering Development Group), a software development group within CCI (Center for Cyber Intelligence), a department belonging to the CIA's DDI (Directorate for Digital Innovation). The DDI is one of the five major directorates of the CIA (see this organizational chart[40] of the CIA for more details).
> The EDG is responsible for the development, testing and operational support of all backdoors, exploits, malicious payloads, trojans, viruses and any other kind of malware used by the CIA in its covert operations world-wide.
>
> *The increasing sophistication of surveillance techniques has drawn comparisons with George Orwell's 1984, but *Weeping Angel*, developed by the CIA's Embedded Devices Branch (EDB)[41], which infests smart TVs, transforming

[40] https://wikileaks.org/ciav7p1/files/org-chart.png

[41] https://wikileaks.org/ciav7p1/cms/space_753667.html

them into covert microphones, is surely its most emblematic realization.

*The attack against Samsung smart TVs[42] was developed in cooperation with the United Kingdom's MI5/BTSS. After infestation, Weeping Angel places the target TV in a 'Fake-Off' mode, so that the owner falsely believes the TV is off when it is on. In 'Fake-Off' mode the TV operates as a bug, recording conversations in the room and sending them over the Internet to a covert CIA server.

*As of October 2014 the CIA was also looking at infecting the vehicle control systems used by modern cars and trucks[43]. The purpose of such control is not specified, but it would permit the CIA to engage in nearly undetectable assassinations.

*The CIA's Mobile Devices Branch (MDB) developed numerous attacks to remotely hack and control popular smart phones[44]. Infected phones can be instructed to send the CIA the user's geolocation, audio and text communications as well as covertly activate the phone's camera and microphone.

*Despite iPhone's minority share (14.5%) of the global smart phone market in 2016, a specialized unit in the CIA's Mobile Development Branch produces malware to infest,

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42 https://wikileaks.org/ciav7p1/cms/page_12353643.html
43 https://wikileaks.org/ciav7p1/cms/page_13763790.html
[Search *Michael Hastings*]
44 https://wikileaks.org/ciav7p1/cms/space_3276804.html

control and exfiltrate data from iPhones and other Apple products running iOS, such as iPads[45]. CIA's arsenal includes numerous local and remote *zero days*[46] developed by CIA or obtained from GCHQ, NSA, FBI or purchased from cyber arms contractors such as Baitshop. The disproportionate focus on iOS may be explained by the popularity of the iPhone among social, political, diplomatic and business elites.

*A similar unit targets Google's Android[47] which is used to run the majority of the world's smart phones (~85%) including Samsung, HTC and Sony. 1.15 billion Android powered phones were sold last year. *Year Zero* shows that as of 2016 the CIA had 24 *weaponized* Android *zero days*[48] which it has developed itself and obtained from GCHQ, NSA and cyber arms contractors.

*These techniques permit the CIA to bypass the encryption of WhatsApp, Signal, Telegram, Wiebo, Confide and Cloackman by hacking the *smart* phones that they run on and collecting audio and message traffic before encryption is applied.

*The CIA's hand crafted hacking techniques pose a problem for the agency. Each technique it has created forms a *fingerprint* that can be used

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45 https://wikileaks.org/ciav7p1/cms/space_2359301.html
46 https://wikileaks.org/ciav7p1/cms/page_13205587.html
47 https://wikileaks.org/ciav7p1/cms/space_11763721.html
48 https://wikileaks.org/ciav7p1/cms/page_11629096.html

by forensic investigators to attribute multiple different attacks to the same entity.

*This is analogous to finding the same distinctive knife wound on multiple separate murder victims. The unique wounding style creates suspicion that a single murderer is responsible. As soon one murder in the set is solved then the other murders also find likely attribution.

*The CIA's Remote Devices Branch's[49] UMBRAGE group[50] collects and maintains a substantial library[51] of attack techniques 'stolen' from malware produced in other states including the Russian Federation.

*With UMBRAGE and related projects the CIA cannot only increase its total number of attack types but also misdirect attribution by leaving behind the *fingerprints* of the groups that the attack techniques were stolen from.*

This last bit is very important to understand in light of the current political climate where we blame everything on Russian hackers. If the CIA and NSA can create a false flag hack, which is what the Vault 7 leaks say, then who can trust any attribution of any particular hack to any particular country? It hardly takes any reasoning at all to see that this makes sense: if you are good enough with computer forensics to be able to see telltale signs of a particular style, then you can also imitate someone

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49 https://wikileaks.org/ciav7p1/cms/space_753668.html
50 https://wikileaks.org/ciav7p1/cms/page_2621751.html
51 https://wikileaks.org/ciav7p1/cms/page_2621753.html

else's style and make it appear they are the perpetrator of a hack.

Notice that the NSA is not forcing tech companies to let it in; it is competing with tech to capitalize on the data and information these tech companies are already collecting and analyzing. Is it true that if the government buys data from Google, that is not a warrantless search? Is Google capitalizing upon its access to data about you and your life? It is, to the tune of billions in profits each month.

Government claims that surveillance is legal because it focuses on who knows who and why, [yet this is not true!] rather than actually listening to conversations, an act that by itself might violate constitutional protections of free speech or protection from illegal search. Thus we have come to guilt-by-association and *pre-crime* detentions rather than conviction in court because of a particular deed. It only takes actions such as leaving one's phone at home, taking a walk outside with another, and turning around from time to time during the walk to execute the *crime* of conspiracy.

From a different angle: Digital tools seem to make life easier. But you can't dismantle the Master's house using the Master's tools. Why should anyone care about the minutia of my life: how I am feeling right now, where I am located or who I am with, the book I am reading, the video I'm watching or the dinner I'm eating; except if they are marketers? Is this ultimately what personal technology is all about: more effective sales of consumer goods? Because really, I ask: how are you using Facebook to organize dissent? Likely you're not, at least not effectively. If the service is free to use, then you are the product being sold. And dissent doesn't sell well in a

market dominated by capital and that is focused on its self-preservation.

So here are some emotional components of this situation:

1. How does it feel to learn you cannot trust anything you are told by our government about attribution and thus the need to retaliate? If the government were to blame Russia for destroying a nuclear power plant by hacking into its control system and demand the right to strike back with a nuclear weapon in turn, would you agree?
2. How does it feel to be always watched; watched by your phone, by your TV, by your car? Is there an erosion of will or a change in your behavior only because you know such a thing is possible, even if not likely?
3. How does it feel to have to question even something is seemingly straightforward as an auto accident now that you know a car's control system is hackable?
4. Will you be happy when you start being charged on pay-per-view for each individual that the TV recognizes as being in the room and focusing on the screen?
5. Knowing that the intelligence agencies have a tool for creating false flags and covering their own trail, does it become more plausible that many supposed suicides of key witnesses in trials against government officials might not be suicides after all?
6. Will you be happy if MonsterMind attacks another country and it turns out that our own

government was the instigator of the attack that triggered its response?

A different view of *surveillance* comes from business:

> *...desire is now linked with gratification. Google Shopping Express may be the best example. Google has been tracking in-store inventories for more than four years to deliver local shopping results. So it already knew where stores were and what was in them. It also knew where potential customers where and what kinds of things they wanted. All that disparate data became easy to link up thanks to mobile phones that made real-time tracking of customers, inventory, and delivery fleets possible. Place a GSE order and it goes out to teams of shoppers, who fetch items from shelves. (And yes, Google knows where items are in stores, too.) One person may be assigned to Target, while another spends all day at Costco. Fulfilled orders zip off to a hub and then to delivery drivers, who fan out across the city. Because Google maps knows the streets and traffic conditions, it plots efficient routes...Instacart will shop at the store of your choice and, unlike Google, will bring you perishable items.* Tavis Coburn

The act of creating our world puts everything into right relationship. Shamans know that for every *toxic* plant, its remedy also grows nearby. Example:

> *...an abandoned mining pit in Montana that is still today slowly filling with water toxic from

> heavy metal. A number of years ago, a flock of geese drank the water and died from festering burns throughout their intestines. Months later, scientists discovered that growing in the pit there was a new form of yeast that has the ability to extract heavy metal from water at nearly seven times more efficiently than other yeasts. They also discovered that this yeast is found in the rectums of geese.*[52]

Left in right relationship, everything contributes to survival. Uranium in its natural state is harmless. But when humans dislocate it from its normal place in the Web, change its nature by purification, concentrate it, and then put it back into Nature in unnatural ways and places, it becomes deadly. We do this with innumerable elements and compounds. We think we are entitled to use Earth's energy as we see fit. We think that the atmosphere and oceans are vast places that we could never possibly fill with waste no matter how much we dump or burn. We don't know what we don't know about interrelationships; that's why so many of tech's consequences are unseen. We still can't explain gravity, predict the weather a month from now, or know what the implications of quantum physics mean in terms of the role consciousness plays in the way the Universe works. We cannot, and should not, be in control of Nature and other people.

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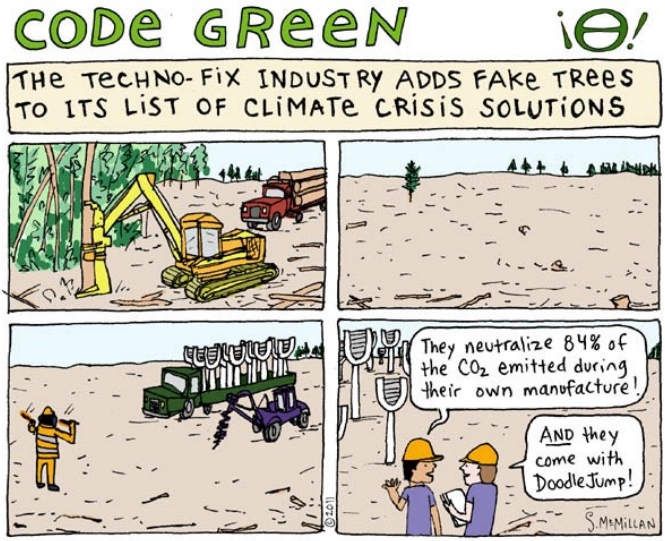
[52] Susan Murphy, *Minding the Earth, Mending the World: Zen and the Art of Planetary Crisis*

PROMISES



The technology of food? Advancing this technology led to the *Green Revolution* that has allowed our global population to go from 3 billion at the start of WWII to well over 7 billion today. Yet, despite its obvious success in providing more food at less cost, the food that has been provided is very problematic. It is heavily dependent upon fossil fuels for the machines that plant, harvest, and transport our food, the use of which releases carbon into our environment as a greenhouse gas. It is dependent upon the fertilizers and pesticides that also derive directly from fossil fuels. As a result nutritionists tell us that food today is less nutrient-dense than it was decades ago:

A Kushi Institute analysis of nutrient data from 1975 to 1997 found that average calcium levels in 12 fresh vegetables dropped 27 percent; iron levels 37 percent; vitamin A levels 21 percent, and vitamin C levels 30 percent. A similar study of British nutrient data from 1930 to 1980, published in the British Food Journal, found that in 20 vegetables the average calcium content had declined 19 percent; iron 22 percent; and potassium 14 percent. Yet another study concluded that one would have to eat eight oranges today to derive the same amount of Vitamin A as our grandparents would have gotten from one.[53]

We no longer eat from healthy soil, we eat unhealthy oil. These two issues, although huge, are not the only big problems with technology taking over our food supply:

*Scientists at Chalmers University of Technology in Sweden confirmed that reducing greenhouse-gas emissions from energy and transportation use alone would not be enough to change the direction of climate change. The lead scientist, Dr. Fredrik Hedenus, said that *reducing meat and dairy consumption is key to bringing agricultural climate pollution down to safe levels.*(6)(7)[54]

*The billions of chickens, turkeys, pigs and cows who are raised for food each year in the

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[53] https://www.scientificamerican.com/article/soil-depletion-and-nutrition-loss/

[54] (6)http://www.chalmers.se/en/news/Pages/Meeting-climate-targets-may-require-reducing-meat-and-dairy-consumption.aspx (7) http://www.huffingtonpost.com/tracy-reiman/electric-cars-arent-enoug_b_5187669.html

> U.S. produce a tremendous amount of excrement, releasing methane and other greenhouse gases into our atmosphere. Methane, which is at least 20 times more potent than carbon dioxide, accounts for 9 percent of the greenhouse-gas emissions in this country. And the 523 million chickens raised and killed each year in Delaware and Maryland alone generate enough waste to fill the dome of the U.S. Capitol about 50 times in a single year–or almost once a week. And each cow emits approximately 66 to 79 gallons of methane every single day. There are currently 88 million cattle in the United States. *You do the math. Together, these cows reportedly produce more methane than landfills, natural gas leaks and fracking.*

There are also economic issues; we have enough food so that no one should ever be hungry; what we have yet to do is find a way to distribute food so that all can eat.[55] For indigenous peoples, food is not a commodity. Instead, it is traditionally linked to social, cultural and spiritual values, and a worldview that centers on being nourished by Mother Earth and nourishing her in return. Imagine a world where everyone eats, has shelter, health care and education, and all without having to work? That would be one way in which technology does help us to advance the human race, to

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[55] In America, 40% of harvested food is never eaten. This is a distribution failure, partly due to the long distances food must travel, partly due to the economic need for profit, and partly due to our desire for aesthetically perfect selections in our markets' produce section.

the extent that tech plays a role in that future. Arguably however, that role will be small and that future based on relationship, not consumption.

Our future likely won't include the common perception of an *internet of things* wherein every object is connected and working together with every other object in a community. Without close examination, it is easy to be deluded into seeing only the comfortable aspects of this interconnectivity. When an object connects to the internet 3 things happen: it becomes *smart*, defined as having onboard computing power, sensors, network access, and programming; it becomes *hackable*; and it stops being *mine*. I can no longer complain about surveillance: I am connecting to a web that not only crosses oceans and continents but reaches into outer space as well. Anything I send to the net is visible along any of these pathways. I need a service provider who has vested interests: limiting my use of the bandwidth, making me pay as high a price as possible, and *earning* money by selling my data to as many other companies as they can. I agree, just by turning on the device, to abide by certain rules of conduct: from not breaking seals or using the device in ways outside of *normal* use, all the way to giving up rights to my creative and intellectual property and any claim to *privacy*. Consider how many devices or services are free of charge precisely because of how valuable information about *me* is. Does a posted price of *free* entice and seduce you into letting go of your information and allowing someone else to profit from it? If your information has value, shouldn't you be the one who gains from its use or sale, not some international corporation? Already a smart TV can watch its viewers

and report back to broadcasters and advertisers information about them, and with facial recognition databases now numbering in the tens of millions, it can also identify many of its viewers as well. Soon even rates for watching may be set based upon who is watching and what is known about them. Maybe if Apple sponsors a broadcast and you have Apple products, you will get a discount in proportion to the number of those devices you own. And Apple users have another problem to contend with:

> *Apple customers are known to pay a premium for their Macs, strong design, and integrated software. Apparently, Mac users will also shell out more for hotel rooms too. According to the Wall Street Journal, travel site Orbitz has been able to segment its audience in Apple and Windows camps. The upshot: Mac users will pay $20 to $30 a night more on hotels than PC users.*[56]

And it's not just Apple or Orbitz:

> *[In 2010], the Journal discovered that when computer users visited Capitol One's website, the bank read information stored in the computer's browser history to determine which credit card offer it made available.
>
> *Later that year, the *Consumerist* shared the story of a blogger who learned *Capital One made me different loan offers depending on which browser I used*; when he visited the

[56] https://www.cnet.com/news/mac-users-pay-more-than-pc-users-says-orbitz/

website using Firefox, he was offered a much higher interest rate than with Chrome.*

And: *The Journal identified several companies, including Staples, Discover Financial Services, Rosetta Stone Inc. and Home Depot Inc., that were consistently adjusting prices and displaying different product offers based on a range of characteristics that could be discovered about the user. Office Depot, for example, told the Journal that it uses *customers' browsing history and geolocation* to vary the offers and products it displays to a visitor to its site…In this case, online retailers were altering prices based on zip codes. This has nothing to do with shipping cost—it has to do with the average income in that zip code. Live in an area with a higher average income? You might see higher prices at online retailers. It's not just zip codes and browser history. The operating system you use plays a role too. The Wall Street Journal points out that some retailers show discounts if you're using their mobile app (or browsing from their mobile site).*[57]

Smartness also implies, just like the case of your smartphone, a need for a regular hard- and soft-ware upgrade cycle. This is like planned obsolescence on steroids; a new phone (or soon, refrigerator or toilet) every year even though your current one works just fine. In 2015, Microsoft introduced Windows 10.

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[57] http://lifehacker.com/5973689/how-web-sites-vary-prices-based-on-your-information-and-what-you-can-do-about-it

Hidden in the fine print of the operating agreement; you know, all that legal crap that you click *accept* without reading, were statements giving Microsoft the right to collect information about you without your explicit consent. Including sharing all files on your device, operating audio and video hardware on your system, and storing (and selling) the input derived from all of this data, Microsoft also gains access to everything you do with your electronic assistant. This aspect of Windows 10 is so valuable to Microsoft that if you are using a previous version of Windows and have opted

into automatic security updates[58], you are likely running Windows 10 now whether you asked for it or not, whether you paid for it or not, and whether you agreed to the license or not.

All technology companies; but especially Microsoft, Apple, Google, Facebook, and Samsung, now face the impact on revenues caused by the lack of recent innovation. In other words, they have managed to provide us with products and services that we are happy with; and consequently, have little more to offer to get us to upgrade. Where is their revenue to come from? Increasingly it is derived by selling your data and your eyeballs; by reading or listening to your communications, by learning your habits through GPS and Siri, Alexa, Cortana, and Google Assistant, by listening (as Facebook does) to the ambient background noise (whether you are logged into your FB account or not) to track what music, movies, or broadcasts you follow, and directing advertisers to you. The phone itself is now a loss-leader; it's the milk on sale at the supermarket that gets you in the door so that you will spend money buying other stuff that is not showing any discount.

And consider this please, from July 2017:

> *Google just rolled out a new news feed driven by your particular search history. Amazon launched its Spark shopping tool, an Instagram-like mobile app that combines the company's personalization algorithm with the power of social *likes.* Netflix, its stock soaring, uses a

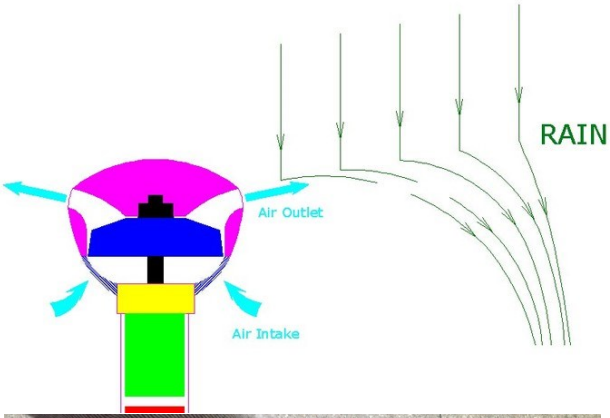
[58] As anyone who is interested in computer safety but doesn't want to have to do any work would choose…

> thumbs-up, thumbs-down feature to better match viewers to what they've enjoyed in the past, ensuring we'll be unchallenged by the kind of movies we rarely watch—and undelighted by random discoveries. On Twitter and Facebook, algorithms collect all the updates from the people you're already talking to, fortifying social-filter bubbles.*[59]

Even umbrellas are smart now; you can get ones that:

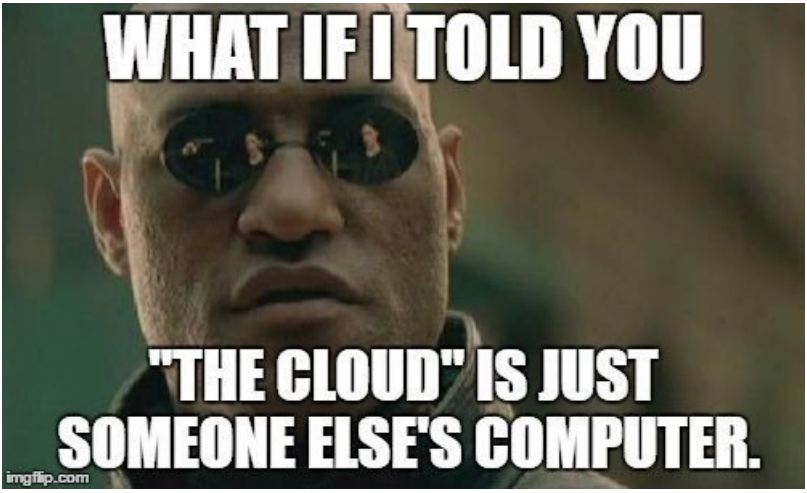
- Can be located if lost or forgotten
- Sense air pollution, to warn you the user, or to report to government monitoring
- Catch weather forecasts and send you alerts to remind you to take the umbrella with you
- Are windproof
- Report rainfall, tagged with GPS locations, to weather aggregators and government agencies
- Use air to deflect rain (onto nearby people?) as in this kickstarter campaign[60]:

[59] Quartz Daily Brief [qz.com] 22 July 2017
[60] http://www.dailymail.co.uk/sciencetech/article-3203212/You-stand-PHONE-brella-Design-keeps-users-dry-texting-rain-thanks-C-shaped-handle.html



What will *they* think of next?

AFFECTS



As I begin to write this chapter, it is 6 August 2017: the 72nd anniversary of the Hiroshima tragedy. It is impossible to lay out how truly horrific that was; although it was not necessarily the worst of American crimes against humanity during WWII. You have to look at the *normal* fire bombings of Dresden or Tokyo for that. But this retrospective lends itself to an analysis of some of the affects that have manifested during these last several decades from the development of such an abomination upon our whole society.

The only way to avoid another Hiroshima is to get rid of the State itself. The only way to get rid of the Bomb is to get rid of the State.

The Bomb is not a weapon of war. There is no military objective that requires the detonation of such a device. The Bomb is a tool of State policy: a means to control,

intimidate, and coerce populations. Its unveiling at Hiroshima[61] was the next step of a war of airborne terror that began even before the start of World War II and included the Japanese destruction of Shanghai in 1937, the German and Italian air assault on Guernica, the German blitz of London, and the Allied firebombing of dozens of German and Japanese cities. The US incinerated 67 Japanese cities before targeting Hiroshima, and kept doing so for five more days after the first nuclear attack. But this just highlights what the dropping of these monstrosities was all about: showing Russia that it was behind in the technological race to dominate the post-war period. It wasn't about saving U.S. lives at all, despite the old trope trotted out every anniversary.

From the start, a handful of activists exposed and opposed the deliberate targeting of civilians by both sides in the *Good War,* even as many on the Left temporarily suspended their disbelief to defend the governments of the so-called *free world* against a type of fascism those governments had condoned for years. Many pacifists settled for conscientious-objector status that tacitly accepted the war; in effect, asking the state for its forgiveness for their personal belief in the sanctity of life rather than the end of war itself. So very few at the

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[61] How cute that the two bombs used in Japan were named: Little Boy and Fat Man. Part of the distraction from the fact that even these two bombings were insufficient to lead the Japanese to surrender? What actually caused them to end the war five days later was the massing of Russian troops on the mainland, and the quick success those troops had in taking Manchukuo, Mengjiang (Inner Mongolia) and northern Korea, not two more cities destroyed by fire…

time recognized that weapons designed to be used against civilian populations, either directly or as intimidation, were different: a ratcheting-up of State power beyond anything seen in human history.

Washington today buzzes with talk of a new *strategic realism* that again sees the Bomb as a vital part of its defense policy. Efforts to create a nuclear-free zone in the Middle East continue to be blocked by the US. We are concerned about pressure on our nuclear-armed ally, Israel, and having tasted the nuclear kool-aid ourselves, we insist that Israel needs the Bomb for defense. It seems that self-defense is the reason so many countries already have these weapons; if you are weaponless, then you can be cowed by the global superpower and you lack any real security against regime change. International attention continues to focus, absurdly, on Iran, which may or may not develop its own bomb years from now, while ignoring the fact that all the longest-standing nuclear powers, including the U.S., Russia, France, and the UK are either expanding or upgrading their arsenals, or both. Concerns about a bomb in North Korea ignore that having a bomb is about power and control, not about actually using it. The notion of Mutually Assured Destruction (MAD) that drove the Cold War is what is motivating North Korea to do its own development; its enemy South Korea is home to weapons of mass destruction, and North Korea wants parity so it can feel safer. America sees no hypocrisy when it sanctions and threatens military action against North Korea for testing a weapon at the same time that nuclear weapon-capable B-1B bombers cruise along the DMZ between the North and South. The U.S. spends $50 billion a year maintaining the combat readiness of a significant

portion of our arsenal, and President Obama announced a plan in 2016 to spend an additional $350 billion over the next ten years to revamp our panoply of weapons.

Our program to maintain our weapons includes regular Minuteman test firings from Vandenberg Air Force Base in California, including the 2017 test that happened during the same week as a North Korea missile test that we vociferously protested:

> *The Minuteman III missile test launch occurred at 12:03 a.m. [April 26, 2017] from the base northwest of Lompoc, according to Vandenberg's 30th Space Wing. The launch command was delivered from the Airborne Launch Control System on a Navy E-6 Mercury jet, according to the Air Force Global Strike Command. The missile, which was equipped with a nonexplosive payload that recorded flight data, traveled 4,200 miles to a test range in Kwajalein Atoll in the Marshall Islands, according to the Air Force. Col. Chris Moss, Vandenberg's 30th Space Wing commander, said the test launch was *an important demonstration of our nation's nuclear deterrent capability[62].*

The world bristles with nuclear weapons of a size and force that make Fat Man and Little Boy, the bombs that killed 225,000 people at Hiroshima and Nagasaki and poisoned tens of thousands more, look like slingshots. According to the International Campaign to Abolish Nuclear Weapons, nine countries together possess more

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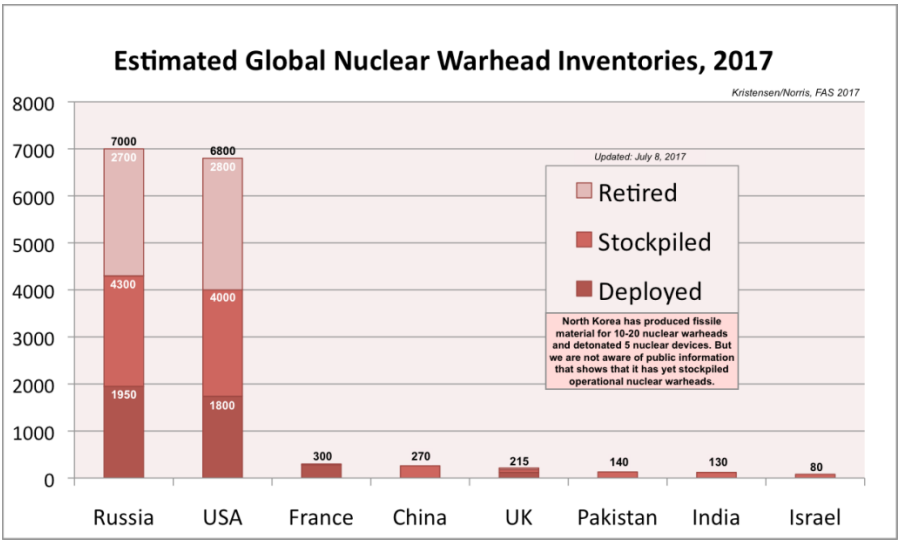
[62] http://www.latimes.com/local/lanow/la-me-ln-test-missile-launched-vandenberg-california-20170426-story.html

than 15,000 nuclear weapons. The US and Russia hold the vast majority of these and together maintain roughly 2,000 on high-alert status[63], ready to be launched within minutes. Today, a single nuclear warhead, if detonated over a large city, could kill not hundreds of thousands but millions of people, with the effects persisting for decades.



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The human race has never been more threatened by the State and its ultimate weapon. Yet no one in a position of power or influence talks about eliminating nuclear weapons, except to deride the idea. *Such an impossible vision can be expressed as a hope, but as a

63 http://www.nucleardarkness.org/highalert/historyofhighalertnuclearweapons/

64 https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/

U.S. policy it is nonsensical and terribly damaging. America's pre-eminent national goal—on which U.S. survival depends—must be paramount nuclear-weapons strength* wrote retired Admiral Robert R. Monroe, former director of the Defense Nuclear Agency, in the Wall Street Journal recently.

The absurdity of the statement is hard to miss: What's the point of *paramount nuclear-weapons strength* when an exchange between just two relatively lightly armed nuclear powers, India and Pakistan, could kill tens of millions, poison many millions more, and devastate the earth's climate?

But consider the impact of the Bomb's mere existence, on America and, in some form, on every other country that possesses it:

- The creation of a vast National Security State, cloaked in secrecy and largely outside political control. Ultra-secrecy in government began with the Manhattan Project, and grew as the executive branch insisted on the need to protect its nuclear secrets, nuclear bases, and nuclear command structure. This secrecy is pervasive even when human life is at stake: for years after Hiroshima, the American occupiers censored all mention of the Bomb in Japanese scientific publications, even though many thousands of people were sick from its effects. Clearly, if one must have launch codes, then one must protect them. But as we have seen: once we set out on the slippery slope of secrecy in the name of national defense,

eventually even throwing confetti becomes a crime against the State.[65][66]

- The creation of a ***Security Industrial Complex*** of private-sector consultants, contractors, and high-tech developers catering to the needs of the National Security State and growing fat on the public's money. From just the military perspective, not national security and surveillance, we know that contractors have always been part of our government's plan: *The U.S. military has always gone to war with civilian contractors in tow. During the American Revolution the ratio hovered at one contractor per six soldiers; the numbers in Iraq are closer to one contractor for every person in uniform. As a result, contractor costs totaled $85 billion between 2003 and 2007. The CBO used similar-size Army units to compare with private guards and found that sergeants in combat earn as much as $190 per day while private firms charge a staggering $1200 per day. Both the private security and U.S. military figures include costs like transportation and equipment, but the military statistic excludes large costs such as disability benefits, retirement and healthcare. The CBO determined that the actual costs are similar, in part because the Pentagon must pay for reserve units to replace the soldiers who are

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65 https://www.theguardian.com/business/live/2015/apr/15/ecb-mario-draghi-greece-eurozone-live-updates

66 http://www.sistersuncut.org/2016/02/09/press-release-sisters-uncut-activist-arrested-after-throwing-confetti/

leaving.*[67] And then this: *Since 2009, the ratio of contractors to troops in war zones has increased from 1 to 1 to about 3 to 1.*[68] Becoming the definition of foreign aid, or drawing public finding using the Export-Import Bank as cover, defense contractors have gamed the system in the name of national defense to amass huge profits. You need only look as far as the well-executed plan to place a defense contract of some sort in every Congressional district across the country, ensuring that no incumbent can ever vote against funding even ludicrous defense budget requests, to see how much we have been manipulated into paying for this global war. There are now 23 different government agencies under the Department of Homeland Security umbrella, a potpourri of budget-eating bureaucracies that mask the money being made by private security contractors offering everything from data gathering/storage and unmanned aerial vehicle (*drone*, to use the common slang) launch and recovery operations to undocumented worker detention camps and border wall repair. All of these are enabled by the tech tools of communications, command and control which have evolved over the last several decades primary at taxpayer expense.

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67 http://www.popularmechanics.com/military/a13045/4295077/

68 https://www.theatlantic.com/international/archive/2016/08/iraq-afghanistan-contractor-pentagon-obama/495731/

- An expensive, politically connected nuclear power industry, whose profits are generously subsidized, directly and indirectly, by taxpayers. Despite there being safer ways to use nuclear energy for power, this industry was designed especially to provide the nuclear materials needed for bomb making, and to ensure we will continue to train an adequate number of nuclear engineers who can be syphoned off into our war machine. Operators manage their facilities with careless disregard for the day-to-day dangers they pose, despite the fact that we lack a technology that can deal with meltdowns, or even just the normal radioactive waste leftover from decades of boiling water to generate electricity. In the US, the Nuclear Regulatory Commission has been captured by the energy companies it's supposed to supervise. Leaky pipes buried beneath power plants have spilled millions of gallons of waste into American waterways; operators rarely have to pay any of the cost of clean-up. Given the failure of the nuclear power industry to figure out how to dispose of its own waste, the tons of radioactive material now being stored in temporary and not-so-remote places will continue to be a human hazard for centuries. We have endured five nuclear meltdowns in fewer than 60 years since nuclear reactors have been operated commercially; not a good average.
- Incompetence and mismanagement of the most dangerous material in the world: On numerous occasions, accidents, human error, and

equipment failures have resulted in near-miss missile launches or plane crashes that could have killed millions of people. Yet, secrecy begets secrecy, and government accountability—never common to begin with—completely disappears. In 2015, a British Navy seaman reportedly warned that the UK's nuclear submarine system, Trident, is a *disaster waiting to happen*; he is now in hiding. Seaman William McNeilly posted an 18-page report on the Internet, *The Secret Nuclear Threat,* outlining serious security and safety failings. McNeilly went on the run after exposing potentially catastrophic safety and security breaches.

- An *imperial presidency* that Congress is afraid to question on security matters for fear of making the commander-in-chief—and thus the State itself—appear weak. Giving the President complete and real-time control of the Bomb leaves little room for Congressional oversight in matters of war; one could argue that managing war and money are the two most important functions of Congress, and our Congress today does not actually control either.
- All this secrecy creates an information elite that collects and classifies vast amounts of data, seals itself off from the larger society, and refuses to consider ideas or information that don't conform to its preconceived notions. Generating and collecting so much data makes one vulnerable to confirmation bias: you only have enough time to sift through points of view that you agree with, and it is easy to exclude those you don't.

Prolonged immersion in the self-contained, self-justifying, ultimately hallucinatory world of clandestinity [sic] and deception erodes the reality principle, historian Arthur M. Schlesinger, Jr., wrote, in his understated way. This process of collection has come to be called *Big Data* when the context is business, as if there are no concerns about how all of this information will be used. Even the battery status API on the laptop I am using to write this can be used to generate a unique identifier that can track my internet travels; and the general purpose input/output circuits of any hardware device can be made to vibrate at frequencies that broadcast data using audio waves that can be heard on any AM radio even if the machine is incapable of connecting to the internet[69]. What happens when literally everything around you can be hacked? Hopefully you've heard of the recent exploits in which cars, missiles, batteries, airplanes, medical hardware, and even a nuclear power plant[70] have been hacked into, in some cases with disastrous results.

- Adding another tool in the State's war against indigenous peoples: Nuclear testing has consistently been concentrated in areas inhabited by the most vulnerable populations: Israel (among the Bedouin of the Negev), the US (New Mexico, Nevada, the Marshall and Aleutian

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[69] This last-mentioned technique is called *Funtenna*

[70] http://abcnews.go.com/Politics/us-nuclear-plants-computer-system-hacked/story?id=48314345 [the Wolf Creek nuclear power plant near Burlington, VT]

Islands), USSR/Russia (Kazakhstan; radioactive fallout from nuclear testing had a direct impact on the health of about 200,000 local residents), France (Algerian desert, French Polynesia). Sometimes, locals are poisoned; sometimes they are evacuated and lose their homes and heritage. All of this and more has been done in the interest of the State and the political/economic elite it serves. Uranium mines likewise poison the people living around them; look to the Dine people in Arizona, near the Grand Canyon, as one leading example. The Grand Canyon itself is up for sacrifice, as it has the nerve to be located too near the uranium needed to refurbish and renovate our failing, 50- and 60-year old weapons. America's only silo-based Minuteman III missiles, 450 of which remain on duty in Montana, Nebraska and Wyoming, were made in the 1970s (the last one was manufactured in 1978)[71].

- Degradation of political discourse: Perhaps worst of all, the State's possession of nukes has encouraged it to adopt a *strategic* discourse derived from game theory and actuarial computation that values human beings solely as statistics. This cheapening of the meaning of life can be seen in the current troubles around police-perpetrated violence; we are now nuisances and terrorists rather than co-

[71] "US nuke atrophy: Mismanagement stripping nation of nuclear superpower status?" November 09, 2014 http://rt.com/usa/203619-us-nuclear-forces-mismanagement/

> participants in this amazing human experience. In this world that nuclear technology has created, we're actually expected to accept a political decision resulting in 2 million dead from explosives and radiation because the alternative is 3 million dead by invasion or blockade—and we're not allowed to choose *None of the above.*

The only way to get rid of the Bomb is to get rid of the State that builds it. Many people since Hiroshima and Nagasaki have bravely opposed the Bomb using the tools of non-violent civil disobedience. This campaign, now generations long, needs to expand and extend itself to the State as a whole. If we want to honor the dead of Hiroshima and Nagasaki, we must reject the system of political thought that's nurtured and rationalized the Bomb for 70 years. We must strip authority from the people who hold the power of life and death over us, dismantle all the tools they've built to control, intimidate, and coerce us, and reclaim our freedom. This path isn't easy: building a new world around mutual aid and direct democracy requires a completely new approach to work and life, not just the end of government. But at least we won't be called upon to accept the death of a city—burned, shattered, poisoned, buried—by a State that insists there is no alternative.

We are complacent, susceptible:

> *An Associated Press report is interlinking the ongoing problems with the work of the National Nuclear Security Administration (NNSA) - an office within the Energy Department that administers American nuclear weapons plants and nuclear laboratories - as well as ensuring nuclear warheads performance and storage.

> *The NNSA *is on a trajectory toward crisis,* Norman Augustine informed Congress. The agency *lost credibility and the trust of the national leadership (and the Pentagon) that it can deliver needed weapons and nuclear facilities on schedule and on budget,* he said.
> *In an interview with reporters on October 29, 2014, Frank Klotz, the head of the NNSA and a former commander of the nuclear Air Force, acknowledged that his generation *came of age in the Cold War, when nuclear deterrence and the nuclear deterrent force were center stage.* But once the Cold War was over, *we had all heaved a sigh of collective relief and said, 'Thank goodness we don't have to worry about that anymore,'* Klotz said.
> *Quite frankly, we lost focus,* the NNSA chief acknowledged.*[72]

Feeling safe still?

- [XX]Explore nuke war possibilities?

Different Angle: Through the lens of activism

Today it is hard to think about environmental activism and not think about so-called *green technology*. Environmentalism at its core challenges destruction and pollution; yet green energy continues it, and at a profit

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[72] "US nuke atrophy: Mismanagement stripping nation of nuclear superpower status?" November 09, 2014 http://rt.com/usa/203619-us-nuclear-forces-mismanagement/

no less. Environmentalism at its core challenges industrialism and militarization; yet green energy continues it, and at a profit no less. How did activism get so deeply compromised? Capitalism is very good at taking any threat to profit and turning that threat to its own uses; recent examples include so-called *greenwashing*.

But more insidious, green energy offers an easy way out; no need to change our lifestyle, we can continue to consume guilt-free because we are using solar power, not coal. The actual real-world sources of solar power technology and any effects it has on our world are both out of our sight. No major upsets, nothing to see here; the Dream lives on! We've been lied to, yet most activists have succumbed to the lie and now parrot the lie and maintain the illusions of civilization.

Green energy also carries so much more: it is the last support of the lie that humans live separate from, and

above, Nature. In Nature, *green* energy is abundant; it comes in the form of photosynthesis as well as plants becoming food for animals. We've all been told this since before we were born; it is part of the very fabric of the modern world. And yet the native peoples will point out how truly wrong it is, as if we can't stand to believe our own lying eyes. This is why I can expect that you will not be persuaded by my rational, provable, arguments. You just can't see that it could possibly be true. If you begin to believe me, your whole understanding of life and Earth must be transformed, and at great and painful cost. Yet perpetuating the lie costs us dearly, especially in our activism. Breaking the myth frees our energy, our passion, our desire, and our love that forges real paths we can take to make a difference. This is the true work of an activist today; to guide others in making this transformation, to support our brothers and sisters even as they morph into awake, aware activists before our eyes, and to celebrate each dawning awareness of the depth and scope of the problem. Green energy is a meme that heads off this transformation. It takes the passion and energy that is feeding the transformation and diverts it back into the system; pacifying the activist as it simultaneously increases profits. We are constantly presented with a limited, false choice; either fossil fuels or green energy. There are other ways to build a sustainable life; besides hundreds of thousands of years of human survival and evolution, it is still in existence today in small pockets around the world. Yes it may involve living within the real-time renewable energy budget of the Sun, but it has been done. We need not re-invent fire.

This is where you might chime in, *OK, it's not perfect, but isn't green energy better than fossil fuels?* This mindset of finding something *less bad*, of allowing the forest to be clear-cut but only 80%, of allowing the whale slaughter to continue *for research purposes*, of allowing the pollution in the developed world to be *off-set* by pushing native peoples off their ancestral lands in the global south; all of these compromises have been unable to even slow our decline. And how could they do otherwise? Allowing some people to die so that others may live is not a solution to the problem of death. And you cannot negotiate on behalf of life that has no voice: Nature itself. Do we want to merely slow destruction, or actually stop it?

These effects are harmful to humans, to all other life, but also to activism itself. It reduces environmental issues to a matter of technology only; what about the spiritual aspects? We need new stories, new institutions, new relationships both with each other and with the rest of the Earth and its creatures too. This problem of civilization requires that we solve it using physical, emotional, mental and spiritual tools and views. Placing the emphasis entirely on technology is insanely inadequate. Green energy responds to only part of our problem and in a limited, particular way that is inherent in the technology itself. There is not enough silver, or land, or oil (yes, oil!) to build all of the solar power panels that we need to maintain our current and projected needs for electricity if solar is to replace fossil fuels entirely. When this statement is brought into the discussion, even well-intentioned, educated activists profess the current cultural view: there's plenty of

resources for the panels, they just happen to be under the ground in China. No problem!

But we can't destroy the world to save it; renewable energy may start out on the right path, environmentalism, but we end up in the wrong place, extraction. What about the large solar projects that focus the sunlight into intense beams to generate power using phase-change; the large projects already complete using this technology have begun to impact the local fauna, frequently killing birds in particular who happen to fly into the beams. The modern way of thinking says. *What are a few birds? After all, we are saving humans here!* But is that who we are? Can we open our hearts and see ourselves embedded with all life, and value it appropriately?

FOSSIL FUELS	GREEN TECH
INDUSTRIAL SCALE EXTRACTION OF OIL, METALS, AND RARE EARTHS	SAME
PRODUCTION AND REFINING REQUIRES ENERGY-INTENSE PROCESSES	SAME
CAUSES EXTREME POLLUTION DURING: EXPLORATION, EXTRACTION, REFINEMENT, MANUFACTURING, DISTRIBUTION, USE, DISPOSAL	ALL EXCEPT (POSSIBLY) USE
CONTRIBUTES TO EXPLOITATION, VIOLENCE, AND RESOURCE WARS	SAME
CONTROLLED BY MULITNATIONALS REQUIRING LARGE CAPITAL EXPENSES; SMALL SCALE MANUFACTURING MOSTLY IMPOSSIBLE	SAME
USED ONCE THEN GONE; MADE IN NATURE THROUGH PROCESSES THAT TAKE MILLIONS OF YEARS OR MORE	SAME

Automation decreases our human workload, and our need to stay engaged with a process, when any situation

it handles is normal. But the more abnormal a situation, the less able the response of automation, and the less prepared humans are to intervene and take back control. In other words, as automation increases the help it provides also increases, and at the same time our human workload decreases as does our engagement in the process. Our disengagement may mean we don't recognize there is a problem until it is too late, or we may not grasp the history that has brought us to this point, or we may fail to adequately understand there real cause and mistake what is happening for something very different. That really means we may not react appropriately, or we may act late or not at all. And the reasons you get into trouble become the reasons why you can't get out of it.

This is not a likely scenario in the near future.
(AP Photo/Jae C. Hong)

Much is being made about the advent of autonomous cars. As you might expect, this development phase has been fraught with horror stories; including fatal crashes and near misses. The media would have us believe that

driverless vehicles are already here; yet the truth remains much more nuanced and unclear. Google's Car is built to use a detailed map that includes everything it might encounter: traffic lights, sidewalks and crosswalks, shoulders, stop signs, lane markings, driveways; measured to the inch using radar in cars that drive, regularly, our heavily traveled roads. Temporary lights or signs (construction zones, for example) or spontaneous and moving hazards are ignored; the car is yet unable to actually *process* what its cameras can *see*, in other words it is unable to form a real-time 3-D map that efficiently parses every photon of light into a decision-making tree that can avoid running over a child darting into the street.

> *Autonomous cars will require maps that differ in several important ways from the maps we use today for turn-by-turn directions. They need to be hi-def. Meter-resolution maps may be good enough for GPS-based navigation, but autonomous cars will need maps that can tell them where the curb is within a few centimeters. They also need to be live, updated second by second with information about accidents, traffic backups, and lane closures. Finally…they'll need to take human psychology into account and win the trust of their passengers…
>
> *Like typical digital maps Nokia HERE, the maps division the Finnish communications company, is using satellite and aerial imagery as a starting point for its HD maps. The maps also incorporate anonymized *probe data* from GPS devices inside fleet vehicles owned by trucking companies and other partners. This data, which

HERE collects at a rate of 100 billion points per month, contains information about the direction and speed of traffic on roads and highways. But the most detailed information being fed into the maps comes from hundreds of cars outfitted with GPS, cameras, and lidar, a laser-based method for measuring distances…

*Of course, road conditions can change quickly, and another challenge for mapmakers is how to detect things like accidents and lane closures and update their maps in as close to real time as possible. Sensors on future autonomous cars could feed information over cellular data networks to HERE's map in the cloud, but that might not be fast enough to avoid an accident. According to Peter Skillman, it could take several seconds for a car in San Francisco to beam its data to a data center in, say, North Carolina, and get a response. Getting response times down to tens of milliseconds—fast enough for a car to switch lanes to avoid some debris in the road spotted by another car ahead of it—will require applications that live inside the LTE networks and can be accessed locally, Skillman says.

*A recent survey found that 88 percent of Americans were worried about riding in a driverless car. The key to getting people to trust autonomous cars, Skillman says, is having the experience match their expectations. If the car signals ahead of time that it's about to change lanes to avoid some debris, and then does exactly

that, it will start to gain the trust of its passengers, he says.*[73]

There are potential political issues in mapping also. In China, restrictions on digital mapping by overseas firms present hurdles to non-Chinese vehicle and tech companies. China will surely be able to devise their own mapping systems, but this will mean that cars designed and manufactured in the West will not be compatible with Chinese roads. The multinational automakers will not be pleased with this type of restriction on their ability to sell to what might be the largest auto market in the world.

The Sun can blind a camera anyway, as it tries to determine the active color on that upcoming stop light. It can't tell the difference between a rock and a crumpled newspaper; it will avoid both. It can't find a parking space in a parking garage or lot. It can't decipher turn or brake lights accurately on nearby cars; hence we are told that cars, as part of the internet-of-things, will talk with each other and telegraph their upcoming moves. We are not being told that this conversation between vehicles will happen because of the deficiencies of the current state-of-the-art in driverless cars. Which begs the question: would it interpret a ball rolling into the street from your front yard appropriately? One key in driverless car development is crafting a silicon-based brain that can adapt to a changing environment, and we're not there yet.

How can we address the handoff problem? We have been sold on the idea that we can get into an

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[73] *Autonomous Cars Will Require a Totally New Kind of Map* By Greg Miller, 12/15/2014

autonomous car and read a book, watch a video, take a nap, or whatever we want to do other than pay attention to the roadway. Would it take five seconds to get our attention away from our distractions, apprise us of the oncoming conditions or situation, allow us to decide what action to take to avoid a deadly impact, and actually take over control of the vehicle and save ourselves or others? Would it take seven? How about ten? What speed would be the maximum the AC could travel, if it takes this long to handoff control to the human inside? And just like with Air France 447, how proficient will you be at assessing and reacting in a bizarre situation if you get no practice driving in mundane conditions? Don't get me started on the impacts of sudden, extreme weather or icy roads….and *is that red light aimed at me?* is not a question you want your car to get stupid on.

It's not just a visual processing problem, or a handoff problem, but also a regulation problem. What will we regulate: the AI code itself, the chip manufacturing process, the desired amount of redundancy? Who decides what is safe? Who writes the code, and for what goal? Will we let the single rider be sacrificed to save the bus full of passengers? Who will own the code, and will it be open and transparent? How will we integrate smart cars with the dumb ones, and especially with the humans that will still be sharing the roads for a few decades? Since much of what we are told now about self-driving cars indicates its initial rollout will only occur inside inner cities under tightly mapped conditions, we won't see a significant drop in fatalities since those happen mostly on rural roads and large highways (at great speed). Existing international treaties require a

driver; how easy will it be to negate that requirement? What about cost, both in money and resources? Will we require two redundant computers with separate power sources, cross-checking each other? And sensors, receivers, and computers all add cost to the existing frame; how easy will it be to keep the vehicles affordable for the average income (currently about $40K per household) while maintaining the style and accessories needed to get us to buy a particular brand? Given that the technology has yet to be able to ascertain for certain which lane is facing the red light up ahead, how can it deal with pedestrians, temporary (and rapid) road blockages and debris, and oncoming and erratic traffic?

There are various auto companies testing various iterations and prototypes of self-driving vehicles. The most advanced system that the general public can use is the Tesla Autopilot; which the company says is for driver-assist, and not ready for autonomous use. It has had at least two fatal accidents that we know of:

1. The crash took place on Jan. 20 2016 and killed Gao Yaning, 23, when the Tesla Model S he was driving slammed into a road sweeper on a highway near Handan, a city about 300 miles south of Beijing, according to a report broadcast on Wednesday by the Chinese government news channel CCTV. The report includes in-car video looking through the windshield as the car travels in the left lane at highway speed just before ramming into a parked or slow-moving orange truck. The video, apparently shot by a camera mounted on the rearview mirror, recorded no images, sounds or jolts that would suggest the driver or the car hit the

brakes before impact. At that point, the in-car video ends.

2. Tesla and Autopilot have been under scrutiny since the disclosure of the May 2016 fatality. That crash killed Joshua Brown, 40, whose 2015 Model S was traveling 74 miles per hour when it collided with a tractor-trailer that had turned left and was crossing a highway near Williston, Fla. Autopilot's radar and cameras failed to recognize the white truck against a bright sky.[74]

Results of the investigations: It was later determined in the crash in China that the range finder had locked onto a billboard with a similar color a mile in front of the street sweeper, and thus never identified the sweeper as a nearby object to avoid. Regarding the second crash, in early 2017 federal regulators stated that: *Neither Autopilot nor Mr. Brown hit the brakes. The agency said that although Autopilot did not prevent the accident, the system performed as it was designed and intended, and therefore did not have a defect…the NTSB concluded in a 500-page report that the driver, Joshua Brown, ignored repeated *Autopilot* warnings to keep his hands on the wheel. *For the vast majority of the trip, the Autopilot hands-on state remained at 'hands required, not detected,' * the report states.*

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[74] https://www.nytimes.com/2016/09/15/business/fatal-tesla-crash-in-china-involved-autopilot-government-tv-says.html

Here is a screenshot of a Tesla dashboard, showing the visual portion of the warning drivers receive if they let go of the wheel:

The ethics involved in programming these vehicles are quite unusual and dense. Please forgive the long excerpt, but Patrick Lin does a good job of describing many of the issues involved:

> *Suppose that an autonomous car is faced with a terrible decision to crash into one of two objects. It could swerve to the left and hit a Volvo sport utility vehicle (SUV), or it could swerve to the right and hit a Mini Cooper. If you were programming the car to minimize harm to others–a sensible goal–which way would you instruct it go in this scenario?
>
> *As a matter of physics, you should choose a collision with a heavier vehicle that can better absorb the impact of a crash, which means

programming the car to crash into the Volvo. Further, it makes sense to choose a collision with a vehicle that's known for passenger safety, which again means crashing into the Volvo.
But physics isn't the only thing that matters here. Programming a car to collide with any particular kind of object over another seems an awful lot like a *targeting* algorithm, similar to those for military weapons systems. And this takes the robot-car industry down legally and morally dangerous paths.

*Again, imagine that an autonomous car is facing an imminent crash. It could select one of two targets to swerve into: either a motorcyclist who is wearing a helmet, or a motorcyclist who is not. What's the right way to program the car?
In the name of crash-optimization, you should program the car to crash into whatever can best survive the collision. In the last scenario, that meant smashing into the Volvo SUV. Here, it means striking the motorcyclist who's wearing a helmet. A good algorithm would account for the much-higher statistical odds that the biker without a helmet would die, and surely killing someone is one of the worst things auto manufacturers desperately want to avoid.
But we can quickly see the injustice of this choice, as reasonable as it may be from a crash-optimization standpoint. By deliberately crashing into that motorcyclist, we are in effect penalizing him or her for being responsible, for wearing a helmet. Meanwhile, we are giving the other motorcyclist a free pass, even though that person is much less responsible for not wearing a helmet, which is illegal in most U.S. states.

*An elegant solution to these vexing dilemmas is to simply not make a deliberate choice. We could design an autonomous car to make certain decisions through a random-number generator. That is, if it's ethically problematic to choose which one of two things to crash into–a large SUV versus a compact car, or a motorcyclist with a helmet versus one without, and so on–then why make a calculated choice at all? A robot car's programming could generate a random number; and if it is an odd number, the car will take one path, and if it is an even number, the car will take the other path. This avoids the possible charge that the car's programming is discriminatory against large SUVs, responsible motorcyclists, or anything else.

*This randomness also doesn't seem to introduce anything new into our world: luck is all around us, both good and bad. A random decision also better mimics human driving, insofar as split-second emergency reactions can be unpredictable and are not based on reason, since there's usually not enough time to apply much human reason.

*Yet, the random-number engine may be inadequate for at least a few reasons. First, it is not obviously a benefit to mimic human driving, since a key reason for creating autonomous cars in the first place is that they should be able to make better decisions than we do. Human error, distracted driving, drunk driving, and so on are responsible for 90 percent or more of car accidents today, and 32,000-plus people die on U.S. roads every year.

*Second, while human drivers may be forgiven for making a poor split-second reaction–for

instance, crashing into a Pinto that's prone to explode, instead of a more stable object–robot cars won't enjoy that freedom. Programmers have all the time in the world to get it right. It's the difference between premeditated murder and involuntary manslaughter.

*Third, for the foreseeable future, what's important isn't just about arriving at the *right* answers to difficult ethical dilemmas, as nice as that would be. But it's also about being thoughtful about your decisions and able to defend them–it's about showing your moral math. In ethics, the process of thinking through a problem is as important as the result. Making decisions randomly, then, evades that responsibility. Instead of thoughtful decisions, they are thoughtless, and this may be worse than reflexive human judgments that lead to bad outcomes.

*A less drastic solution would be to hide certain information that might enable inappropriate discrimination–a *veil of ignorance*, so to speak. As it applies to the above scenarios, this could mean not ascertaining the make or model of other vehicles, or the presence of helmets and other safety equipment, even if technology could let us, such as vehicle-to-vehicle communications. If we did that, there would be no basis for bias.

*Not using that information in crash-optimization calculations may not be enough. To be in the ethical clear, autonomous cars may need to not collect that information at all. Should they be in possession of the information, and using it could have minimized harm or saved a life, there could be legal liability in failing to use

> that information. Imagine a similar public outrage if a national intelligence agency had credible information about a terrorist plot but failed to use it to prevent the attack.
>
> *A problem with this approach, however, is that auto manufacturers and insurers will want to collect as much data as technically possible, to better understand robot-car crashes and for other purposes, such as novel forms of in-car advertising. So it's unclear whether voluntarily turning a blind eye to key information is realistic, given the strong temptation to gather as much data as technology will allow.*[75]

Given our society's tendency to litigate every tragedy, who should bear the responsibility for an action taken by the car's AI?

As humans we see ourselves as being able to integrate various data flows and make effective decisions that control and affect the world around us. We are, however, also misguided and prone to making mistakes. We also vastly over-estimate our abilities…again, think Air France 447…

Oh, my God. What is it doing now? is not a question about his autopilot that you want your pilot to ever say. William Langewiesche writes about this in his Vanity Fair article *The Human Factor*:

> *On the last day of May in 2009, as night enveloped the airport in Rio de Janeiro, the 216 passengers waiting to board a flight to Paris could not have suspected that they would never

[75] http://www.wired.com/2014/05/the-robot-car-of-tomorrow-might-just-be-programmed-to-hit-you/

> see daylight again, or that many would sit strapped to their seats for another two years before being found dead in the darkness, 13,000 feet below the surface of the Atlantic Ocean. But that is what happened. Air France Flight 447 carried a crew of nine flight attendants and three pilots—their numbers augmented because of duty-time limitations on a 5,700-mile trip that was expected to last nearly 11 hours. These were highly trained people, flying an immaculate wide-bodied Airbus A330 for one of the premier airlines of the world, an iconic company of which all of France is proud. Even today—with the flight recorders recovered from the sea floor, French technical reports in hand, and exhaustive inquests under way in French courts—it remains almost unimaginable that the airplane crashed. A small glitch took Flight 447 down, a brief loss of airspeed indications—the merest blip of an information problem during steady straight-and-level flight. It seems absurd, but the pilots were overwhelmed.*

To understand what happened, we have to acknowledge that pilots today are little more than systems managers; even the most *experienced* really only hold the stick and control the plane for literally two or three minutes during take-off and landing. Otherwise, they intervene only during the rare failure of the autopilot. On Air France 447, the failure was caused by ice that formed and blocked the three pitot tubes; sensors that indicate the airspeed of the plane. The blockage lasted for less than a minute; but when the sensors fed the computer the information that the plane

was no longer moving through the air, the autopilot disengaged and the pilot was supposed to take over. The pilots were unable to translate or understand what the display data was telling them, and they flew the plane into a fatal stall by giving it more and more power and raising the nose, trying to generate enough speed to stay in the air. They took the plane into such a steep angle of attack that the stall warning shut off; the programming did not expect the plane to ever report this kind of data. Then as the plane would begin to level off, the stall alarm would once again sound as the data fell *back into stall range*; a vicious cycle that, given a visual reference in daylight, the pilots likely would have easily sorted out. They did not recognize that they were flying and not stalling; or that they could re-engage the autopilot, because they didn't know what had caused the autopilot to shut off in the first place.

So what we really have is a situation where technology does 98% of the flying, with humans handling the other 2%, and sometimes very badly at that. If merging all the various electronic systems is so unpredictable, so unprogrammable, and so deeply complex, how do pilots adequately anticipate it, prepare for it, or train for it? Flying has become a mind-numbing monitoring of flat panel displays that almost never deviate from expectation, and that hide much of the available data. How can a pilot possibly remain focused, year after year? Can four hours of stick time each year actually maintain sharp flying skills that might only be called upon during an in-flight emergency? The truth of it is this: if we take away the *crutch* of an autopilot, many pilots today would kill far too many passengers, and quickly. A plane that *anyone can fly* can have anyone

as pilot. Unmanned Aerial Vehicles (UAVs)[76] are demonstrating that soon software will be able to handle all flight decisions; want to ride on a plane with no cockpit? And yet even UAVs crash, and so far, at a rate that would be totally unacceptable for a plane with passengers. We are spiraling out of control: more human errors demand more automation which leads to more serious human errors and so on. Each error becomes a one-off: we fix the software issue that caused that crash, but next time the problem is different. We solve the last battle loss, but still lose the next one because we are unprepared for the new challenges it presents. Are we ready to have only computers to blame?

> *The situation today: First, you put the Clipper Skipper out to pasture, because he has the unilateral power to screw things up. You replace him with a teamwork concept—call it Crew Resource Management—that encourages checks and balances and requires pilots to take turns at flying. Now it takes two to screw things up[77]. Next you automate the component systems so they require minimal human intervention, and you integrate them into a self-monitoring robotic whole. You throw in buckets of redundancy. You add flight management computers into which

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[76] Little known detail; despite the paucity of news, drones do crash and have caused power outages, damage to property and even some injuries to people on the ground. One man was fined $3,200 because his drone crashed into a lake in Yellowstone National Park

[77] Or one, if one leaves the cockpit and gets locked out by the other as happened with the Germanwings flight in March 2015

flight paths can be programmed on the ground, and you link them to autopilots capable of handling the airplane from the takeoff through the rollout after landing. You design deeply considered minimalistic cockpits that encourage teamwork by their very nature, offer excellent ergonomics, and are built around displays that avoid showing extraneous information but provide alerts and status reports when the systems sense they are necessary. Finally, you add fly-by-wire control. At that point, after years of work and billions of dollars in development costs, you have arrived in the present time. As intended, the autonomy of pilots has been severely restricted, but the new airplanes deliver smoother, more accurate, and more efficient rides—and safer ones too.

*It is natural that some pilots object. This appears to be primarily a cultural and generational matter. In China, for instance, the crews don't care. In fact, they like their automation and rely on it willingly. By contrast, an Airbus man told me about an encounter between a British pilot and his superior at a Middle Eastern airline, in which the pilot complained that automation had taken the fun out of life, and the superior answered, to paraphrase, *Hey asshole, if you want to have fun, go sail a boat. You fly with automation or find some other job.*

*He kept his job. In professional flying, a historic shift has occurred. In the privacy of the cockpit and beyond public view, pilots have been

> relegated to mundane roles as system managers, expected to monitor the computers and sometimes to enter data via keyboards, but to keep their hands off the controls, and to intervene only in the rare event of a failure. As a result, the routine performance of inadequate pilots has been elevated to that of average pilots, and average pilots don't count for much. If you are building an airliner and selling it globally, this turns out to be a good thing. Since the 1980s, when the shift began, the safety record has improved fivefold, to the current one fatal accident for every five million departures. No one can rationally advocate a return to the glamour of the past.* William Langewiesche

Complexity breeds unforeseen interactions and consequences. Throw in a healthy dose of life-or-death fear with a correspondingly large lack of actual hands-on experience, and tragedy is the likely result.

The technology of *the universe as a machine* has dark sides; one is that when we *control* life with technology we expect perfect replication every time it is used. Flip the switch and the machine stamps out a million identical plastic parts. Pull a small lever, and a buffalo always drops dead. We are then shocked when the system that acquired the raw plastic or the ecosystem formerly sustained by buffalo provide us with deadly feedback or consequences instead of the ease that we have come to expect: think Deepwater Horizon or the Dust Bowl of the 1930's.

Tech is not only a problem because of climate change. Cars, for example, have atomized society by creating vast

suburbs where we clear the trees from all around to access more sunlight for the solar panels on our roof and maintain fences to keep out the *bad people*. Most people today don't know their neighbors, nor do we care to. Cars kill more than 30,000 of us each year despite our efforts to make driving safe. Even electric cars have problematic manufacturing and disposal processes that have lots to do with changing our climate. What has happened to family life and culture as so many spend hours each day alone in a car while commuting or usually eat alone? Can we question not only the residues that result from car technology but also the forms and goals of this driving culture? It's not just what cars do to our environment but also what they do to our spirits. The twenty-somethings are already seeing cars differently: the percentage of them with driver's licenses is the least since we began to require them in order to drive. Granted that may be due to the fact that their student loans limit their ability to borrow the money needed to buy the car in the first place. Every technological solution comes with a host of problems, many unforeseen. Changing our technology only really changes the problems that we have to deal with.

Again, many of the problems with technology are not confined to the hardware itself; they arise from the other *soft* areas of life, like emotions, soul, and spirit. Read Abby Norman, as she wrote in October 2014[78]:

> *The truth is, in terms of virology, Ebola should not be a threat to American citizens. We have clean water. We have information. We have the

[78] http://www.alternet.org/personal-health/im-hazmat-trained-hospital-worker-heres-what-no-one-telling-you-about-ebola

means to educate ourselves, practice proper hand-washing procedures, protect ourselves with hazmat suits. The CDC Disease Detectives were dispatched to Dallas almost immediately to work on the front lines to identify those who might be at risk, who could have been exposed. We have the technology, and we certainly have the money to keep Ebola at bay. What we don't have is communication. What we don't have is a health care system that values preventative care. What we don't have is an equal playing field between nurses and physicians and allied health professionals and patients. What we don't have is a culture of health where we work symbiotically with one another and with the technology that was created specifically to bridge communication gaps, but has in so many ways failed. What we don't have is the social culture of transparency, what we don't have is a stopgap against mounting hysteria and hypochondria, what we don't have is nation of health literate individuals. We don't even have health-literate professionals. Most doctors are specialists and are well versed only in their field. Ask your orthopedist a general question about your health -- see if they can comfortably answer it.*

In a time of lots of data, how can anyone be expected to stay abreast of new and changing information? And change it does: studies show now that once someone completes their fourth year of college, fully half of what

they learned in their first year of school is out-of-date.[79] Clearly to me, although this is not being reflected in how we educate anyone, it is more important that we learn how to learn and how to evaluate what we are told rather than to learn a bunch of facts or standard operating procedures which undoubtedly will be different within a few more years. How many times have we been told that margarine is better for our health than butter; no wait, butter is better; no it's not, margarine…. Because it is so easy to lie with statistics, because there has been so much fraud in order to make money by selling a particular product or to burnish a reputation, and because we have yet to acknowledge or understand placebo and nocebo effects, one can prove just about anything one desires while using a peer-reviewed medical study these days. A widely reported study published in the journal *Science* in 2015 found that of 100 important psychology experiments, more than 60 couldn't be replicated; there is a crisis of trust in science. Then in 2016, Science published a follow-up to the reproducibility paper arguing – ironically – that it used flawed statistics. Correct for these, and almost all 100 studies were reproducible, its authors claimed. So

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[79] "By the end of World War II knowledge was doubling every 25 years. Today things are not as simple as different types of knowledge have different rates of growth. For example, nanotechnology knowledge is doubling every two years and clinical knowledge every 18 months. But on average human knowledge is doubling every 13 months. According to IBM [http://tiny.cc/y2uomy] the build out of the "internet of things" will lead to the doubling of knowledge every 12 hours." http://www.industrytap.com/knowledge-doubling-every-12-months-soon-to-be-every-12-hours/3950

maybe science isn't that bad after all; that bodes well for any concerns about Big Data....

Big Data facts from 2015:[80]

- 2.7 Zetabytes of data exist in the digital universe today. (Source)
- IDC Estimates that by 2020,business transactions on the internet- business-to-business and business-to-consumer – will reach 450 billion per day. (Source)
- Walmart handles more than 1 million customer transactions every hour, which is imported into databases estimated to contain more than 2.5 petabytes of data. (Source)
- More than 5 billion people are calling, texting, tweeting and browsing on mobile phones worldwide.
- Decoding the human genome originally took 10 years to process; now it can be achieved in one week. (Source)
- The largest AT&T database boasts titles including the largest volume of data in one unique database (312 terabytes) and the second largest number of rows in a unique database (1.9 trillion), which comprises AT&T's extensive calling records.571 new websites are created every minute of the day. (Source)
- Using capital expenditures in remote locations and electricity consumption to measure the quantity of data centers and the number of servers at each respectively, one group estimates that Google holds somewhere around 10-15

[80] accrued from various sources

exabytes of data. An exabyte equals 1 million terabytes.

- 100 terabytes of data uploaded daily to Facebook. (Source)
- Facebook users also click the like button on more than 4 Million posts every minute: that is nearly 6 Billion Facebook posts liked each day.
- Since 2013, the number of Twitter posts increased 25% to more than 350,000 Tweets per minute.
- Instagram users like 2.5 Million posts every minute.
- Youtube usage sees users uploading 400 hours of new video each minute of every day.
- According to The Radacati Group, 205 Billion emails are sent each day in 2015, and by 2019 that number will increase to 20% to 246 Billion emails each day
- Data production will be 44 times greater in 2020 than it was in 2009. (Source)

Clearly we have so much data, we should be able to combine it with technology for good, not evil; right?

The problem with data is that it fails to provide context, and relationship is everything in this world. Here's John Koetsier writing about a talk given by Malcolm Gladwell[81]:

> *Developmental change, in Gladwell's story, is behavior that occurs as people age. For instance, *murder is a young man's game,* he said, with almost all murders being committed by men

[81] *Malcolm Gladwell: the Snapchat problem, the Facebook problem, the Airbnb problem*, John Koetsier July 24, 2015

under the age of 25. Likewise, dying in a car accident is something that just *statistically doesn't happen* over the age of 40. In other words, people age out of developmental changes — they are not true long-term lasting shifts in behavior.

*Generational change, on the other hand, is different. That's behavior that belongs to a generation, a cohort that grows up and continues the behavior. For example, Gladwell said, baby boomers transformed *every job in America* in the '70s as they demanded more freedom, greater rewards, and changes in the boss-employee relationship.

*The question is whether Snapchat-style behavior is developmental or behavioral. *In the answer to that question is the answer to whether Snapchat will be around in 10 years,* Gladwell said.

Facebook is at the stage that the telephone was at when they thought the phone was not for gossiping — it's in its infancy, Gladwell said, referencing that the early telephone marketers thought the phone was only for business. *We need to be cautious when making conclusions … we can see some things now, but we have no idea where it's going.*

*The diffusion of new technologies always takes longer than we would assume, Gladwell said. The first telephone exchange was launched in 1878, but only took off in the 1920s. The VCR was created in the 1960s in England, but didn't reach its tipping point until the 1980s — over and above the vociferous opposition of the TV and movie industry, which was convinced it would destroy their business.

And that's for technologies that are just innovative. Technologies that are both innovative and complicated, like Facebook, take even longer to really emerge.

*The sharing economy, featuring companies like Airbnb, Uber/Lyft, even eBay, rely on trust. And they're growing and expanding like wildfire. And yet, if you look at recent polls of trust and trustworthiness, people's — and especially millennials — trust is at an all-time low. Out of ten American *institutions,* including church, Congress, the presidency, and others, millennials only trust two: the military and science.

*That's conflicting data. And what the data can't tell us is how both can be true, Gladwell said. *Data can tell us about the immediate environment of people's attitudes, but not much about the environment in which they were formed,* he said. *So which is right? Do people not trust others, as the polls say … or are they lying to the surveys?*

*The context helps, Gladwell said. That context is a massive shift in American society over the past few decades: a huge reduction in violent crime. For example, New York City had over 2,000 murders in 1990. Last year it was 300. In the same time frame, the overall violent crime index has gone down from 2,500 per 100,000 people to 500. *That means that there is an entire generation of people growing up today not just with Internet and mobile phones … but also growing up who have never known on a personal, visceral level what crime is,* Gladwell said.*

Which brings us to Geoengineering: because the models cannot be built to scale, models rely upon data and not context, and because they are woefully incomplete, we not only can't predict what the world looks like if it warms more than a degree or two from today, we also can't predict with any degree of confidence how particular geoengineering techniques will change the climate, either for good or bad. In just one example of what we still don't know about the relationships of life on Earth and the impact they have on geoengineering projects, relationships we clearly have yet to build into our computer models about climate change, there are relationships between plants and microbes we are now only guessing at:

> *Susannah Tringe uses a corer to extract soil samples in a wetland on Twitchell Island in the Sacramento-San Joaquin River Delta. The wetland sludge Tringe is sampling isn't just any muck. It holds carbon dioxide-processing microbes that play a key role in climate change dynamics. Wetlands are widely valued as natural pollution filters and as habitat for endangered species such as the Yuma clapper rail, whooping crane and least tern. But they're also a key part of the carbon cycle: Although wetlands cover only about 3 percent of Earth's surface, they account for as much as 30 percent of soil carbon storage. Yet some wetland microbes secrete another potent greenhouse gas, methane, which may cancel out some of the benefits of pulling carbon dioxide from the atmosphere. Tringe is trying to determine just how much wetlands actually help offset climate change.

*Those answers will come none too soon. Because of development and sea-level rise, the U.S. loses more than 80,000 acres of wetlands each year, according to a study by the U.S. Fish and Wildlife Service. To offset those losses, as required under the Clean Water Act, the government invests at least $3.9 billion each year to restore degraded wetlands or construct new ones to reach an annual net increase of 100,000 acres of wetlands.

*By documenting the biological functions of wetland microbes, Tringe will learn how these tiny organisms affect the greenhouse gas equation, and eventually she'll be able to help restoration experts design projects in a way that enhances climate benefits. *A better understanding of the wetland microbial community will likely improve our ability to maximize carbon storage in these habitats,* says John Bourgeois, who manages California's South Bay Salt Pond Restoration Project.*[82]

Even staid conservative groups: World Bank and the International Atomic Energy Agency (IAEA) just to name two, now predict 4 – 6 degrees of warming this century. And while speaking to everyone, even those who don't believe the climate crisis is human-caused, it doesn't seem like folly to stop the economic plunder of the planet, and the ever-increasing poisoning of our air, water, and soil with the residues of extracting and burning fossil fuels and the spread of chemicals whose

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[82] *How Wetland Microbes Impact Global Climate*Elizabeth Svoboda, April 30, 2015

interactions have not yet been studied and found to be safe, even if that doesn't turn out to be a solution to climate change. Most of what we could do for all of these problems would improve our life experience too. It does seem unspeakable however, to imagine that we could end capitalism in order to save the planet; and since capital and the tech it spawns are the source of the problem yet untouchable, this is the source of much of my angst. At least the part of me that is not grieving over what our mindless, insane sense of entitlement and need for consumption is bringing in our future.

And one issue not on the list above is this: what about the data points that no one is gathering; like say, how much methane is leaking from fracked or uncapped wells? How much is escaping into the atmosphere from melting permafrost? Could this be because deciding the types of data we collect is a choice? Besides, in the case of fracking wells, too much information about their side effects would lead to them all being shut down and then how would we export oil to other countries for profit?

Tech is more than computers, robots, electric cars, or solar panels. It is also the complex system that involves the division of labor, resource extraction, and death needed for its survival. Tech steps in between the real world and our experience of it; we inevitably become alienated from reality, and our view of that reality is evermore distorted and warped. Tech is not neutral as many suggest; the value system needed to create it, which is fundamental to its use, is inherently dysfunctional. Not all tools are tech: using reeds to craft a net for catching a few more fish does not separate me from nature. It doesn't kill me with pollution, or enslave another human to make it for me so I can be lazy. It

doesn't require that I serve the societal machine before I can use it. It does however, encourage me to share my abundance and enjoy life; something else that distinguishes tools from tech. We build tech that can replicate itself. We build tech and imbue it with some degree of autonomy and decision-making; abilities usually reserved for humans who have been trained to analyze and think critically about the seriousness of what they are about to do. Autopilots can in many instances fly planes better than human beings. Siri is getting better about predicting what you will do next; it also continues to learn the more you use it and it remembers your past better than you do, and knows who and where your friends are. We slowly begin to lose the need to do these things for ourselves as our tech takes over control of our lives.

How has technology altered the pacing of our lives, even just in the last few decades; but certainly as compared to pre-agricultural times? Agriculture, by allowing that the harder you worked the better chance you had to get a lot more than you needed, also opens us up to having to work more, and adds to the stress our bodies are under by working. Gatherers may not have searched for food more than a few hours a day. You gathered all the edible food you could find and that took a few hours. Now rest. But if that was enough to eat, and if the rewards from relationship and camp life were great, then what is the problem? In nearly every instance when a gatherer tribe came in contact with farming tribes, and even when living side-by-side, the gatherers refused to convert to the more stationary, harder working, farming lifestyle.

Social networking provides security: instead of money in the bank lending us security; giving away everything, and thus building up a reserve of goodwill so that in times of need I can ask for assistance, this is a model that gets me through the hard times. As one indigenous person said, *I store my surplus meat in the belly of my brother*. Culturally, this looks like every chance I have to demonstrate that I am a good kinsman, a dear friend, I will do it. It is not about keeping score; rather it is about understanding *enough*, not being greedy and hoarding, and ensuring that if anyone is hungry, then everyone is hungry. This would be a huge cultural shift in thinking; but it is already beginning. Imagine: two hunters meet. They exchange spears. No one walks away any *richer*, there is no *profit* in the trading. But they have just demonstrated their willingness to share, to help, to give. And that reinforces the mindset that no one starves, left alone in a cold hut. That also means my life slows down, becomes much more spacious, and leaves room for awe that Nature will quickly fill.

Even a *simple* technology such as refrigeration hides reality[83]:

> *The produce you buy in the supermarket or grocery store is not fresh. With many items, like spinach, the leaves may have been plucked no more than a few weeks ago. But with many others, like apples, the fruit probably sat in cold storage for a year before making its way to the supermarket. I thought this was common knowledge.

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[83] *Your Apples Are A Year Old* by Kristen Michaelis

> *Here in the U.S. apples generally ripen between August and September. They pick the apples when they're slightly unripe, treat them with a chemical called 1-methylcyclopropene, wax them, box them, stack them on pallets, and keep them in cold storage warehouses for an average of 9-12 months. I guess we should be grateful. It used to be that rather than being sprayed with 1-methylcyclopropene (also known as 1-MCP), cold storage apples were sprayed with fungicide.*

From the USDA's Agricultural Research Service, we learn this:

> *Apples not intended for fresh market are stored at low temperatures, with low levels of oxygen and high levels of carbon dioxide. While this slows the apples' natural production of ethylene and its effects, fungicides must often be applied to prevent fungal rots from taking hold. But since its commercial debut in 2002 under the name *SmartFresh,* 1-MCP has in some cases diminished the need for such treatment.[84]*

Why should we care? Kristen continues: *Aside from dietary fiber and sugar, apples are a rich source of polyphenols — antioxidants that can help fight cancer and improve post-workout recovery by reducing muscle fatigue. Yet according to this study[85], antioxidant

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84 http://www.ars.usda.gov/is/AR/archive/oct07/apples1007.htm

85 http://pubs.acs.org/doi/abs/10.1021/bk-2007-0956.ch020

activity in apples gradually drops off after three months of storage in the cold. An apple stored for nearly a year? It will have almost no antioxidants remaining in it whatsoever. This is also true of most vegetables and fruits: the less fresh they are, the less nutrients they have.*

Other technologies are much more complex; and as you might expect, can have even far more serious consequences on our lives:

> *In some 35 years people will have sex just for fun, without worrying about contraception. Babies will be conceived from frozen eggs and sperm, the father of the birth control pill says. He predicts people with no fertility problems will turn to IVF.
>
> *Women in their twenties will first choose this approach [in vitro fertilization, IVF] as insurance, providing them with freedom in the light of professional decisions, or the absence of the right partner, or the inexorably ticking of the biological clock,* Austrian-American chemistry professor Carl Djerassi said in an interview with the Daily Telegraph.
>
> *For them the separation between sex and reproduction will be 100 percent,* said 91-year-old Djerassi, who is known as the *father of the Pill*.*[86]

Test-tube babies: YEAH! That's some good worthwhile tech for ya.

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[86] https://inventkathmandu.com/sex-reproduction-to-separate-100-by-2050-says-pill-inventor/

Some technologies border on the ridiculous: the length of muscle fiber used to be limited by the size of the animal it was growing in. Now, freed from the constraints of the body, it's possible to culture *thread* made from continuing strands of muscle tissue. Colorful spools of meat yarn, from the light pink of chicken to the vibrant red of beef, can be woven into eye-catching patterns. Super markets could install knitting machines with pre-set patterns, making it easy to knit a package of burgers or a meaty scarf. Over the holidays, many families could replace the traditional turkey or ham with a festive centerpiece of knitted meat.

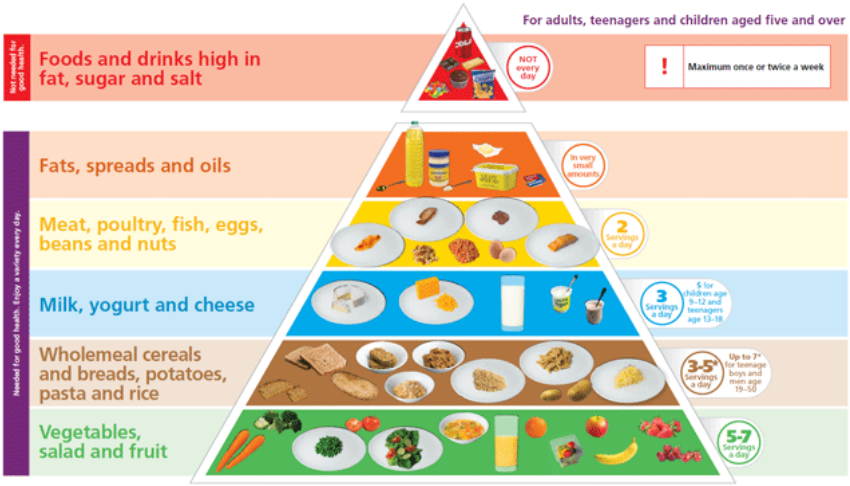
Humans used to be lean and strong. Today we blame our obesity and weakness on our desk jobs. Yet how much of this might be the result of exposure to this toxic environment we grow each and every day? We have created thousands of chemicals with no safety testing. We have not tested them in conjunction with the other natural chemicals they encounter in our air, water, and soil; nor with their interactions with each other. The interactions of drugs we take sometimes kill us; that would be an acute example, although drug interactions are now the fourth largest cause of death in the U.S. No one is studying the chronic example, if only because we cannot find a *control group*, a subset of our population that has not already been exposed. Babies in America are born now with hundreds of chemicals already in their system compliments of their mother's blood supply. We're getting more fat, sick, tired, and depressed every day. What has changed in our environment that might be the cause of these complaints? Chemicals. In other words, compounds that exist in Nature in usually-benign ways, that become toxic when uncovered,

clarified, concentrated, disturbed, rearranged or moved by Man. Our plastic bottles for water and other drinks need Bisphenol-A to remain flexible. This is a known endocrine disruptor: it is fat-soluble; which means it is stored in the fat cells of my body. That means when I lose weight; when my fat cells are tapped as fuel and release their contents, these disruptors are also released and have an impact on mood, energy, and other hormones in my body in addition to today's normal *dose*. I get flooded with more of them than normal; could this be why it's hard to stay on a diet? I may be able to get past the momentary hunger pangs; but if my emotional body is also being affected, I may be unprepared to cope with its reactions at the same time as my physical body is trying to cope. Other endocrine disruptors may be found in many everyday products– including metal food cans, detergents, flame retardants, food, toys, cosmetics, and pesticides. Other side effects include the ability to adverse developmental, reproductive, neurological, and immune effects in both humans and wildlife. It is a good idea to stop drinking water from plastic bottles.

And what about our apparent, and growing, technology addiction? Addiction is not just a chemical dependence; because emotions are chemically or hormonally induced, emotions can also be addictive: winning in a game (cards, slots, betting, or your Saturday afternoon adult-league softball tournament), love, adrenalin, even applause. And because we are so unaware of what drives our emotions, so emotionally dysfunctional or unintelligent, we are at the mercy of those who know emotionally manipulative strategies and tactics. Periodic and random rewards stimulate

dopamine and other *feel good* chemicals and precursors. And we will be used in this way continuously until we become emotionally intelligent: to understand where emotions fit into the greater scheme of our life, to learn from our emotions rather than be ruled by them, and to see how triggers like fat and sugar or emotional scenes in a movie bring out specific emotions that feed someone else's agenda rather than our own. Here we are not just talking about alcohol, heroin or cocaine, drugs that most people envision when the word *addiction* comes into our conversation. Take something very innocuous for example: *Lunchables*. Developed by Oscar Mayer, the hot dog company, these snack foods (crackers, cheese and some kind of formed *meat product*) sold very poorly when first introduced. Then Oscar Mayer was bought by Kraft, the large food conglomerate, which was then bought by Phillip Morris, the cigarette manufacturer. Phillip Morris of course knows how to get people addicted to its products; I say *Joe Camel* and you know how they targeted young people, even those too young to legally smoke, with their hugely successful advertising campaigns. Statistics show that after their first taste of cocaine, only 6% of people become addicted to the drug. Yet although Oscar Mayer had difficulty getting people to try this new, complicated, and different mass of chemicals they called Lunchables, nearly half of first-time buyers came back for more. Because Phillip Morris knew that, they managed to make Lunchables a regular part of school lunches; and beyond. This is the tech of marketing, and of gaining profit by encouraging addiction.

We are also manipulated by the *science* of nutrition as espoused by our government. The Food Pyramid is likely familiar to you[87]:



Things to notice about this concept that our government has propagandized for decades:

- humans evolved over tens of thousands of years eating fibrous plants, but not grains
- humans evolved over tens of thousands of years without eating dairy products, other than human mother's milk
- humans evolved over tens of thousands of years eating meats that were high in fat; fat was considered to be more necessary and nutritious than sugar
- humans would eat sweets when they could find the natural variety; honey or fruit sugars, and salt when

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87 http://www.safefood.eu/Healthy-Eating/What-is-a-balanced-diet/The-Food-Pyramid.aspx

available, but salt was not something to add to every bit of food they ate

Nora Gegaudas has written books on this subject and points out that the food pyramid looks more like a shopping list that will help bring profit to American farmers than a list of the foods humans grew up on. She points out that our brain size has diminished by 10% since the dawn of agriculture. Also noted about food, we didn't experience gluten intolerance to the degree we see today until we began to use the modern technology of pesticides on agricultural land. Might there be a connection? Would Monsanto, the maker of glyphosate, let you know if there was?

There is also a relatively new theory that humans brains were fed and led to development because of having so much fruit in the early diet:

> *Alex DeCasien, the new study's author, didn't set out to shake up this decades-long debate. The doctoral student in biological anthropology at New York University in New York City wanted to tease out whether monogamous primates had bigger or smaller brains than more promiscuous species. She collected data about the diets and social lives of more than 140 species across all four primate groups—monkeys, apes, lorises, and lemurs—and calculated which features were more likely to be associated with bigger brains. To her surprise, neither monogamy nor promiscuity predicted anything about a primate's brain size. Neither did any other measure of social complexity, such as group size. The only factor that seemed to predict which species had larger brains was whether their diets were

> primarily leaves or fruit, DeCasien and her colleagues report today in *Nature Ecology & Evolution*…
>
> *According to the research, the animals which feast on fruit have brains that are about 25 percent bigger than those filling their bellies primarily with leaves. The results call into question the theory that has prevailed since the mid-1990s, which says bigger brains developed out of the need to survive and reproduce in complex social groups. Decasien said the challenges of living in a group could be part of getting smarter, but found no link between the complexity of primates' social lives and the size of their grey matter.*[88]

Diet is critical to the development of any species; we are what we eat. Fruit brings amino acids and energy into our systems and fuels development; why isn't it a bigger part of the suggested daily guidelines?

Tech has also changed how products are developed. Hydrox cookies (later copied as *Oreos) began as one man's idea; he made them for sale in his bakery. Then customers liked them so much he made enough to stock a nearby grocery store with them too. Soon they attracted the attention of a local distributor, and eventually they were being sent throughout the country. Today that rarely happens; few corporations with that kind of distribution network will chance a product emanating from one little kitchen, they convene focus

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[88] http://www.sciencemag.org/news/2017/03/fruit-eating-responsible-big-brains

groups and chemists and marketers and craft a product that fills both a marketing niche and a space on the company's balance sheet labeled *profit*. Chemicals that enhance addiction will clearly be a key component, both of the product itself and of the target for marketing efforts. But that's not all: the saltiness or sweetness, the crunchiness, the size of the bite and the amount needed to be satisfied but not sated, the package design; all are components requiring research and testing. But little research goes into the interactions between the myriad chemicals involved: how does it feel to be a guinea pig? What's wrong with unadulterated *food*, rather than *food products*?

What about how tech has also capitalized on more traditional gambling addictions? Sure we still have the traditional games: poker, craps, roulette; but what rules casinos today are the computerized games like video poker or video slots because they do a better job of providing small rewards at sufficient intervals to drive continued play without giving away the house advantage. B. F. Skinner showed that you could train a rat that pressing a lever would dispense food whenever it was hungry; that's nice. But if you set the lever to only dispense food randomly: yes, yes, yes, no, no, yes, no, no, no, no, yes, no, no for instance, the rat will just sit there and press the lever even when it is no longer physically hungry. The food will pile up; the rat is not after food anymore, but now wants *the emotional pleasure of a random reward*. We are predictable, given enough data about what makes us tick. Technology is very much about data-gathering, as we have seen. And technology allows for easier and greater manipulation of

the very emotions that lead us to part with our hard-earned money. Give us a small animation, a little sound, an image of a coin; something completely meaningless as a reaction to a random event, and we will quickly become hooked and cancel real-world appointments and relationships in pursuit of another short, small dose of brain chemicals.

XX gamification?

US grocery stores got a new brand of milk in December 2014 from beverage giant Coca-Cola. It costs twice the price of standard milk, and the company expects the new product will be a *money-spinner*. The milk, called Fairlife, contains 50 percent more protein and 50 percent less sugar than standard milk, no lactose, and 30 percent more calcium. According to the company, the milk will *rain money*:

> *We're going to be investing in the milk business for a while to build the brand so it won't rain money in the early couple of years. But like Simply, when you do it well it rains money later,* Sandy Douglas, senior vice-president and global chief customer officer at Coca-Cola, said November 19 at the Morgan Stanley Global Consumer Conference, *Seeking Alpha*[89] reported.

Douglas boasted the milk will *taste better and we'll charge twice as much for it as the milk we are used to buying in a jug.* The way the milk is filtered will remove the fat and sugar, which will put it in competition with energy and protein drinks, and not just milk.

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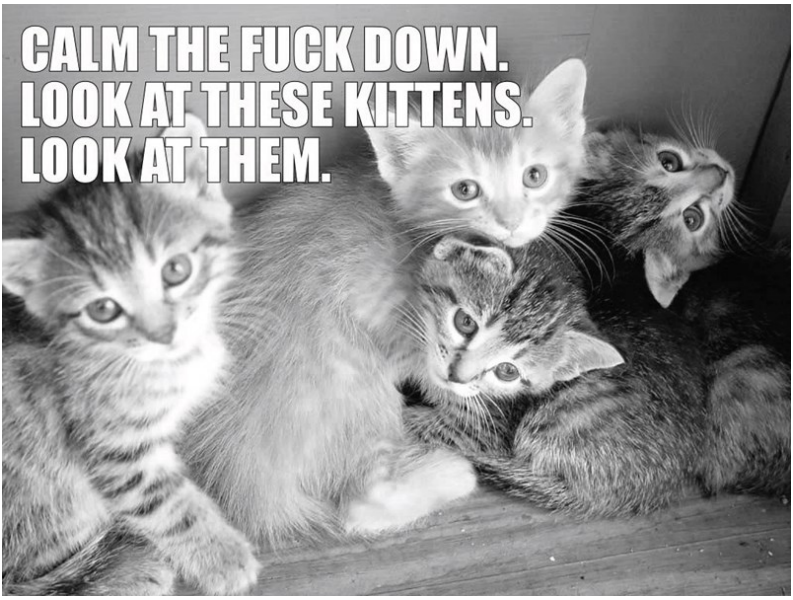
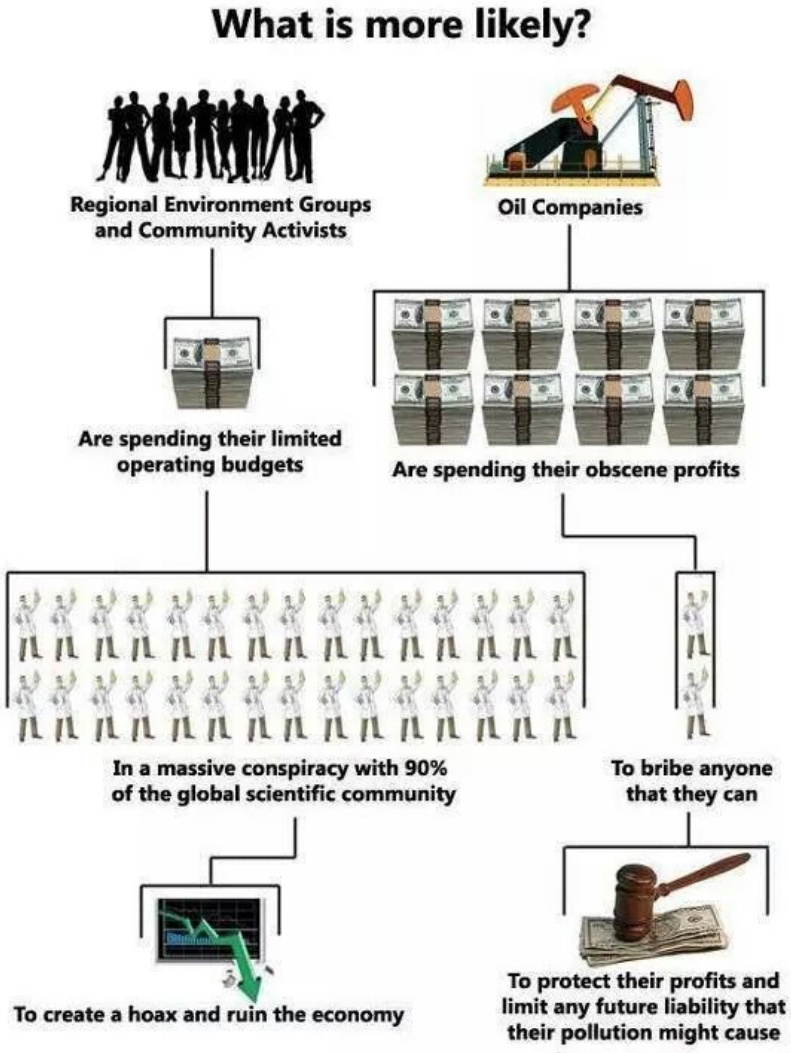
[89] http://seekingalpha.com/article/2695965-the-coca-cola-companys-ko-presents-at-morgan-stanley-global-consumer-conference-transcript?all=true&find=pepsico%2Bprotein

The real issue here is that we have no good understanding of how we, as humans, operate; nor do we truly understand the world in which we are embedded. We continue to learn about DNA and epigenetics, we don't understand the impact chemicals have on our wellbeing, and we don't have any handle on consciousness. We are not going to be able to heal our addictions in any meaningful or consistent way until we do.

Thankfully, technology does have at least one redeeming characteristic: memes about kittens. It is rather appropriate, after this tough discussion of technologies affects, to look at some kittens now.



PROBLEMS


What is more likely?
Regional Environment Groups and Community Activists
Oil Companies
Are spending their limited operating budgets
Are spending their obscene profits
In a massive conspiracy with 90% of the global scientific community
To bribe anyone that they can
To create a hoax and ruin the economy
To protect their profits and limit any future liability that their pollution might cause

On our finite world, we are reaching many limits. Climate change caused by burning oil and coal is not the only problem caused by technology; we also face crises in:

1. Using chemicals and genetically-modified organisms on agricultural land and products has provided us with lower soil quality and less arable land per person. Erosion of topsoil, depleted minerals, and added salt combine to mean there are fewer nutrients in our food. Increasing population puts pressure on existing farms to increase production in the face of declining soil fertility by any (i.e. chemical) means available, and yet we ignore that organic farming can still produce greater yields than chemical treatments on the soil
2. Fresh water: rapid depletion of aquifers that only replenish over thousands of years
3. Deforestation: cutting down trees faster than they regrow. This may be the result of switching from plastic to paper products; it might be from converting forest to grassland so a farmer can raise beef, or it might that as people lose their ability to pay increasing utility rates they resort to burning wood for heat
4. Decreasing ore quality: depletion of high quality ores leaving us to disturb more Earth in our search for ever-lower quality ores
5. Extinction of other species through loss of habitat: as we build more structures and disturb more land, we remove or pollute the natural spaces that other species use

6. High tech goods tend to use considerable quantities of rare or rare-earth minerals, many of which are quite polluting, and even toxic, if they are released into the environment where we work or live. The methods to extract them are usually toxic, the methods of disposal currently used are also toxic; this offsets most if not all of the benefits of using renewable energy over fossil fuels
7. Pollution; its many types: CO2, heavy metals, noise, smog, fine particles, radiation, chemicals released into waterways and aquifers, plastic gyres in our oceans, dead zones in oceans and lakes due to toxic runoff, just to name some
8. Recycling: contrary to popular belief, we are not recycling any materials in effective ways or amounts

Many of our problems also impact more than one aspect of our planet: for example, growing corn for ethanol can degrade soil quality (erosion of topsoil), diminish fresh water supplies by using water from ancient aquifers, put greenhouse gases into the air from the machinery used in growing, harvesting, and transporting the corn to the processing plants, and if farmers take the advice of *green activists* and switch to no-till farming to prevent erosion and to limit the release of CO2, that usually means that great amounts of Round Up are used, polluting the local ecosystem with a toxic residue and killing off much of the natural life in the fields. All of this activity destroys habitat for the local ecosystem and often enough it pushes humans to relocate too, leaving behind their traditions and their neighbors.

Manufacturing renewable power devices, such as wind turbines, solar PV, and electric cars aren't very scalable because of high required subsidies to keep their cost per unit of energy competitive, raw material depletion issues, pollution issues both from the extractive and the disposal phases, and other limits that we don't often think about. For instance, even if an energy product is *renewable,* it still needs long-term maintenance. A wind turbine needs replacement parts from around the world; and our recent experience shows that this is normal and frequent, rather than infrequent. These parts are not available without fossil fuels for their manufacture and transport to the site where they are needed. Any electrical transmission system transporting wind or solar energy will need frequent repairs, also requiring fossil fuels, usually oil as electrical power is still far from meeting even a tiny fraction of our transportation needs and as vehicles need roads and roads are built today with oil byproducts and oil-powered machinery.

Given the problems with scalability, there is no way that all current uses of fossil fuels can all be converted to run on renewables in any reasonable period of time; transportation is only about half of the total use of oil and its byproducts in the U.S.:

Petroleum products consumed in 2015

Product	Annual consumption (million barrels per day)
Finished motor gasoline[1]	9.178

Distillate fuel oil (diesel fuel and heating oil)[1]	3.995
Hydrocarbon gas liquids (HGL)	2.549
Kerosene-type jet fuel	1.548
Still gas	0.683
Petroleum coke	0.349
Asphalt and road oil	0.343
Petrochemical feedstocks	0.331
Residual fuel oil	0.259
Lubricants	0.138
Miscellaneous products and others[2]	0.089
Special napthas	0.052
Finished aviation gasoline	0.011
Kerosene	0.006
Waxes	0.006
Total petroleum products	**19.531**

[1]Includes fuel ethanol in gasoline and biodiesel in distillate fuels.
[2]Others includes other liquids not included in the table.
Note: Sum of individual products may not equal total due to independent rounding.
Source: U.S. Energy Information Administration, *Petroleum Supply Annual*, September 2016

In 2013 renewable energy accounted for only 9.4% of total energy use; nearly all of that came from hydroelectric plants. Wind amounted to 1.1% of world energy use; solar amounted to only 0.2% of world energy use. By 2015, solar had increased to just under 2% of the total electrical power generated:

> *The International Energy Agency's Photovoltaic Power System Programme's latest report (*Snapshot of Global Photovoltaic Markets 2016*, PDF) found that 75 gigawatts of solar were installed globally in 2016 -- bringing the installed global photovoltaic capacity to at least 303 gigawatts.
> That equates to producing 375 billion kilowatt-hours of solar power each year, which represents 1.8 percent of the electricity demand of the planet.[90]*

As the electrical grids require constant, dependable power being fed into them, renewables would have to become nearly 100% of our energy source before we could stop feeding the coal, gas, or nuclear plants that now keep the grid functioning. Thus renewable energy is being produced in addition to the existing infrastructure of fossil fuels, not replacing much, if any. This issue of the transfer from a grid to all-local generation just in the U.S. is never discussed among activists. Nor are the difficult problems of:

- where the raw materials for that much solar and wind power systems will come from and how

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[90] https://cleantechnica.com/2015/06/12/solar-power-passes-1-global-threshold/

those processes will become much more sustainable than they are today

- where all these devices will be sited, especially since the best sites for solar also tend to be in the best climates for farming
- how we will raise the efficiency of solar panels while maintaining a low carbon footprint, as they get dirty and lose efficiency rapidly (as in hours, not weeks)
- how these investments will be financed, as consumers are loathe to pay higher prices, yet total renewable energy costs are much higher than fossil fuels[91]. Germany has been adding wind and solar, in an attempt to offset reductions in nuclear power production. Germany is now running into difficulty with its pricing approach for renewables. Some of its natural gas providers of electricity have threatened to shut down because they are not making adequate profits with the current pricing plan. Germany also finds itself using more cheap (but polluting) lignite coal, in an attempt to keep total electrical costs within a range customers can afford
- Even if we can add all these new sources of power to our mix, we will face new problems. As we add intermittent renewables, *smart grids*, *smart appliances* that turn on and off depending on the needs of the electric grid, and the charging of more electric automobiles; these changes add to the complexity of the system. Any

[91] in the current economic system whereby oil continues to receive huge, direct and indirect, government subsidies and many costs, like pollution cleanup, are externalized

disruption of this complex system becomes more critical: the cascade of problems, some unforeseen, that result in deeply complex systems cannot be adequately mitigated, at least until they happen the first time and become visible. More complexity, and more reliance upon connectivity, also increases the vulnerability of the system to hackers

- Our whole system of incentives (code for our economic system) needs to be changed to make resilience, not profit, our top priority

Then there is the issue of where the materials for batteries come from:

*The 200+ mile on a single charge range of a Tesla using a 60-80 KWh battery requires 19kg of cobalt. 30 million [one electric vehicle per two persons in the UK only, compared to the US with a 1:1 ratio] such vehicles would therefore require 627,000 tons of cobalt, which would be immobilized (taken out of the market) for 5-8 years (the currently projected lifetime of the Li/Co type of battery used in the Tesla).

*This is nearly 5 times today's annual output of new cobalt production…so the UK's less than 1% of the globe's people would require by 2040 around 20% of the world's production of new cobalt at today's production rate to completely eliminate fossil fuel powered cars and replace them with vehicles with a 200+ mile range. China in the meantime has mandated 5,000,000 EVs to be on the road in their country by 2020! This would require 104,000 tons of cobalt immobilized in Chinese batteries within 3 years. This will require about 30% of all global new

cobalt production between now and the end of 2020.

*The immobilization of the world's production of cobalt in operational EVs and the absolute limit of the new production of Cobalt, which is produced 95%+ only as a byproduct of the mining of base metals such as Copper and Nickel, will limit the production of new EVs to a maximum dictated by only what is produced new each year plus what is eventually recycled.

The conversion of today's fleet of 1 billion vehicles totally to pure long range EVs would take all of the world's known resources of cobalt, most of which are not today recoverable economically, and therefore could not occur in much less than 50-100 years and then only if direct financial profit were not the motive but rather quality of life. This is against the neoliberal agenda. -- Jack Lifton, who has written extensively on natural resource issues of supply and demand, focusing on the underlying drivers of economics and human nature. As he puts it, *I am not a 'peakist' of supply or demand; I am a peakist on the amount of capital the human race is willing to commit to achieve a goal.*

I don't agree with you that geo-engineering, new technology, or new laws (if we can ever get control of both Houses of Congress!) are the solutions we need. We have role models that show us how to live sustainably, happily, and easily; and they do not use oil. Every solution proposed by the climate movement is geared to maintain the toys but lose the problems, an impossible task.

Let's point to how alcohol is an issue on Native American lands – domestication pits – and how it squanders time, money, health, focus, creativity, awareness, and fellowship there. Then broaden your lens; it accomplishes these same goals on behalf of global capitalism, keeping the masses docile and compliant. In particular, note how alcohol is marketed in ways that target the poor and the macho; two groups of people in particular that if not tranquilized by addiction and incapacitated by the shattering of family and community ties that mass incarceration for non-violent drug offenses wreaks, would be leading our efforts to destroy capitalism. Note also how often privilege makes it easier to avoid drinking too much as a form of self-medication, and to get rehabilitation (while avoiding time in jail) when you do.

Sedition not Sedation
Brew only Trouble
The only good cocktail is a Molotov

Further: drink only substitutes for what nature already provides safely. You awaken with energy and focus. But if you lean on coffee long enough, your body relaxes and lets coffee do that work alone. That is addiction and its seriousness, in a nutshell.

Crude oil is an amazing substance. It contains dozens of component parts that we use today for other purposes, far beyond mere gasoline. Plastic was *discovered* as one of those byproducts; this begs the question, what will happen to the gasoline portion of crude oil once we no longer run internal combustion engines for our personal transportation? Will we still want to use plastic and fertilizer and cosmetics? Or will

we curtail the refining of all oil, and let go of all the various uses we now have for crude? And will we turn our backs on the benefits of making inexpensive houses from plastic, instead of bags or bottles or other disposable goods? Plastic homes could be modular; moveable; could store rainwater in the walls for insulation and for use; would be completely customizable; could be able to be made on site with our 3D printing technology; would have no rot or termites; would allow us to plant food on the roof, around or under the solar panels; and would save trees and the ecosystems that inhabit forests...

Silicon Valley draws in workers from around the globe, many of them ostensibly to further anti-war, social justice, and other mutual aid-type goals. Many are also anti-tax, in a libertarian or capitalist mode of thinking. And yet nothing is done for the local, pre-existing residents, many of whom are natives to the area and now displaced from homes so that luxury apartments can house the newcomers. The engineers and founders move into the homes of people who lost their low-tech jobs due to automation and/or were evicted as neighborhoods *redeveloped* into hot, trendy places to live. They use stock option windfalls to bid up housing prices and *steal* buying opportunities from the less-well-off, formerly middle class. What does this look like to those who live in Silicon Valley?

> *People repeatedly fought for the City [San Jose, CA] to install water, toilets, and trash bins [near a homeless encampment] but the City has refused, claiming that to do so would *encourage people to live outside* -- as if its housing policies

> are not such a dismal failure that people have no choice…Silicon Valley has all the signs of a broken system: the economy goes up, but the standard of living goes down. Corporate profits skyrocket, but so do rates of poverty, homelessness, and human misery. Especially since the 2008 recession, corporations have found they increase their profits faster when they use the very technology they produce to replace human workers with computers.* Sandy Perry

This problem can best be seen by looking at Apple and its impact on the Valley of Heart's Delight:

Apple Makes Us Homeless

October 11, 2013

Day Three of our four-day *March to Heal the Valley* across Silicon Valley: our feet are sore from the concrete sidewalks, but our spirits are filled with expectation and loving intentions. We began in the heart of East San Jose; touching the lives of the service workers who maintain the infrastructure that high technology firms like Apple and Google depend upon to operate their businesses. We have a rally scheduled at Apple World Headquarters, 1 Infinite Loop, Cupertino in another hour or so; and Christie is making a sign. It reads, *Apple Makes Us Homeless*. We smile and nod, and prepare for the coming encounter.

As we march onto the Apple property, a pedestrian on the street corner says (true story!), *I know Apple are bastards, but they make you homeless? Really???* Our answer involved two parts.

Part One is the immediate cause of the suffering of more and more people, even here in what is arguably one of the ten richest parts of the world. The most

trusted surveys show that there are over 7,000 families that are homeless and living in cars or under bushes and overpasses. Some live in the largest tent encampment in the U.S., along Guadalupe Creek, several miles from Apple and likely that is why it is out-of-mind for those who live in the high tech bubble. More than 18,000 individuals and families are provided with housing assistance of some sort. Yet due to the now-infamous *sequestration*, the first year's 5% budget cuts have led to some people seeing their rent double, triple, or worse. An elderly lady, whose sole source of income is her $816 Social Security direct deposit each month, will now have to pay $1,000 just for her room. Another homeless person on the way... Many of the occupants of affordable housing or the Section 8 assistance programs are disabled or retired and have no possibility of ever working again. How are they to manage as, year after year for the next ten years, the housing assistance for low-income households gets cut more and more due to the sequestration compromise agreed to in congress and signed into law by President Obama? *Oh,* you might well be thinking, *the government just hasn't got the money; this isn't personal, it's just what has to be since we don't have the tax revenues to continue helping the poor as before.*

And that brings us to part two: here in Santa Clara County nearly all the top twenty high tech firms have, if not their headquarters, then a significant presence. Besides Apple and Google, Facebook, Intel, Hewlett Packard, Cisco, and dozens more companies are based here. Our real estate market is buffeted by the vagaries of IPOs and product launches: instant multi-millionaires cash out their start-up stock and pay cash for homes

close to the company campus. And of course, those 4-, 5- and 6,000 square foot homes require landscaping and cleaning done by others, not the owners; yet those who do the work struggle with the rents that continue to increase, year after year, while wages stay stagnant or even decrease. But the worst of it is this: in the midst of these giant trees of industry, companies that not only make billions of dollars each year but also are holding tens of billions in profits, most of them pay a lower tax rate than you do! Some even pay no tax at all! This is why the government has no money: the corporations seek out the tax lawyers who did the best in their education and pay them much more handsomely than the IRS can ever hope to offer in terms of not only salary, but also benefits and even stock options that may someday be worth millions. These lawyers write new tax laws that favor their company, and the company then provides the proposed law to the Congress people they have already bought and paid for so that it can be introduced an passed (often without the Congress person even reading the entire bill). The IRS, undermanned and outgunned, is left to try to sort out what Congress has passed; left to understand it and regulate it and enforce it. Meanwhile the companies enjoy the benefits of laws they wrote themselves, all the while excusing their civic stinginess by falling back on the claim that they of course pay all the taxes they are legally obligated to pay. Here's one of their great schemes: transfer pricing.

Most transnational corporations use some variation on this scheme; I'm going to use Apple as my example because you'll quickly get the point. Apple has several wholly-owned subsidiaries, such as Apple of Ireland.

Just a few rooms in an office building, these subsidiaries are incorporated in countries that don't tax, or tax very minimally, foreign corporations. And every time Apple designs a new product, they patent every component, and sometimes even such *features* as *rounded corners*. Apple then transfers the ownership of these patents to one of their subsidiaries, and every time Apple sells that product, they send a license fee payment to their offshore holding company. In the U.S., they report oh let's say, $10 billion in sales and $10 billion in expenses: no profit and thus no taxes are due. What they don't advertise is that most of those expenses are license fees that they are actually paying to themselves. Naturally, they report sales and profit as an entire company, including their little cash caches all around the globe; Apple is now sitting on over $100 billion in cash due to their profits over many years. But there is a catch: the money *made* by the offshore entities, has to stay offshore or else Apple would have to pay the taxes to bring it back into the country. This is what has motivated the big corporations to lobby Congress for either a special one-time exemption of the tax, or a low 5% tax rate, to encourage them to bring the money back to where it was earned. Despite Apple's tagline *Created in California*, and the fact that their world headquarters now and in the future[92] are in Cupertino California, they are registered as a company in Texas, a state that has no corporate tax: they dodge not only federal but state

[92] Apple is planning a circular building that will hold over 14,000 employees and be, in their own words, a *tourist destination to rival Disneyland* in Cupertino to replace 1 Infinite Loop. Approval by the city is expected within two months of this writing.

income tax as well. In fact, in early 2013, under demands from their shareholders Apple declared they would finally pay a dividend, and that it would total over $40 billion. But because their cash is offshore, they decided to borrow the money, using the cash as collateral, rather than bring that money home. This is why the government has no money to help those who need assistance; and this is how Apple makes us homeless.

And what do you suggest we do about this, now that you know?

As that was written in 2013, here is my Apple Park update. Employees have begun to move into that new headquarters building (April 2017). Here is what it looks like from the air:

A little explanation is in order. The building itself is four stories tall. The campus used to be a four-by-six block residential area, until Apple bought out every single homeowner and scraped the neighborhood down to the

dirt. This picture was taken in December 2016; so much of the landscaping is missing. The two long solar panel structures near the top cover the parking garage; for an Apple employee (and I know many personally) who parks a car in that structure and then walks to their cubicle, it can take as long as twenty minutes for only that walking portion of their daily commute. Not to worry though: the campus is blanketed with Wi-Fi, so they can still be working on their iPad as they walk. Also, nearly half of the office structures visible in this photo are owned or leased by Apple, too. Apple employs 57% of all workers in Cupertino, per the city's Mayor in January 2016. That is more than even Detroit at the height of the auto making years. Now admittedly, Cupertino is only one small part of Silicon Valley. But still this has caused rents to rise throughout the area.

Environmentalism to a great degree is no longer about protecting wilderness or life but rather is about protecting this modern, high-tech culture. It tries to compromise with the killers; it looks at future consumables as if they provide *sustainable living*. In a dysfunctional, abusive family situation, people can talk about all of the *safe* stuff; where or what to eat, the baseball game last night, the sunset; whatever that has no bearing on any real issues: the alcohol, the rape, the beatings, the emotional manipulation and control. This operates at the societal level too: we can talk about celebrities, or new gadgets, or the latest movies; but we can't touch capitalism, our corrupt official authoritarian state, or the myriad ways by which religion and technology help to keep people docile. This system is designed, not by a cabal or a conspiracy, but because of

the values espoused by capitalism, to convert the entire Earth into money and to concentrate that money in the hands of those who control *capital*. Money is just a counter that allows us to know how quickly something that used to be alive is now dead and able to be transported to where it can be sold and then used or discarded.

Derrick Jensen tells the story of a conversation he had with Ward Churchill. Derrick commented that he is always amazed that during the War, Nazis kept meticulous records of the atrocities as they were committed. Ward looked at him and asked, *Derrick, what do you think GNP is? It's a record of how quickly mountains have been turned into money.* Control the land and you prevent people for forging a subsistence existence. Tax the land and you force people to enter the *money* system and work for wages so they can pay the tax just to stay in touch with their land. Keep them off the land and they can't eat without working for money that can then be used to buy food. Let these conditions exist for just a few generations and quickly people forget that any other lifestyle is possible. Their entire experience shows them that they need money to eat, that food comes from the supermarket and water from the tap, and that they have no control over any of their life other than what car to buy and TV show to watch. They will now defend to the death their right to get food from the supermarket; even as it kills them with its poisons.

Non-governmental organizations (NGOs) are part of the problem:

> *Environmental groups used to be funded largely by their members and wealthy individual supporters. They had only one goal: to prevent

environmental destruction. Their funds were small, but they played a crucial role in saving vast tracts of wilderness and in pushing into law strict rules forbidding air and water pollution. But Jay Hair--president of the National Wildlife Federation from 1981 to 1995--was dissatisfied. He identified a huge new source of revenue: the worst polluters.

*Hair found that the big oil and gas companies were happy to give money to conservation groups. Yes, they were destroying many of the world's pristine places. Yes, by the late 1980s it had become clear that they were dramatically destabilizing the climate--the very basis of life itself. But for Hair, that didn't make them the enemy; he said they sincerely wanted to right their wrongs and pay to preserve the environment. He began to suck millions from them, and in return his organization and others, like The Nature Conservancy (TNC), gave them awards for *environmental stewardship*.

*Companies like Shell and British Petroleum (BP) were delighted. They saw it as valuable *reputation insurance*: every time they were criticized for their massive emissions of warming gases, or for being involved in the killing of dissidents who wanted oil funds to go to the local population, or an oil spill that had caused irreparable damage, they wheeled out their shiny green awards, purchased with *charitable* donations, to ward off the prospect of government regulation. At first, this behavior scandalized the environmental community. Hair

was vehemently condemned as a sellout and a charlatan. But slowly, the other groups saw themselves shrink while the corporate-fattened groups swelled--so they, too, started to take the checks.*

*Examples: *They [NGOs] take money, and in turn they offer praise, even when the money comes from the companies causing environmental devastation. To take just one example, when it was revealed that many of IKEA's dining room sets were made from trees ripped from endangered forests, the World Wildlife Fund (WWF) leapt to the company's defense, saying--wrongly--that IKEA *can never guarantee* this won't happen. Is it a coincidence that WWF is a *marketing partner* with IKEA, and takes cash from the company?

*Likewise, the Sierra Club was approached in 2008 by the makers of Clorox bleach, who said that if the Club endorsed their new range of *green* household cleaners, they [Clorox] would give it [Sierra Club] a percentage of the sales... The Club's Toxics Committee co-chair, Jessica Frohman, said, *We never approved the product line.*

*But while the Sierra Club accepts money from some corporations, it doesn't take cash from the very worst polluters. So why is it, on this, the biggest issue of all, just as bad? It seems its leaders have come to see the world through the funnel of the US Senate and what legislation it can be immediately coaxed to pass. They say there is no point advocating a strategy that

senators will reject flat-out. They have to be *politically realistic* and try to advocate something that will appeal to Blue Dog Democrats.

This focus on inch-by-inch reform would normally be understandable: every movement for change needs a reformist wing. But the existence of tipping points--which have been overwhelmingly proven by the climate science--makes a mockery of this baby-steps approach to global warming.

*A classic case study of this inside-the-Beltway mentality can be found in a blog written by David Donniger, policy director of the climate center at the Natural Resources Defense Council (NRDC), after the collapse of the Copenhagen climate summit. He said people were *holding the accord to standards and expectations that no outcome achievable at Copenhagen could reasonably have met--or even should have met.* This last sentence is very revealing. Donniger believes it is *reasonable* to act within the constraints of the US and global political systems, and unreasonable to act within the constraints of the climate science. The greens, he suggests, are wrong to say their standards should have been met at this meeting; the deal is *not weak.* After fifteen climate summits, after twenty years of increasingly desperate scientific warnings about warming, with the tipping points drawing ever closer, he says the world's leaders shouldn't be on a faster track and that the European and American media should stop whining.

Remember, this isn't an oil company exec talking; this is a senior figure at one of the leading environmental groups.*

By pretending the broken system can work--and will work, in just a moment, after just one more Democratic win, or another, or another--the big green groups are preventing the appropriate response from concerned citizens, which is fury at the system itself. They are offering placebos to calm us down when they should be conducting and amplifying our anger at this betrayal of our safety by our politicians.

*Today, the chopping down of the world's forests is causing 12 percent of all emissions of greenhouse gases, because trees store carbon dioxide. So the rich governments say that if they pay to stop some of that, they can claim it as part of their cuts. A program called REDD--Reducing Emissions from Deforestation and Forest Degradation--has been set up to do just that. In theory, it sounds fine. The atmosphere doesn't care where the fall in emissions comes from, as long as it happens in time to stop runaway warming. A ton of carbon in Brazil enters the atmosphere just as surely as a ton in Texas. If this argument sounds deceptively simple, that's because it is deceptive. In practice, the REDD program is filled with holes large enough to toss a planet through. To understand the trouble with REDD, you have to look at the place touted as a model of how the system is supposed to work. Thirteen years ago in Bolivia, a coalition of The Nature Conservancy and three big-time

corporate polluters--BP, Pacificorp and American Electric Power (AEP)--set up a protected forest in Bolivia called the Noel Kempff Climate Action Project. They took 3.9 million acres of tropical forest and said they would clear out the logging companies and ensure that the forest remained standing. They claimed this plan would keep 55 million tons of CO2 locked out of the air--which would, in time, justify their pumping an extra 55 million tons into the air from their coal and oil operations. AEP's internal documents boasted: *The Bolivian project...could save AEP billions of dollars in pollution controls.*

*Greenpeace sent an investigative team to see how it had turned out. The group found, in a report released last year, that some of the logging companies had simply picked up their machinery and moved to the next rainforest over. An employee for San Martin, one of the biggest logging companies in the area, bragged that nobody had ever asked if they had stopped. This is known as *leakage*: one area is protected from logging, but the logging leaks a few miles away and continues just the same... When you claim an offset and it doesn't work, the climate is screwed twice over--first because the same amount of forest has been cut down after all, and second because a huge amount of additional warming gases has been pumped into the atmosphere on the assumption that the gases will be locked away by the now-dead trees. So the offset hasn't prevented emissions--it's doubled

them. And as global warming increases, even the small patches of rainforest that have technically been preserved are doomed. Why? Rainforests have a very delicate humid ecosystem, and their moisture smothers any fire that breaks out, but with 2 degrees of warming, they begin to dry out--and burn down. And the news gets worse. Carbon dioxide pumped out of a coal power station stays in the atmosphere for hundreds of years--so to genuinely *offset* it, you have to guarantee that a forest will stand for the same amount of time. This would be like Julius Caesar in 44 BC making commitments about what Barack Obama will do today...

*Becky Chacko, director of climate policy at Conservation International, tells me, *Our only interest is to keep forests standing. We don't [take this position] because it generates revenue for us. We don't think it's an evil position to say money has to flow in order to keep forests standing, and these market mechanisms can contribute the money for that.* Yet when I ask her to explain how Conservation International justifies the conceptual holes in the entire system of offsetting, her answers become halting. She says the *issues of leakage and permanence* have been *resolved.* But she will not say how. How can you guarantee a forest will stand for millenniums, to offset carbon emissions that warm the planet for millenniums? *We factor

> that risk into our calculations,* she says mysteriously.*[93]

Much of our economy is capital-intense: offshore oil drilling, integrated circuit manufacturing, satellite-based systems, pharmaceuticals, to name a few industries that really epitomize technological development. In other words, tech solutions to our problems depend upon a consistent (and growing) economy. But as tech replaces non-tech, we become more brittle. We forget how to forage for food in our yards, where to find clean water not from a tap, and how to start a fire to keep warm. Without electricity, we are lost in the dark and have nothing to do. Without gasoline, we are hungry. Without pumps and unbroken pipes, we are thirsty. This hints that an economy even slightly contracting would send nations spiraling into failure; how many national economies can we lose without bringing the rest of us down? Would it take only one, if it is a big one, to cause global transportation and thus trade to collapse? Japan, maybe? The welfare-state of Saudi Arabia cannot continue business-as-usual if oil prices stay lower than $75/barrel for any length of time; its citizens are used to not working, they have grown dependent on just getting their share of the oil revenues. Low oil retail prices have been pressuring companies to restrict exploration and development for a few years now; and 10% of total production each year comes from new wells opened as old ones fade. After five years, our ability to bring new wells into production will fade away; and it will take an additional five or more years of new

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[93] Johann Hari, The Nation magazine, 22 March 2010

development spending to return us to where we are today. Despite what you hear in the media, peak oil has not gone away. Peak, as in *maximum production we will ever see*, may be reached by virtue of the oil price being too low to sustain high-cost operations like deep-water drilling in the Gulf of Mexico and the Bering Sea or any tight oil fracking well. If Saudi Arabia finds it impossible to replace failing wells with new ones due to low prices and their falling income triggers citizen revolts, we may permanently lose infrastructure and never produce 80 million barrels a day again.

We now know that there are ten *foreign* cells for every *human* cell in our bodies. This is recent knowledge, and shows us just how much we still don't know. This *micro-biome* is an incredibly interconnected environment of cooperation and, occasionally, warfare on a cellular scale. We could not extract energy from food without the help of microbes; scientists call it our *gut flora*. Many people take probiotics to restore healthy microbes to their guts, but that is just the tip of the iceberg. These microbes are truly living organisms that live in and on us, and we rely upon the exchange of information and energy between them and ourselves to remain healthy and vibrant. This biodiversity in our guts is often wiped out by taking antibiotics; eat something that is *against life* and you can't be surprised if the microbes that help you are among those that die. Ruining our gut flora has been proven to cause obesity, diabetes, arthritis, and inflammation; the rates of which are exploding in

America now[94]. We are also putting antibiotics into our gut when we eat meat that has been factory-farmed; especially beef, since cows that are fed grain instead of grass develop ulcers and get sick. To prevent them from getting too sick before you eat your steak, cows are routinely given antibiotics as a prophylactic, which is passed along to those who eat the meat taken from the slaughtered animal.

The first six meters of intestine contains 70% of our immune system; that makes sense, as the gut is where we trade most of our energy with the outside world. We take in energy there, and not all of that energy is benign. If we alter our ability to process energy by taking in drugs or chemicals and killing off our microbes then we shut our window into the *outside* world; we close ourselves off from the energy abundance Nature can provide. Because this decline is gradual, we rarely notice. We don't make a connection between the drugs we took to get over an infection ten years ago and our inability to process food today. When our gut encounters compounds it can't recognize and digest, it gets inflamed. This inflammation quickly becomes *leaky gut*, a condition where the walls of the intestine become porous, food particles slip out into the body despite being incompletely digested, and our immune system must respond and attack the *invader*. When my immune system is under constant threat, I can develop auto-immune illnesses, or I can be so taxed to deal with these rogue food particles that I have nothing left to fight a legitimate, infection-causing invader. What can I do? Ensure I get an unpasteurized, live, raw

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[94] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4709861/

fermented food in my daily diet. A simple suggestion: sauerkraut is a classic; but also kimchi, if you prefer that type of flavor.

We have neurons in our hearts; in fact, HeartMath Institute has shown that 9 messages travel from heart to brain for each one message that goes the other direction. Others have shown neurons in our gut; so that *gut feeling* you get might actually be reflecting something real being detected in the surrounding energy field, and bringing about a reaction that is appropriate based on memories.

Nuclear regulators are told that the chance of a nuclear reactor accident is one in a million years; reactor design and regulation, including any need for evacuation planning, is based on this ratio. If you take the roughly 400 reactors in the world today, that means we can expect one accident every 2,500 years. We've had five major accidents, all of which could have been worse than they were, in less than 40 years; an average of one accident just about every seven years. Should we design and regulate using the first calculation, or the last? Even today, following the Chernobyl accident, cattle in Wales, wild boar in Germany, and the reindeer in Lapland can't be eaten because they remain radiologically contaminated.

Nuclear reactors make an average profit of $1M per day; and yet it is still not a profitable business when cradle-to-grave costs, and reserves to cover accidents, are factored in. Not to mention, it relies upon huge government subsidies to fund construction, and huge government guarantees that place the taxpayer on the hook for any damages following an accident and to

decommission the plant once it's no longer able to be used. The profit provides capital to help with media campaigns to spin the nuclear issues in the public's mind. Nuclear power is in no way *green* or carbon neutral. The uranium mining process leaves behind toxic, radioactive tailings. To build and refuel the reactor these materials must travel; often on roads or rails that pass through the heart of neighborhoods around our nation. The rest of the plant itself is built with carbon-intense materials and processes. It requires enormous amounts of oil and water to run the reactor. Additional water is required for years to cool the fuel after it is no longer able to function in the core; and after 50 years of operation, we still have no plan that can effectively and safely store this *spent* fuel. This spent fuel, produced by every reactor in commercial use today, contains plutonium: the most toxic substance known. One-millionth of a gram, inhaled, will cause lung cancer. It has a half-life of 24,000 years; requiring 20 cycles to become neutral, or about 500,000 years.

There is no safe *dose* of radiation. Why do you think the nurse runs out of the x-ray room before opening the door between you and that tiny piece of radioactive material in the lead-lined box? Eight days after the Fukushima accident began 11 March 2011, *hot* particles, able to become lodged in lung tissue, began to drift over the U.S. Our government's response was to shut off the monitors along the West Coast; a don't ask, don't tell policy brought up close and personal to every resident in our country. Studies have shown that people in Seattle were breathing in, on average, 10 hot particles a day during late-March and April that year. This level of exposure was concentrated along the coast from

northern Oregon all the way up to Alaska. There were also spikes in the radiation counts in localized areas around the Northern hemisphere, anywhere that rain formed around particles that had been carried into the Jetstream in a process known as *rain-out*. To be safer, we need to have a daily radiation forecast that can warn us when it is better to stay indoors.

Understand: every radioactive particle is…radioactive. It doesn't dilute, meaning it doesn't lose its nature of throwing off electrons just because you add it to air or water. It can float suspended in air or drift in water until it becomes stuck on or in some tissue, which then begins to be bathed in a constant stream of energetic particles that affect the cells that make up that tissue. It is cheap to detect radioactive Cesium, so that is what we look for coming from Fukushima. It has a half-life of 15 years, so it will remain hot for about 300 years; in other words, that particle in your lung will still be hot long after any cancer it causes has killed you. And that ignores all the other radioactive particles that are more expensive to detect and have longer half-lives, but which are generally found in the same air or water as the Cesium.

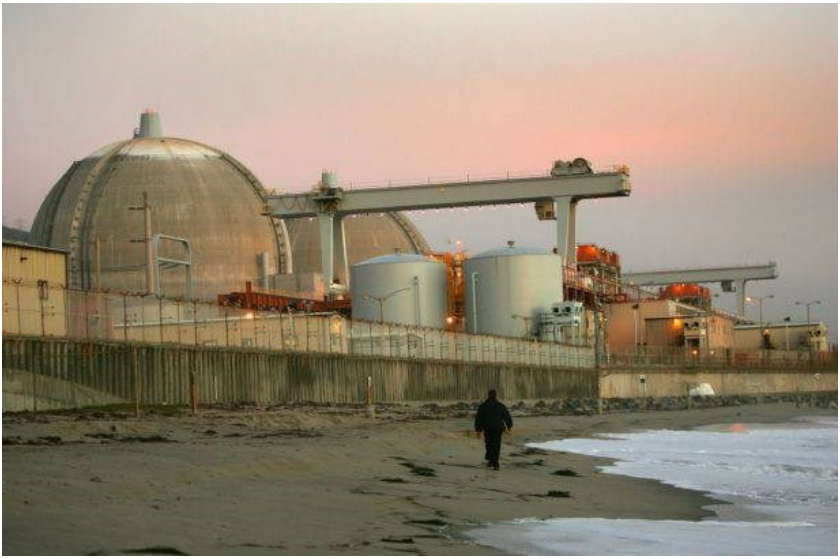
Ah, Fukushima. We think of it as one accident; but it was really three. Three reactor cores escaped their containment; melting out at least onto the floor, if not through the floor. But through the floor or not is irrelevant since the cores are today in contact with groundwater. Fukushima was built above a flow of water from the mountains above the town to the sea. As water has been continuously poured into the broken reactor shells to try to keep the cores from melting, cracks and holes have allowed that water to mix with the naturally flowing water underground and on into the ocean. Then

in October 2014, two super-typhoons crossed the islands of Japan and dropped between 10 and 16 inches of rain in one day on Fukushima. The radiation count in testing wells next to the site jumped 800 – 900 times what it had been the previous peak, because the runoff sent lots of surface radioactive contamination underground and into the flow of water out to sea. The reactors continue to release radioactive particles into the air. The destroyed reactors we call Fukushima form an open sore on the body of our Earth, and will continue to ooze radiation for decades if not longer.

Note: the media is loath to mention this, but we still don't know where the cores actually are, or the extent to which they have moved away from their containment. This is due to their highly radioactive nature; we have no equipment that can survive the radiation long enough to get close enough even to take a picture. A robot device was finally able to return photos from inside Reactor 3 in July 2017; that at least is a step forward. The analysis is not complete at this writing; we still don't know the location or condition of the melted fuel in any of the three reactors that melted down. Any statement you hear that estimates when the clean-up will be complete or what it will cost is utter crap. We don't even know when we will be able to get close enough to gauge the problem, let alone come up with a plan and then implement it.

Lest you think that we only face a problem in Japan, allow me to point out that there are more than 20 reactors in the US active today that use the same General Electric Mark I blueprint as the three in Fukushima that melted down. Most of our reactors, more than 120 total, are sited near water in order to

have access to the huge quantities needed for cooling; that makes them prone to be in areas subject to flooding. During Hurricane Sandy, 29 October 2012, the Oyster Creek reactor in New Jersey, sited on the seacoast of course, came within a foot of flooding due to storm surge, which likely would have caused a similar meltdown. Diablo Canyon in California, pictured next, was built in the 1960s and had continual issues with shoddy construction and poor design before being forced to close in 2013 for maintenance following a particularly shoddy repair. It has been announced that the plant will not reopen. By the way, there are 13 earthquake faults within 30 miles of these two reactors:



Forced to close is misleading: you might think the danger is over, but you would be wrong. The fuel and core remain radioactive and deadly long after they are

no longer being used to generate power. Of course, once they are no longer generating revenue, their *owners* tend to want to avoid spending money on maintenance or decommissioning. That tends to become a taxpayer burden; yours and mine. And scarily, the NRC's own representative at Diablo Canyon is on record saying that there are components in use there that are not in compliance with the operating license; he recommended that the reactors be shut down. The NRC sat on the report, and sat on the report he filed pointing to the original report in an effort to get something done about his information. It wasn't until the report was leaked to Friends of the Earth that the NRC had to admit it knows there are problems. The Diablo Canyon owner, Pacific Gas and Electric Company, applied for a 20 year extension of its operating license; despite all of these issues, until the repair work became too costly. Yet as we see across the board in this late-stage capitalism, enforcement of regulations is non-existent. Regulations are there to help us feel protected; not to actually cause any business to have to remedy problems or keep the world safe.

There is much misinformation about the effects of radiation; thus the truth is hard to find. Many of the studies that have been done focused on the survivors of Hiroshima and Nagasaki and were either classified or heavily redacted before release to the public. Even following Chernobyl, the studies that show affects, clearly obvious to anyone who visits the regions that were heavily dosed, are barred from being released and must be leaked to enter the public domain. Once again, science is over-ruled by capital and its need for profit at any cost.

What about the toxic chemical soup we've been cooking up since the Second World War? Dow Chemical's new *Enlist* genetically modified crops are touted as replacing round-up Ready crops because Round-up resistance is making Round-up useless. After a mere twenty years. Across the population, antibiotic resistance is also growing; due in part to the over-prescription of antibiotics by doctors, the prophylactic prescribing of antibiotics for cows who are being fed grain before their stomachs are fully developed and for chickens to reduce salmonella, and the appearance of antibiotics in soaps, towels, shirts, and just about anything that we use around food or our hands. You can never, it seems, eradicate 100% of any life form through technology: unless you destroy every ecological hideout that life form can inhabit.

Plastic: BPa[95], thalates[96], cause problems. They are synthetic estrogens, or endocrine disrupters: what does that mean[97]? It means they have hormone signaling powers in the human body; such as signaling an 8-year old girl's body to begin puberty, or fish living in waters polluted with plastic debris to develop both male and female genitalia. In America today, girls age ten have more estrogen in their body from plastic than is

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[95] A *plasticizing agent* that is used in plastic bottles to make them sturdy yet flexible.

[96] Another *plasticizing agent* that is used in lotions, creams, and sunscreens (for some examples) so that they form a cohesive layer of *protection*

[97] It means they have hormone signaling powers in the human body; such as signaling an 8-year old girl's body to begin puberty, or fish living in waters polluted with plastic debris to develop both male and female genitalia.

produced from their own ovaries. Could we have foreseen the impact on fish or humans as that first plastic production plant opened for business? We've been making and discarding plastic for decades, we now see how even our soil is becoming contaminated with these substances; and that means they are showing up in our food. If we had foreseen its impacts, would we have allowed that plant to open? Why do we feel it is too late to change that decision, one that was made out of ignorance?

And here's Robert F. Kennedy Jr.:

> *In our toxin-filled world, we often look to government agencies to tell us what levels of exposure we should consider safe or unsafe. If our exposure does not exceed an agency-determined threshold, we assume there is little cause for concern. How do regulatory agencies determine these thresholds? There is considerable evidence to suggest that safety limits are often arbitrary and do not accurately flag risks. A new study published in Environmental Research by a group of researchers in upstate New York underscores this point. Lead author Dr. Brooks Gump of Syracuse University and coauthors call attention to problems associated with low levels of background exposure to lead and mercury, at concentrations notably lower than those deemed *elevated* by federal agencies such as the Centers for Disease Control and Prevention (CDC) and the Environmental Protection Agency (EPA).

*The authors report on results from the Environmental Exposures and Child Health Outcomes (EECHO) study, an ongoing study involving African-American and white children (ages 9–11) in low- and middle-income urban neighborhoods. Although the EECHO study's primary purpose is to investigate the influence of environmental toxicant exposures on cardiovascular risk indices, the Environmental Research paper focuses on interesting associations between environmental toxicants and neurodevelopmental outcomes. The sample included 203 children (53% male, 57% African-American). Over half (53%) of the families had incomes of less than $35,000 per year. The study measured:

- Blood levels of lead and total mercury
- Hostility (administered to participants)
- Other disruptive behaviors (administered to parents), including oppositional defiant disorder (ODD) behaviors and attention-deficit/hyperactivity disorder (ADHD) behaviors
- Emotion regulation (participants)
- Autism spectrum disorder (ASD) symptoms (parents)

*The investigators initially excluded children with serious medical or developmental disabilities (as well as children taking medications such as Ritalin). Even with these exclusion criteria, the researchers found substantial levels of neurodevelopmental disorders in their sample. They rated more than

one in six children as ODD (16%) or ADHD-inattention type (15%), one in nine (11%) as ADHD-hyperactivity/impulsive type, and one in twenty (5%) as Asperger's/high-functioning autism. The investigators found significant associations with hostile distrust, ODD behaviors, lack of emotional awareness, and emotional uncertainty correlating with increasing blood lead levels. These significant associations occurred in children with blood lead levels (0.19 to 3.25 micrograms per deciliter) well below the reference level of 5 micrograms per deciliter at which the CDC recommends initiating public health actions.

*Gump and coauthors also measured heart rate variability (HRV) to assess parasympathetic (vagal) responses to acute stress. They explain that they included HRV because emerging research suggests that underlying differences in parasympathetic nervous system responses to acute stress may shape neurobiological susceptibility to environmental factors. After Gump's research team added HRV measures to their statistical models as interaction terms, they found a statistically significant and *novel* relationship between blood mercury levels and ASD symptoms (especially social skills, attention to detail, and imagination) in the subgroup of children who showed sustained vagal tone during acute stress. This latter result matches findings from a 2003 study in which autistic children displayed an *excessively controlled vagal system* suggestive of *autonomic hyperarousal.*

> The authors point to the need for further research to elaborate on mercury's role in triggering greater frequency of autism spectrum symptoms in children who exhibit atypical parasympathetic activity.*

Has our trust in science been misplaced? Writing in her Discover Magazine, November 2014 article, *Trial and Error*, Jill Neimark explains about the troubles genetic testing is going through. First she explains how cancer treatments are tested using cell*lines*, derived from a particular cancer type. It should be clear to everyone that if you are testing a drug for breast or thyroid cancer on melanoma cancer cells, an actual case a few years ago, you might not get reliable or even useful results. Over the last decade, it has been shown that nearly half of the cancer cell lines used in testing regimens are contaminated and no longer offer researchers the cells that they are labeled to be.

> *But rampant contamination is not the shocker of the story. [Dr. Kenneth Ain] …sent letters to 69 researchers in 14 countries who had received [contaminated] lines. He heard back from just two…*
>
> *There are about 10,000 citations each year on false lines – new publications that refer to or rely on papers based on imposter cell lines…*
>
> *Today [2014], cell lines known for nearly 50 years to be imposters are still in wide use under their assumed names – wrong identities regularly invoked in peer-reviewed publications. How can this be?*

[Rebecca] Schweppe and her colleagues fingerprinted the remaining thyroid cancer lines. In the fall of 2008, they reported that 17 of 40 widely used lines were imposters…But until her team's results appeared in a peer-reviewed journal, it was difficult to get the word out. She even served as a reviewer for papers using false lines, but couldn't say a word…

*Experimental pathologist John Masters of University College London tells of a normal endothelium line that turned out to be bladder cancer, but researchers still refer to it as *endothelial-like* so they can use it in studies…*They clearly know that these are not endothelial cells, but to get around it and not admit they are bladder cancer cells they call them 'endothelial-like'. I don't know how they reconcile that sleight of hand. It is beyond my comprehension.* Masters says.*

And sadly, this as well: *Exposing contaminated cell lines cost Walter Nelson-Rees his career. He was an expert at University of California Berkeley and ran a cell line bank in Oakland. From 1975 to 1981, he published a series of articles in Science outing contaminated lines and naming the laboratories where they originated…eventually the NIH terminated his contract and he became so isolated from his peers that he left science…*

So can we trust that the high-priced medications prescribed for an illness as serious as cancer are actually effective? It appears not. And it is sad that we believe scientific methods always lead us to new discoveries and

then are translated into products or techniques that actually bring us longer life. Clearly this is not the case; we are being fooled into thinking that science is both moral and above reproach when it is not. As a sidebar to her article, Ms. Neimark notes:

*There is a rising tide of worry over the spike in fraudulent scientific papers.

- In the past ten years, retractions of scientific papers have rocketed more than tenfold, while actual publications have increased by only 44%
- The Office of Research Integrity, which pursues cases of scientific misconduct, received more than 400 allegations in 2012 – double the average the prior twenty years
- Of 53 papers deemed *landmark* studies over the last decade, only six held up and were reproducible
- To be successful, today's scientists must often be self-promoting entrepreneurs whose work is driven not only by curiosity but by personal ambition, political concerns, and quests for funding*

And let me point out: those quests for funding often result in pharmaceutical companies being able to control not only the protocols, but the results that will be published. Time and again, studies purporting no benefit, or even detriment, from a new drug are ignored or *lost*; all in the pursuit of profit rather than health.

Another example: does the CRISPR gene-editing method cause hundreds of extra, unwanted mutations?

That's the question raised by a small study in mice. The idea of gene editing is to alter a single DNA sequence in the genome of cells while leaving the rest untouched. However, in practice, every gene-editing method sometimes results in unwanted changes. This is not necessarily a problem if the rate of unwanted changes is low, as most mutations have no effect. But mutations in certain genes can lead to cancer, so the safety of CRISPR depends on how often it makes these off-target mutations.

Most studies have found few if any unwanted mutations with CRISPR. However, almost all of these studies looked for off-target changes by predicting what these were likely to be, and then seeing if they could find them. Stephen Tsang of Columbia University Medical Center and his team have now used a more extensive method, sequencing the whole genomes of two CRISPR-edited mice, and comparing these with a non-edited control. In this way, they identified more than a thousand common mutations in the two edited mice that they think were caused by CRISPR.[98]

[98] https://www.newscientist.com/round-up/crispr-gene-editing/

ALTERNATIVES

It happens daily: *Millions of barrels of oil reaches port in major environmental disaster…* but it's a sarcastic headline. At least I write *sarcastic* so that you will not think I am one of those loonies on the environmental fringe…but really, I happen to believe it is true.

How can we get past the mindset that green technology, at best only a minor improvement over the

current deadly energy system, is an acceptable alternative? And what are acceptable alternatives? This chapter will be a potpourri of alternative views and methods that we might consider. Apologies if it is somewhat disjointed.

Buying *green* tech still encourages the use of fossil fuels. It also rewards someone for their unsustainable uses of coal, oil, or nuclear power, with all those attendant issues. And the issue is not just power: it takes 400,000 liters of water to produce one car. Or one tree to produce the paper used in 300 cigarettes (15 packages). We still need to ask:

1. Does it do a necessary task? Can you do without?
2. Can it be done simpler or with biology rather than tech?
3. How much damage will it cause, cradle-to-grave?
4. Is it resilient, or easy to repair or re-use?
5. Is it harmful to any life?
6. Does it make us weaker if we use it?
7. Can you buy it used instead of new?
8. Is it handmade, not mass produced?
9. Remember the myth of recycling; recycling's not a panacea.

What will it take for us to acknowledge that winning means stopping, not merely negotiating a slight reduction? With such high stakes, is anything less than winning enough? I shouldn't have to say this; compromise is not an option. What would an

acceptable compromise with Hitler have looked like? Only 3 million, not 6 million, dying from the gas? Only 1 million?
Currently in our movement there are many themes; notions that people latch onto and think they have found *the way*:

- Eco-socialists: analysis of capitalist economies; raising minimum wage; based on a model where industrial production continues. Socialist models around the globe have the same approach of pro-industrialism; they just change how the rewards of work are distributed.
- Permaculture: building critical local food infrastructure and meeting other basic needs is a good goal; while there is no attempt to stop any pipelines or strip mines it may be only a partial solution. It will not win by denying or ignoring the industrial-capitalist complex, upon which it depends in order to have the tools it uses to meet its goals.
- Mainstream movement: attempts to be a big tent but has only had true success with the white middle class (global minority). Reliance on NGOs; problematic when funded by capital. They operate within a very confined space of acceptable reform; they win small victories but never come close to winning the war and stopping the destruction of the environment. They often focus on climate change but ignore nature itself and its inherent rights and value. There are many that do as much as anyone towards the problems of today; but again, we are not winning, we haven't managed yet to reverse

the trend lines and start to go in the right direction. I wonder…might allowing the global majority to lead the movement be a step in the right direction? First though, that majority needs to have its survival needs met or they won't have the energy or time to work on climate disruption.

- Radical land defenders: direct action can be effective in stopping some destruction and in gaining attention of media, even if only locally. It leads to court and has won some victories there. But direct action against the Keystone XL (KXL) pipeline did not ultimately succeed; now the humans who endured lockdowns, tree-sits, and arrest are left with court costs and jail time and the knowledge that the pipeline about to be completed. And notice how the *distraction* of fighting KXL has allowed the railroad companies, owned and led by Warren Buffet and Bill Gates, to ramp up transporting tar sands by train throughout Canada and the U.S. with hardly a complaint. In Canada, First Peoples have successfully blocked a continent-spanning pipeline from taking tar sands to the West Coast for shipment. In late-2014 they began to mobilize in the East of Canada, because new pipelines are being sent that direction to avoid the problems in the West. If these eastern protests are successful, there is only one direction left: North. To the Arctic Circle. Which is now open to water for the first time (in summer) in tens of thousands of years; thanks to our use of fossil fuels these last 150. When we do nonviolent protest, they crack down. The only way it works is to have enough

people and sufficient support for our visible and our arrested members that the system caves in to our demands before we run out of volunteers. If you compare the March on Washington for Civil Rights in 1963 or the first Earth Day marches, the numbers of one million in D.C. and 10 million around the country in 1972 dwarf the 400,000 in NYC or 750,000 worldwide for the People's Climate March in 2014. If we can't even get people to march for our climate in equal or greater numbers when our population has more than doubled, why are we surprised when leaders ignore this movement? Targeting one pipeline, or one coal mine, while tens or hundreds of thousands of fracking wells are drilled, re-drilled, and abandoned all while going unremarked seems kind of futile, don't you think? The reality is that we just don't have the numbers that can effectively put a stop to the extraction process that feeds this capitalist beast. Too many people are too complacent and unwilling to rock the societal boat. And many species went extinct today, and will tomorrow, and will every day after that until this system is stopped. You may think the climate movement is fighting a good game. Some would say it is merely a running retreat; I call it losing in a rout.

- Direct attacks on critical industrial infrastructure: appears to be the only strategy with a chance (see the possible exception, a change of spiritual consciousness, later), as all the rest have miserably failed. This is uncomfortable for most of us who have been

trained from birth to follow the rules. We are proud that we live by *the rule of law*; even when the law is working hard to end our lives and is controlled by the very capitalists that have brought us to this point. Sabotage is an honorable and time-tested method of political resistance. We cheered the French when they derailed Nazi trains in WWII, and the Underground Railroad that spirited thousands to safety out of enemy territory during slavery. Why not now?

Nelson Mandela: *I do not deny that I planned sabotage; I did not plan it in a spirit of recklessness, nor because I have any love of violence. I planned it as a result of a calm and sober assessment of the political situation that had arisen after many years of tyranny, exploitation, and oppression of my people.*

Of course this takes a plan:

- Mission: to live in harmony and balance with all of life and Earth.
- Goals: livable planet; sustainable lifestyle, an end to the threat of extinction.
- Strategy: stop industrial logging, industrial fishing, industrial extraction of resources, industrial farming, dams, coal power plants, oil drilling and refining, and capitalism itself. Strategy might acknowledge that small groups of autonomous, committed people can bring down the global industrial economy. It would involve targeting critical nodes like communications; fossil fuel extraction, refining, or transport; power grids and generators; and global finance.

This is not a game, and these speculations are not taken lightly. This is not reckless, nor done out of any love of violence or destruction. Rather it is in the name of survival, of defending what I love with my life, if necessary.

- Tactics: What are your ideas? We already have lots of books on tactics, organization, security procedures, DIY how-tos, and the histories of other successful and unsuccessful movements that have come before us in times that seemed just as tenuous or threatening, and against foes as implacable as this global militarized economy. No matter how massive the system, strategic sabotage can be effective. *Movement for the Emancipation of the Niger Delta (MEND) is one of the most visible armed groups based in Nigeria's Niger Delta region. It is a loose coalition of armed groups partly responsible for disrupting oil-production and kidnappings in the Niger Delta over the last several years. It emerged in late 2005-early 2006, targeting the oil infrastructure in the area, and abducting and holding oil workers for ransom.*[99] MEND has knocked out 30% of the oil production there through targeted infrastructure attacks. In the U.S. the largest and most sophisticated attack on the electrical grid happened just south of San Jose, CA in 2013 when a fiber optic cable carrying communications was cut and a power substation was taken offline for nearly a month

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99 http://www.globalsecurity.org/military/world/para/mend.htm

by gunfire. That innocuous act is, sadly, the worst we've managed to pull off. We've a lot to learn from the Nigerians, it seems. Small groups of individuals, trained, focused, equipped, and with good target selection, can make a difference.

What about less stressful, more *legal*, tactics? Prepare now for the end of this capitalist-industrial way of life; stop feeding the system with any of your energy unless you truly have no choice. That might look like not using credit or debit cards (using only cash, to starve the banks of the fees for plastic payment processing); buying only real food (not food products) from now on; when you have to buy any tool, buying one that does not require electrical power; selling your car; growing food and planting fruit trees in your yard (including the front yard); starting a neighborhood association; working as a volunteer in a local organization working for human rights, especially land and racial justice; or starting co-operative ventures that help women or members of the global majority sustain themselves without being subjected to capitalist hierarchy and exploitation.

Or:

*...a post-scarcity, participatory economic model: a way, through modern technical means, to refocus society towards an abundance-producing interest, an incentive towards abundance, that meets human needs directly, to get rid of social inequality, to make sure no one doesn't have a high quality of life in sustainability with the world around them. To aspire to a 500-room mansion with two jets parked around the front lawn with half of the continent of Africa as your backyard, isn't just some gratuitous act of greed and materialism, it's actually an

act of violence. And it is time we realized that [ours] has to be a shared planet; we can't have this ethic that we're just going to over-run people because we want the *freedom* to do so. When you have a social model that reinforces social and ecological interests, everything will change, and that's what our system doesn't do. In other words, self-interest: that driving little thing that we all have and obviously when we are backed into a corner we will always predominantly be self-interested; right into our evolutionary psychology, we're no use or good to anybody if we can't survive ourselves and maintain a decent living and the like; that will be combined explicitly with social interest. Every act of engagement in this new model benefits everyone and takes the environment into direct account explicitly. And the beauty of that awareness is it really embodies a new incentive structure that can facilitate true cultural and environmental sustainability and actually generate a steady-state environment while also eliminating the costly and destabilizing inequality that is continuing right now.*[100]

Phase out, as quickly as possible: weapons, nuclear, mining, extraction, plastics and petrochemicals, advertising, insurance, gambling, alcohol, tobacco, Big Pharma, candy and soft drinks, concentrated animal feeding operations (CAFO), and cosmetics. Many others will need to be transformed if we want them to continue: building, electrical power, furniture, clothing, food, and media. What will replace these? Replanting, restoration,

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[100] https://www.youtube.com/watch?v=9FoAtKeExOA Peter Joseph, speaking to Abby Martin, 2013

removing asphalt safely and quickly, repairs, repurposing.

The concept of voluntary simplicity is very, very old. Humans evolved as small groups and only later developed globe-encircling culture and finance. Even now, some few of us embrace a choice to value highly what is non-material and truly satisfying: love, relationships, compassion and caregiving; and rejecting what is soul-killing, such as violence, exploitation, domination and control.

> *The radical left in general has failed to recognize the significance of the *limits to growth* analysis of the global situation, and as a result its understanding of the required alternative to consumer-capitalist society is unsatisfactory. The most serious implications concern the many ways in which traditional radical left thinking on the transition process now needs to be revised or abandoned. The core element in the limits case is that we are entering an era of intense and irremediable scarcity, which rules out notions of emancipation in terms of centralized, industrialized, technically sophisticated or globalized systems, growth economies or affluent lifestyles. There must be dramatic reduction in rich-world levels of production and consumption and *living standards*. The Simpler Way vision is of an alternative which achieves this goal while liberating us to enjoy a higher quality of life. It involves mostly highly self-sufficient zero-growth local economies, self-governing via local

> participatory processes, driven by commitment to cooperation, stability, the common good, frugal lifestyles and non-material satisfactions. This vision can only be realized via the gradual development of local communities informed by Simpler Way ideas and values. It cannot be imposed or given by a vanguard or state. This defines the revolutionary task and traditional radical left thinking is of little assistance in approaching it. Thus limits, scarcity, self-sufficiency and frugality are among the concepts that are now focal and that urgently need to be integrated into left theory and practice.* Created by Ted Trainer at The Simplicity Institute[101]

The so-called de-extinction projects: bringing back a handful of extinct species using cloned DNA; may sound great in your online newsfeed but are much harder to actually pull off than we are told. Just bringing back a mammoth is headline news; but without the bacteria that lived in a mammoth's gut and the flora it ate, it is hardly a successful project. And who is going to teach the first one how and what to eat…in other words, how it can actually *embody* a mammoth in the first place? And once you see the resources being diverted away from projects that are really important now, the whole question of distraction takes center stage. These projects are more like we believe this pending disaster is too much and we'd rather not think about it, rather than being anything at all constructive or useful. But of course, this is the kind of thinking that derives from a

[101] http://simplicityinstitute.org/

technology will save us attitude. Should we be trying to bring back a solitary, isolated creature from a past that we will never inhabit again, or might we be better served by accelerating our own adaption to avoid extinction in our new climate? On June 28, 2017 Ahvaz Iran reached 53.7 degrees Celsius, which is 128.7 degrees Fahrenheit. Due to the humidity, it felt like an incredible 142 degrees. In 2015, India managed to touch a *feels like* 64◦C (147◦F)...and hundreds of humans died. Maybe finding a way to survive high temperatures like this would be a better use of our money.

Each miraculous lifesaving (actually, only life-extending) technology that medical research discovers also brings fundamental questions: should I use it? How grateful am I for a few more months or years of life; and how much suffering will I endure because of it? How will I balance the quality v. quantity of my life? What are the tradeoffs? Should the wellbeing of my caregiver figure into the equation? When does death morph into a blessing, rather than our everlasting human curse? Would I prefer to die too late, or too early?

Self tech (deprogramming ourselves): Our fear of discarded food is fed by rare media stories of illness, repeated. A proper process of cleaning and cooking food is more important than expiration dates mandated by law and meant to account for the least common denominator. Just as your phone battery shows *dead* with a 90% charge remaining, so too the expiration dates are well within the foods' nutritional, and safe, lifetime. Even if I use common sense, and protection, culture's voice still whispers, *GARBAGE*. Becoming a

freegan, and using food discarded by markets that make their profit selling only unblemished food and packages, is less about technique and more about courage. Along the entire process, America wastes 40% of the food that we grow, nearly all of it for reasons of appearance only.

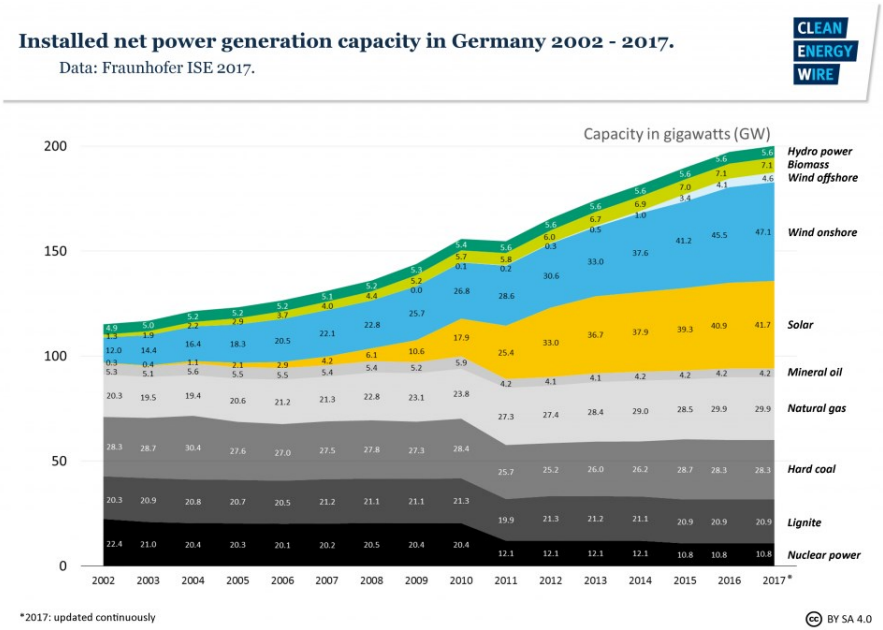
I feel we can agree that many of the environmental costs of our culture today are not included in the price we pay when we buy something. This is the concept of *externalized* costs; we see it everywhere: coal power plants that cause acid rain and asthma, the costs to remediate being borne by society and neither the company nor the direct consumers of the power itself. In the gasoline, where we don't pay for the costs of effective clean-up after spills; actually no one pays for effective clean-up which begs the question, what is the true cost of all this oil we burn? So here's what I can do, compliments of Derrick Jensen: set a cost myself, for the externalized costs associated with anything and everything I consume. It might be an additional $1 per gallon of gas, or 10 cents per pound of meat, or 15 cents per one item with any part made of plastic. Now if you are like me, you don't have enough *dollars* to accommodate such an increase in the cost of goods. No matter; keep the account and then pay yourself the minimum wage, or even as much as $10/hour, to pay off the accumulated externalization debt by doing the work you hope will make a difference in the environment, the politics, or the economy of our time.

What do you love? It's probably under attack. There's a ton of work there, just in that one issue, once you decide to defend what you love.

Asking everyone I meet, *What's it going to take to...* ...make this system sustainable? ...end the possibility of human extinction? ...end poverty and slavery? I could even first ask them what they are most concerned about, as it pertains to their great-grandchildren, and then ask what it will take to solve that problem. My response to them might center on these questions:
What are your gifts? What are the largest problems you can solve when you use your gifts to their fullest? If you were free of fear, or had enough money to survive, what would you be doing right now? What lights you up? (different from what do you love)
Just do something. Start small, but start.

We choose to trade our higher productivity, largely due to technology, for goods rather than time. Yet we never hear of people on their deathbed, regretting not having enough toasters in their kitchen. We do hear regrets about the quantity and quality of the time spent in relationships with others. Can we begin to work for money less, and to work for love more?

Germany, with less sun at 54°N latitude than Adak Alaska (51°N), has gone from 6% of its energy from renewables (solar and wind) to nearly half in just ten years (because of public will as a result of education or propaganda).



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It is not just about localization; ending a dependence upon a national grid infrastructure and keeping the money generated through supplying power to the community within the community (stop hemorrhaging money from taxpayers into the accounts of hedge funds), but also about reclaiming utilities from private hands and placing them back into the commons. It is nearly impossible today to get a capitalist company to align the corporate structure in support of green values; just demanding that they do the right thing is insufficient, as it doesn't engender more profit. Boulder CO wanted its local energy provider XCEL to switch to renewables; the profit would be less and the company

102 https://www.energy-charts.de/power_inst.htm

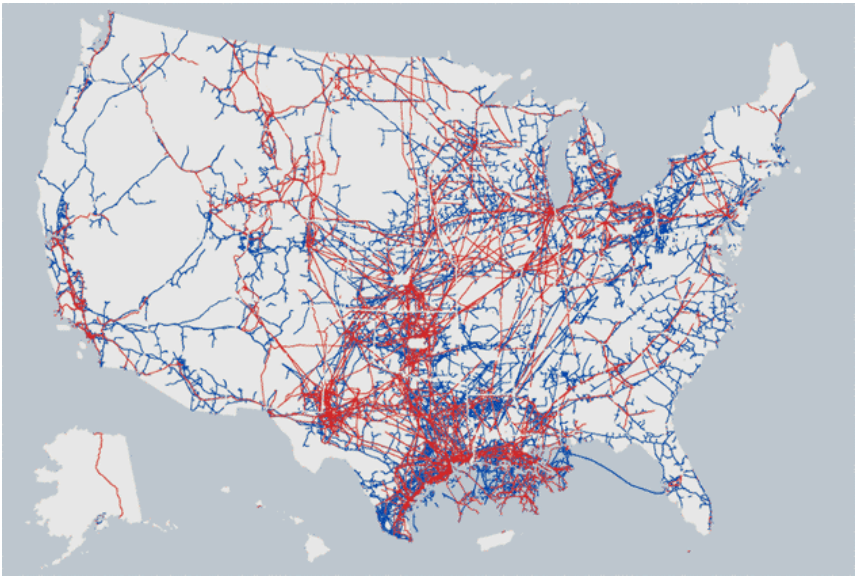
said no. This drove a movement to take back the utility; not driven by any anti-capitalist ideology, instead arising from a desire to have a sustainable future. And so their fight against privatization is a tool or a tactic, not a belief system or a goal fully formed prior to being implemented. It is easier to change public utilities than for-profit enterprises; especially in a culture that so deeply values *I built that*.

We need creative ways to say *yes* to what we want, and bold ways of saying *no* to what we don't want. *Blockadia* is defined here by Naomi Klein in *This Changes Everything*:

> *Blockadia is not a specific location on a map, but rather a roving transnational conflict zone that is cropping up with increasing frequency and intensity wherever extractive projects are attempting to dig and drill, whether for open-pit mines, or gas fracking, or tar sands oil pipelines. What is clear is that fighting a giant extractive industry on your own can seem impossible, especially in a remote, sparsely populated location. But being part of a continent-wide, even global, movement that has the industry surrounded is a very different story. Blockadia is turning the tables, insisting that it is up to industry to prove that its methods are safe – and in the era of extreme energy that is something that simply cannot be done.*

Blockadia has added layers of cost that the extractive companies did not plan into their budgets. Just as the trade organizations build the very coalitions that oppose them, and as our military creates terrorists with every innocent we kill, thus we learn about our inherent

power. So too the octopus tentacles of rail and pipe now being laid around North America are inspiring tens of thousands of unassuming citizens to find their ability to resist the ecocide coming to their neighborhood, compliments of coal and oil. They are our best recruiting tool.



Map of major natural gas and oil pipelines in the United States. Hazardous liquid lines in red, gas transmission lines in blue. Source: Pipeline and Hazardous Materials Safety Administration.

Are pipelines bad? This is a valid question, so here's an answer:

> *Crude oil is moving around the world, around our country, around pristine wilderness, around our cities and towns. It's going to keep moving, will undoubtedly increase during our new energy boom, so what is the safest way to move it? The short answer is: *truck worse than train worse than pipeline worse than boat*

> (Oilprice.com). But that's only for human death and property destruction. For the normalized amount of oil spilled, it's *truck worse than pipeline worse than rail worse than boat* (Congressional Research Service). Different yet again is for environmental impact (dominated by impact to aquatic habitat), where it's *boat worse than pipeline worse than truck worse than rail*. So it depends upon what your definition is for *worse*. Is it death and destruction? Is it amount of oil released? Is it land area or water volume contaminated? Is it habitat destroyed? Is it CO2 emitted?*[103]

And especially heartening is the resistance mounted by the Native Peoples, especially in Canada but in America also. Standing Rock was a watershed in the movement, as US Native tribes came together to protect their water supply which is at risk due to the Dakota Access Pipeline. Framing the struggle as water protection, they reject the label *protest*; which is an important distinction to make, and one that subtly indicates there is no room here for negotiating a compromise that would allow some amount of pipeline and profit rather than total protection of life. This is showing us more and more how a different worldview: an inclusive, indigenous worldview; is not only possible, but likely our only hope. As they stand up for their treaty rights, they add tremendous value to the rights that belong to Mother Earth already, albeit unrecognized by capital.

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[103] https://www.forbes.com/sites/jamesconca/2014/04/26/pick-your-poison-for-crude-pipeline-rail-truck-or-boat/#5640d0c517ac

They educate us about what is important, and add the energy of all life to our struggle, a struggle in which the authorities try to divide us or distract us and so to make us easily conquerable. We see aboriginal title and indigenous treaty rights standing in the way of capital; and those rights become more powerful when defended by mass movements. Solidarity; shown when we recognize each other and act together because of our shared values, if not tactics; our shared legacy and source, if not beliefs. It's not: *We want to use those rights to protect the biosphere*; that's the old extraction model, making everything a tool or a resource there for us to use. These rights were hard-won and point us toward a non-destructive way of living on this planet. Hard-won by ancestors; hard-defended today.

Defenders of capital denigrate our efforts saying that capitalism is not causing the sea levels to rise. And if it were this simple; then only stopping climate change would allow capitalism to continue on as a perfect system. But climate change, while inherent in capitalism, is not capital's only or even worst problem. Solve climate change and this economic system is still exploitive and destructive and genocidal and unequal and corrupt. Addressing capitalism as the core problem of climate change sets us on the path toward solving all of our most intractable social problems. We can create more jobs building the new infrastructure of public commons and transportation and health and food and shelter than we lose by shutting down the oil economy. Making those changes will give us stronger relationships and communities and healthier bodies and mental health; this is not news, we all know this already. The movement to save humanity needs a big tent: we all have

to be involved, although we can't wait for all to be on board before we start. But we are already all under a big tent: it's called our atmosphere. Seen from space the air that sustains us is but a thin blue line around the Earth; it can be irreparably polluted, not just with greenhouse gases, but with hot radioactive particles and other debris of our modern world and chemicals that engender cancer.

We as a culture have done a terrible job of matching people with activities that maximize their gifts. You likely know someone who is brilliant, but is working in some dead-end job that makes absolutely no use of their talents. Maybe they didn't want to go to college or couldn't afford it; maybe they saw something and thought that they would love to work in a particular field, but upon graduation found there were few opportunities to make a difference, or that after all that schooling they find they aren't as happy with this field as they had anticipated. In any event, millions of people today are just marking time until they die. If someone decides in their forties that they really should have chosen a different field: they are gifted with facile hands and would make a fantastic surgeon, for instance, and want to utilize their desire to heal others; we make it nearly impossible for them to feed that passion. Imagine trying to become a surgeon while in your forties, how difficult it would be to get into school and then get the training and get hired once you are in your fifties. It's as if we fear that someone will be able to change their station in life and we won't allow that. It is this conundrum: we are developing the technological tools that will allow most people to never work again. But if

one must have money to eat, what are we to do? Do we, out of the goodness in our hearts, leave people in jobs that could be done faster, easier, better by robots rather than kick someone off the company payroll? Wouldn't it make more sense to change the paradigm of needing money to eat? The crime rate has plummeted since the 1990s; teen pregnancy rate has also plummeted; what is also plummeting at the same time is the labor participation rate. More and more adults are out of work and have no hope of getting work, either because their field has been automated, their skills have eroded because they have been unemployed for years, or their health is poor and they can't manage to hold a job consistently enough for an employer to keep them on staff. Despite more people with less to do, crime rates have fallen because we have developed ways to keep people distracted, entertained, drugged, and in some ways psychologically sated. But humans' creativity and spare time are both incredibly important and useful resources. Unleash this creative power and we can transform the world literally overnight. Keep us playing Candy Crush or Facebook or Call to Duty and while we may feel good, even as we are letting the real world fall off the cliff of sustainability. Having more people, having all people, discover what they are passionate about and unleashing them to go forth and do good work should not be a threat. But if change is seen as upsetting the capitalist cart and we fall for the trope, *we can't change how we do money*, then nothing of any real substance will change. We are not living in a zero-sum game; if someone who serves you food in a restaurant is unleashed to write and pens novels better than Ernest Hemingway that is a good thing, not a threat to all the

other authors who already get money for what they write. Now we have a society where 20% of us do real creative work and the rest just perform drudgery and then fall into distraction at every opportunity. That's no way to live.

> *When I say the words, *Energizer Bunny, Taco Bell Chihuahua, or Geico gecko*, did a picture of those little animals appear in your head? Did you know you were carrying them around? Can you *unsee* those images?* Jerry Mander

We like to think that our intelligence protects us from being swayed by advertising, but advertising is extremely powerful. It is image implantation. It stays with you forever, affecting your thoughts, actions, and beliefs. Unless, and possibly not even then, you study every bit of data you ingest for veracity and motive, you are being manipulated by the information presented for your viewing, reading, or listening pleasure. The average viewer sees 30,000 commercials per year; which means half of all viewers see more. That's a lot of manipulation, resulting from hundreds of billions of dollars spent by industry to shape what you want out of life.

If we were to take control of the propaganda, and begin to program ourselves based on our true needs and not some illusory profit motive, these are some attitudes we might codify around tech:

1. Precautionary Principle: since nearly everything we are taught about technology comes from its proponents, be deeply skeptical of what you are taught. Beyond *do no harm*, require that a tech be proven safe before use. Don't be part of a

global experiment that might turn out badly. No more innocent until proven guilty.

2. Look beyond how a tech benefits me personally: seek the holistic view. How does it impact Nature, community, and society? Ask who benefits most, and in what ways and with what goals?
3. Lose the meme that tech is neutral. Every tech has problems; unless you recognize and identify that risk you are not making good decisions concerning its use. Accept cars and roads, oil, pollution, suburbs, isolation and death are the inevitable results.
4. Separate the local: solar, food and water, from the global: nuclear, fossil fuels, ocean dead zones and plastic gyres.
5. Don't believe that once the genie is out of the bottle you can't put it back.
6. When thinking about tech, emphasize the negative; under this current system, we are unable to adequately understand the ramifications of the negative until it is too late. There are always unforeseen consequences; adequately allow space for that. Negativity is positive!
7. Ask questions about the economic systems that have an inherent need to drive destructive behavior in order to continue. When profit is required and it goes hand-in-hand with amorality or even immorality, there can be no good ending.

Even if solar cells were massively more efficient and less expensive, they might only serve to expand energy supplies and eventually accelerate overall energy demand, if history is any guide.

The only real *clean, green energy* is less energy than we use today, and then only what the Sun naturally provides in any given space and time. If we wish to leave a smaller footprint on the earth and back away from resource scarcity we should develop strategies to use far less energy overall, not offer payouts to energy conjurers or smoke-and-mirrors projects. Any number of conservation strategies offer far higher dividends than solar cell investments; and not just monetary dividends, but also environmental and social too. A shift toward energy taxes could help reduce fossil fuel use while filling public coffers rather than the pockets of Big Oil. Or for no net cost at all, we could support strategies to passively bring our homes and commercial buildings into sync with the sun's energy rather than working against it. We could question growth in energy production, economy, and population. All of these initiatives are left underrepresented as we unwittingly rush to celebrate energy firms who are building the next round of ecological disaster machines.

But what about nuclear, many (even green) people ask? Nuclear is neither *green* nor an answer to mass extinction for myriad reasons. A few: it uses fossil fuels heavily during its construction, tries to pay it all back during its operation, but then uses them heavily again during shutdown and eventual decommissioning (which, by the way, we don’t yet know how to do so we can’t accurately predict its carbon footprint or monetary cost).

Without constant, assured long-term power (decades if not centuries into the future), we face a Fukushima everywhere we have a reactor operating or shutdown today if the national grid collapses before we are ready to remove and protect a reactor's fuel in an orderly fashion. And they are extremely expensive to build and operate, not to mention uninsurable against calamity.

Disruption is too mild of a word; at least if you believe the underlying premise of the film with that name. The same scientists who tell us that our human activity is driving climate change also tell us that we must reduce carbon emissions by 80% over the next few years. Follow the math: if, as is now the case, 40% of Americans don't buy the argument for climate change, then they will not contribute to reducing anything of import. That means that every person in the remaining 60% must reduce their own contribution by 100%, and *hope* that the resulting economic and cultural dysfunction forces an involuntary 50% reduction on those who deny.

Those that won't (.4 X .5) + We that will (.6 X 1.0) =
Our goal .8

So what does 80% look like, even if everyone plays well together? It looks like not another drop of gasoline for your car; not another newly-manufactured piece of plastic anything; not another lump of coal making 50% of America's electricity; and not another ounce of meat on your plate.

This is the end of the world as we know it, like it or not.

We face two paths. Business As Usual = Extinction.
No More Oil = Life
Seems pretty easy to decide, don't you agree?

There is life after oil, just as there was life before oil. Let's get on with it! As daunting as it appears, we can overcome this addiction. But in each moment, with each decision, as we grow our commitment to life on Earth one day at a time, saying no to oil will be not only the right choice, but an easier choice. Institute this in your own life, and then instigate others to do the same. Spread the mindset.

No oil.
No coal.
No plastic.
No meat.
Start Now.

We can't use the Master's tools to dismantle the Master's house, or even to build something different. Our task today is to discover how to build something new, originally. Tech is one aspect of this Master's tools: so if I am relying on theft, slavery, and genocide, how can that create a new and sustainable world? This means no NGOs. No voting. No electric cars. No begging for scraps from the Master's (government's or corporations') table.

We have let the other matters of the day: war, poverty, and immigration to name but a few; distract us from the core cause of each of these problems, capitalism. Occupy brought the focus back to the roots of the issue and re-opened the discussion; it is up to us to carry this

educational opportunity to our brothers and sisters. Squashed quickly like most potentially successful movements, Occupy went silent, learned what it had done wrong, and is now beginning to re-emerge as the Climate Justice Movement. It is pulling together survivors of so many movements: civil rights, indigenous sovereignty, women's rights; and working to deeply shift our worldview away from the supremacy of capital and instead placing our emphasis on the supremacy of life. Climate Change is Mother Nature's wake-up call to humans' telling us we have been asleep for too long, have allowed too much destruction to be done in our name, and now is the last chance we have to throw off the yoke and return to a peaceful, blissful, and long life in connection with the Earth. It is imperative that we understand what is driving us over the cliff of extinction, and act accordingly.

A lot of liberals just really don't want to talk about capitalism. It could be that denial is necessary in order to allow this trade of a comfortable, easy lifestyle of distraction and consumption in return for some mind-numbing *work* to continue. Maybe it is easier to talk about growth; and clearly even if we do manage to contract the economy and move beyond the paradigm of infinite growth on a finite planet, there will still be some parts of the economy that will rightly need to grow. So it's not about reducing population, it's not about preventing developing countries from reaching a life-sustaining level of tool use. It is about identifying what drives our economy to destroy the very planet that we all need in order to live; and then changing that drive into one that is life-affirming and sustainable. There are many industries that must cease operations if we are to

survive, regardless of how many people will lose jobs and have to find other ways to support themselves. Using fewer resources and less energy will obviously mean there will be more hand work for people to do. We need not worry yet about getting everyone on board; let the deniers stay in their little bubbles of unreality. We have yet to come together even on the left, among progressives, with any kind of solidarity that truly flexes our inherent power. Let's focus on coming together in that way to reach our own tipping point. But surely we can begin to get behind a motto: *No More Sacrifice Zones*; be they war zones, militarized police and incarceration zones, unemployment zones, homeless zones, hunger zones, ….

This is the culture of Empire. Everything works together to keep the Empire expanding. Technology is the tool; domination is the goal. You likely argue that tools can be used for good or for bad; yet that judgment, to be made properly, requires a knowledge and understanding of cause and effect, which we humans sorely lack, as well as complete data, which we also lack.

When looking for solutions don't forget what causes societies to collapse or cohere:
Dmitry Orlov: *Social collapse: There would likely be a wide spectrum of outcomes. Those communities that are ethnically homogenous, well-defended, strongly bound together by conservative and uniform social and religious traditions, with a history of favoring self-sufficiency and perseverance, would be likely to survive and recover. On the other hand, those communities that are ethnically diverse with a history of bigotry, racism

and ethnic strife, with weak, optional, or nonexistent standards of public morality, which are integrated into the global economy in non-optional ways, and which are unaccustomed to hardship, are likely to perish.*
Do you see our society in that last scenario?

Dominant culture makes promises about the future: that technology will make even the poor rich and work-free; that medicine will let us live well forever; that social progress will make all of us equal. Any mismatch between these fantasies and our actual reality will be swept away by growth and development; so don't get in the way of *progress*. Now we see that progress is rotting while still wrapped in its package.
Disillusionment is such a bitter pill that most of us can't choke it down. Like most medicine though, once we swallow it and let it do its work, we are happy we managed to take the prescription. Ask this: what does it mean to live a life waiting for a future that the universe is serenely unwilling to provide?

Note John Michael Greer :
*There are more constructive ways to deal with the decidedly mixed bag that human existence hands us. If I may risk a significant oversimplification, there are broadly speaking three ways that work. It so happens that the ancient Greeks, who grappled just as incisively with these issues as they did with so much else, evolved three schools of philosophy, each of which took one of these three ways as its central theme. They weren't the only ones to do that in a thoughtful fashion; those of my readers who know their way around the history of ideas will be able to name any number of examples from other societies and other ages. I propose to use Greek

examples here simply because they're the schools with which I'm most familiar. As Charles Fort said, one traces a circle beginning anywhere.

*The first of the three approaches I have in mind starts with the realization that for most of us, all things considered, being alive beats the stuffing out of the alternative. While life contains plenty of sources of misery, it also contains no shortage of delights, even when today's absurdly complex technostructure isn't there to provide them; furthermore, the mind that pays close attention to its own experiences will soon notice that a fairly large percentage of its miseries are self-inflicted, born of pointless worrying about future troubles or vain brooding over past regrets. Unlearn those habits, stop insisting that life is horrible because it isn't perfect, and it's generally not too hard to learn to enjoy the very real pleasures that life has to offer and to tolerate its less pleasant features with reasonable grace.

*That's the approach taught by Epicurus, the founder of the Epicurean school of philosophy in ancient Greece. It's also the foundation of what William James called the healthy-minded way of
thinking, the sort of calm realism you so often see in people who've been through hard times and come out the other side in one piece. Just now, it's a very difficult philosophy for many people in the world's industrial nations to take up, precisely because most of us haven't been through hard times; we've been through an age of extravagance and excess, and like most people in that position, we're finding the letdown at the party's end far more difficult to deal with than any actual suffering we might be facing. Get past that common reaction, and the Epicurean way has much to offer.

*If it has a weakness, it's that attending to the good things in life can be very hard work when those good things are in short supply. That's when the second approach comes into its own. It starts from the realization that whether life is good or not, here we are, and we each have to choose how we're going to respond to that stark fact. The same unlearning that shows the Epicurean to avoid self-inflicted misery is a first step, a clearing of the decks that makes room for the decisions that matter, but once this is taken care of, the next step is to face up to the fact that there are plenty of things in the world that could and should be changed, if only someone were willing to get up off the sofa and make the effort required. The second approach thus becomes a philosophy of action, and when action requires risking one's life—and in really hard times, it very often does—those who embrace the second approach very often find themselves saying, *Well, what of it? I'm going to die sooner or later anyway.*

*That's the approach taught by Zeno, the founder of the Stoic school of philosophy in ancient Greece. It's among the most common ways of thought in dark ages, sometimes worked out as a philosophy, sometimes expressed in pure action: the ethos of the Spartans and the samurai. That way of thinking about life is taken to its logical extreme in the literature of the pagan Teutonic peoples: you will die, says the Elder Edda, the world will die, even the gods will die, and none of that matters. All that matters is doing the right thing, because it's the right thing, and because you've learned to embrace the certainty of your death and so don't have to worry about anything but doing the right thing.

*Now of course the same choice can express itself in less stark forms. Every one of my readers who's had the experience of doing something inconvenient or unpleasant just because it's the right thing to do has some sense of how that works, and why. In a civilization on the downward arc, there are many inconvenient or unpleasant things that very badly need to be done, and choosing one of them and doing it is a remarkably effective response to the feelings of meaninglessness and helplessness that afflict so many people just now. Those who argue that you don't know whether or not your actions will have any results in the long run are missing the point, because from the perspective I've just sketched out, the consequences don't matter either. Fiat iustitia, ruat caelum, as the Roman Stoics liked to say: let justice be done, even if it brings the sky crashing down.

*So those, broadly speaking, are the first two ways that people have dealt constructively with the human condition: in simplest terms, either learn to live with what life brings you, or decide to do something about it. The first choice may seem a little simplistic and the second one may seem a little stark, but both work—that is, both are psychologically healthy responses that often yield good results, which is more than can be said for habits of thought that require the universe to either cater to our fantasies of entitlement or destroy itself to satisfy our pique. Both also mesh fairly well with the habitual material-mindedness of contemporary culture, the assumption that the only things that really matter are those you can hit with a stick, which is common to most civilizations toward the end of their history.

*The third option I have in mind also works, but it doesn't mesh at all with the assumption just noted. Current confusions about the alternatives to that assumption run deep enough that some care will be needed in explaining just what I mean.

*The third option starts with the sense that the world as we normally perceive it is not quite real—not illusory, strictly speaking, but derivative. It depends on something else, something that stands outside the world of our ordinary experience and differs from that world not just in detail but in kind. Since this *something else* is apart from the things we normally use language to describe, it's remarkably difficult to define or describe in any straightforward way, though something of its nature can be shared with other people through the more roundabout means of metaphor and symbol. Elusive as it is, it can't simply be ignored, because it shapes the world of our ordinary experience, not according to some human agenda but according to a pattern of its own.

*I'd encourage my readers to notice with some care what's not being said here. The reality that stands behind the world of our ordinary experience is not subject to human manipulation; it isn't answerable to our fantasies or to our fears. The viewpoint I'm suggesting is just about as far as you can get from the fashionable notion that human beings create their own reality—which, by the way, is just one more way our overdeveloped sense of entitlement shapes our habits of thinking. As objects of our own and other's perceptions, we belong to the world of the not quite real. Under certain circumstances, though, human beings can move into modes of nonordinary perception in which the presence of the underlying reality stops being a theory

and becomes an experience, and when this happens a great many of the puzzles and perplexities of human existence suddenly start making sense.*

Sustainable culture is deeply tied to nature and land, is slow and relationship-heavy, and is not subject to human *control*. Imperial culture is fast and heavy on personal responsibility, the counterpoint to its highly-touted *personal freedom* motif. Empire is an ethos that seeks to control humans by keeping us all in an immature, lower state of being, out of touch with reality and therefore willing to submit to the latest myth spun by our leaders. Empire is ancient; and even the times we point to when empires have collapsed, that's not true. Empires don't collapse; they just step out of one cultural milieu and craft a new one. Empire needs ignorant people, in pain and reproducing, so that it has slaves to do the hard work of mining and farming. Empire is apolitical and amoral. It is hard to get Americans to understand the apolitical piece: we have been told, incorrectly, that we live in a democracy. But politics and power are not the same, nor are they connected. No matter the flavor of politics you subscribe to: green, libertarian, neocon, fundamentalist, or the typical two main *parties* (interesting term, political party, which might be understood to mean something frivolous and inconsequential, designed to distract from the real work), the shenanigans of politicians and campaigns have little to do with ensuring that the will of the people is enacted in law or in society. The key here is that Empire needs the consent of the governed before acting. Thus we endure elections; although completely ineffective, and serving only the interests of Empire

itself. Without some sham to get the people to acquiesce Empire has no ability to dominate anyone. Withdraw our consent, and things change. Of course this is easier said than done; it is nearly impossible today to withdraw from this Empire as it has wormed its way into nearly every place where three or more people gather. How do I eat without Empire and its roads and ports and runways to bring in food from thousands of miles away? How do I find safe shelter without Empire and its police and utilities? How do I drive without a license from the Empire and its rulebook? How do I explain the nasty, brutish things Empire does in order to keep me *safe* without buying into empire's constructs of race, class, and gender?

The answer is: I fight Empire by maturing, and by circumventing its agenda of keeping humans ignorant, in pain, and reproducing more of the same. If all is energy, I change my energy into that of a whole, mature, spiritually fulfilled human soul embodied on Earth. This is the opposite of what Empire can withstand, and has benefits like showing others it is possible and making it more difficult for Empire to explain why someone not pursuing the Imperial agenda is so effective and happy. See, the answer is spiritual, not political. I won't have success thinking that putting in more effort on the hamster wheel is going to make me happy; the wheel is the design of Empire and works to serve its goals, not mine. There are other ways to live; and until I look for them I'm not going to find them.

Elizabeth Oriel: *Both climate change and rapid species extinction are usually framed as problems arising from human overpopulation, resource depletion,

industrial, technological, and economic development. Another way to frame and understand these separate but interconnected catastrophes is to see them as human failures to coexist with natural systems. This alternate frame puts the focus on a certain goal, namely coexistence, which is rarely expressed or discussed in the media. This concept is not compatible with human-centered ways of viewing the world, and the human focus cuts to the root of the problem.

Prescriptions for these crises are centered on outer solutions, outer issues, but there are inner and outer realms and both must be addressed. If we are to attempt to prevent further climate-driven ecological collapse, the energy infrastructure has to be transformed rapidly, as does, concurrently, the inner landscape, the cognitive infrastructure, in terms of how we frame human relationships with natural systems.

CONCLUSION

YOUR CHOICE.

dear matafele peinam,

you are a seven month old sunrise of gummy smiles
you are bald as an egg and bald as the buddha
you are thighs that are thunder and shrieks that are lightning
so excited for bananas, hugs and
our morning walks past the lagoon

dear matafele peinam,

i want to tell you about that lagoon
that lucid, sleepy lagoon lounging against the sunrise
men say that one day
that lagoon will devour you
they say it will gnaw at the shoreline
chew at the roots of your breadfruit trees
gulp down rows of your seawalls
and crunch your island's shattered bones

they say you, your daughter
and your granddaughter, too
will wander rootless
with only a passport to call home

dear matafele peinam,

don't cry

mommy promises you

no one
will come and devour you
no greedy whale of a company sharking through political seas
no backwater bullying of businesses with broken morals
no blindfolded bureaucracies gonna push
this mother ocean over
the edge

no one's drowning, baby
no one's moving
no one's losing
their homeland

no one's gonna become
a climate change refugee

or should i say

no one else
to the carteret islanders of papua new guinea
and to the taro islanders of the solomon islands
i take this moment
to apologize to you
we are drawing the line here
because baby we are going to fight
your mommy daddy
bubu jimma your country and president too
we will all fight

and even though there are those
hidden behind platinum titles
who like to pretend
that we don't exist
that the marshall islands
tuvalu
kiribati
maldives
and typhoon haiyan in the philippines
and floods of pakistan, algeria, colombia
and all the hurricanes, earthquakes, and tidalwaves
didn't exist

still
there are those
who see us

hands reaching out
fists raising up
banners unfurling
megaphones booming

and we are
canoes blocking coal ships
we are
the radiance of solar villages
we are
the rich clean soil of the farmer's past
we are
petitions blooming from teenage fingertips
we are
families biking, recycling, reusing,
engineers dreaming, designing, building,
artists painting, dancing, writing
and we are spreading the word

and there are thousands out on the street
marching with signs
hand in hand
chanting for change NOW

and they're marching for you, baby
they're marching for us

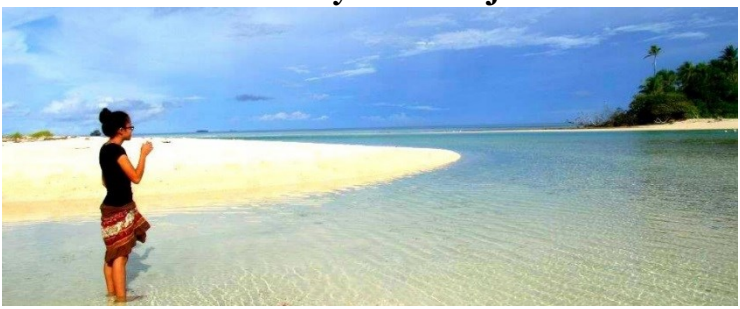
because we deserve to do more than just
survive
we deserve
to thrive

dear matafele peinam,

you are eyes heavy
with drowsy weight
so just close those eyes, baby
and sleep in peace
because we won't let you down

you'll see

from Kathy Jetnil-Kijiner



We will not apologize for our way of life.
Barack Obama

Kathy and Barack can't both be right.

This is not the first time, scientists tell us, that our Earth has been this warm. There have been occasions in the past when there was no ice on the poles. They also say that there have been previous mass extinction events; and that we are at the beginning of another one:

> *Nearly 20 extinction events in Earth's natural history have been analyzed in a new study[104] by David Bond from the University of Hull in the U.K. and Stephen Grasby from the University of Calgary in Canada. They found that most of the events seen in the geologic record, starting about 500 million years ago and extending until today, can be linked to periods of massive volcanic activity, which caused global warming of the atmosphere together with acidification and oxygen depletion in Earth's oceans. Other associated kill mechanisms were acid rain, damage to the ozone layer, enhanced ultraviolet radiation, and toxic metal poisoning. Sound familiar? All these kill mechanisms are also side effects of the human-induced climate change we're seeing today.*[105]

From just the perspective of how our modern society destroys, negates, and sanitizes the natural world for our comfort, this one will be considered *anthropogenic* even leaving aside the temperature changes caused by our CO2 emissions, if that is truly the cause of the climate changes we see today. Tipping points are being passed so that we can have our smartphones, to-go coffee from a drive-thru, vacations via airliners, and Facebook. It seems that our level of denial about our destruction of our planet is only exceeded by our level of demand for comfort and protections from anything we

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104 http://www.sciencedirect.com/science/article/pii/S0031018216306915

105 http://www.airspacemag.com/daily-planet/most-mass-extinctions-are-due-global-warming-180963910/

deem *bad*. We weigh keeping our toys and saving the Earth, and nearly always choose the instant gratification of toys over long-term survival.

One piece we may be missing in this decision-making process is that the world we live in and the one we *think* we live in are not the same. I shouldn't have to say this; but the world we see is not the real world. It is conditioned, by propaganda, by ego, by fantasy and by wrong-headedness. Our subconscious mind filters the data flowing in to our mind through our various senses and we only consciously process a small fraction of it. Nothing of what we think we see has any relevance to what is. We project our fears and desires all the time; one of those projections consists of how we think Nature should behave in response to our commands. Meanwhile, Nature has no sense of that state; it doesn't have a sense of self, with needs and desires and delusions. Our campaigns to *save the earth* are not about saving Nature, but about saving human delusions.

And yet…Nature is not something *out there*; rather, it is something that I am. That you are. Many indigenous cultures have no word for *Nature* as something separate from people or that was placed here for our use. Paul Kingsnorth writes:

> *…if I see an old-growth forest being logged I will want to lie down in front of the logging trucks. If I see a river being poisoned I will want to stop it from happening. I can't abide factory farms or oil terminals or the destruction of clean air and open space. I have a sense of ecological justice that comes from something far deeper than mere principle. Because I am here, because

> I am nature, because I am Earth, these things, to me, are a violation of something sacred.*

And we are missing, losing, much that is sacred in this modern world, by holding fast to the false narrative that technology is dominant over Nature. If you are concerned about Nature, then sit with Nature and pay attention: not just attention to what your mind is telling you about Nature, but also what is present with as little *filter* as you can manage. Thomas Berry:

> *We are talking only to ourselves. We are not talking to the rivers, we are not listening to the wind and stars. We have broken the great conversation. By breaking that conversation we have shattered the universe. All the disasters happening now are a consequence of that spiritual *autism*.*

One story about the life of Buddha tells of him sitting beneath the Bodhi tree, having attained enlightenment. Mara, the personification of demonic temptation, demands that he produce a witness to confirm his Buddhahood. He simply reaches down and touches the soil he is sitting upon. *The Earth is my witness* he says. What are you feeling compelled to do, as you witness Earth and Earth witnesses you?

Joseph Tainter: [Understand that we need…] *…a return to the normal human condition of lower complexity.*

It is clear we have a lot of work remaining. The air quality in southern Utah is worse than in Los Angeles.

And speaking of L.A.:

> *Astronomers and others interested in a night sky unencumbered by the glare from artificial

> light love to tell this story: When the Northridge earthquake knocked out power in Los Angeles in 1994, numerous calls came into emergency centers and even the Griffith Observatory from people who had poured into the streets in the predawn hours. They had looked into the dark sky to see what some anxiously described as a *giant silvery cloud* over the shaken city. Not to worry, they were assured. It was merely the Milky Way, the vast galaxy that humans once knew so well — until the glare from electric light effectively erased most traces of it from urban and near-urban skies.*[106]

Can we be any more disconnected from the real world? As hard as it is today to imagine life without heated homes and lights all night long, it is even harder to picture life without the current paradigm of capitalist exploitation, racial disharmony, and spiritual poverty that we are accustomed to. There are a few billion people alive today who have never held a phone, have never flipped on a light, or have never taken a drink from a cup made of plastic; in many instances, not because they can't but because they don't want what goes along with this way of life. That these people exist is not a bug in this system, it's a feature! Is it selfish to want luxury that ends up devastating your descendants? I must argue yes, it is; and what's worse? Breaking some laws and social norms trying to prevent extinction, or an inability to take any action at all?

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106 http://www.nytimes.com/2008/08/31/business/31essay.html

We have bought the myth of civilization that constantly whispers in our ears, *a bountiful, beautiful, happy human life needs toys and technology and money*. It is just a myth, and in actuality it is a lie. The bountiful, beautiful, happy human life we all crave is waiting for us, if we only step out of this industrial wasteland and return to the connected Web of Life in which humans evolved over millennia. Maslow's *actualized* human does not require the latest iPhone; indeed part of the problem with all technology is that it is based on science, and science has been unable to include consciousness in any of its formulations. Ultimately it is our consciousness that we value in this lifetime; for without that, what beauty is there in a flower sparkling with dew in the soft early morning light? What passion is there in a gentle loving caress, or what love is there in watching a baby take its first steps? None of these joys have anything to do with environmental destruction or human exploitation; where should we put our attention, our efforts, or our hope? If not on life, then what? Will you continue to destroy the Earth to make a buck?

What's the point? Do we seek the end of prisons or just their reformation? The end of war or merely *just* wars? A community of all, or one of just *our* people? Is it true that a good citizen does what everyone should do in a civilized society: never takes more than is his or her due; even if that is more than is needed? How is *his or her due* even calculated? And are all of the rest criminals? Is it violence to attack infrastructure? Or to attack the technologies of domination, exploitation, or pollution? Do we fear being criminalized, so much that

we acquiesce to the criminalization of others as a scapegoat or distraction? Are we right to fear? How do I create a culture of resistance in a real, concrete way?

According to its supporters, tech has the potential to revolutionize society. Our key now is to focus not on *anti-tech* but on *pro-wild*. Wild inspires inter-relation, tech puts focus on the cogs in the machine. Wild points to creative and crafty, tech points to mass-produced and rote. But a view of Nature as machine-like, where mass-produced and identical parts are upgraded or replaced in an instant, is not consistent with how the natural world works. The wild is not a bunch of identical beings; every life is different in some way from every other life, every single body unique. Every life begins as wild, however briefly.

This notion that science is the *truth* ignores a fundamental fact: we cannot study reality *objectively, from the outside*, because we are inexorably involved in our own perception of that reality through our consciousness. Every speck of matter in the Universe is actually a speck of energy and a speck of mind. As matter becomes more complex, so does mind, and so does consciousness. Mind and matter are two aspects or facets of One: outside and inside. If science today has it right, then one day we will be able to create awareness in a petri dish by crafting just the right electrochemical mix to bring forth mind. However, might the whole of consciousness really be more than just the sum of its parts?

Likewise, we have been taught that in a Newtonian, mechanical universe, we are merely computers and the

wild Nature around us is an *eco-system*. While it might be easy to describe the deeply intertwined and interconnected whole of life as a system, we have used this model to define nature as separate and subordinate to our human selves. There is a tendency to treat all of reality as only matter, without consciousness, when we use mechanical analogies. This also implies that the qualities that give rise to our human experience of love – goodness, truth, and beauty – are the result of just the right recipe of ingredients, and not, as is the case, subjective experiences of consciousness felt in the moment rather than concocted by shopping or by working harder. The notion that tech is just going to solve all our problems and provide everyone with free wealth via our future internet and robots is insane fantasy. The wealth worth having – goodness, truth, and beauty – are not something you can 3-D print in your garage.

The ideology of capitalism, and thus the ideology of technology which is an integral part of it today, attempts to retain control by co-opting any beliefs that would work to disrupt it. Thus we have Google offering *Search Inside Yourself* programs to employees; on a company website offering the program, we read:

> *...based on the latest in neuroscience research, our programs offer attention and mindfulness training that build the core emotional intelligence skills needed for peak performance and effective leadership. We help professionals at all levels adapt, management teams evolve, and leaders optimize their impact and influence.*[107]

[107] https://siyli.org/programs

Is mindfulness really about *maximizing my impact*? Is meditation merely a *new* technology, a tech of the mind, or just another application that only supports the evolution of business? By bringing meditation into the workspace, Google not only negates the potential disruption that would occur if its employees became mindful without the company's veneer of *business effectiveness* to limit its transformation of one's spirit, it actually helps employees *feel better* about themselves, which they will likely thank Google for as the provider of the training. This method of adopting the methods of disruption in order to alleviate the pressure to change is used by our culture widely and across all the myriad disruptive ways and technologies. Look at how yoga, a deeply spiritual practice, has become just another set of exercises to be repetitively performed and complete with its own identifiable accoutrements that define the wearer as a practitioner. Or how sports fans adopt team colors and jerseys to display their loyalty, without regard to how the distraction of sports is an outlet for many of the emotions, like rage, betrayal, domination and submission, and playing within the rules that would otherwise be tapped by those working to end capitalism or society itself. We have forgotten that mindfulness is about this moment, and that this moment is all we ever have. When we live in the tech fantasy, we live in the future, for the future, always believing that today's problems are just one *killer app* away from being solved, magically, by some bright kid writing code. The *nature* of society that we have created using Science, Technology, Engineering and Math (STEM) is plastic, fake, confined, and far from the wild reality within which we will always live. Nature is

our Mother, why do we disown her in favor of this mechanical vision devoid of life?

We've made shockingly little progress in understanding consciousness; especially considering it contributes so much to our experiencing of life here on Earth. Researchers needing funding for research and development will of course over-promise what their results will accomplish; this leads to misconceptions about the effectiveness and abilities of machine intelligence. The internet of things promises to cognitize anything powered with electricity, but autonomy is much further down the developmental road than mere basic cognition. We can't yet craft a silicon brain because we have yet to understand our own.

In the end, we don't have a technology problem, we have a cultural problem. Our culture believes in infinite growth despite living on a finite planet. Our culture believes that progress must include an expanding economy, more stuff, rather than better and deeper relationships. Our culture has given women second-class status and taken away their ability to become educated and understand and control their reproductive choices; the resulting population boom, largely also abetted by the *green revolution* of fossil-fuel-based fertilizers, herbicides, and pesticides, has overwhelmed Earth's ability to clean up our wastes, provide raw materials, and even to grow sufficient food near the places where we choose to eat. It is the culture that has to change; and tech is not addressing the roots of our problems. Tech may help distract us so we feel less pain or give us more options for pain-relieving self-medication, but like any

allopathic strategy, it does little if anything to alleviate the causes of our pain.

Dictionary.com explains the origin of the word *civilization* this way: “Civilization entered the English language in the mid-18th century with the meaning “the act or process of bringing out of a savage or uneducated state.” In this preimperialistic age of exploration, it was popular to view people from less-developed lands as barbaric and in great need of cultural edification.”

European society had decided that it was the best way to live; not narcissistic, right? Most of this best way to live depends upon technology. Actually, the root of civilization means citizen in a state or city; that’s a hint, the word points to city rather than nomadic living. And cities need more resources than can be maintained inside the city itself; hence war and violence, because trade for what you need to survive is not sufficiently guaranteed. There will always end up being someone who has what you need who is not open to making a deal and so you have to teach them to share, usually by beating them into submission. And once you introduce violence against outsiders as a necessary evil, the violence inevitably turns against insiders too; hence patriarchy and slavery. Notice also that cities are the refuge of people who don’t have access to land. When large corporations (or historically speaking, when Kings…) take over the farmlands, those who used to do subsistence farming now have to work for money in order to survive. If you have land and can provide for your own basic needs, you don’t need a *job*. Authority begins with taxation of whatever can be produced from the land, but quickly that becomes an insufficient

income stream and so the authority must take the land itself. In order to have workers who are willing to accept whatever conditions and pay a company desires to provide, the pool of people tapped for labor can't be self-sufficient; it behooves corporations to ensure that no one can survive outside of the city. But what this means is that we are trying to solve the wrong problem: this can't be about saving civilization, which is an unsustainable system. Instead we have to find a way to move forward that is outside of civilization. This is not about reform v. revolution; rather it is about getting each person to stop doing nothing to change how we relate to each other and to Nature, and start to do something that is the result of critical thinking about where we are and how we got here.

In one particular society, an African indigenous people, a person's life begins even before conception. A mother, heeding a call to birth a new soul, will leave the hustle and bustle of the village and meditate upon this call. She listens to hear the song of the child who wishes to be born. Once she has learned the song, she returns to the village and teaches the child's song to the man who will be the child's father. As the couple makes love to create the child, they sing the song together. Once the mother is pregnant, she begins to teach the song to the midwives who will help birth the child. They will sing throughout the birth process, welcoming the child with his or her very own song. After the child is born, the mother teaches the child's song to everyone in the village. If the child is challenged, hurt or sad, anyone in the village can soothe them by singing the child's song. Eventually, as the person lies upon their deathbed, those attending them can sing the song for the final time,

escorting the person out of the world the same way in which they entered it and completing the cycle of life. The western culture that has nearly eradicated them using violence and economics also has nuclear weapons. Which society calls to you?

> *Creatures that have survived in the long run, have survived in the long run; you survive in the long run by improving your habitat, you don't survive in the long run by destroying your surroundings.* Derrick Jensen

Buffalo and prairie dogs make the world a better place. As do salmon, and redwood trees, and mountains. Anytime you start with one hundred of something and then you use more than can be replaced so that you only have ninety-nine, then ninety-eight, then ninety-seven….it doesn't take a scientist to know that eventually you have none. The fallacies of the modern world are that the ocean is infinite and will always have fish; the sky has an infinite capacity to hold toxins and other chemicals without changing; the land has myriad life forms that add nutrition to our food and using oil as fertilizer and herbicide doesn't destroy them; and that humans can evolve into separate individuals islands in a sea of consciousness called the Universe and yet still survive without the help of their tribe.

Why is this [land, community, or maybe animal] being destroyed? Usually the answer is to make money for someone. Why do we base our entire system on destroying land, communities, or living beings? To make money for someone. Who is crazy in this scenario, and who is suicidal? We've been bought off by access to

smartphones and nationwide 4G networks; by having light and temperature control at the flip of a switch; by having grass-fed beef once again available, just this time in plastic wrap at the nearby market because the cow was slaughtered a few thousand miles away, well outside our own involvement or awareness. Indeed, we use our thinking skills today in order to rationalize and abet a system that has no possible end other than extinction.

This is a government of occupation; sure, we know about the military bases in more than 100 other countries, at more than 800 places around the globe. But we have military bases in every city in America now too; we just call them the police. And this government is doing to us, its residents, what it does to residents around the world and what any occupying government does: it strips out local resources for the corporations to use to generate profit, it squashes dissent with violence and extra-judicial executions, and it points the blame away from itself by using propaganda broadcast by a complicit media.

If aliens appeared in saucers in our skies and began killing all the fish in the oceans, spraying toxic and cancer-causing chemicals on all of our agricultural fields, putting flame retardant in polar bear fat and dioxins in human breast milk, and used some kind of special energy ray to melt the ice at both poles, we would all complain and likely unite as one human community and try to stop the invasion. The fact that it is corporations and capital, not a flying saucer, does not suddenly make it OK.

If your environmentalism is about defending a particular piece of local land, or a particular local species on the edge of extinction, then go for it. But the

mainstream of environmentalism these days, in particular the whole NGO green movement (but other types of green too), is taking us by the nose and leading us down the path that has been paved in front of us by the corporations. We stay on that path because we are no longer *wild*,we are *civilized*. The mainstream movement has become all about sustainability, meaning keeping 3 vehicles in every garage just powering them with coal instead of oil. Yet any attempt by environmentalists to reform the system with regulations and even enforcement does not treat the cause, it only treats a symptom. Symptoms will continue to evolve and reproduce; so without stopping the leak under the sink, you will always be mopping the floor no matter how good your mop. If you ask marchers in New York City in September 2015 during the People's Climate March why they are marching, a likely answer would be that they want subsidies now given to oil companies to be given to solar manufacturers instead, in support of renewable energy. That is a remarkable display of mind control and the power of propaganda, to repeat a lie often enough that it becomes true in the mind if not in the material world. Do you see that this mindset has us becoming just another shill for corporate power and profit? Be green: buy this new LED light bulb; buy a reusable grocery bag; buy this low-fat enriched high fructose corn syrup disguised as food and shipped thousands of miles to your market, get an energy-saver television that remains on 24/7 but uses less power than the smaller one you bought just three years ago. Or, buy this electric car so that instead of profit going to BP for drilling and extracting oil from the Gulf of Mexico, mountain tops in West Virginia will be blown up for the coal that fires

electrical generators for corporate and shareholder profit. Same mess, different color mop. The answer lies not in changing the energy source we use to one that also, again, exceeds both what the world provides on any given day and what is safe for all life forms on this planet; rather the answer lies in rejecting the system that requires more energy than is safe to produce in the first place. This industrial system requires that the natural world give up what it has evolved over millennia in order that a few humans can make some fiat currency profit over a few centuries before it all goes away for good in a cloud of dirty air over toxic land and dead zones in the oceans. We forget that the real world is more important than the economy; without the world there is no economy. How can we not see that and act accordingly by putting Nature and its survival first? Of course we defend that which gives us our sustenance; if our food comes from the supermarket and our water from the tap, it is only natural that we will defend to the death our right to satisfy our hunger in that manner. This system offers us no alternative other than a local market for food and taps for water. This is the problem, why we can't see the forest because we have trees blocking our sight. We drive our cars to protests focused on stopping oil transport systems called pipelines or bomb trains. We buy disposable plastic products that reinforce the need to drill oil wells in order to have more plastic goods, and throw them in the container on the street so they can be burned in someone else's, and always poor, neighborhood. The system knows this and is content; how can you rebel and destroy the system when you can't support yourself outside the system itself? Are you truly suicidal?

It's not a conspiracy; we all buy into the way this works and go along to get along. No one has to put a gun to your head to get you to buy this plastic throwaway plate or cup; you buy it because you want the convenience. Our culture amazingly thinks that it is easier to: drill and extract oil from under the ground and/or water, transport it to a refinery, turn it into plastic, shape it appropriately, ship it to a store where you drive to buy it and take it home, use it once and throw it into a *recycling* container to be trucked to some unfortunate neighborhood or ecosystem where it will last forever, in an attempt to absolve your own guilt; than it is to wash a spoon after eating.

How do we begin to see this so that we can act on it? Be the annoying child, ask why and don't take the first or fifth or even tenth reply. Keep asking why, keep ask who benefits and who is hurt. Dig into Byron Katie's Work… asking what is really true, 100% true, and not just what is a sense we hold in common. Begin the hard work of questioning everything in these ways. You will surprise yourself by what logic shows you about this system we live in.

Here may be the crux of our lives as humans: in a world of polar opposites, a world framed always along a spectrum of dualities; what is compassion? Some of us honor compassion and the love that it arises from as the most cherished experience of life. But even as we exalt the urgency of kindness and call it compassion, our polar world serves up the opposite: humans exalting cruelty and seeking new and innovative ways to practice what they preach. We have torture and we have *Make a Wish*. We have collateral damage and we have parents

who create a loving, nonviolent foster home and release healthy young adults into our community, despite a system that seemingly doesn't care a whit about what happens to orphans or abandoned children, later in their life. Really, then, the only question to concern yourself with is this: which side of compassion do I want to live on; the kind one or the cruel one?

As this book draws to a close, it might be clear that nearly every bit of this conclusion points to an aspect of life that is decidedly not technology as we think of the term; rather, I point to the spiritual, experiential, subjective perspectives that tech tries desperately to conceal and override. I do this for a reason, and that reason is that the only way out of this mess is to begin to see the world as it truly is, not moderated through the lens of our camera, through our phone, by using our electricity or our gasoline. Our tech can't keep us safe; and anyway, who is to say that safe is the best life form that we can be? *Tech Is No Answer* has laid out a lot about the problems of our time. I hope that you are interested in which path holds the answers to this snag full of catastrophes. For that, please expect Book 2 in this series: *The Veils Are Thin Here*. If all goes well, it should be ready for you within a year.