

Saving Civilization by Rationing

The gritty details

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Note: Professor Radin died on 1/21/2013, and his final wish was that this article be published.

This is a complicated list of facts, estimates, and proposals, requiring much thought and some time. Don't reject the ideas on an impulse – try an open mind! Here is my latest analysis of the problems.

If you have an interesting comment on this article, please cue it to a numbered paragraph and send it to my email address. (*Comments may be sent to Norm's son, Lon Radin, lonradin@pacbell.net*)

1] Some recent American history tells us what we need to do, but it has been almost universally forgotten. Few people now alive were thinking adults during World War II, a period when the U.S. and other civilized countries had to take extreme steps to survive as free nations. We faced two powerful, pitiless countries determined to control all our lives and literally kill many citizens. President Franklin Roosevelt, with approval from Congressional Democrats and Republicans (imagine that!), instituted a program that reduced the use of energy and materials that were unnecessary for the fight to survive. It was called *rationing* and required whole-hearted cooperation by American citizens and rapid decisions by rationing boards to set priorities on the importance of major activities.

2] Some items were rationed by distributing stamps, each good for a specific amount of material, good for a specified interval. Stamps were distributed for gasoline, sugar, meats, butter, oils, cheese, coffee, tires, clothing, etc. Car manufacture was stopped, except for high priority needs. A 35 mph speed limit was established, automatically improving car fuel efficiency and reducing the rate of accidents and wear of the cars. Worn tires had to be recapped, saving rubber. Recycling drives picked up metals, paper, and rubber. (I still remember, with some pain, turning in a pair of bookends I had made from aluminum, copper, and brass pipes.) Movie and radio entertainers tried to activate everyone instead of – as today – encouraging everyone to consume more resources. Magazines published advice for using rationed foods and the new allowances. Cottage cheese, a protein source that helped replace meat, rose in popularity. This reduced the use of farm animals, which (involuntarily) waste much energy and heat up the Earth because of the methane formed by the bacteria in their digestive system. Surprisingly large amounts of America's food were grown by individuals with plants in miniature Victory Gardens. Industries that consumed metals had to get priorities assigned in order to leave enough metals for

maintenance and war goods. Rationing applied to the rich as well as the poor, making the sacrifices easier for most people to bear and more effective.

3] You can get some idea of how much our country wastes today by visiting a large mall and a garbage disposal plant, or watching the stream of garbage trucks heading toward far-away dump sites. It is evident that Americans can get along quite well without most of the products one sees. Look at the travel section of newspapers and magazines and decide how essential those trips on giant floating cities are. The multi-color ads and catalogs (consuming more energy than black-and-white ads) delivered by your mail man also reveal how little we need – and how small a Postal Service we actually need. At last, rationing will allow us to avoid the nuisance of the daily trip to the paper recycling receptacle to discard the ads! The U.S. adds to the waste by using *two* measuring systems, metric and the outmoded British system. A little honest thought can reveal to everyone the fact that much of our disposable income can be eliminated. All that is needed is understanding of the extent of the coming dangers. However, those dangers lie in the future, and few people can prepare ahead of time for such an indistinct vision. We need leaders who can see ahead.

4] During the war years, the dangers were obvious: death by weapons and death from your own side by errors of warfare. Today the dangers are much more varied and mentioned in the press only episodically, so people cannot see the connections between ill health and death and human activity. The wonders of science and engineering have brought us so many unforeseen benefits that people simply want more and ever more benefits, regardless of cost and quality. “The problems you are talking about will be solved by science (or God).” Some people with extra cash take a chance and lend it to the people who can’t afford their desires. Few people save their extra cash in order to survive the shock of job loss or retirement. The latter now requires much larger savings because of the great increases in life span, but – of course – no one wants to work longer simply because they did not save enough to last their full lives. Many employers force their workers to save *some* money, but these savings are in the hands of people who are untrained in the use of large amounts of money, some of them relying on unscrupulous stock brokers. The latter was illustrated in the sad story of the Orange County Teachers who are gamblers who pay themselves large salaries from one’s savings for their investment decisions, both good and bad. Many people are over-producers of children, thereby accelerating the consumption of even more products and money.

5] The concept of rationing is now familiar to many people, who accept the resultant changes in life style. Many countries, such as Japan and India, ration electricity, making it available only at specific hours. Moreover, in any country where a power plant suddenly breaks down, or the outgoing power cables are accidentally cut, there is a schedule of priorities for repowering specified users (hospitals first, etc.). When a severe heat spell attacks an area, specified users (factories) are simply blacked out to prevent total system collapse. Water supply agencies frequently have to ration competing users. Prolonged droughts force people to stop their use of swimming pools, car washing, and lawn watering. Farmers in drought areas had to shift to deeper and deeper wells, thus lowering the level of the water table. Entire countries have been

forced to ration their meat and butter use by the occupying Nazis – and survived with improved health! What we need now is the recognition that much heavier rationing by the entire world is needed.

6] We are already spending much wealth reacting to our deteriorating world – fighting droughts, the effects of hurricanes, wilderness fires, the rising proportion of sick, obese, and wounded people, recovery from nuclear power accidents (estimated at \$12 billion in Japan after the 3/2011 tsunami failure), disappearing fish and drinkable water, disappearing usable farmland, and dangerous infections. These unplanned, unevenly applied, responses have failed to help today's ~10 million unemployed workers in the U.S. The loss of taxable income and property by the unemployed has pushed governments into a downward spiral that is forcing abandonment of many essential operations. Conservatives, who see attempts at corrective actions as simply a demand for higher taxes, are willing to generously finance their battle to block all efforts to stop the coming downfall of civilization. Supporting the wrong priorities is bound to yield African- and Arabian-style anarchy controlled by the strong, armed, and ruthless. We are seeing the beginning of this stage in the disappearance of compromise, disrespect for government and individuals, death threats growing in intensity, an avalanche of lying Internet blogs, and the murder of doctors who perform abortions. Large numbers of migrants, seeking a safer home and an opportunity to work, together with preservation of their customs, are fueling group hatreds. Floating above these events lies a comfortable wealth package of trillions of dollars in the hands of relatively few millionaires and billionaires. A recent estimate of the size of this package by Bloomberg Services is \$39 *trillion*. This figure undoubtedly omits the hidden holdings of drug lords and dictators, as well as the families owning oil wells. Most of these people view everyone else as spigots feeding wealth into their bank accounts in Switzerland, who otherwise are unnecessary. "We don't need people who need financial help." The unspoken recommendation: Let them starve. The man who first told me that common people were unnecessary decided to prove it by cooking for himself. Unfortunately he failed to learn more from commoners and killed himself with a clogged pressure cooker. Moral: If you are ahead, don't prove it. I see these ultra-rich people as *mega-misers*, like the misers of yore, who played with their gold coins, enjoying the feel and shine of the metal. Modern mega-misers must be playing with their billions, using just a few hundred million, buying homes, politicians, car collections, tangible reflections of the main part of their wealth. They can brag to friends about how much tax they avoided paying, how many billions they added last year, other topics I can't imagine.

6.1] The denialists are like their prototype, Alfred E. Neuman of Mad Magazine, whose motto was "What, me worry?" They point to each discovery of a new oil or fuel gas deposit as evidence that our fossil fuel supply is infinite. Perhaps they also believe in perpetual motion machines. They see no harm in drilling deeper and deeper under the sea to tap supplies. Any accident that destroys a drilling rig and its workers is "just one of those things" so, as a leading attractive Alaskan female geologist advised us, "Drill, baby, drill." The atmosphere-warming effects of the resultant CO₂ and methane are totally unimportant to the denialists, so they don't have to mention them. New sources of fossil fuel are just around the corner, in shale (methane)

and oil sands (“tar sands”). Recently we have started to drill gas wells into certain rocks that contain fuel gas in their pores. By trucking huge amounts of water to the wells, mixing it with sand and certain chemicals, and pumping it into the rocks with powerful blows that fracture the rocks (“fracking”), the trapped gas is released. The gas comes up to waiting collectors, together with some of the water, sand, chemicals and minerals that were present in the rocks. These minerals include much salt and some radium, so the water has to be repurified for further use or transported and dumped somewhere, or sold to road commissions for salting roads in the winter to help melt ice. Imagine the costs of corroding your car in the winter with salt and a bonus, radium! The well owners have coaxed the state mining board and legislature into allowing the disposal trucks to keep their destinations a secret, leaving other polluters envious. As the number of fracking wells has increased, the occurrence of small earthquakes (up to size 5.0) in their regions has increased. The well owners do not admit there is a connection, only that one cannot be sure. [Notice that people who risk their capital in a venture are perfectly willing to risk your capital – and health – too.]

6.5] A rarely mentioned poison in the Earth is radon, a radioactive gas that leaks into the air above ground, especially where builders have disturbed the soil. This is a known problem in some areas, for example in the East, where many homes are built with basements. Constantly blowing the gas out of basements costs money. While radon dilutes itself in the atmosphere, it is nevertheless a source of cancer and dangerous mutations. It would be better to simply ration the right to disturb the ground with “projects.”

6.6] Another dangerous gas is the gas in refrigerators and air conditioners. As the Earth warms and more people in India and China become rich enough to buy a home air conditioner, conditioner sales boom (20%/year in 2012). The gas inside is far more effective than CO₂ in its Earth-warming activity and must be controlled by trained specialists. In question is the ability and willingness of the Indian and Chinese specialists to obey the rules. Currently only parts of these countries have enough available power. A lesson in the need for more active control can be seen in the Indian blackout of 670 *million* people in July 2012 that left them stranded on trains, in mines that need a constant stream of cooling air, etc. Many organizations, already familiar with the unreliable supply of electricity, switched to their own generators.

7] A huge amount of methane is also present in the cold depths of oceans, but uncontrolled release could suffocate many people. This happened some years ago around a lake, which somehow got disturbed and released enough gas to kill local inhabitants. Bubbles of methane now rise to the surface in regions of the warming Arctic Sea. Perhaps these sources will actually stretch out our current supplies of energy and postpone their inevitable disappearance. Do we have to worry about our children, our grandchildren, or our great-grandchildren? How far into the future are we responsible? On whom will we dump the horrible news that they have to switch to the cave man life style?

Carrying out the rationing process today:

8] *The culture of infinite growth*: Rationing cannot be considered an enjoyable process: it is simply essential. A large obstacle to beginning the rationing process is the sincere claim of entrenched individuals who steadily feed us growth propaganda. “All companies must grow in size or die!” Even the diluted concept of a steady state, non-growth, economic plan – adopted to some extent by Britain, France, and Germany – evokes an immediate rejection. The April 5, 2010 issue of Newsweek (a magazine sensitive to issues of green energy, oil reserves, and overpopulation) devotes all of 12 sentences to an article entitled “Europe’s No-Growth Fantasy.” We are warned that a “society that gives up on growth invites nasty fights over the distribution of limited resources.” In other words: keep on fooling our people into believing that our resources are infinitely large and stop their complaints about the current inequitable distribution of resources. In this country, a CEO’s salary of \$100 million/year and a common peon’s salary of \$20,000 (a ratio of 5,000 to 1!) does not constitute a fantasy. The same Newsweek issue devotes three full pages to the real-life question: do people in Heaven have bodies? Having seen movies on the subject, I am certain that they do (pretty attractive ones) and they all are rationed drastically, wearing the same style of simple white gowns – next big question?

9] In today’s world, much more complex than WWII’s world, assignment of priorities for rationing needs much more thought and publicly-visible calculating by public figures working with people who have the relevant technical knowledge. Obviously there will be a big culture shock and resistance in Americans accustomed to uninhibited spending, with cash or credit. People who have borrowed money to buy goods they really couldn’t afford, expecting their income to grow, are going to find themselves in a difficult situation (like the millions now stuck with unpayable home mortgages). In all democracies, 50.1% of the voters can force 49.1% of the voters to change their life style or income. We live in a world of limited freedom (e.g.: you cannot run around naked or take money out of people’s pockets). Some people despise the rich, others admire them and thrill in sympathy with those who can consume as much of the world’s resources as they want. Like those who build 22-room homes, buy \$100 million yachts, and spend \$400 million to build a sail boat for racing games. Many people will suddenly learn that the “cheap” wars of Pres. Bush have consumed about \$100 billion/per year of our tax money, destroying young Americans, energy, oil, and resources far faster than they thought – paid for by borrowing the money. When all the current government subsidies are listed, there will be surprises and resentment; the subsidies need review with a realistic understanding. Many citizens do not know that each member of Congress has the traditional right to “pork,” spending much tax money on any project they like, such as an extra Post Office or bridge to nowhere or a road from a highway to someone’s factory. These are the people who say they want to balance the budget! The immense human and Veterans Administration costs of the Bush wars are also hard for people to visualize. [2012 update: Pres. Obama has actually reduced our military presence in Iraq, shrinking the longest American war. The Afghan war, mysteriously, continues.]

10] Enthusiastic supporters of rationing are trying to introduce energy reduction by a back-door approach: subsidize individuals and companies for the purchase of “green energy”-generating devices. One can get a rebate on a solar water heater set on your roof. If you can

make solar cells, you can get a huge subsidy. This was demonstrated ignominiously by the Obama staff, who gave a huge lump sum of money to a new company that promptly took the money and declared bankruptcy! Our government is in the hands of people who have no understanding of the importance of thorough financial records examination, strengthening the common impression of taxpayers, who say governments do not know how to spend or earn money. It is clear that rationing should *reduce* the use of energy and materials, not increase their use. The process should be carried out as described in paragraph 9.

10.1] Simply trying to reduce fossil fuel use by other means cannot help much. Nuclear energy is independent of the sun, but it depends on storing the very dangerous by-products safely in someone else's region. Contact with radioactivity is definitely dangerous to anyone's health. I just read of the "milling widows," whose husbands have died of cancer after having milled uranium for atomic bombs (milling machines are powerful cutters for shaping metals). American Indians who dug up uranium ore during WWII also suffered unexpected illness. Moreover, as several severe nuclear accidents have shown, nuclear engineers readily fool themselves into thinking that their designs are fool-proof. They fail to consider human error and the riskiness of estimating risk factors. Expecting a roomful of safety engineers to keep their eyes constantly on a myriad of large meters (lacking standard danger limit light flashers) strikes me as ridiculously poor designing. A major defect in *all* large, complex constructions is that the owners secretly decide that construction errors appearing after operation begins are just too expensive to fix. They simply adjust the risk factors in their minds until the final catastrophic failure is investigated. Construction workers add their own risk factors, reassuring themselves that a weak weld, a poor rivet, a slight change in specifications, etc. are factors too tiny to worry about. Operations workers also add their own ideas on how their job should be done, so they can confidently omit specified steps. We saw this last example recently in a Japanese uranium plant in which one worker invented a shortcut that disregarded the laws of physics, producing a small runaway nuclear explosion that killed him and contaminated other workers, as well as many fish in the nearby ocean.. These thinking errors occur in every field, and must be considered a biological error in the human brain. Expecting constant alertness in operators (pilots, flight controllers, train engineers, nuclear plant maintenance men., sentries, airport security checkers) is ridiculous in real life, yet disregarded by owners, supervisors, and engineers. Test runs involving chemical handling typically leave some valves in the incorrect position (closed when they should be open or vice versa). Warning indicators can be turned off if they are annoying, until – oops! The invention of "smart phones" led to an enormous increase in simple gabbing. In the worst cases, drivers of vehicle could not resist the urge to text someone while driving (crashing their vehicles, of any size and capacity).

10.2] *The futility of complexity.* If you read newspaper reports or governmental safety reports, it becomes evident that a large, complex operation is doomed to yield large catastrophes, many of them traceable to a few individuals who simply couldn't keep their minds on their job. Many examples are shown in paragraph 10.1. I remember the 1984 release of methyl isocyanate into the air around a chemical plant in India. Eight employees were cited as the culprits, responsible for poisoning over 500,000 neighbors and killing thousands. "Bigger is better" and the "economy

of scale” mantras give inventors and owners bragging rights – and higher income. However human beings eventually make errors, dooming their victims. The only way to reliably reduce these hazards is to ration your life: do less, buy less, simplify your life.

11] I remember being poisoned in Ann Arbor by a single elderly worker, who worked in a nearby chemical plant, doing a simple task: fill one bag with a mixture of nourishing growth substances, which sold to Michigan breeders of chickens and cattle. The bags were labeled “Feedmaster” in a small red and blue rectangle. His other job was to fill a nearly identical bag a few feet away with the label “Firemaster.” This bag was filled with a fire retardant, a poisonous mixture of chemicals, which was required for TV cabinets by Federal law, to prevent your TV set from catching fire. Here is an example of company owners, who thought it was cute to make the bags virtually identical and invite a serious error. Along with many meat eaters in the Michigan region, I developed typical symptoms: constant fatigue which lasted about 2 years. In another large breakdown, my wife and I were caught in New York City by a broad blackout that forced many people to walk miles before they could get home. Cabs could not refuel because the fuel pumps were useless. We were lucky, catching a final cab to my sister’s home, where she was prepared for blackouts with long-burning candles. We were able to buy dry Ice (frozen CO₂) to keep her refrigerator cold for a while. We were marooned several days until the airport could unsnarl the air system. All this was due to a few power grid controllers, the rarely considered people who control the distribution of electricity throughout the nation by constant evaluation of a myriad of complex factors. In August 2003, workers at one of the control nodes who went off-line to upgrade their new computers but forgot to tell other workers of this. At another node, the workers quit for lunch, leaving no one at the controls. This led to the biggest blackout in American history, an investigation, and the hiring of a “human factors” expert. If you delve into your own memories, you will find many examples of the inability of people with great responsibility to understand the meaning of the words *responsibility* and *duty*. Remember the time when a huge tornado was bearing down on New Orleans and the actual televised preview when Pres. Bush congratulated “Brownie” for the excellent job he was doing to prepare the Federal government’s aid to the city’s residents who lived below sea level. Brownie had actually spent important time in buying men’s clothing at bargain prices. His large purchase of temporary housing facilities proved to be a big waste because the homes were exuding formaldehyde (a poisonous gas) that rendered them useless. Who was too busy to actually evaluate the homes before signing the contract? One could also wonder if the president had actually listened to Brownie’s preparation report. Bush also revealed his dismal leadership when informed on television *again* of the ominous simultaneous hijackings of four large passenger planes. After a few seconds he did – *nothing* – and continued reading a child’s book. He left the hijackers totally undisturbed and their victims on the ground totally unwarned. With similar unconcern, no one in New York City did anything to send helicopters to save workers at the top of the World Trade Towers after the suicide hijackers set them afire.. Other workers, trapped by the burning plane fuel, leaped to their death. The fire department chief doomed many obedient but ignorant firemen by sending them up a struck tower with a water hose to extinguish an oil-based fire (an approach known to everyone with a little knowledge about fires as a method of *spreading* the fire). After

the collapse of the two towers and conversion to toxic dust, people nearby were assured that it was safe to breathe the dust, including powdered tower workers. The mayor of NYC was praised for his good handling of the murder of thousands of New Yorkers!

11.1] Dumbing down humanity Perhaps the greatest barrier to the acceptance of the necessity of rationing is the connection between the growth of technology and the dumbing down of human beings. This becomes clear by the study of toxicology. `Almost 2,000 years ago, the Roman Empire reached a high level of income and, with it, the ability to get cheap alcohol. The deleterious effects of alcohol were augmented by the use of technology; the mining, fabricating, and use of lead for storage and pipelike structures that let the rich Romans drink with little effort. When the savage northern Germanic tribes decided *they* should have all the fun, the Empire dissolved. (Actual chemical data supports this analysis.)

11.2] The Dark Ages that followed were used by the Catholic Church to further dumb down millions of people. They strictly tamped down glimmerings of rationality [rationing?), using a convincing favorite tamper: combustion of a thinker while he is still conscious. More recently, bullets were found to improve their murderous efficacy by making the pellets from lead. Thus they dumbed down any survivors of a bullet wound. Later, hunters who liked to shoot down flying birds found that lead pellets gave the best yield, but birds who survived for a while were eaten by wild animals who spread the pellets mpre widely, contaminating the ground and other animals. Paint manufacturers did their bit, making white paint from lead. As the dry paint aged, flakes fell to the ground, to be eaten by dumb children, dumbing them further. What can we say about the billions of people who simply cannot notice these problems?

11.3] Probably the most damaging error of all time is tetraethyl lead, which was developed to prevent the “knock” of automobile engines trying to accelerate rapidly. This problem of 100 years ago was an unpleasant hiccup-jerk of a car whose driver stepped on the gas pedal too hard. This also damaged the engines. Thomas Midgley Jr., a mechanical engineer, showed that the problem lay in the fuel, not the engine. This was a chemical problem. His boss promptly decided Midgley was a chemist. Apparently the challenge to teach himself chemistry appealed to Midgeley and he quickly became a remarkable chemist, ultimately becoming head of the American Chemical Society and winning four major awards for chemical research. He soon found that a chemical containing lead or other heavy metal would solve the knocking problem and found that tetraethyl lead (TEL) was excellent at very low concentrations, making its inclusion cheap. Lead was known to be poisonous but Midgley decided it surely must be harmless. Everyone was anxious to believe this, so Esso and General Motors formed a new company, called Ethyl. [They were careful to avoid the word *lead*. Like most drivers, I couldn't avoid getting splashed with leaded “gas” while filling the car tank. Soon after Ethyl entered the market, committees and scientists complained about the effects of TEL on the brain. Children with a high lead content in their bodies did poorly in school, becoming behavior problems. If they grow up to have children, the new generation might be defective even before birth. (Some medicine might wash out the lead from their bodies...?) Ethyl embarked on an expensive battle against these fears and findings, setting up an Ethyl “toxicity lab” to deny every scientist's data,

threatening expensive law suits to shut them up. Despite the counter battle of some scientists, Ethyl was able to stall governmental interference (including the EPA, the Environmental Protective Agency) for about 75 years! All this while children absorbed the lead products from car exhausts while playing on the sidewalk and in their well-dusted homes. The land near the streets, when used to raise food, delivered more lead. Hunters who loved to shoot flying birds used lead balls in their shotguns. Birds who survived the shot initially fell to the ground later and were eaten by wild animals, who spread the lead widely. The lead deposited around all busy roads, leading to widespread mental deterioration in every country that used cars. This war against humanity may explain the widespread stupidity one sees in people everywhere. Ethyl officials were said to have had more impact on the atmosphere than any other single organism in Earth's history. Today, we don't need TEL: it has been displaced by better gasoline. Meantime many tons of lead still exist in our environment, washing into water supplies, lying quietly in playing fields and crevices.

11.4] As technology progressed, industrial chemists added new toxins. When they tested some of them for danger, many were found to be acceptable when used by a consumer. None of them asked whether a *combination* of different toxins in different materials added up to a serious danger. "It's not my responsibility to keep you away from those other toxins." In addition, one can argue about what is a safe limit—not a simple scientific problem!. Another problem comes from criminals who know a little chemistry. For example a Chinese crook who knew that glycerin is a popular liquid for dissolving common medicines while giving them a sweet taste. He also knew that car radiator fluid is cheaper than glycerin and also sweet. (This similarity has killed many dogs during the days when many car owners changed their fluid by opening the drain valve under the radiator. The fluid entered the street where dogs later came along and lapped up the fluid.) The crook in China bought 55-gal. drums of radiator fluid, relabeled them, and sold a large number of drums to dealers in wide areas of the world. No pharmaceutical company who bought the poison bothered to check the purity, simply using it the way they always used glycerin. I don't know how many children died or lost the use of their kidneys. The only good side of this tale is that the crook tasted it himself, decided it must be safe, and died from it. We can never know how much damage these chemists did to their young customers' brains.

11.5] Are the above toxic effects significant? Is the average I.Q. dropping almost everywhere? There is no way to give a convincing statement, but one can look around and see that there have been a record number of really stupid activities in the past 100 or years. The U.S. has been in over 4 major wars: WWI, WWII, Vietnam, and Afghanistan. The prosecution of the 1st wars were probably the most stupid in history. In Vietnam, the lessons were: there has to be a visible difference between the good guys and the bad guys, and you cannot trust your military leaders. These lessons could not be remembered for the recent wars, where the good guys grow drugs and ship them to ruin the lives of our dumb children. American soldiers are returning to veteran status with twisted minds – understandable but unknown to our current leader who can't quit! In Europe, the Euro countries are trying to cure the Greek problem of over-borrowing. What is dumber than lending them more money? Greece is not even identifiable as a real country, with

patriotic citizens. Of the European countries, Germany shows up as the dumbest, with a leader who excites them to murder millions of Germans, kill and torture their most innovative citizens and gypsies, and murder additional millions in countries it wanted to conquer— probably 50 million victims. All this in a country that had been a leader in scientific discoveries and chemical manufacturing. Thinkers of all sorts produced great new ideas that changed the world. These incredible changes were not the result of dumbifying toxins?

11.6] Take a look at the world closer to you. Sony and Toyota, once outstanding examples of Japanese technology, can no longer make their high quality goods. Take the electronic industry, which makes control knobs as black as their labels and surrounding surfaces. Their programs cannot be designed without including errors that have to be constantly corrected and “upgraded.” Their trend in recent years has been to make the screen letters smaller and smaller, preferably in colors that are difficult to read. At one time people of letters knew this – no longer. Tax lawyers in Congress issue tax simplifications that add 60 or so pages to the present tome. When tested, U.S. tax examiners cannot agree on the correct taxes. Doomed by the poisons in the world, which no one wants to clean up. Just read this article for many examples of seemingly impossible bad situations. Thinkers about the problems of civilization cannot even imagine the word, rationing.

12] The over-complexicity error. A recent example (~June 2011) of the difficulties intrinsic in highly complex procedures comes from the belief that detailed analysis of a sick person’s genes can tell the doctor which one of the available medicines is best suited to that patient. This has the great name of “genetic profiling” and no one seems to question whether the observed genetic abnormalities affect susceptibility to the disease by the patient or are simply the effect of the disease itself or previous treatment attempts. Well-known scientists have claimed they have solved the technical problems of the measurement and have organized companies that use very complex machines to do the analyses. Now we learn that the data from one large study are useless because the statistical analysis of the test results was incorrect and the workers were making serious errors in handling the huge amount of data. Apparently no internal checks were utilized by the scientists to ensure that everything was being done correctly. The chief scientists admit they don’t know how their machines work – no single person knows how to work all the parts of the entire system. Perhaps we are heading to the situation described by H. G. Wells in his 1895 story of time travel. The traveler in this tale goes far forward in time, discovering an innocent, totally non-intellectual population of idle young people who are fed and kept alive by the Morlocks, the productive workers living underground with all their complex machinery. Apparently evolution had produced two types of humanity, mutually interdependent (in which the Morlocks *ate* the youngsters to keep alive). Of course, a little arithmetic shows the impossibility of such a system.

13] The radioisotope storage problem arising from nuclear power plants has not been solved, even in the >60 years that have followed the introduction of nuclear power. America’s plan to store the wastes inside a mountain for 10,000 years are farcically optimistic – is civilization really going to last that long? Will no earthquake break open the stored poison casks? As it is now, no one wants the wastes anywhere near them, so power plants continue to store them in

giant vats that might or might not withstand a severe quake, widespread flooding, plane crash, or attack by a terrorist or end-the-world fanatic. The designers who place the storage vats next to the nuclear plant assume that the plant itself will never – no never – get out of control and break open the vats.

14] France is famous for producing most of its electricity from atomic energy, but it is not so famous for sending its nuclear wastes to Russia, which – in turn – *is* famous for its Chernobyl experiment (originated by a few plant controllers) and propensity for dropping nuclear plants into the ocean. Many serious waste storage problems exist in countries formerly controlled by Soviet Russia (probably also in Russia today), supposedly corrected in order to gain membership in the European Union. Romania now admits they have 1,000 sites to clean up, after suffering a 26 million gallon spill of cyanide-containing water in 2008 (killing a vast number of animals). Hungary suddenly leaked 200 million gallons of caustic red sludge in Oct. 2010, and still has a storage site 10 times as large, ready to break out of its containers any day. It is clear that empowered leaders (industrial, governmental, and military) can deliver products and services more cheaply by hiding postponable costly expenses. Thus they tempt people into purchases and activities that are actually beyond their incomes and detrimental to their health or their children's health. These tricks have to be exposed when honest rationing is adopted. Germany has bitten the nuclear bullet by closing half their nuclear plants and scheduling rejection of the remaining ones by 2020.

15] One could point to Denmark, which gets much of its electricity from wind turbines. Portugal is moving toward wind, solar, and hydroelectric power and expects to furnish 60% of its power needs that way within a few more years. They have a working "smart grid," a system of electricity transmission lines that shifts power from one supplier facility to another as the weather changes in different parts of the country. It is manned by workers in close contact with local weather conditions and forecasts. Two fossil-powered generators have already been retired. Unfortunately, Portugal's financial institutions have mimicked the foolish risks adopted by major countries (uninhibited borrowing), and is having difficulty in correcting the errors.) Fossil fuel is becoming less essential in several other countries that have no fossil fuel at all. In the U.S., with its many separate control commissions, fossil fuel suppliers, and their workers and politicians, it is currently impossible for congressmen to consider the future.

16] Wind turbines generate power from the wind but kill many birds, who seem to be unexpectedly deaf and nearsighted. While some birds can learn a great deal, they are not all fast learners. I saw this in a cardinal who adopted my home for its nest site. The bird would sometimes rest on a tree behind my house, close to a large door-wall, then dive bomb the glass door and fall to the ground, clearly stunned. It would shake its head, fly up to the tree, and dive bomb the door again. After some more trials it would rest and try again later. This stubbornness is also a serious problem around some airports, where they can bring down passenger planes. There is clearly a need for more inventiveness to divert the birds. I wonder if strobe lights on the turbine vanes would divert the birds. Perhaps chicken and turkey – and yes, ostrich – farms could be established under turbines to utilize the fallen birds? Large airports, like those in New York

City, have been able to trap and euthanize many Canadian geese in the area. Establishing turbine and solar generators on semi-abandoned large farms, far from migration routes, might be the most efficient solutions to this problem. Farms lacking water or mineralized by long-term evaporation of irrigation water are available. They have the advantage of being out of sight of those highly sensitive people who find these sources of energy unbearably ugly or noisy. Humans can be dangerously stubborn too.

17] Global warming It is difficult for non-scientists to understand the complex mechanisms that control world weather, so they can't believe we live in a world that is getting hotter. Everyone knows there are areas that are very cold; how can they be in the same greenhouse? Photographs of famous high mountains, partly naked due to melted ice, the newly navigable Arctic Ocean, and gigantic ice floes breaking loose from the Antarctic continent and Greenland are simply too hard to remember and comfortably far away. The inhabitants of 14 island states that are being covered by the rising Pacific Ocean complain about the near-universal disregard of global warming and plead to be moved to higher ground somewhere. The climatologists seem unable to present a simplified explanation and some have shot themselves in the foot with some ill-advised slang terminology that sounds like fakery. A serious examination of climate prediction quickly shows what many denialists point out: quantification of the many factors is extremely difficult, and reliance on the use of computer modeling is not quite convincing, especially for computer users limited to Facebook. For denialists willing to admit that much of the world is really warming up, it is always possible to claim that human activity is not a significant contributor to the heating. Understanding the facts is made more difficult by paid lie-mongers, who seem to know that all the scientific measurements are wrong. Some of these denialists have Ph.D.'s in some field or other but are referred to as climatologists. I wonder if they know they are being quoted or misquoted. Some of the denialists are simply antagonistic to science. Meantime, climatologists keep predicting that the weather is going to show more and more extreme changes. [See the droughts and floods of 2011-2012.] One of the few climatologists who believed that human-generated CO₂ does not produce warming effects has recently (July 2012) reanalyzed new data and concluded that human activity is indeed the true cause of the extra rapid rise in atmospheric solar heat trapping gases. This seems pretty obvious simply by considering the recent rapid rise in population growth and the new prosperity of billions of people who rush out to build power generators, cars, air conditioners, and the other power-consuming devices we all need. Rationing everywhere is desperately needed.

19] Regarding the possible misuse of computers mentioned above, I am thinking here of animal sympathizers who insisted for a while that biological scientists should not hurt experimental animals and instead use computer simulations. Similarly, economists win prizes for creating computer models that predict human use of money, whether or not raw materials disappear from the Earth, disregarding also the wholesale lying by money handlers who warp important data. Nevertheless, many industries utilize computer models to predict important events or possible events, so this use cannot be dismissed as ridiculous.

20] People still write to their newspaper asking why CO₂ is important, especially if you can't see or smell it. They don't know that CO₂ dissolves in lakes and oceans, forming carbonic acid, thereby acidifying the water and killing off sensitive life forms. Few remember that the rock exposed by melting ice absorbs much more heat than the original ice cover even though Northerners have shoveled off many tons of snow from their sidewalks and relied on sunlight absorption by their sidewalks to finish off the job. In the Arctic sea, the loss of ice (which reflects most of the sun's heat back into space) is being replaced by darker sea water, which absorbs much of the sun's heat that hits it. This melting has turned the Arctic Sea into the Arctic Canal. The new connection to the Pacific Ocean is mixing warm water into the ice water of the Arctic, accelerating the further melting of the floating ice. I find pictures of penguins walking on the bare ground of the Antarctic continent pretty convincing. The birds seem to have adjusted to the disappearance of ice. Pity poor George Will, the Newsweek columnist who fought a losing battle against the reports of melting ice. When he finally admitted the Earth was warming, he saw something good about it: fewer people will freeze to death. He was unable to ask about the fate of people in the tropics. Especially in the case of Antarctic ice, tremendous changes in the distribution of weight are occurring in the Earth's crust, which may lead to widespread severe earthquakes (see Wikipedia on "post-glacial rebound" and "isostasy"). The super earthquake and tsunami that devastated Japan March 2011 may be one of the first such examples. When ice slides off rocks near the ocean, that ice raises the ocean level all over the world, even before it melts. (This last fact is known to restauranters who can stretch a few ounces of Coca Cola into a full glass with some ice cubes.)

21] The "hockey stick" data described in Al Gore's notable graphs have been understood by few people because few people have seen or understand a graph. Newspapers are careful to avoid a normal graphed curve, preferring simple bar graphs. Thus the term "man-made warming" does not create a clear picture for most people, who see mostly humorous snide comments and cartoons about the subject. One of the best sources of misinformation is a comic strip duck, who draws scientists' figures with a dwarfed brain and crossed eyes, uttering stupid (but sometimes funny) statements about warming of the Earth. The duck finally agreed that the planet is actually warming but explained that it's all the sun's fault, not ours. Smarter than the average duck! Gore's data showed that the rate of CO₂ production has jumped in recent years. The data are supported by new data for 2010: an increase of more than 10% in just one year. Of course, nature does not change smoothly so a really blind denialist can continue to claim that the annual data simply fluctuate

22] Global warming exists regardless of the estimated size of man's contribution: the problems caused by warming need attention anyway. If the denialists successfully convince more people that scientists are unreliable, we or our children will have to adopt much more radical approaches to respond to the effects of rising temperature and sea levels, disappearing potable water and land for living and farming, and the growing population that absorbs all the advances. For the time being, we can try to save our energy sources by rationing and building green energy sources.

23] Chicago is an example of a group that is actually planning and taking action to minimize the expected heat problems. Committees have consulted experts in different fields and chosen priorities, considering costs, job promotion, choosing projects that quickly pay for themselves. Now the city is repaving many miles of alleys, which are currently made of concrete that floods adjacent homes whenever there is a heavy rain (the water table under the city is close to the surface.). The alleys are being covered with material that lets rain soak into the ground. Roads are being rebuilt with a rubber-containing mix that is relatively light in color (to reflect heat) and reduces the frequent cracking of concrete during cold weather and bulging in hot weather. Trees that need a temperate climate are being replaced with hot-weather trees. The number of trees in the city is increasing, since they are a major cooling and water-retaining factor. These and other steps clearly reduce waste of money for many citizens and promote health.

24] What will it take to convince the denialists they are wrong? An article in the N. Y. Times (8/23/10) by a professor of global systems, Thomas -Dixon, offers a few possible catastrophes. Might it be a widespread drought in America's south [think of Texas], where the high population is already near the end of its water supply? Syria – once a food exporter – has suffered a 4-year drought that has covered farms and farm villages with sand, forcing many people into tents near the large cities. Now, in 2012, they are suffering also from severe unemployment and a vicious battle with their dictator. Large areas of China have suffered from severe drought and city people demand more of the remaining water from the farm people. This kind of war continues in California, where a compromise organization has allowed farmers to abandon their dry lands. The desert country, Yemen, has to ration its water because of fighting in the widening battle against corruption and dictatorship.

25] Would a widespread crop failure change denialists' minds? As the population grows, unaffected farmers might be unable to take up the slack and grain prices would zoom up. This would guarantee the appropriate riots and efforts to remove current governmental leaders. Even the U.S. government report on inflation has admitted there is inflation; the base payments from Medicare have actually responded with a small increase in its 2013 payments. As a big eater of foreign style bread, I have been struck by the great shrinkage in loaf sizes (12/2012). Conceivably denialists would be convinced they were wrong by a very aggressive mold attack on major farm plants, like the great potato famine in Ireland and Europe of 1845-52. In Africa we now see millions of people starving due to anarchy, drought, incorrect farming techniques,, and intense hatred. Surveys estimate that 100 million people are severely undernourished.

26] Would massive flood damage do it, like the displacement of millions of Pakistanis and the land around the Mississippi and Missouri Rivers? New York City and surrounding areas have recently undergone massive damage and flooding from a record-sized hurricane. Damaging floods are expected from the breakdown of hundreds of earthen dams in the U.S. These dams are primarily piles of dirt that block rivers, forming lakes on the upstream side, just like concrete dams. Water oozes out of the earthen dams, carrying some of the dirt downstream. An earthquake can easily send a flood into the river below, which has been partially occupied by large cities and

land-hungry people who have to keep listening to the news channels. How about a massive infection by E. coli from the tons of human and animal sewage deposited on the farms as the waters subside from a flood? One could also imagine a very widespread wild fire that destroys a billion trees, such as an enlarged version of the recent Russian fires which have killed Muscovites and forced the country to stop exporting grain. A potent microbe or virus imported from the Orient or Africa as the result of our free trade theory might shake the denialists. There has been an outbreak of a fatal E. coli mutant that caused a boycott of German foods. Because of the low cost of foreign travel in Europe, a surprising number of the E. coli victims have been non-Germans. This is another example of the undesirability of travel and need for oil rationing. (So is the world-wide spread of non-infectious but unpleasant bedbugs due to incessant traveling.) Would people respond to such disasters by giving control of their country to religious fanatics or criminal gangs like the ones now threatening atomic war, mass ejections of population groups, or simple breakdown of their economic systems? Such people now fill the pages of our remaining newspapers and magazines. My hope is that intelligent leaders will learn the facts and grasp their significance, then form a group that will take a strong, clear, productive stand that rallies the population into demanding action. America's ill-trained current president, before election, sounded as though he might adopt this kind of action, but his experience as a social compromiser has given us an indecisive orator who calls on Congress to devise solutions for our problems. Inadequate training is, of course, standard practice for the world leaders, who are chosen by ill-trained politicians or militarists. Unfortunately, a large country like the U.S. has so many overlapping and competing committees and officials that it is impossible, as with a jury of 1,000 peers, to come to an agreement. In the older countries, these bureaucrats can bring the entire country to a halt by demanding payoffs (graft). The leaders of Portugal and Denmark – perhaps a few more – have begun to mobilize their countries but tradition is strong. Success here might spread.

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27] Building sustainable energy devices will have to be undertaken on a very large scale in order to quickly slow the consumption of fossil fuel, a thought that paralyzes many minds. Tell people of the WWII days, when prodigious mass production of warplanes, ships, and war materials and the bold scientific (and financial) gamble on the atomic bomb had to be undertaken. Worldwide expenditures on solar cells and wind energy were about \$100 billion in 2009, according to the Clean Edge research firm. Texas, a conservative state that earns much money by selling fossil fuel while trying to keep its children ignorant of evolution, generates more power by wind turbines than any other state, thereby creating over 10,000 jobs. Clearly there are many people and large companies unwilling to play Russian roulette with the future of civilization. It is poignant that the money spent on sustainable energy sources is a small fraction of the (more than) half trillion dollars we can spend on war materials and soldiers.

28] If we adopt rationing, we don't need to replace *all* of our current energy sources. My guess, based on the way Americans lived 25 or 50 years ago, is that we could live quite pleasantly today while using only 1/3 of our present rate of energy consumption. As each production lot of green power generators is installed, there is an immediate decrease in the need for fossil fuels. There are many sensible current proposals for increasing the efficiency of

ordinary activities, like home building (insulation, double pane windows), lighting methods (LEDs and fluorescents vs tungsten bulbs), car efficiency, fuel cells, and use of biological wastes, but the amount of energy saving is limited and will soon be neutralized by traditional baby production. Moreover, we must remember that green energy is not always available – think cloudy days and nights without wind. Periods of drought, which exist in many areas these days, make bio-fuels unreliable too. Thus we have to keep some of our current generators available, using fossil fuel, sending power over transmission lines to the points in temporary need. Those giant machines cannot be started up at a moment's notice, as when a large storm stops solar energy, but in some areas of our country it is possible to store energy in large reservoirs up-hill by pumping water from down-hill, using excess energy, and then recover much of the energy by letting the water flow down-hill through a hydroelectric generator. This kind of power is readily turned on to handle temporary lapses in green energy. It might turn out eventually that small fuel-powered generators, widely distributed, will solve this problem despite their lower efficiency. This might make it unnecessary to build more transmission lines, but “smart grid” transmission lines might still be needed. The localized production of energy should allow the establishment of local manufacturing jobs, a much-needed arrangement.

29] It is sad to learn that a plan to build a new water-energy storage system in California has to go through an estimated 6-year review by multiple approval agencies before the actual building plans can be decided on and building begun. I suppose each agency will buy a new filing cabinet to store the proposal for 11 months, then read it for a month. If agency #1 approves it, the next agency will buy its own filing cabinet for an 11-month storage and 1-month review, etc. If the last agency decides that a rare worm found only at the proposed site might be obliterated, the 6-year process will end up rejected. The Presidential order to “speed it up” probably has no force in it. This situation is like the recent expenditure of some Federal “stimulus” fund, given to an agency in South CA to install a solar energy farm. The low bidders on the project were a Chinese solar panel factory and a Canadian group that will install the cells. This was a successful stimulus to Chinese and Canadian workers, while we continue to support unemployed American workers! Authorities just don't quite get the idea.

30] It is discouraging that improvements in efficiency will be outmatched by the rapidly increasing rate of population growth. At least, with rationing, the burgeoning population will consume less per capita. Perhaps halting the manufacture of disposable diapers will cool off the fecund population. Honest teaching in schools about birth control would certainly help. (After all, schools teach algebra without expecting all children to become mathematicians.) Genuine efforts to stop immigration into the U.S. (quietly rejected by all our presidents) would certainly lower the national birth rate and assuage Republicans as well as realistic Democrats. Note that polls show Americans favor halting immigration – but they don't have to run for office. Editorial cartoonists show us the futility of erecting a wall to stop illegal immigrants, but they don't know that a wall around much of Israel's border (erected by a country the size of Vermont) has been strikingly effective at holding back terrorists. Arizona, plagued by destructive, dangerous invaders at the southern border, is pleading for money to build a genuine wall.

31] The Mexican government is much at fault for forcing its citizens to make the dangerous trip into the U.S., penalized by their weak grasp of English speech and customs. Education and physical safety are so weak in this country. In addition, American drug addicts furnish the wealth and weapons of Mexican drug dealers, so it is apparent that our own politicians are much at fault too.

32] Petroleum should be reserved for its best major uses: transportation and manufacture of chemicals and plastics. Bio-fuels like corn alcohol that compete with human food needs should be stopped, because of the growing population and dwindling farmland. Our government pays subsidies to corn farmers, helping to produce an inflationary rise in grain prices throughout the world. Although bio-alcohol is touted as a fuel that reduces our dependence on oil imports, a rationing step would be much more effective.

33] It will be helpful when farmers reduce their use of fertilizers, much of which now produce the dead zones in ocean waters around river estuaries. Near the mouth of the Mississippi River, the flood of fertilizer nourishes growth of algae, which kill marine life in the area. Currently (June 2011), the huge floods in this river and the Missouri River are washing the remaining fertilizer and insecticides from submerged farms into the dead zone. (It might be possible to collect the algae – which fixate much CO₂ – and extract their oil for energy production.) A major fraction of fertilizers, the nitrogen part, is made by the use of electricity working on nitrogen gas from the air, so this a major target of rationers. A new type of dead zone has recently appeared near Oregon, due to the rise of nutrient-rich, oxygen deficient water from the ocean bottom. This surprise may come from changes in the upper atmosphere wind patterns, the result of global warming.

33.3] The proposal of Dickson Despommier to shift much agricultural production to huge multi-story greenhouses deserves very serious consideration. These vertical farms would produce 3 to 4 crops a year in a wide range of climates and consume much less fertilizer (preventing run-off into rivers), avoid the use of insecticides and weed killers that now attack our bodies, minimize the current disappearance rate of top soil from farms, and conserve water, slowing the growing “water wars” like the ones in California. A significant portion of current farm products is spoiled by transportation from farms to cities while consuming truck fuel to carry the food. This waste can be reduced by locating the giant greenhouses inside or near cities. Useful farm land is becoming scarce, while the world population continues to grow. The thin layer of topsoil, on which our lives depend, gradually washes away with the rain, loses its nutrients, forms a hard cake from dried-up irrigation water, and – remarkably – also evaporates!

34] Some important advantages of greenhouse farming for vegetables is that the produce is free of the dangerous forms of E. coli. These bacteria are typically brought into open-field produce by wandering animals. This source is readily controlled by the use of greenhouses. Another, potentially very important advantage of greenhouses, is that the workers there do not have to stoop or work in stressfully hot open farms. The stoop laborers have, for many years, been seasonal, illegal immigrants who are paid abysmally low wages because “we can’t get

American workers to do this kind of work.” Perhaps hot houses will be able to find American help and pay them a humane wage.

35] The common-sense concept of using city areas (paragraph 33) has been adopted - partially – in Montreal, where the farming season is short and fresh vegetables must come from warmer regions. One group is building greenhouses on building roofs inside the city, enabling the growth of several crops a year and quick, cheap delivery to customers. Another is building greenhouses on top of supermarkets, reducing transportation costs to the customers even more. Government officials who recognize the value of greenhouses are in a position to promote the use of government buildings for roof greenhouses, and save on the cost of air conditioning the rooms below. Chicago, a city predicted by climatologists to become much warmer and wetter, has already covered their city hall with a large garden, a good step but not quite as valuable as greenhousing. I suppose that the weight of a roof greenhouse is significant, and must be taken into consideration by builders and architects – retrofitting sounds difficult (like retrofitting homes for earthquakes).

The benefits of rationing:

36] Obviously rationing quickly leads to a large decrease in energy and fuel consumption, greatly slowing the production of global warming gases and depletion of Earth’s minerals. Some petroleum experts have predicted a point before 2020 when the demand for petroleum will exceed the supply. (That does not mean that the supply will suddenly drop to zero; it is simply a situation when many users will be told that their order cannot be filled completely.) We do know that many of the current sources are producing oil more slowly. If you drive in Texas and Los Angeles, you can see oil depletion at work, in the statuesquely frozen oil well pumps. In the oil-producing countries, the rising demand for gasoline will force them to demand the return of a substantial portion of their exported petroleum in the form of finished products, leaving less for the oil-poor countries. If the oil-producing countries are taken over by haters of the U.S. and the free world, we would find a sudden disappearance of much of our energy and transportation. The denialists point quickly to the recent technological advances that are raising the yield and deposit sizes of oil or gas from deep water, oil sands, shale, and other sources. All of these sources seemed too expensive to rely on but the prolonged rise in ordinary fossil fuels have made them worth developing. The new sources seem to exist almost everywhere, making the output of hostile countries almost irrelevant and raising the hope that third-world countries will be able to rise from poverty. The gleeful students of the new era of reliance on fossil fuels do not mention the rise in CO₂ production or faster global warming. Nor do they wonder what will happen when all these sources fail to keep up with demand decades from now.

37] In this distant foggy future we will see long waiting lines at gas stations as the supply drops below the needs of drivers. This happened in the U.S. when the OPEC oil-producers put the squeeze on us in their first boycott in 1973. At that time, President Nixon tried to limit the high gasoline prices imposed by the remaining suppliers, but American drivers nevertheless had

to drive to work, and self-rationing or car-pooling could not neutralize the actual shortage. Nixon's "Energy Czar," appointed to apply some kind of rationing, invented the most unsophisticated method imaginable: he simply ordered delivery of gas to each state according to its usage a year before. Like a typical Federal official, his plan cost the Federal government almost nothing and left the actual administration of gasoline allotments to each state, no matter how much change in state gas usage had occurred. Some truckers resorted to guns and bombs to improve the gas distribution. Within a few months, 20% of the gas stations had no gas to sell. Ironically, the long lines of waiting cars burned up a significant fraction of the available gasoline, making the situation worse. Later in 1974, OPEC dropped the embargo, raising oil prices to a frightening extent (trivial by today's standards), somewhat appeased by Israel's withdrawal from some Arab areas. (These sites had previously been used for Arab attacks on Israel.). In 1974, an auto speed limit of 55 mph was established to conserve gasoline. Nixon asked for power to ration gas at the individual level, while Sweden did ration gas and heating oil. Several European countries banned driving and flying on Sundays. Holland rationed electricity use and the prime minister of Britain asked citizens to heat only one room in their homes. Today there are cities where the electricity is unavailable for all users, who must live with rolling blackouts. Iranian motorists recently reacted to a rationing plan (that was not applied on individual need basis) by setting fire to a gas station. These events remind us that countries *have* instituted rationing when the governing authorities recognized the need; the concept is far from new. However there has been a surplus of officials who did not quite grasp the concept. Professional fishermen on North America's west coast can tell us what depletion looks like, as they abandon their attempts to extract more fish from the depleted seas and off-limit regions. However, many fishermen and restaurants have minimized the shortages by renaming the remaining, more abundant fish so that diners can continue to enjoy eating expensive fish with the desired name. But don't carry your DNA kit with you!

38] Today (Sept.-Oct. 2010) we see a similar example of industrial warfare: the embargo against Japan by China, which owns 90% of the world's rare earth sources. These minerals have quietly achieved a surprisingly important place in technology that is best treated by using less of them. The embargo is the result of the usual dispute between the two nations over the drawing of national borders but China seems to have discovered that they need more rare earths for their own use. Users of rare earths have been forced to salvage them from junk. Competing suppliers of the minerals (which are really not rare) are enlarging their mines and facilities but this will take a long time. Holding back on this response is the discovery that the rare earth deposits contain radioactive material that must (outside of China) be isolated and stored safely. When the non-Chinese deposits are brought into play, I suspect that China will offer their minerals for sale at lower prices to wipe out the foreign mines. This was effective with the companies in many countries and continues to work today.

39] A similar problem comes from the silent war by government-supported computer hackers, who are trying to gain control of U.S. power and military systems. Perhaps they have already succeeded; this constitutes their hedge against any punitive measures the U.S. might undertake. Efforts to block the hackers have a lower priority by American companies that make

money from unhampered operation of the Internet. The traditional independence of Americans is exemplified by the refusal of police departments, fire departments, and other services to buy compatible radio-telephone systems.

40] In 1975, Pres. Ford established a storage system, the Strategic Petroleum Reserve, allowing our government to buy oil and store it in porous rock underground. Some effort was devoted to reducing fuel waste but much larger international changes also began, such as the shift of Japanese auto manufacturers to lighter, more efficient cars and Brazil's shift to alcohol as a gasoline extender. We saw country after country bow to Arabian demands, especially countries with very low sources of energy; only Brazil attempted to develop new sources of energy! The U.S. continued its sacred approach, the appointing of committees to recommend improved responses. Such committee reports constitute the place where good ideas come to die, stored forever in a time warp in a government warehouse.

41] Another oil shortage arose in 1979, when radical changes in Iran's government arose. The oil workers there went on strike and Iraq invaded Iran, stopping oil production from this major supplier. While the decrease in world oil production was not large, it was now evident that even a small imbalance in supply and demand could cause a great deal of misery and fear. Lines of cars waiting for gasoline reappeared but the Nixon freeze on oil prices prevented increases in the production of non-OPEC oil. When Jimmy Carter became president in 1976, he gradually lifted price controls but this lifted the prices of all items made from oil energy and money lenders demanded incredibly high interest rates. In a major speech 1979, he described plans to reverse our country's growing dependence on foreign oil, calling for money to develop sources of solar energy, increased use of coal, preparation of alcohol from plants for gasohol, strengthening public transportation, and extracting oil from oil shale. He called for increased energy conservation in home building and voluntary reductions in gasoline usage. As in present times, Americans and Congress disregarded these exhortations, refusing to halt business (and spending) as usual.

42] If we don't ration our oil supplies soon and build alternative energy sources on a very large scale, we can expect to see large-scale riots as people begin to understand the belated response of our government. In this country we see the rise of Tea Party radicals and anarchists who sense glimmers of the truth about the future. In the small countries that depend on Russian fuel for survival, we see restrictions imposed on the countries that are running out of cash. Without rationing, we can expect soon to see more of such supply manipulations. Incidentally, it is interesting to note that Russia is now the largest supplier in the world, a change that encourages the most radical leaders of the country.

43] A lucky side-effect of rationing for over-eaters is improved health. Today, we spend billions on reducing drugs, treating the obtuse obese in hospitals, advertising the new, larger portions available from restaurants, leading millions of young people to loathe their bodies. The present excessive fat and sugar consumption is producing a newly-recognized disease, the "metabolic syndrome," which is constantly raising the occurrence of diabetes and liver damage,

with all their expense and pain. The magazines describing new reducing diets are themselves a large consumer of energy and trees (which produce much toxic waste when turned into paper). Today we spend billions to advertise goods that we should not make and should not subsidize. When Mayor Bloomberg of New York City tried to block the expenditure of food stamps for the purchase of carbonated sugary drinks, he was excoriated by “freedom lovers” for implying that poor people do not have enough sense to avoid these pro-diabetic drinks. In fact, poor neighborhoods are hyperactive buyers of these poisonous products. Companies that offer tasty, easily-prepared and eaten foods high in fat and sugar spend fortunes on preventing doctors and legislators from forcing them to normalize their products. Meanwhile their clients are developing fat bodies with diabetes, cancer, heart attacks, liver breakdown, and other disorders. Acceptance of rationing might give our leaders the power needed to stop these “dietary murderers” and force them into the ranks of the “smoking murderers” and “pollution murderers.”

44] Energy consumption under simple rationing will lower air and water pollution and add to our health and wealth, while reducing the need for expensive pollution controls for coal and oil power generators and human (and pig, chicken, and dog) waste disposal. Why allow huge pig factories to “dispose” of the pig wastes in open pools that stink out nearby cities and poison the underground water table that preserves our lives? Why do our health protectors allow egg farms to keep chickens in their own excreta and allow infection of their eggs with anti-human pathogens? Why continue the perpetual enlargement of sewage disposal plants, dump sites, bridges, and roadways? (Don’t forget that each expansion in infrastructure comes with substantial maintenance costs.) Why try to coax a heavily polluting power generating company with cap-&-trade, which penalizes the local power consumers, when the reduced need for power will soon retire the plant? Typically, Pres. Obama chose to fight for the weak and arbitrary carbon tax approach to climate control. To reduce the cost of travel, he chose to allocate funds to projects of limited application and extremely high cost, such as super-fast trains and the dangerous electric cars. Attention, Science Officer Dr. Spock: we need you

45] A long and surprisingly detailed article by James Fallows in the Dec. 2010 issue of the Atlantic Monthly points out that coal is the primary source of energy in the U.S. and that we will have to develop new ways of using it that do not produce poisonous or accumulating greenhouse gases. “It’s the only way to stop global warming,” the issue cover states. This claim disregards the fact that global warming is continuing even if we could miraculously stop the production of CO₂, because the sun shines constantly on the Earth and the greenhouse gases now in the air continue to add heat to the Earth. At the end of the article, we learn how to solve the problem: a major method will be collection and compression of CO₂ to turn it into a liquid. This liquid will be pumped into deep wells in appropriate locations, where the cold liquid will be stored inside pores in the rocks. Apparently the liquid and gas now in the pores can be pushed out to somewhere. The high temperatures found in the Earth’s depths will apparently be unable to turn the liquid back into gas. When appropriate rock formations are found, engineers will assure us that the liquid CO₂ will never warm up and come rushing out into our atmosphere, where the gas

might suffocate millions of people. (CO₂ is denser than air, so it will stay in our part of the atmosphere.) To me, this proposal sounds like the current attempts to hide radioactive wastes from nuclear power plants safely in the Earth for thousands of years – not yet accepted by the skeptical U.S. public.

46] A second major method will be the gasification of coal while it is in the ground (without digging it up). Air will be pumped into the coal deposit and ignited underground. This would avoid the dangers and pollution of mining and – somehow – keep the coal toxins (mainly sulfur, nitrogen, and mercury) underground. Combustible gases (carbon monoxide?) will come up from the well and be burned in a standard power generating plant. Of course the underground combustion step will be partially wasted by heating the underground coal. What will happen when this mine tries to expand from the heat? The promising part of the idea is that it is being tested in Texas, so we may know its effectiveness in a few years. Dare we mention that a Federal donation of cash is needed for the test (like the developers of solar cells)? Engineers seem to have forgotten that there is an underground coal deposit in Centralia, PA whose fire has burned since 1962.

47] All discussions of alternative methods of power generation compare the cost of generating a kilowatt. I have not found the methods involved in the calculations, but everyone (perhaps) agrees that solar and wind methods are more expensive than the current fossil fuel methods (burning gas, oil, or coal). I have seen little comparison of the longevity of the installations, a major factor in cost estimates of any “long-lived” asset, including homes, cars, factories, power plants, etc. Many costs are very difficult to predict and cannot be entered into these analyses. For example, what is the cost of replacing a miner when a cave-in or explosion kills him? Who pays to support his dependents afterward? If the water downstream from a coal mine is ruined by the acid coming from the mine, how much does that affect the price of coal? How much money is spent by oil well drillers when a leak kills sea animals and plants? If the CO₂ from fossil fuel combustion actually is kept out of the air by liquefaction and burial, how much of the power they produced will be devoted to the process? This could be substantial and very dangerous. In thinking about the magnitude of the job, note that a pound of pure coal turns into 2.67 pounds of CO₂. The amount of coal burned in the U.S. and China (the major users) is now over 5 trillion pounds *each year*. This amounts to perhaps 2.4 times as much when counted as CO₂. How much fuel would it take to bury, say, half that much each year? Is there any possible way to reduce that amount significantly without rationing and radically reducing the world population? When a fuel burner makes electricity, the cost of fuel affects the price of generated electricity every day, but solar cells – once made and installed – make power without cost except for the use of transmission lines and eventual replacement. (I don’t know yet how long green energy devices are expected to last.) That cost is not affected by fluctuations or blockades by oil well owners. Will the price of oil remain below \$100/barrel no matter how much the demand increases? What is the cost of military intervention in the government of an oil producing country? The CO₂ produced by fossil fuels definitely increases the temperature of our

planet, no matter how trivial the effect, as proposed by the denialists. This will result in immeasurable costs of moving homes northward or buying more air conditioners. Farm crops will also require movement north or somehow creating more rain to prevent drying of the soil. Recent photos of Antarctic penguins walking on dry, rocky ground instead of their normal ice glaciers are notable, however, for showing that some species can adapt to marked effects of warming.

48] Despite the obstacles demanded by denialists, solar is a growing source of power. A commentary by David Hochschild in Sept. 2011 points out that the solar cell industry in the U.S. employs >100,000 people (20,000 more than coal mining) and is growing at 10%/year. During the past 5 years, the Chinese government has subsidized four solar companies with \$20 billion, a clear sign that a major country recognizes the seriousness of the need. The U.S. also subsidizes energy companies, especially the fossil fuel and nuclear power companies (which are already highly profitable) but the sum going to solar cells is a minor fraction. To make progress more difficult, shortsighted American bargain hunters prefer to buy from China. Federal subsidies for solar and wind power are scheduled to expire in 2012 and the denialists are very likely to block renewal, in order to reduce their tax burden. They point to the recent growth in discovery of fossil fuel fields and advances in the technology of fuel extraction. They carefully avoid mention of CO₂ and the costs of responding to global warming.

49] A great feature of rationing is that more people will finally be able to save money for retirement years, since there will be less to buy. This will minimize the coming showdown due to the growing costs of Social Security and Medicare. Moreover, the prices of raw materials – especially fossil fuel, phosphate ore, and metals – will drop significantly, because of the lowered demands. Few people realize that the use and cost of energy infiltrates the price of everything we buy, since fuel is needed to make almost everything (e.g.: plastics, aluminum, steel, cars, fertilizer, paper, cloth, medicine, computers, you name it). These price drops are occurring already to some extent, due to the depression, which has produced involuntary mini-rationing. Some people, recognizing the serious dangers of overconsumption, have voluntarily decreased their spending, while some of the ultra-rich have called for higher taxes!. With controlled rationing, there would be minimal unfair distribution of the pains of change, especially those of unemployment. However it must be realized that the price of gasoline is controlled to some extent by the level of desperation on the part of the buyers. It is also regulated by coal and oil producers who want to discourage the growth of green energy.

50] Few people think about the hazards to workers and local inhabitants in the present system of generating energy and raw materials for conspicuous consumption. Coal miners live a risky life, fighting cave-ins, methane explosions, suffocating gases, and slow death by black lung disease. In the process of removing junk from the coal, strongly acidic wastes are generated, leaching into the drinking water of surrounding areas. In the process of burning coal, sulfur acids spread with the furnace fumes, together with mercury vapor – something for people who live down-wind to think about. Miners seeking gold have been exposed to large amounts of mercury,

and spread it widely for others to endure. Miners seeking other valuable deposits have left wide swaths of ground with open mine shafts, gaping unbarred for children, and scraps of arsenic, asbestos, and lead on the open ground that is now blithely enjoyed by hikers and bicyclists. Workers who make explosives for civilian and military use tend to get blown up, car builders have had hands cut off by stamping presses and hearing loss from the factory noise, etc. Even the simple handling of petroleum involves significant risk to the workers, as in exploding well drilling platforms in the sea and the surprisingly frequent loss of oil tankers to shallow rocks and collisions. How would you like to risk your life in order to make a big gas-guzzler for a person much richer than you? Of course rationing would make everyone's life less risky.

51] Proponents of renewed nuclear power have correctly pointed out that almost no Americans have been hurt in operating the power generators, but they omit the fates of uranium miners exposed to radiation and disregard the potential *size* of the damage from a leakage breakdown. Workers with nuclear fuel in other countries have died from improper handling or killed many nearby inhabitants, and American workers have had a frighteningly close call too (Three Mile Island, 1979). This “minor” accident melted a great deal of uranium and caused a hydrogen explosion that failed to break the containment dome. About 140,000 neighbors of the unit left home for several days and the ruined plant has been locked down. The breakdown of similar plants in March 2011 in Japan remind people that the best of plans can go horribly awry.

52] Since mining causes the release of methane from the earth, and since methane is about 25 times as damaging in global warming as CO₂, we are seeing warming simply because we mine more coal to generate more electricity. Methane is also released from the earth by leveling the ground for the constant construction of more roads and excavation of building foundations for our growing population. The recent phase of global warming that has melted part of the Arctic ice is now releasing much methane that had previously been trapped in the ice in the depths of the sea and Alaskan tundra. Thus there has been an acceleration in the release rate of the warming gas, a phenomenon guaranteed to speed up further.

53] Along this line of thought: some people remember the Erin Brockovich story of the refusal of Pacific Gas & Electric Co.'s executives to stop poisoning their workers and others in a California town. The executives knowingly allowed their cooling system to release a cancer-inducing chemical, a chromate derivative, into the drinking water. They did their best to cover this up, denying complaints of sickness and death. The fine for this attitude, paid by company stockholders and customers, was a record \$333 million. Ten years later they were still poisoning people in another town and were fined \$335 million, creating a record for stubborn destructiveness in the name of vital power generation. We don't need power this badly.

54] Stubborn refusal to face the fact that an entire company or industry is hurting people is not new. “Mad as a hatter” is an old expression of the toxic effects of mercury by hat makers who used felt. Bakers in the 1800s in England added mercuric chloride to their bread to prevent mold growth, despite laws pointing out that it is poisonous. Unlike our laws, these did not fool

around and it proved necessary to hang some bakers. While the FDA put a stop to food use of the poison, it was unable to stop its use in many industries. As recently as 1998 foreign car manufacturers stopped using mercury electric switches, and American car makers reluctantly gave in 4 years later. About 500,000 lbs. of mercury have been used this way. However the older cars still release the metal into the air when they are squashed for recycling. After much squabbling, the steel makers and car makers agree to put up the immense sum of \$2 million to pay someone to remove the switches before the final squash. This step forward was expected to reduce the spread of mercury in the U.S. by only 5%, so it may be necessary to reinstitute hanging to prevent further mind numbing.

54.3] The battle of cigarette manufacturers to fool and entrap new users caused millions of deaths but there were no comparable penalties. The insistence of the manufacturers of dieldrin, DDT, and other pesticides ridiculed the findings of Rachel Carson and got the final laugh on all the victims when DDT was adopted by the U.S. Army for the Vietnam debacle. Car manufacturers insisted that back-up tail lights were unnecessary, that safety glass was too expensive, that bumpers had to be different heights on different cars, that safety belts were useless, that air bags for the driver might be needed but not for passengers or side doors, that Ralph Nader was a laughable nag – these leaders of industry managed to aid the death of multitudes of drivers and pedestrians. My guess is that the net punishment to the leaders of the auto industry was a smaller than usual bonus supplement and a larger package of stock options. How many readers of this article remember the asbestos industry's insistence that asbestos miners and handlers did not get lung cancer and gradual suffocation? This risk was discovered in 1931 and denied for many decades, leading to billions of dollars in damage suits. Stockholders of these large industries constituted a second group of victims.

55] Perhaps the most damaging error of all time is tetraethyl lead, which was declared an essential component of gasoline for many decades, everywhere in the world. This anti-knock chemical spread lead poison around all busy roads, leading to widespread mental deterioration which may underlie many of our world's problems. General Motors and Standard Oil, the manufacturers of the chemical, called it "Ethyl," avoiding the word "lead." The inventor of Ethyl, Thomas Midgley, was said to have had more impact on the atmosphere than any other single organism in Earth's history. When commercial manufacture began, Ethyl workers suffered lead poisoning, hallucinations, insanity, and death. Midgeley denied all this and demonstrated its safety to the press by pouring it on his arms and breathing the fumes for a full minute. He later had to stay away from work almost a year to recover but did not reveal this to the press. The sale of tetraethyl lead was stopped in this country only by the actions of pesky do-gooders who forced gasoline manufacturers to invent – wow! – gasoline that does not need lead. Meantime many tons of lead still exist in our environment, washing into water supplies, lying quietly in playing fields and crevices. Gunslingers who glory in killing wild birds with lead gunshot have succeeded in poisoning the soil and ground animals and wild birds – who swallow the missed pellets and are later eaten by successful hunters.

56] Thousands of chemical manufacturers turn out chemicals having valuable uses, but toxic to people. Their toxicologists explain that the tiny amounts leaching into our food and water have no detectable harm. It is true that the average person contains in his body (especially liver) a group of detoxifying enzymes that help counteract the industrial poisons, but tests of the enzymes in *individuals* reveal wide variations in body content. Moreover their contents vary with time of day, number of days used, and type of food and medicine intake. Thus only a guaranteed “average” individual can feel safe about swallowing the poison - but only in an average time of day and after eating an average meal. The final assumption made by company toxicologists is that each poison sold by each manufacturer acts independently of the others; in other words, they do not augment each one’s damage. Experimentally speaking, this assumption simply cannot be tested without doing an immense amount of work. A warning from civic water purification plants: do not dump leftover medicines into the sink; we cannot remove them completely from drinking water! Some poisons accumulate in body fat, which tends to reduce their toxicity. However, if your body fat decreases, that protective effect decreases and may well account for the fatigue constantly felt by many old people. One such poison, the flame retardant, polybromobiphenyl ether, was carelessly mixed into animal feed and eaten by many citizens of Michigan (including me). Countless farm animals had to be killed and buried in a specially lined pit in order to remove this source of poison from our food. It was recently found in many pregnant women at high, forbidden concentrations, so it is still around.

The overpopulation problem – let’s face it at last:

57] People in poorer countries, who individually produce only a small fraction of the anti-green gases, sewage, air pollution, and Earth depletion, can’t be expected to decrease their consumption very much by rationing. However, their sheer total numbers contribute large effects. These billions of people can help solve the problem (and decrease their poverty problem) primarily by stringent birth control. If they see that Americans are taking serious cuts in their greed intensity and reproduction rate, they might respond effectively. They might even turn to honest savings accounts and a Social Security forced saving system instead of raising numerous sons as future supporters. If Americans were to follow the voluntary agreement of people in several major countries to *decrease* our population and to offer free condom factories and their equivalents to billions of people, the ensuing increase in individual wealth might become noticeable. As it is now, the people of poor countries correctly view the rich countries as major sources of global pollution and warming – and wish they could join us in profligate living styles. I think they do not appreciate how small a fraction of the world problems comes from our apparent wealth.

58] We are lucky that Chinese leaders understood the significance of overpopulation and ordered a switch in 1979 to one baby per urban couple, preventing the burden of raising and maintaining life for an extra 300+ million people so far. Of course the policy was resisted by baby-hungry couples, and enforced cruelly in an unknown number of citizens, but most Chinese today – seeing its benefits – approve the policy. Despite this slowing of energy demands, China is still growing, still highly polluted, already the leading contributor to global warming. They

have been able to devote much energy to becoming the cheapest manufacturer for almost any product, able to bankrupt manufacturing companies throughout much of the world. Moreover, unlike our country, they educate huge numbers of engineers and scientists despite their low average per capita income. In our much richer country, I estimate that we spend more money attacking efforts to teach contraception methods, and scientific discoveries like evolution and the Big Bang than in paying for the education of young engineers and scientists. It is not surprising that the Chinese radical approaches have coincided with the most rapid percentage growth in total national wealth in history. How many people can see the connection?

59] In the U.S., our kindly legislators have worsened the problem by giving baby generators a tax credit, tax money when they have fertilization difficulty, and unrestricted education, water, and sewage facilities for all their children. Medical expenses of the little darlings are eligible for tax reduction. Furthermore, our government welcomes or allows entry of apparently unlimited numbers of foreigners (mainly the fecund ones) to help us consume even more energy and raw materials. If baby generators were required to forgo the subsidies and pay their expenses themselves, or even pay tax penalties, they might reduce the problem voluntarily. Rationing that limits the size of homes, cars, and food intake might also slow them down. Couples planning to become parents should fear that competition for money might lead to restrictions on governmental support for their college-bound children. Parents now have to pay for the beer kegs, the cars, a little Ecstasy, detox camp, date money, trips of their sport-loving child to compete in other cities and countries, and the all-important year abroad. Presently, we see more young people refusing – or financially unable – to leave home, needing supplemental income out of the parents' retirement savings. A related factor, not readily evaluated, is the rising fraction of children who grow into adults unable to hold a job or needing psychiatric care. Our children's need for drug self-abuse, which supports the world's poppy and marijuana growers, with their murderous drug chemists and dealers, seems to be a nation-destroying problem. Quite possibly a decrease in population and reduction in material consumption would reduce this heart-wrenching problem. Firm restrictions on drug users, not futile attempts at education and gun fights with drug sellers, are desperately needed. The popular acceptance and humorous response to alcohol use, especially among judges, keeps killing numerous drinkers – as well as their non-drinker victims. A disproportionate share of car-produced deaths in California has been found to come from illegal immigrants. Maternal deaths (due to pregnancy) are relatively small in the developed nations, but they have taken a sudden increase in the past decade. Could this be due to the rising concentrations of toxins in our world? In Asia and Africa, we see far greater maternal death rates, probably due to the male attitudes of desire (for sex and prestige) mixed with contempt for women's weakness. In Afghanistan, a country whose freedom the U.S. expends so much life and money, a woman has a probability of dying that is about 1 in 28 births in the course of a lifetime. The men there sacrifice their women in a futile attempt to keep up with the over-populators. We continue fighting to protect the freedom of a major drug-making country to continue growing its poppies!

60] The true costs of overpopulation are somewhat invisible, like the gradual heating of cooking water around a tethered live crab – the temperature rise is so gradual that the crabs don't

realize they are being boiled alive. [crabs may not agree with this claim.] Take the growth of crime: as cities become more congested, criminals readily find supporters, colleagues, and hiding places. In 1906, there were only 236 reported murders in the entire U.S., showing how rapidly the bad effects of overpopulation increase as the population density rises. Youngsters are flooding into the U.S. from nations lacking a culture that enforces education, giving us teenagers who cannot learn, who form gangs that enjoy the thrill of murdering without the bother of robbing the victim. Taxpayers refuse to believe these things are growing and refuse to pay for a corresponding increase in police, judges, and prisons. Other taxpayers insist that better teaching would civilize them, but no one seems able to do that and thus we should do nothing. Because of the present almost universal reduction in tax revenues, our taxpayers are forcing the firing of policemen just as criminal and anti-establishment protestors need control. The overloading of prisons is limited by orders from judges to free the non-violent prisoners. Thus we can expect to see more car thieves and Ponzi theft schemers like Bernard Madoff in open circulation! Take the lengthening and widening of roads and construction of fast train rail lines: as the population increases, the amount of cheap land surrounding transportation routes decreases and road improvements are postponed. The same goes for the increasingly painful installation of traffic lights and appearance of new side branches to heavily trafficked roads. Each new branch slows traffic on the main road. Maintenance expenses for bridges, enlargements of tunnels for increased traffic, replacement of formerly-adequate water supply and sewage pipes, the use of larger and heavier trucks and the need to repair the roads they break— every expense arising from population growth gets postponed until a fatal, but predictable “accident” occurs. In heavily congested cities, like New York City, adding a telephone wire, a water pipe, and other underground public facilities is a fascinating expensive exercise in 3-dimensional squeezing and maneuvering. The increasing need for delivery trucks to obstruct city traffic must raise the blood pressure of drivers in large cities. Of course, cities are growing larger, worsening these problems. Note, as an indicator, that at least 11 cities in the world now have a population over 10 million, suffering from the inefficiency and expense of congestion.

61] Cities grow but lakes and rivers do not, so fresh water becomes scarcer. Water-supply agencies must build more reservoirs in a decreasing amount of available land. Cities have to install parallel water pipes to take advantage of partially purified sewage water (“gray water”). This is supposedly safe for watering roadside plantings; perhaps for cooling towers too, but it requires much new pipe installation. I doubt that any large area in the world can survive a 5-year drought, no matter how deep their wells. Dwellers in dry country areas rely on wells, which have to be dug deeper and deeper to reach the diminishing underground water table. Some of those wells run through arsenic-rich soils, requiring expensive cleanup. Another expense of population growth is appearing in coastal cities that have outgrown their limited river water supply. They have to pay for desalination processes (which require much energy), but at least they can cut the cost temporarily by mixing ocean water with deep well water from the river. A good example of the growing recognition of water scarcity is the recent (Oct. 2011) construction project in China, where a \$4 billion coal-powered desalination plant is being built. Israel is also building one and

so are oil-rich desert nations, oil-powered of course. So much for reducing CO₂ emission and stretching out the supplies of underground oil.

62] Some cities build long, expensive aqueducts to share water with drier cities. Lucky cities rely on rivers, but there are rivers that cross the borders of 145 nations, thus the disappearing supply of good water produces very realistic anxiety and discord in downstream nations. The denialists who seek to sell more land at inflated prices and sell more building materials for new homes and the workmen who need jobs, cheerfully deny the possibility of scarcity. There is great need, especially in poor countries, for more scientific usage of water, but improvement comes slowly and is sometimes ill-designed. An excellent detailed analysis of water problems appears in *The Economist*, May-22-28, 2010.

63] In 1798, Thomas Malthus, an English cleric and economist, pointed out that there is a limit to the number of people who can be supported by farming, no matter how much farming technology increases. He elaborated on this point and other economic topics in five more books. Malthus' point was derided by later writers, who pointed to the new improvements in farming (especially, much later, the Green Revolution in plant design). These writers wanted readers to believe that an improvement, once made, could inexplicably be expanded forever when applied to the (presumably) infinite amount of farm land on the Earth. Meantime many people are forced to live and grow crops on the sides of mountains and volcanoes, or on land that is very close to sea level, risking their lives every time there is a mud slide, flood, or eruption. It is interesting that the British Corn Act of 1819 prevented importation of foreign corn until the home-grown corn price rose to a specified level – in other words, the land owners deliberately stimulated inflation. The same effect resulted from the Bush corn alcohol law almost 200 years later, which transferred American tax money to corn farmers everywhere in order to subsidize the corn fermentation process and stretch out the use of imported oil. In both cases, this produced food riots by the poorer people whose income could not handle the inflation. Alcohol producers point out that corn alcohol is not so harmful, since improved corn growing methods have increased the amount of alcohol and corn scraps (corn cobs eaten by farm animals). Side problem: corn plants require much water for growth. For those denialists who can't see inflation in grain prices (and like it), a trip to a bakery would reveal the newly expensive and newly shrunk bread loaves.

63.5] A recent report (5/25/12) clearly shows the current direction the world is taking. Metals of many kinds have become much more expensive, because of the demands of the growing population. As a result, mines are being reopened to get the former "dregs" that were too expensive to dig out. Upper Michigan, once a major source of metals, is currently undergoing reactivation, with large mining companies investing large sums to explore and reevaluate the size of the deposits. Miners hope to earn billions of dollars from copper, silver, gold, zinc, and iron. But how long will this metal rush satisfy the next billions of people?

64] Japan, a group of islands with no fossil fuel in the ground, is a good example of population excess. This formerly agrarian country entered the modern age of excessive

production and consumption by importing fuel and raw materials from other countries and turning them into exportable products. As shortages of these basic supplies continue to grow, the Japanese people will have to compete with their current suppliers and buyers, who will gradually find fuel too important to export. They have partially countered their fuel scarcity by building many nuclear power plants but that is not a viable solution and they are already rationing electricity in some areas. (The NY Times has actually headlined this news with the bad word “rationing.”) The country is being left with a large, crowded population in which the young people have an unusually high suicide rate. Even China and India, with their large coal reserves, have to import coal from other countries. How much more air pollution and CO₂ production can their people and the world take?

65] Brazil’s great rain forest and the current Arabian desert rebellions are good examples of the overpopulation problem. In the former, people overproduce children they cannot afford and release them in the big cities to fend for themselves. There, they learn to survive by petty theft and have in the past been shot by police to eliminate this trying group. People who survive in slums reject controls and battle the police, who have to make the cities safer. Other parents solve the survival problem by (illegally) cutting down the rain forest trees and planting food crops. Others sell the downed trees for wood burning or furniture manufacture. These activities damage the world’s climate. In the Arabian dictatorships, we see young men, hungry for (nonexistent) jobs, rebelling violently against their uncaring or inept leaders. But the primary villains are their ancestors, who have recently produced five times the number of young men as they did in 1950. [Datum from Lindsey Grant.] How could they expect to find such a great increase in jobs in arid countries that exist primarily because other countries buy their oil? Only a relatively few people are needed to pump oil and even fewer get the resultant cash. Unemployment is a widespread problem; the U.S. has had its share of violent eruptions. Some of these come from religious instigators, some from racial prejudice, some from the inability of many people to learn modern knowledge, many from leaders who had no interest in these populations. But the basic cause is the failure of couples to see the consequences of bearing children. Now there are very few jobs for making buggy whips and horseshoes. Large population groups leave their countries and seek job opportunities (and freedom from crime and rebellions). They are usually rejected because the nearby countries already have an overpopulation problem, and a surprising number of small ships, heavily overloaded, sink together with their desperate migrants. The migrants from poor, hot countries where sanitation is unknown or impossible, are spreading major tropical diseases (Chagas, trichinosis, liver flukes, Leishmaniasis). A side problem: how do you check “donated” blood for all these diseases? The rising earth temperature and speed of plane travel speed the spread too. A new report in the NY Times (5/2012) reports the lack of jobs for the latest crop of American high school graduates.

66] As Robert Bryce has suggested (paragraph 17), it may be impossible to reach a point of decreasing heat-absorbing gases in our air, no matter how hard we work at installing green power generators. The constantly growing tsunami of babies entering the world will demand more

energy and materials, neutralizing all our efforts to reverse history. How many catastrophes will occur before people recognize their responsibility?

67] I wish I could summarize the book, *The Case for Fewer People*, a 2006 collection of essays, over 700 pp in total length, edited by Lindsey Grant. It spells out many of the values of a smaller population. I hope we do not have to wait for too many catastrophes to coax people away from the custom of thoughtless instinctive production of babies over the past several million years. In this respect, humans are little superior to the animal world. Efforts to bring these topics to public and legislative attention are easily blocked by the denialists, who complain that these efforts constitute “social engineering.” These people use the term derogatorily and do not even recognize that they too are “social engineers,” seeking to promote universal lack of rational thinking and dismissal of the multitude of vital world-changing facts.

67.5] Demographers, whose job is the study of human population size and changes in subgroups, attempt to predict their future sizes and their expected social effects. They mine census data and survey data, ending up with a pile of graphs. They note the “fertility” (rate of baby production) of people over the last 200 years has been decreasing and is now below the replacement rate (2.1 babies/couple) This will affect global power and wealth and the proportions of racial/cultural types of people. As the percentage of old people in a country rises, the proportion of younger, employable, taxable people decreases. Who will take care of the oldsters? There may not be enough money in the Treasury to pay for the promised old age benefits. Thus there will be no unemployment, just a demand for workers. Curiously, our eyes tell us that just the opposite has happened: too many workers and too few jobs. Demography has a weakness, the same one that bedevils economists: too much reliance on inadequate data. Many people ration themselves or are being forced into it, suffering the results of inadequate planning in their rationing. With carefully planned rationing, you don’t have to worry about finding young people to make unnecessary products.

68] When one considers the level of education for billions of people and the strength of the fast population growth proponents, the difficulty of change seems insurmountable. Still, we can see some successes. An interesting group, PCI Media Impact, chooses an appropriate region, then gives lessons to local activists in the techniques of writing radio soap operas. The story lines emphasize women’s rights, the value of reducing their birth rates, good health practices, climate change, and – of course – steamy love stories that attract the audience. With cooperation from local radio stations, these programs have produced measurable changes in behavior, such as an increase in condom sales. Recently they have adapted their broadcasts in Africa to cell phone reception, because of the relatively widespread use of cell phones in that continent. Fortunately, there seems to be no interference by the religious leaders and other vested interests. In fact, the younger men seem to be leaning toward more liberal attitudes, so there may be a host of benefits from the programs. This approach surely would benefit from a great infusion of money. It is important that the poor countries now have young people as a large fraction of their population, so tradition does not have quite the frozen grip on their minds.

68.5] In 1832, Charles Knowlton, M.D., published a brief manual on methods of contraception, "Fruits of Philosophy: the Private Companion of Young Married People." It called for the need to reduce the rate of population growth and criticized the so-called instinctive need to reproduce. When he tried to sell the pamphlet, he was arrested for "peddling without a license" and charged with obscenity. The denialists won one legal battle, giving him a 3-month sentence at hard labor, but hundreds of thousands of copies were sold in the U.S. and Britain. The rate of population growth rapidly decreased as a result. It is strange that so many groups of people try to accelerate population growth. It is so sad to see poor women struggling at substandard jobs just to save enough money to send a talented child to school, when it would be so much more sensible to save the money for her own education. The richer people cynically like to see many poor people seeking jobs, making their salaries lower. The roles of a small group of Catholic leaders in promoting population size is well-known and substantial.

The big problem – finances:

69] Rationing, more than other approaches to our contemporary problems, requires remarkable and careful adaptations to our financial lives. If people consume less, they will pay lower sales and excise taxes. If entire industries are destroyed or shrunk, their workers will need jobs. If people stop buying big homes, heavy cars, and large TV sets, manufacturing and building workers will become unemployed. With fewer people able to pay sales and income taxes, governments will have less money for vital services, paying off bond and loan debt, and the many entitlements we now offer to lucky recipients. Government leaders have appeased union workers by promising generous pensions but never calculated how big a bite they would take from their budgets when the happy days arrive. They assumed that population growth and inexorable inflation would increase their tax basis and cover their promises so they could eventually pay the pensions out of current income. Thus they protected their current budgets and appeased Republicans, neglecting to set aside money into money-accumulating accounts for later payment (this is called "saving"). These plans failed as leaders also decided to appease groups and companies with "benefits" that were paid out of money borrowed simply by selling bonds. Alas, they further assumed that population shifts and loss of large taxpayers by bankruptcy or outsourcing to low-tax nations could never happen. A popular trick used by company CEO's forced workers to accept a yearly payout of company stock for use on retirement. This cost the company nothing and a drop in the stock's value could shrink the expected cash to a trickle. Even worse was the trick of bankrupting the company or selling the company to avoid any pension at all. Promised pensions are being cut back these days as accountants finally receive attention. Some pensions have been evaporated by criminal CEOs and care-free, overpaid pension plan administrators. Even in "good times," legislators have deliberately refused to fund maintenance of infrastructure (roads, bridges, etc.), waste-preventing civic operations, and debt repayment. A little-known example of refusal to face facts is found in the many earthen dams, made of dirt that keeps washing away, leaving hulking lakes poised to demolish people and property down-stream. This enormously expensive problem is met by paralyzing indifference. Aggravating today's awakening is the deliberate enticement of property-hungry people (the modern version of misers, now called "collectors") by credit card companies and bankers to take on personal debt without

underlying assets. As you know, the above is an incomplete list of bad decisions. Most Americans still don't understand where their financial problems came from despite numerous articles in newspapers and magazines. Discussing money and debt is just too mathematical and boring for most people, but complaining comes naturally to everyone.

70] This loss of a sense of responsibility and civic pride is not endemic only in the U.S. Greece is now a small copy of the U.S., with a government that deliberately falsified their debt situation in order to postpone the eventual awakening, with an electorate that was underworked and overpaid out of the loans, and a lack of a governmental agency for assuring tax compliance (partially copied by limiting I.R.S. funding by American Republicans). In the U.S. we have an additional burden of supporting a large group of child-bearing non-employable citizens descended from the horrible ethical American error of slavery. More recently too we have the unopposed invasion of Mexicans whose limited education and tradition of repeated child production doom them to a minimal livelihood. To aggravate the problem, American law guarantees their "anchor babies" American citizenship and the right to import relatives. Their older children, of course, get free schooling and its fringe benefits. The main difference between the two countries is that the U.S. is "too big to fail." So many countries rely on our interest payments and the success of enterprises that they now own here, that they have to keep lending us money. The Chinese government recently pleaded with the U.S. to reduce its borrowing but our government can count on continued lending to postpone the reckoning assured to all spendthrifts. Actually, the difference is really not great, since Greece belongs to the European Union and apparently can't be allowed to go bankrupt. Both countries are like surrounded holdup men: "Don't stop me or I will commit suicide," they say. Argentina, a spendthrift directed by a dictator, simply refused to pay their \$100 billion loans and shifted to a democracy that has adopted sensible financial approaches that look promising. Greece might have been wiser to renege on its debt and throw their crooked leaders into jail.

71] In 2011, several countries recognized, or were forced to recognize, their spendthrift life style and adopted "austerity" measures. The list now includes Britain, Ireland, Spain, France, Italy, and Greece – quite a collection, which is gradually including the U.S. In Europe, as the leaders see how unbridled borrowing of money led to their problems, they decide to save the weaker countries by – letting them borrow more! Of course, this error raises their present level of indebtedness. Austerity includes reductions in aid programs to the poor, children, and unemployed. Civil servants, such as police and firemen, are being kicked off the government payroll. Rules favoring union workers are being weakened, especially to make it easier to fire a unionized worker. Income taxes are being increased, especially on those in the higher brackets. Many governmental agencies are given smaller budgets, reducing their services and safety checks. The age at which one can retire with Social Security and Medicare payments clearly has to be raised simply because people live longer now and have to save more money to do this. Government leaders express their conversion to the "Spend only money that you have" rule, recommended in my paragraph 49. However, austerity is not the same as rationing, which applies priorities and evaluation of consequences to the cutting process. U.S. Congressmen openly but quietly rub our noses in the problem by special laws that exempt them from the financial rules

everyone else has to obey. In order to restore the profits of rich people, they pass special tax exemptions.

72] Does the mass of bad financial decisions mean that we cannot afford to buy less and consume less? To me, it seems to be a good reason to lower our expectations of material grandeur. Rationing is simply a way to decide which expectations to drop from your plans. If you thought you would have ample fresh water for drinking and filling your swimming pool or spraying water in fountains or on lawns, well – you have to compete with your children, farmers needing water to grow the food you all expect, and power plants, which need water for cooling their machines (such as nuclear power plants). If you expect to drive bigger cars on gasoline, well – you have to assume a permanent supply of petroleum in the ground or simply let future generations worry about the final depletion. If you expect your savings for retirement to grow in value by investment in low-priority companies, well – that is a substantial risk, which is reflected in the current stock market indecisiveness. If you are currently retired, living off interest and dividends instead of accumulated cash, you may need some governmental supplements. The complexity of the required decisions calls for slow adoption of rationing decisions, watching to see each effect.

73] There are people who delight in examining the effects of efforts to coax citizens into accepting a minimalist life style. A good example is the subsidizing of fuel-efficient cars, like the hybrids. These cars slow the importation of oil, lower gasoline prices, make us less dependent on Middle East rulers, and reduce the wear of roads, so they are a step in the right direction, correct? However, the risk of death or body damage due to road collisions is increased by the relative flimsiness of light cars. Obviously a collision with a heavy car, the dominant type of vehicle on the road, is to be expected so this effort to achieve “greenness” seems to be a mistake. Oops – our leaders forgot this and neglected to ration the number of heavy gas-guzzlers being built. (An extra benefit of such a step would be a pressure against the generation of large families, a far more anti-green activity.)

74] Free trade errors A major error of past and present Federal administrations was the swallowing of the free trade mantra, which ordained that countries should eliminate all tariffs on their imports. These proponents explained that the world should buy from the most “efficient” sources, thereby raising the standard of living for everyone. In the minds of these simple-minded analysts, who had never run a business, the word “efficient” actually meant “low priced.” If a country could control its working class so that the workers would accept low salaries, high pollution (with its accompanying higher death rate), unsafe working conditions, and pie-in-the-sky pension promises, and simultaneously control the value of its currency – well, those factors should not deter you from benefiting from that country’s bargain exports. The free trade system has indeed paid some countries well and caused a large redistribution of wealth. Simultaneously it made the richer countries into dupes of dishonest suppliers in countries lacking the ability or willingness to catch these toxic crooks. It also exposed us to the vagaries of radical leaders who need a scapegoat.

75] I don't think the free-traders actually even lowered their intellects to consider the possibility of damage to the U.S. We saw manufacturing and farming jobs disappear, endured shoddy workmanship and lead-poisoned imports, and did not notice unemployment payments to displaced American workers, or the interest on the money our government had to borrow to pay for the bargains. Americans went on a spending binge, buying more cheap imports than they could afford, and going into debt. Working Americans simply drove (faster) past the abandoned factories and boarded up store fronts.

75.1] A side effect of free trade is the increased rate of fossil fuel consumption, partly to pay for the greatly increased shipping activity. We pay also for the increased rate of oil tanker collisions and piracy. The increased level of importation and international air travel greatly raise the costs and misery of dealing with the increase in imported diseases (e.g.: influenza and HIV). The increase in importing increases the cost of inspecting port goods (inadequately) for biological and destructive weapons. Free trade has also brought us the cost of inspecting imports for consumer safety. Purchasers of foreign-made electronic gadgets, useful and not, consumes many batteries – and subsequent expensive special burial of the dead batteries – and pull a remarkable fraction of the nation's electricity off the national power grid. This brings it closer to the overload/blackout point and brings inefficient (polluting) generators out of retirement. Have the gadgets really improved our efficiency or style of living? Perhaps they simply distract users from useful work.

75.3] The false promises of borrowing We are constantly taught that we should borrow money and go into debt in order to be able to buy more. This concept of spending borrowed money was avidly adopted by cities, states, and Congress, urged on by workers demanding annual raises, promulgated by people with spare cash, retailers, stock brokers, IPO generators, home sellers, and real estate agents. Legislators discovered a need for new government buildings, each one reaching for a prize for its architect, paid for by taxpayers. Professional sport entrepreneurs succeeded in getting cities to invest in grand stadiums, selling bonds with 25-year amortizations that have left taxpayers with long-term bills even as the sport teams abandoned the stadiums. Current financial news from other countries has revealed the same excesses of the borrowing virus. Governmental leaders know that their constituents will have more babies, raising the number of future taxpayers who will pay for their excessive promises. It is frightening to see the present bankrupt cities that made ill-calculated promise to pay union members money that was simply impossible to raise, especially in cities that lost population.

76] The horror of inflation The concepts described above lead to inflation. It is welcomed by all debtors who expect their incomes to rise and by investors who overpay for stocks in the same expectation. Did you ever wonder why stock brokers and business writers refer to a drop in the market as a "correction?" If a drop is a correction, what was the error being corrected? Obviously, a rise in the market, manipulated by the same advisors. It is shocking to realize how much this hunger for nominal, illusory increases in income motivates human activity. The true increase in wealth comes from technological improvements and the improved health that is the result of scientific and medical research and the demands of our government that force people to

eat better and get better health care. In my lifetime, the cost of mailing an envelope has gone from 2¢ to 45¢, a 22⁺-fold rise! That 2¢ included a large envelope. The number of mail deliveries rose enormously in that period (mostly junk mail and requests for money by charities and advertisers), thus competing with unsubsidized distributors of ads, the newspapers. Technological advances in mail processing made great progress, so you might expect the “economy of scale” theory to reduce the cost of mailing, but other factors were injected into the problem, such as unfunded promises of retirement benefits and the need for Congressmen to fund pork construction projects and create unnecessary jobs for their voters. The U.S. Postal Service is required by Congress to charge the same for every piece of first-class mail, no matter how far it travels – a penalty not forced on the private mail services. Competitive technological advances in computer-driven e-mail have left the Post Office with unpayable overhead. The guilty arrangers of this losing system solve the problem occasionally by making taxpayers cover the losses.

77] It is frightening to read that the head of the Federal Reserve tells us that inflation of 3 to 4% is good for us. In other words, he thinks it is good to lose 3 to 4% of your financial savings each year while believing they are increasing! This is on a par with the men who slaughter chickens and pigs: “This won’t hurt a bit.” Even worse was his previous leader, who loved to collect data and draw rising graphs. He predicted that everyone will get richer and richer, but never collected data on the developing scarcity of raw materials, the increasing lies of financial leaders, the increasing mountain of unpaid maintenance costs. After all, he was a noted economist and couldn’t be wrong.

78] People with spare money can buy bonds, in the face of the universal money-eating inflationary practices. They know that the cash they will receive some day will be worth substantially less than their investment but they hope that the interest payments will neutralize this loss. In the present period (2009-2012) the state and city bonds are relatively risky investments, because of the downward income spiral for these agencies, so investors are reluctant to buy them. The psychological shock of these events has paralyzed legislators – can they stop increasing governmental spending? Can people produce children faster than entrepreneurs can create jobs? Yes they can, everywhere in the world.

79] The above information about sport stadiums reminds me of another way that taxpayers fund sport facilities, without knowing it. Some colleges assign a significant portion of their budget to building stadiums and other competitive sport facilities, together with large salaries for coaches and scholarships for athletes. Generous sport fans donate special tax-exempt gifts to the players to sweeten their bonuses, such as an expensive car or a fast-food franchise. Taxpayers contribute a portion when a generous donor to the athletics department lists his charitable deductions on his tax form. Rationing the production of alcohol and availability of gasoline would lower the death and alcoholism rates among college students and – secondarily – the death rates of innocent drivers and pedestrians who suffer the ravages of someone else’s liquor. A new factor is the growing realization that football players have been accumulating brain damage from

simple concussions. These accumulate over time, ending up as serious brain damage and neurological disorders. The problem is showing up in teenaged football players, as well as soldiers who survived concussions in Iraq from roadside bombs. Football and possibly other popular sports may vanish like boxing, which produces dementia pugilistica. What will happen to criminal game fixers?

80] It is sure that the free-trade economists and politicians assumed that the citizens of 2nd and 3rd world countries would never master American technology or efficiency of production. They expected to increase *our* exports to these countries and thus pay for cheap imports. They surely did not expect these countries to develop their technological and scientific skills to the point where they matched or *exceeded* ours. One way that foreign exporters improved their overall efficiency was by stealing or buying American industrial technology, thus avoiding huge research and development costs. Japanese car makers demonstrated remarkable originality that couldn't be matched by the frozen-in-place American car companies and workers. Nowadays one sees many more scientific publications from foreign researchers, while American scientists have to import young foreign scientists to develop their findings. Some of those foreign researchers remain in the U.S. but others return home to transfer our technology to foreign producers and researchers. Like other scientists, I have found, throughout my career, a shortage of Americans who are willing to enter the difficult field of research.

81] An article in the N. Y. Times Sept. 10, 2010 by Alan Tonelson and Kevin Kearns points out that the U.S. trade deficit at the moment (perhaps Sep.2010) is \$289 billion, while the same period in 2009 cost a mere \$204 billion – a 42% increase. They calculate that the entire Obama “stimulus package” has been leaked away by citizens buying imported products – in other words, we have gone into debt to generate jobs for foreign nationals! The article proposes a tariff to protect American industries that are clearly being targeted by outside competitors, and forcing American governmental spenders to “buy American.” At present, many items are not made in the U.S. – they have been completely sucked out of our country by low costs and secret governmental subsidies. The above writers also recommend a practice seen in other countries: applying a “border tax” on goods that are exported by an American producer. This tax is returned to the producer, lowering his costs. The free traders warn that this would set up trade wars, but President Nixon did this in 1971 without any harm. I agree and warn that the current “freedom” will destroy the U.S. and efforts to guide the world to a survival level of activity.

82] Rationing would automatically reduce the costs of free trade by setting priorities on American production and spending. By reducing the need for corn-derived alcohol, we would reduce the drain on our scarce water supply and help the hundreds of millions of people who depend on corn for food. By reducing our acceptance of free trade, we might eliminate the international court that ordains lower safety and quality standards that neutralize our own standards (especially in California). Why not acknowledge the seriousness of the free-trade error, back off from it, and let our citizens try to rebuild our high-priority factories? This would create jobs and increase tax collections. Call it the New Marshall Plan, like the 1947 Marshall Plan that

handed out \$25 billion (10% of America's GDP!) to European nations to modernize their industries and business rules. Somehow we were rich in those days (before the free traders won).

83] Consider how the introduction of rationing and realistic understanding of the world would affect life expectations. When banks were found to have overextended their loans for inappropriate purposes and over-generously allocated profits to bank executives, our current government loaned them hundreds of billions of dollars to allow them to lend more money and simultaneously increase the payout to the same bank officials who had run their banks so badly. Overpaid officials have told us – with a straight face! – that one must overpay financiers and CEOs if one wants the best. Unspoken was the next sentence: “They might quit their jobs and move to another company that pays what they deserve.” Unfortunately our President believed his economist advisers and paid the ransom demands.

84] Now (6/30/10) we learn that some of the same banks that were “too large to fail,” have been helping Mexican drug dealers launder billions of dollars in cash, helping them to buy planes for transporting more drugs (\$100 million dollars worth in each trip). They just “overlooked” their legal requirement to report large cash transfers – well, they were indeed too busy selling legal scams to customers, so there is no need to punish the executives. Or the drug addicts who furnish all that cash.

85] But should banks continue to lend such large sums as before? If we adopt rationing and sensible priorities, banks will not lend money to canceled resource-wasting enterprises. Think of some undesirable uses of loaned money:

[1] building large luxurious homes instead of apartment houses;

[2] building gambling resorts which consume inordinate amounts of energy per capita. Gambling now sucks much money into the hands of a few while strengthening illegal activities and encouraging gambling addiction. Gambling is a perfect example of a Ponzi scam – but the victims know this.

[3] building luxury cruise ships and luxury hotels;

[4] building high school and college stadiums (not schoolrooms and laboratories) for student athletes who are learning how to make a living in the sports world while risking severe damage to their bodies;

[5] building fuel-consuming rocket ships to give millionaires a thrill ride into space;

[6] building large luxury cars that raise the insurance rates for smaller cars.

86] People who own their own homes are especially susceptible to the risk of joining the unemployment ranks because they cannot easily move to a location that needs workers. We see this today in the growing number of mortgage defaults and rotting walk-away homes, followed by failing banks and loss of taxes to the local governments. Many of us would be better off by living in large rental units. Such residences free people from the expense and time needed to maintain their own homes, while adding the advantage of having shared maintenance workers always at hand and communal easy garbage and recycling facilities. Instead of buying a \$1,000 clothes washer for your private home that is used just a few times a week, your large apartment

building can install washers in public rooms so the cost can be shared by many families. Because of the lower building outside surface area per capita, heating and painting costs are much lower. They can be built with protected parking areas and shared public rooms for local events (parties, games, entertainers, clubs, meeting places for children, exercise, etc.) A bus stop in front of the residence helps people get to their jobs without using a car or walking a long distance to a bus stop. Admittedly, apartment dwellings have their own risks, such as undesirable neighbors, but this can happen also with a bad neighbor in a nearby home or a financially depleted owner who had to abandon his home. Home owners like myself have seen their property values shrink as nearby “undesirable” sections of the city grew closer. Some apartment buildings, designated as low-cost housing, have lost control of the inhabitants and had to be torn down. Obviously vigilance committees are necessary to maintain social standards. An apartment building should have built-in fire detecting and extinguishing sprayers, with a central warning system, an advantage over most private homes that have only smoke detectors. One of the pleasures of home ownership for some people, the desire to work in a garden, can be attained just as easily in the grounds surrounding an apartment building. In large cities, apartment buildings (not many as enticing as the one described above) are very common, making public transportation a powerful advantage over distant homes requiring long, tiring commutes. A simple, obvious benefit of apartment houses is the preservation of farmland, which is becoming more necessary to life support as people continue to generate babies that demand a place to live – and eat – when they grow up. An article by Barbara Kiviat in Time magazine (9/6/2010) presents additional factors explaining the value of apartment living, including the cost of governmental subsidies to home owners, ~\$100 billion/year.

87] Skyscrapers are undesirable because they are expensive work spaces, wasting money and space to build and run massive elevators. They consume an inordinate amount of steel to support the upper floors, require expensive pumping of drinking water and fire-fighting water, constitute tempting targets for terrorists or suicide-bound pilots, and form time-wasting congestion points for the thousands of workers who must reach the buildings at about the same time. Their construction owes a great deal to a competition for prestige, not social value.

88] Making the switch to green energy is difficult because of the reluctance of the newly-refunded banks to support the seemingly risky building of green energy sources. Solar cell and solar heating manufacturers are still refining their technology, so there is a risk that a particular company will be pushed out of existence by improved techniques. A similar problem exists in wind turbine manufacture, which requires large scale investments in order to make efficient turbines. Governments have to absorb the risk in order to get these operations going, as the U.S. does with nuclear energy plants and with banks that gamble their depositors' money. Governments should sign contracts with green power generating companies to buy power for a long period at a profit-making price, as Portugal has done.

89] Moreover, our governments – Federal, state, and city – should stop unnecessary energy and resource consumption. They employ a huge number of workers and military personnel who can save on fossil energy consumption by using less. Publicity-seeking power expenditures, like

the lighting of buildings from the outside, and showing off dangerous jet planes flying in formation, have to be discontinued despite the public love of spectacles. My school, the University of Michigan, has saved much money by simply removing many ceiling lights in hallways and building a power generator on the premises. This is all part of setting priorities. Such economies would cut government demands for ever more taxes, a particular hate of most citizens.

90] A cut that would lower tax dollar waste would be the abandonment of projects with questionable claims of increased efficiency, such as all-electric or hydrogen-fueled cars. These cars will require the building of a large number of power supply stations, but recharging an electric car cannot be done as fast as pumping gasoline into a tank. The expected Tesla cars will be too expensive for almost everyone to buy and the preparation of lithium batteries will consume much electrical energy. Unmentioned is the question of what a car crash might do to nearby people – splashed lithium and lithium compounds are poisonous and free hydrogen goes Boom! Few people know where electricity comes from and they accept the implied claim that fossil fuel will not be required to run the cars. A long newspaper article I read said there is no shortage of hydrogen because the ocean is full of it. So are reporters who pretend to know science. Hydrogen is not the same as water. The light elements, like hydrogen and lithium, require extra power to produce. Meantime the owners of electricity transmission lines tell us that billions of dollars are needed to bring more power to the growing population and satisfy people's demands.

91] A similar grand plan to build high-speed rail systems promises the creation of many jobs and enough riders to repay the investment, but the usage predictions are based on optimistic expectations that predict an increased need for faster services. The American stimulus package calls for a tremendous investment, which is claimed to reduce the maintenance of roads and reduce the need for gasoline. The proponents don't tell us how to get to the high-speed rail stations or how to replace the main polluters, the many trucks that bring us food, supplies, and mail. They point to the efficiency of such trains in Japan and European countries, which are small countries with short rail lines and easy access to many riders. The famous Shinkansen of Japan serves about ½ of the nation's population, reducing the enormous car traffic congestion on the route. The relative tortuosity of American terrain, with its hilly and curved sections, would slow the trains and require expensive roadway intersections to be elevated. How will this help the severe road congestion in the big cities, like New York City and Los Angeles? A large country like the U.S. has to run rails through much land of low population density, with long distances between stations. What an appetizing situation for a publicity-hungry terrorist! The new Chinese high speed trains have demonstrated how large the crash between two trains can be.

92] Similarly, we have the giant 500-passenger planes that have been developed in recent years. While the European consortium has actually made some of these planes, Boeing has stretched out its plans for production. Luckily this branch of activity has not been entered into the wishing-pot of recession recovery. Many airports are too small for these giants, so the actual increase in efficiency that you can expect is limited. In a world that has to down-size, the super-

sized planes may end up in the vast parking spaces that now store unneeded planes. That is a losing battle.

93] A merit of battery-operated cars is that the electricity in some regions can be created by gas burning generators or wind powered generators, reducing dependence on imported oil. The improvement in air quality in big cities is also a good feature. These cars are being introduced to the American public by means of considerable government rebate subsidies; their acceptance by the public is yet to be seen. I wonder if hybrid cars could use liquefied gas instead of gasoline, but we have to remember the many explosions in homes and factories due to leaking gas.

94] The same governmental subsidies may go for bio-fuel proponents who want to grow fuel in large microbial culture tanks. Their projected costs warrant review by scientists familiar with culturing costs. The world currently uses roughly 70 million barrels of oil *per day*. Making just a dent in that number would require a tremendous amount of culture medium and tanks. Such a method constantly risks breakdowns from infection of the growing vats. Similar riskiness applies to the idea of burning weeds and farming scraps, which are claimed to have no effect on atmospheric CO₂. In fact, burning fuel of biological origin (petroleum, coal, alcohol, waste fat, or farm scraps) converts sequestered carbon to CO₂. Moreover the yield of energy from low-carbon fuels (plants, alcohol) is relatively low because of their lower content of carbon-hydrogen atomic linkages. And burning plants and coal produces major polluting gases that have to be trapped. Don't stand downwind when burning poison ivy!

95] A proposed source of energy, which is in small-scale use, is scrap fat, which can be converted to a liquid usable in diesel engines. The fat can be prepared from animal or plant wastes. After cleanup and simple chemical processing, the fat now consists of a mixture of methyl or ethyl fatty acid esters and steroids ("biodiesel" fuel). While the total amount of energy in this source is only a small fraction of the world's needs, it is readily produced and utilized on a small scale in many locations, consuming little fossil fuel, thus possibly well worth pursuing. The true efficiency will depend on modernization of current techniques and study of combustion waste products. One of the unfortunate properties of fat is that it includes significant amounts of commercial poisons, such as 2,4-D, polychlorinated biphenyl, polybrominated biphenyl, and many wastes from chemical factories. These substances end up in body fat, having poisoned animals for many years. As they burn in diesel engines, the combustion products (hydrochloric acid?) may exert a further blow to the engines and their users. A similar health problem comes from fish oil, which has to be carefully cleaned up to remove mercury compounds.

96] I am surprised that geothermal heat sources seem to be neglected. The earth generates heat, either stored from the daytime sunlight, or coming from the earth's center (which has been extremely hot since the earth was formed), or from the decay of radioactive elements in the ground. People cannot work in very deep mines because of the high temperature. There are now over a million rather shallow geothermal heat pumps in the world and probably 100,000 new

units installed each year. In the right region this can be an economical “green” way to cool a building.

97] NASA (the National Aeronautics & Space Administration) is another massive boondoggle by the U.S. that has absorbed over \$400 billion of taxpayer money over 52 years, initially for the sake of “prestige.” President Kennedy was determined to show the world that the U.S. is smarter and richer than Russia. No other branch of science has received so much support and produced so little of value to humanity. In 1966, the peak expenditures amounted to more than 5% of the Federal budget! The Space Laboratory, in all its years of occupancy and emergency repairs, has never announced a research plan or experiment, or produced experimental results of significance. The only results I have seen were experiments on how to maintain the health of the “researchers.” Too typical of NASA research projects is the 2009 plan to send monkeys into deep space so that we will know more about radiation effects. The exciting trips to the Moon produced some minor information; the main effect has been to ask for more funds so that the rocks brought back can be stored properly. The Hubble telescope, soon after launching, was found to have a fatal flaw in manufacture (that was not checked before sending it into space). Luckily, corrections could be made in orbit, raising the cost to at least \$6 billion. This device, a marvel of scientific and engineering effort, has produced beautiful, striking pictures that have had no effect on human health or behavior. The same can be said for the trips looking for signs of life on other planets; these too yielded intriguing photos. The cost to energy conservation was and continues to be enormous. (I realize that NASA’s purchases indirectly helped develop useful devices, but the same expenditures could have been made without the Space Agency. Also I am not criticizing the space satellites that have been great aids to communication, location indicators, and scientific tests.)

98] WWII saw an actual *shortage* of workers, as our government adopted rationing, put people to work making weapons and ships, sending men off to fight the enemy. Somehow, despite the continuing severe depression, the U.S. found the money to do this. Today, the war against the downfall of civilization is much more important.

99] It is time to disregard those who feel solar cells are unattractive or undignified, and those who find wind turbines unattractive to their delicate eyes or ears. The way to prolong the use of combustible resources is to ration their use – they will never reappear. The way to a stable economy is to stop depending on foreigners to finance our every move, to control our prices, and to manufacture so many of our wants. (It is true that most U.S. bonds are owned by relatively rich Americans who hope these are a safe place to store their money and are happy to benefit from the interest payments, guaranteed immune to the risk of bond “calls” that force the money into bonds paying lower interest.) A simple decision by a Chinese leader can direct millions of workers to undersell and wipe out a single industry throughout the world. Our nation has been turning out so many computer gamers, ranting political and religious bloggers, misinforming pundits, lying “public relations” and advertising men, Ponzi scheming investment advisors, criminals in prison and still out of prison, and drug addicts – how will they ever be able to repay our trillions of dollars of borrowed money? The mere interest – not debt repayment – on the

public debt was about \$190 billion in FY2009. We can't even launch a hopeless energy-consuming, air-polluting little war in the Mid-East without loans and oil from other countries, just as the Moslem Taliban and al Qaeda depend on *our* oil purchases to buy *their* weapons (via the oil-selling countries). How can we possibly expect never-ending growth in luxury items while claiming that our children and grandchildren will somehow repay our debt? By selling *their* children, perhaps? In Japan, young people are evading their assignment by suicide. Hundreds of American soldiers have reacted similarly. Do we have to say, like some denialists, "we don't need them?"

100] In 1935 our country had entered a period of depression, worse than today's, after a period of irrational exuberance and mass deceit like the recent one. Unemployment was much more severe. President Roosevelt moved to prevent mass starvation and potential rebellion against the capitalist system, with a new concept called the Works Progress Administration (WPA). This produced jobs for over 8.5 million people (out of a population 1/3 the current size), who constructed, repaired, or augmented many high priority neglected public works. This was paralleled by a program for unemployed young men, the Civilian Conservation Corp (CCC), producing many high public values over a 9-year period by 3 million men. Among their activities was tree planting, which slowed the accumulation of anti-greenhouse gases in the air. These were temporary measures that did not end the depression because they were not "real" jobs. Today we have to reactivate industries that can make saleable, useful products that are currently made abroad. These objects should include sustainable energy devices that will eventually greatly shrink the place of fossil fuels while saving money. My guess is that a future rational civilized world will be maintained by a shorter work week and a much smaller population. It is possible right now to end the current unemployment by sharing jobs, i.e. by working 10% fewer hours and taking a salary cut of 10%.