

Preparing for Change – Anticipating Psychosocial Changes From Global Warming

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In October 2007, suggestions were made to immunize House Homeland Security Committee staffers before they went to NASCAR races. The concern was that a germ based terrorist attack might occur, and the first responders – that is, the government workers – would need to be protected.¹ Clearly someone is already thinking about who will get on Noah's Ark and who will not.

In October 2007, Al Gore shared the Nobel Peace Prize with the UN Intergovernmental Panel on Climate Control (IPCC). Part of Gore's background included his long history of climate control work as well as his Oscar winning movie, *An Inconvenient Truth*. Rajendra Pachauri, Chairmen of the IPCC, thought this years' Nobel Prize would end the debate on climate change and that governments would then take action.² But in October 2007, British High Court Judge Michael Burton ruled that Gore's movie was littered with nine significant untruths. It would be shown in British schools only if it was noted it to be "broadly accurate", and if written guidance of these errors, called "partisan political views," was provided to teachers. The International Herald Tribune³ notes that "it was a partial victory for claimant Steward Dimmrock" who fought to have his children educated about the environment "free from bias and political spin." Judge Burton suggested that some comments in the movie were in "the context of alarmism and exaggeration."⁴ Thus a doubt was introduced that climate change advocates had too many non-scientific political goals.

There have always been global warming skeptics, though their population is waning. Sir David Attenborough, a long time skeptic, announced his conversion in May 2006: "I'm no longer skeptical. Now I do not have any doubt at all. I think climate change is the major challenge facing the world." He later said he didn't want to hear his grandchildren say "grandfather, you knew it was happening – and you did nothing."⁵

In April 2006, Boston Globe reporter Jacoby wrote that MIT scientist Richard Lindzen felt the climate change suspicions grew more from fear mongering than science. Lindzen further said on national TV that earth's warming is a natural phenomena.^{6, 7} He considers the computer models of climate change as "untrustworthy."⁸ The Globe article

¹ <http://www.washingtontimes.com/apps/pbcs.dll/article?AID=/20071014/NATION/110140046/1001>

² Gentleman, Amelia: Chair of UN Climate panel "stunned" to share Nobel Prize with Gore. www.iht.com, October 12, 2007

³ www.iht.com, copied from the Associated Press, October 2, 2007

⁴ Smith, Lewis: Al Gore's inconvenient judgment, www.timesonline.co.uk October 11, 2007

⁵ Pettifor, T: Death on earth; After years of skepticism, David Attenborough admits: climate change is our biggest threat. The Mirror (London), May 25, 2006. www.highbeam.com

⁶ <http://cbs2chicago.com/video/?id=31988@wbbm.dayport.com&cid=6>

⁷ <http://www.cnn.com/id/15840232?video=173744201>

⁸ Jacoby J: Doubting doomsday. The Boston Globe, April 15, 2007. www.highbeam.com

offered the thought that massive amounts of money are now funneled into global warming projects because people are worried. The insinuation is the feeding of alarmists with windfall sums of money. This complicates the debate because well credentialed scientists are standing on both sides.

Fred Singer is another well know climate change skeptic.⁹ On July 18, 2000 he testified before the a US Senate Committee.¹⁰ He said there is no appreciable climate warming.

A decade ago, in 1996, MacKenzie¹¹ wrote these comments. It is worth the time to read:

Global production of oil is projected to reach its peak during 2007 to 2014 as demand for oil grows at 2% annually. Oil prices are expected to rise as this period approaches, thus, the US will have to start shifting to other new sources of energy. Industries such as the transportation sector will be one of the hardest hit. Some of the ways to hasten the movement away from oil include raising oil taxes to increase fuel prices, regulating relevant technologies or offering subsidies for usage of other sources of energy.

Recent gasoline price hikes were a portent of real trouble to come. Policy changes are needed now to ease the transition to high-priced oil.

The 1996 spike in gasoline prices was not a signal of any fundamental worldwide shortage of crude oil. But based on a review of many studies of recoverable crude oil that have been published since the 1950s, it looks as though such a shortfall is now within sight. With world demand for oil growing at 2 percent per year, global production is likely to peak between the years 2007 and 2014. As this time approaches, we can expect prices to rise – markedly and, most likely, permanently.

In the 1970s, as Americans waited in gasoline lines, concern was focused primarily on falling domestic production and its implications for national security. Was the United States really “running out” of oil and would the nation become ever more dependent on imported oil, especially from the unstable Persian Gulf? Should we develop synfuels based on coal and oil shale’s to hold down imports? In a country where most people and corporations look ahead only as far as the next quarter, the prospect of a true shortage in global oil supply was never considered.

Yet, there is a growing body of evidence that a decline in world production is likely to occur in less than 20 years. As the peak in production approaches, prices will begin to rise and the United States – consumer of 25 percent of world output

⁹ BBC News November 18, 2004. <http://bbc.co.uk/go/pr/fr/-/1/hi/uk/4021197.stm>

¹⁰ Singer F: Testimony before eh US Senate Committee on Commerce, Science and Transportation, July 18, 2000. Assessed via www.highbeam.com on October 19, 2007

¹¹ MacKenzie, JJ: Heading off the permanent oil crisis. Issues in Science and Technology, June 22, 1996 www.highbeam.com

– will have to quickly shift to new energy sources to mitigate the impacts on its heavily oil-dependent economy.

Two decades is precious little time for such a sweeping transformation, a point few decision makers appreciate. The time to formulate policies that encourage more efficient oil use and a switch to alternative energy sources is now. The transportation sector, almost totally dependent on oil, will be especially hard hit. The good news is that only a few simple, though bold, policy changes are needed to ensure a smoother transition.

Many who remember the warnings of disaster in the 1970s shrug off this analysis with “We’ve heard this all before.” Not really. Let me address the arguments of those who maintain that the world is awash with oil and that there will be no supply problems in the foreseeable future. First, a little history. After the 1974 oil shock, oil prices rose and worldwide exploration increased greatly. In the United States, drilling quadrupled, but proved reserves and production both declined. (Production in the lower 48 states has fallen 44 percent since 1973. Alaskan production peaked in 1988 and has fallen 25 percent since then.) Worldwide, many new oil fields were found, but their size was disappointing. The world’s most recently discovered giant fields – the North Sea, the North Slope in Alaska, and Mexico – were all found in the 1960s.

In fact, most of the giant oil fields have already been discovered. According to the U.S. Geological Survey (USGS), global discovery of large new oil fields peaked in 1962 and has been declining since. The reason is simple: Most oil occurs in a few very large fields and these are usually discovered early on because they are so big. The largest 1 percent of oil fields contain 75 percent of all the discovered oil, and the largest 3 percent contain 94 percent of the oil. The implication of this skewed distribution is that as exploration progresses, the average size of the fields discovered decreases. In other words, exploration in the declining phase of oil development – where we find ourselves today – is a far different game than in the early phase. In the early stages, it is the large fields that are readily discovered; in the declining stages, geologists are much more likely to find small fields and oil companies must do a lot more drilling just to stay even. That’s why it’s so much harder to maintain production in the declining stages than in the growing phase of the industry.

What, then, is the difference between today and the perceived crisis of the 1970s? It is that the evidence grows stronger daily that a resource-driven global peaking of the sort that occurred in the lower 48 states in 1970 will soon be upon us. According to scores of studies, ultimately recoverable global oil reserves are simply not that large and we will be about halfway through them sometime between 2005 and 2015. Typically, when half of the recoverable oil from a well has been produced, production begins to decline. This is the prospect for global production as well.

This does not imply that the world will soon “run out” of oil or hydrocarbon fuels. Oil production will continue, though at a declining rate, for many decades after its

peak, and there are enormous amounts of coal, oil sands, heavy oil, and oil shale's worldwide that could be used to produce liquid or gaseous substitutes for crude oil, albeit at higher prices. But the facilities for making such synthetic fuels are costly to build and environmentally damaging to operate, and their use would substantially increase carbon dioxide emissions (compared to emissions from products made from conventional crude oil).

For the moment let's ignore the scientists. Let's look at the flowers. An article by Brian Nearing from *Times Union* in Albany NY offered a chilling headline. "Judging by the azaleas, winter is losing it's bite: Warmer regional temperatures mean new plant species thrive while others are threatened."¹² An arboretum that overlooks Schoharie Creek used to be a "Zone 5 climate", meaning that the lowest winter temperatures dropped to 10 and 20 below. Now that area has warmed enough to support plants such as the miniature azalea, which thrives in Zone 6. Each rise in zone represents an increase of 10 degrees." The article further reports that Atlanta has warmed out of the zone for rhododendrons, and New York's sugar maples will face a gradual decline as the weather warms. The maple sap season has already shortened, and may disappear in 100 years.

US Senators Lieberman and Warner released their climate package in October 2007.¹³ This bill wants to require a cap and trade system to cut covered emissions to 2005 levels by 2012, 10 percent from current levels by 2020, and 70 percent by 2050. The bill covers roughly 80 percent of emissions sources, which means that actual reductions would be closer to 51 percent by 2050.¹⁴

Nearing¹⁵, in another piece titled "CO2 busters", reported in September 2007 that New York State was beginning a massive campaign to cut greenhouse emissions. New Jersey's law is more ambitious than New York's; it requires an 80% reduction by 2050 of the current 2007 levels. California and Hawaii were the first to adopt CO2 drops. California wants to be at 1990 levels by 2011, and Hawaii wants to be at 1990 levels by 2020. But despite the wonderful first step intentions, the efforts may be too late or too slow for what needs to be done on a global scale.

Clearly the levels of CO2 aren't being reduced fast enough. If the CO2 production can't be reduced fast enough to put a stop to the problems, then what can we do?

Can we about sequester it? That is, can we bury the CO2? This is from the US EPA:

Geologic sequestration is the process of injecting CO₂ from a source, such as coal-fired electric generating power plant through a well into the deep subsurface. Once underground, it is believed the CO₂ will be trapped, or sequestered, for a long period of time. Because the earth has widely-distributed geologic formations

¹² Nearing, B: www.timesunion.com, May 8, 2006

¹³ view at : www.katenagroup.org/essays/ACSA2007.pdf

¹⁴ <http://www.lcv.org/newsroom/press-releases/page.jsp?itemID=35236366> Accessed October 16, 2007

¹⁵ <http://timesunion.com/ASPStories/storyprint.asp?StoryID=625931>

which have the capacity to contain and store the injected CO₂, geologic sequestration may become a major technology used to mitigate climate change. Current estimates indicate that the storage capacity of these geologic formations is large and widespread. With proper site selection and management, geologic sequestration could play a major role in reducing emissions of CO₂.

... June 2009 will mark the end of the Validation Phase with the completion of the geologic and terrestrial sequestration field tests. These Validation Phase field tests are designed to demonstrate that regional sinks have the capability to store thousands of years of the nation's potential CO₂ emissions and will form the basis for large volume tests in the Deployment Phase.

... The Deployment Phase, scheduled to begin in FY 2008 and run through FY 2017, will demonstrate at large scale that CO₂ capture, transportation, injection, and storage can be achieved safely, permanently, and economically.

These large-volume deployment tests will provide concurrent input to the FutureGen Initiative, which will produce both hydrogen and electricity from a highly efficient and technologically sophisticated power plant while capturing and sequestering the CO₂ emissions. The geologic structures to be tested during these large-volume sequestration tests could become candidate sites for future near zero emissions power plants. While projects in the Validation Phase are designed to demonstrate that regional sequestration sites have the potential to store thousands of years' worth of CO₂ emissions in the U.S., the large-volume sequestration tests in the Deployment Phase will also address practical issues such as sustainable injectivity, well design for both integrity and increased capacity, and reservoir behavior with respect to prolonged injection. Such issues can only be addressed by scaling up the size and duration of sequestration projects. Key operational issues and lessons learned will vary since each Region will have different geologic formations, overlying seals, and structural issues that can affect the safe and effective storage of CO₂ for millennia.

Effectively, we hide the CO₂!¹⁶ The crafty part is that it appears to cut down on the pressure to eliminate the basic problem in the first place. Sequestering carries the flavor of letting us continue to burn fossil fuels without the burden of lingering and uninvited emissions. Looking at the EPA statement highlights a concern about how 'sustainable' the sequestration will be. They don't know. What if the reservoirs break and uncountable tons of CO₂ erupt like a volcano back into the atmosphere. Bridges and dams still collapse.. History can be chilling. In August 1986 Lake Nyos released a massive and lethal quantity of CO₂. Since CO₂ is heavier than air, it flowed like a ground fog, killing 1700 people and countless animals.¹⁷ Our sequestration efforts will be done with new engineering We may not need a comet to end our time on earth.

¹⁶ http://www.epa.gov/safewater/uic/wells_sequestration.html

¹⁷ http://vulcan.wr.usgs.gov/Glossary/Lakes/description_volcanic_lakes_gas_release.html

Our planet is a organism of large and small ecosystems. Each one influences each other, and each one may require some individualized plan to protect or regenerate. This worthy quote is from the IPCC:

“Article 2 of the United Nations Framework Convention on Climate Change (UNFCCC) explicitly acknowledges the importance of natural ecosystems, food production, and sustainable economic development. This report's assessment of regional vulnerability to climate change focuses on ecosystems, hydrology and water resources, food and fiber production, coastal systems, human settlements, human health, and other sectors or systems (including the climate system) important to 10 regions that encompass the Earth's land surface. Wide variation in the vulnerability of similar sectors or systems is to be expected across regions, as a consequence of regional differences in local environmental conditions, preexisting stresses to ecosystems, current resource-use patterns, and the framework of factors affecting decision making-including government policies, prices, preferences, and values. Nonetheless, some general observations, based on information contained in the Second Assessment Report (SAR) and synthesized from the regional analyses in this assessment, provide a global context for the assessment of each region's vulnerability.”¹⁸

This same IPCC report offers a concise and worthy summary.

Human activities (primarily the burning of fossil fuels and changes in land use and land cover) are increasing the atmospheric concentrations of greenhouse gases, which alter radiative balances and tend to warm the atmosphere, and, in some regions, aerosols-which have an opposite effect on radiative balances and tend to cool the atmosphere. At present, in some locations primarily in the Northern Hemisphere, the cooling effects of aerosols can be large enough to more than offset the warming due to greenhouse gases. Since aerosols do not remain in the atmosphere for long periods and global emissions of their precursors are not projected to increase substantially, aerosols will not offset the global long-term effects of greenhouse gases, which are long-lived. Aerosols can have important consequences for continental-scale patterns of climate change.

These changes in greenhouse gases and aerosols, taken together, are projected to lead to regional and global changes in temperature, precipitation, and other climate variables-resulting in global changes in soil moisture, an increase in global mean sea level, and prospects for more severe extreme high-temperature events, floods, and droughts in some places. Based on the range of sensitivities of climate to changes in the atmospheric concentrations of greenhouse gases (IPCC 1996, WG I) and plausible changes in emissions of greenhouse gases and aerosols

¹⁸ IPCC Special Report on The Regional Impacts of Climate Change An Assessment of Vulnerability, <http://www.grida.no/climate/ipcc/regional/index.htm>, accessed October 15, 2007

(IS92a-f, scenarios that assume no climate policies), climate models project that the mean annual global surface temperature will increase by 1-3.5°C by 2100, that global mean sea level will rise by 15-95 cm, and that changes in the spatial and temporal patterns of precipitation would occur. The average rate of warming probably would be greater than any seen in the past 10,000 years, although the actual annual to decadal rate would include considerable natural variability, and regional changes could differ substantially from the global mean value. These long-term, large-scale, human-induced changes will interact with natural variability on time scales of days to decades [e.g., the El Niño-Southern Oscillation (ENSO) phenomenon] and thus influence social and economic well-being. Possible local climate effects which are due to unexpected events like a climate change-induced change of flow pattern of marine water streams like the Gulf Stream have not been considered, because such changes cannot be predicted with confidence at present.

Scientific studies show that human health, ecological systems, and socioeconomic sectors (e.g., hydrology and water resources, food and fiber production, coastal systems, and human settlements), all of which are vital to sustainable development, are sensitive to changes in climate-including both the magnitude and rate of climate change-as well as to changes in climate variability. Whereas many regions are likely to experience adverse effects of climate change-some of which are potentially irreversible-some effects of climate change are likely to be beneficial. Climate change represents an important additional stress on those systems already affected by increasing resource demands, unsustainable management practices, and pollution, which in many cases may be equal to or greater than those of climate change. These stresses will interact in different ways across regions but can be expected to reduce the ability of some environmental systems to provide, on a sustained basis, key goods and services needed for successful economic and social development, including adequate food, clean air and water, energy, safe shelter, low levels of disease, and employment opportunities. Climate change also will take place in the context of economic development, which may make some groups or countries less vulnerable to climate change-for example, by increasing the resources available for adaptation; those that experience low rates of growth, rapid increases in population, and ecological degradation may become increasingly vulnerable to potential changes.

¹⁹

I do not want to be an alarmist. I freely grant that earth has its own environmental cycles. The cycles, per se, are not the concern. The concern is the speed of the cycles. By all the best evidence, we are causing the problem because these climate changes are just too rapid for nature to handle, and, at the same time, we want to live on earth. Nature hasn't yet figure out how to undo the quantities of CO₂ we produce. Nature is smarter than we are, but nature is much slower. If a comet changed the global climate, the earth would quiver a little but in time another ecosystem would be restored. The problem is how and where we will live until that balance returns.

¹⁹ see footnote 13

Nature is also not committed to keeping us alive. We are but guests on this planet. Nature is also indifferent to where we build our communities. This is a harsh reality for many people.

I worry that we aren't preparing for the time when these changes force us to re-do much of the way we live. I feel we are in a spiraling cycle of over-consumption of energy and indifference to the eco-costs of energy. We are too short-sighted. The movements to address climate change are wonderful. But the painful fact is that our remedial actions may be too late. How do we plan for such a horrible possibility?

I began this essay with the chilling notion of protecting the first responders. What about the rest of us? When supplies begin to disappear, how will we handle the shortage? It's unsettling to feel in this same unfriendly wind that unlike a war that will end, or a battle in which supplies can be brought in from other countries, that there is no identifiable end point to global climate changes. Unlike a blizzard, hurricane, tsunami or war, there is no end to the injurious forces. **The time needed to rehabilitate or normalize a climate could be very long because it is something that humans cannot do.** We can only watch and wait. That same time period may be too long for our current society to survive.

The needed changes are not purely political. That is too high on the behavioral ladder. It is too risky to let them alone fight this war. Making it a political process also excuses us from the personal nitty-gritty of the task. The needed changes dwell in the intimate levels of our psychosocial behaviors. Like sex or drug abuse education, we have to do it ourselves. A teacher can help to guide, but a good parent deftly guides and models in special ways. If we do it right then our government will have to follow us or it will collapse.

We may ask our teachers for guidance, but we must become parents to our society. One thing our behavioral grassroots need to do is to learn from the skills of the social psychologist and the psychotherapist. People often say that sociologic and psychotherapeutic interventions fail too often, so why copy them? I say the failures occur too commonly because either the efforts can not get into the actual nucleus, or at some level, the organization doesn't support any change. The therapies work when the motivation for change exists. We need to change the motivations.

We need change from the bottom up. We need to survive.

The social psychologist is vitally important because their models give reasons for the underlying processes in everyday social life. Sociology studies topics such as taboos, family forms, systems of maintaining conformity, social learning patterns and status dominance in a culture. It tries to do this in somewhat of a pure science model. The clinical psychotherapist and psychiatrist work not from a world of pure science, but rather in a world of applied science. The reason it is "applied" is because of the many variables in people that are not know, and it is the process of making a "best fit" system work.

Climate salvation also has unknown variables as well, so we apply an ever changing best fit principle.

Behavioral specialists apply their science to induce or assist people to change. Historically many people used psychotherapy to learn how to correct critically impairing problem, such as a foul anxiety or hysteria. There ought to be within the combined wisdom of therapists the ingredients needed to get people to change. The call, therefore, to get common people to change their life styles. It is a psychotherapy of the masses. Sometimes people do not want to change. The therapists and social psychologists ought to illuminate the way to move the unmoving.

One problem in getting people to change stems back to term immunity. The concept is anchored in the fact that once, when people completed an obligation or a task, they were granted immunity. The term eventually meant that people were 'exempt from an inconvenience'. It was an earned privilege. Our society is heavy with entitlements against inconvenience. Many say, in fact or in theme, that "I worked hard for these comforts, and I feel the right to drive, consume or act as I wish..." The immunity sense went even further -- the person would become immune from a disease. Disease is an inconvenience in it's own right. The problem with the disease of global warming is that even great wealth cannot exempt people from it's impact. There is no immunity. Human entitlement is the earth's death knoll. The planet is sick. It is the ultimate epidemic.

Other group of people say "My life is horrible, I suffered so much " or "I am special, and I want the joy of due comforts. I feel justified to drive, consume or act as I wish...". These are socially impulsive or dangerous groups who are very tough to bring round because their emotional cores are so traumatized and threadbare. However, they too are not impervious to global deterioration.

Much of the hurdle against change rests in enduring adolescent traits. Freud perceptively described the problem: "The starting-point and the final aim of the process (of change) ...are clearly visible. The intermediate steps are still in so many ways obscure to us. We shall have to leave more than one of them as an unsolved riddle"²⁰

Viewing the masses as adolescents can help. Adolescence is the process of psychological adaptations to pubescence. This also, of course, represents periods and areas of considerable conflictual anxiety. One useful teenage realization is that the safety of childhood must fade and a new homeostasis must evolve. That homeostasis results from experiencing conflicts – it is the consequence of countless feelings of "my needs versus other's needs". With time, instruction, good models, and growth, an adolescent evolves into an adult with a maturity in their operational skills. This maturity facilitates the mutual maintenance and survival of the individual and the community. The process is to convert people into doers and not just supporters of climate salvation. Adolescence is also a time of many fads. Saving the planet cannot be a fad.

²⁰ Freud, S: Transformations in Puberty. In Three Essays on the Theory of Sexuality. Basic Books. New York

Too much harsh reality, coming too quickly and in headline form, will scare, scar and perhaps desensitize people to the real danger.

Adolescence is the time to *master* one's environment. Now the need is to *protect* one's environment.

Our planet is like a baby. It communicates to us with actions. Perhaps in it's dying loneliness it is making the loudest of noises. Those noises are storms, famine and drought. Or perhaps it is the opposite. Perhaps earth is laughing at us. Earth is reciting the Adam and Eve story to us, that we will lose our Eden if we disrespect what is being told to us. Other living creatures have come and gone, and when we humans are finally extinct, earth will take the time to clean itself up and start anew.

Noah was told: "And the fear of you and the dread and terror of you shall be upon every beast of the land, every bird of the air, and all that creeps upon the ground, and upon all the fishes of the sea. Into your hands they are delivered." *Genesis 9:2*

What do we do? What is our treatment plan. There are two levels of intervention.

First is from the government. The government must remove itself from devotee political beliefs to rid itself of all unreasonable barriers which interfere with the production of realistic plans to help people anticipate the psychosocial effects of global changes. For example, debates must become based on scientific issues, not political histories and strategy. I know of no plan to assist in the long term planning for the anticipated submergence of south Florida. I would imagine doing this will cause a tsunami of panic. When these issues are mentioned in the media discuss, it can still be hidden, minimized and couched as an opinion. Imagine the impact following an official commission birth to plan for the those days. The commission will rapidly initiate the 15 ideas to start the process. But the energy behind the alarm bell might cause social explosions.

The focus is to prevent the social alterations that will precede society altering geographic assaults. It is hard to picture that our very geography will change!

Official policy already exists on the protections of first responders and others who are judged to be essential to community survival. Is the government also planning to relocate millions of people as coastal areas go under water? Ten years ago a CNN report talked of how Manhattan would be under water and how social planners should begin to think of countermeasures.²¹ The EPA has a report on the cost of holding back the sea.²² The estimate is that in 50-100 years, up to 250 feet of Florida beachfront will be lost.²³ Do engineering plans to build these levees even exist? It would take thousands of miles of levees to protect coastal communities. Shouldn't the project at least be in the design stage now? Yet to even offer a bid on the designs is to acknowledge that we may lose the climate change battle. That's scary.

²¹ <http://www.cnn.com/EARTH/9804/07/global.warming/index.html>

²² <http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterPublicationsSeaLevelRiseIndex.html>

²³ <http://www.nrdc.org/globalwarming/flaeffects/effect1.asp>

Properly values would plummet in countless areas. Likewise, the cost for the levees would be enormous. The media has noted that many cities might be underwater in the foreseeable future. The response has been less than enlightened. Are we too late with these projects? The general psychosocial rendering used to comfort us is based on the notion that we can stave off disaster by acting now. This may not be true.

The United States has to become, like one syllable words, utterly headstrong in reducing energy use. I recommend that 10% of all non-critical lighting be turned off. Mow the lawns less often. A taller stand of grass is drawing down carbon dioxide. Airlines have to schedule flights so their planes don't sit on tarmacs – not everyone will get the 5 PM take off, and people have to see the new flight schedules as good for all of us. Businesses have to immediately insist on staggered work hours so gas wasting traffic jams are reduced. Trees by the millions have to be planted. Huge homes and office buildings have to further reduce air conditioning and lighting use. Biofuels are not the miracle they appear to be since the corn needs fertilizer and the fertilizer demands energy to make. Communities must be built so people can walk to regular daily services. The habit of jumping in the car to get a single item must stop. People will have to learn to suffer more inconvenience and discomfort, and they must feel proud that they are feeling the discomfort. Our leaders must be the models, as King George was in World War II when he took his bath in only a few inches of water. Life doesn't have to become a doldrum of fears and joylessness. Life has to be approached the same as if we are on a vacation and there is only a limited amount of money to spend. Fun can be found within any budget. Occasional celebrations can of course occur, but they have to be seen as the diabetic who knows that tomorrow, after the party, he must re-establish his glucose and weight levels. Our problem is that we use credit cards for vacations, and so we arrange to pay for the trip later. That theme is environmentally dangerous thinking. That theme, however, speaks to the problem. We don't see ourselves as an influential warrior in this battle. We have also become accustomed to not worrying about the environmental future. Unlike the credit card, the environmental bills can't be re-financed.

We must go the each person. This can start in schools, but primarily it needs to be done in each home. A massive governmental effort must be undertaken, including the clever use of public relations efforts, to start the process. It can also be done from pulpits, in schools, at jobs, and in organizations such as religious social groups, retirement facilities, adolescent groups, etc. Much of it must be fueled by an incontestable community and legal requirement.

Four procedural concepts will be presented in the next essay on ways to make psychosocial changes. But below are fifteen specific ideas that we can use now.

The goal is to create creation of legions of advocates with new second-nature habits and behaviors. A Medical Journal of Australia editorial noted in 2006 “International assessments have sounded serious environmental alarms before, but the emerging evidence on climate change now brings an unprecedented urgency to policy debates... It has been widely assumed that wealthy human society will be bale to buffer themselves

from the more severe impacts of climate change....the focus must be on primary prevention...(but) anticipatory and precautionary adaptation is more effective and less costly than last-minute emergency adaptation or retrofitting.”²⁴

These fifteen ideas are places from which to start. I know there are others. The purpose of The Doctor’s Ear is to gather those other ideas and then use them.

Here are my ideas:

1. At least one course in environmental science and advocacy will become required before high school graduation.
2. All children will be asked to sign on to one of the web-based, safe and monitored, environmental sites designed for children. They must visit it at least once every 2-3 weeks, and use and share this information as part of their current events curriculum. Different students may be asked to enroll in different web sites so they can compare the information. Obviously, older students can subscribe to the more advanced web sites, such as the EPA or the UN Intergovernmental Panel on Climate Change (IPCC). Since current events should be an on-going experience across all grades, this will be in large part separate from the requirements in #1 above. However, during those courses, this activity can be integrated into those meetings.
3. Colleges will require at least a 3 hour course in environmental advocacy. This is preceded by a distinct course in environmental science. Some courses can be less or more geared to hard science. It will vary with the students area of study, i.e., the course for biology majors will be different than the course for literature majors. However, the advocacy course will be the same.
4. A 30 minute video about fossil fuel emissions and how better driving habits will reduce CO2 must be watched before the issuance of a new or renewed drivers license.
5. Governmental officials need to reveal what they are doing, if anything, to deal with impending psychosocial and economic changes from global warming.
6. Industry and businesses must have at least a twice-a-year semi-annual one hour assembly with their employees to talk about environmental science and advocacy. Small businesses can meet this requirement by using videos that will be developed for this group. They may also, however, be allowed to borrow topical videos used by larger businesses, or perhaps the viewing of works by PBS’s *Nova* or *Frontlines*, the History Channel, etc. This activity must be required by law. The issue of asking what more a person can do to help with the problem has to be part of each assembly. Doing this will be a requirement for business or occupational license renewal. People are asked, as part of the assembly, to write a letter to an editor or elected official on some environmental issue that peaks their interest.
7. Any licensed professional group, including legal, clergy, banking, construction, medical, service, teaching, insurance, etc group must have at least 2 continuing

²⁴ Woodruff RE, McMichael AJ, Hales S: (editorial) Action on climate change: no time to delay. *Med J Aust.* June 5, 2006, 184(11), 539-540

- education hours per year on environmental science in order to have their licenses renewed. This was done for AIDS and domestic violence, risk management, etc., so it can be done for the biggest risk management and epidemic of them all. This requirement will be established by law. Courses could be developed, borrowed, local environmental faculty or support groups be used as teachers, and so on. A portion of the class work is devoted to science and a portion devoted to advocacy training.
8. Airlines must be asked to re-schedule flights to reduce the waste of fuel while waiting to take off.
 9. A law to turn off 10% of the street lights in non-critical areas must be passed.
 10. The government must plant trees in open public lands, such as in interstate intersections, along median strips, etc. There are literally tens of thousands of acres of land that could support millions of CO₂-consuming trees. The EPA could be funded to do this, and tree nurseries could meet school children at the sites so the kids can do the planting.
 11. There needs to be a earth-day-of-rest model. It would be a day that people do very little insofar as driving, and they would see it has their contribution to the parental saving account by producing a little less CO₂.
 12. Architects should be required to plan new construction that is less reliant on closed window air-conditioning and which demands the use of fans, natural light, winds to cool, etc. in non-critical areas.
 13. Traffic fines must be imposed on those who, because of their reckless driving, cause traffic jams. The fine is because of the extra gasoline use required until the road re-opens, all of which is the result of the person's recklessness.
 14. Every high school and college newspaper should be encouraged to have an environmental science and advocacy column.
 15. High school and court order community service requirements should be allowed to be fulfilled by work in environmental advocacy work.

This paper will never have an end. However, it will pause with two ominous notes that serve to call us to action. On October 6, 2007, Holmes wrote “the climate is warming so rapidly that many species will become stranded.” This speaks to what could happen to humans as well.²⁵ Then on October 11, 2007, the Christian Science Monitor reported that the IPCC says the levels of greenhouse gases are at much higher concentrations than previously thought.²⁶

To conquer fear is the beginning of wisdom. Bertrand Russell

²⁵ Holmes B: Special Deliverance. The New Scientist, October 6, 2007. page 47-49. www.newscientist.com

²⁶ Lamb G: A key Threshold Crossed. Christian Science Monitor, October 11, 2007