KIT KAT ESSAY
Tuesday, March 18, 2003

"As Thy Purse Can Bear"
by
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The Holocene age, in which we still live, started an estimated 10,000 years ago. That was before Chuck Lazarus' sophomore year at Yale. Which is in the East. This long geologic age has been characterized by warming, which melted glaciers and caused the ocean to rise by some 100 feet or more.

- Cutting off Siberia to Native Americans who then couldn't go back to open casinos.[1]

There is some feeling by scientists that the world was, very gradually, headed back to another ice age. Your grandfather intuitively knew this when he explained how bad the winters were back then. But just in the nick of time, the English, who are among our few allies, invented the industrial revolution. Or at least claimed to have done so.

So what has apparently happened in the last 150 years is that industrialization has been successful in reversing the quite gradual trend toward a new ice age. This reversal could have caused a lack of pessimistic "iceman cometh" news on which the media thrive. However, a replacement worry has been introduced ... Global Warming.

- It is alleged to present a danger to bears, which provides a tie into my essay title.

The danger to bears comes about in this way. And here we focus mainly on polar bears. They live mainly by eating seals. To eat a seal one must first catch it. The time-honored way to do so is to wait patiently by a breathing hole in the ice until a seal comes up and then grab it. But suppose the breathing hole gets wider ... perhaps the size of Buckeye Lake ... this is bad news for seal hunting. Typical ... you say ... of financial people who always bring us the bad side. Isn't that good news for seals ... and their lobbyists? No, not entirely. Because there has been a sharp reported increase in the number of young seal cubs drowned in the Arctic where there are now fewer ice floes for them to climb up on and rest.

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[1] Joe Blackmore, former President of Capital University, will tell you the prehistoric camel's ancestors came from western North America and some migrated, before the Bering Strait was created, to Asia and then Arabia. Others went south and became llamas. Meanwhile, their ancestors died out in North America.

It turns out that in most places the world has adapted to the way it is, so that any major change is disruptive. This is true everywhere except the Middle East where things are normally disruptive anyhow.

You don't have to take the word of just polar bear fans on ice meltdown. The U.S. Navy, seldom regarded as a polar bear front, reports that the nuclear submariners say the ice cap is 40% thinner than it was as recently as 1950 and covers 10% less territory. Often overlooked is the acceleration factor: ice and snow reflect much of the sun's heat. But as they melt, the surfaces that are revealed absorb more heat, so the problem compounds.

Clouds are also a related problem. If you assume that a warmer earth produces more evaporation, then we get more clouds. If they are gray, like the ones we seem to prefer in Ohio, then that adds further to heat retention. But if they are white, as in Colorado, it may reflect more sunlight. Unpredictable things like this add to the confusion.

To probe for the reasons behind warming, society has turned to scientists. The reason for turning to scientists is that they are cheaper to turn to than lawyers. Although it must be said they are often duller.

Scientists theorize that the reason the ice is melting is because the climate is getting warmer. This might seem obvious to you, but that is because you are not a scientist. However, they are not content to let it go at that ... they keep trying to figure out how come.

If you look at trends over the last 150 years, there are several startling conclusions:

1. There are more people in China than anywhere else. They like food, such as your lunch, but that's not all they want.

2. There are more SUVs in the USA than in Bulgaria.

   - In China, the number of cars per 1,000 people is 3.2. But in Taiwan it is 207. In Bulgaria, it is 220 per 1,000 people. So just project the Chinese car population half way to the ratio of Bulgaria and you begin to see the problem. And if you don't see it, then factor in India, which now has only 4.5 cars per 1,000 people.

3. All electric homes use electricity; even welfare families now want air conditioning.

4. Put it all together and you see that the above involves burning either more wood, gas, oil or coal.

When you burn anything it produces byproducts, besides heat itself, and the main one of these is carbon dioxide. (Named possibly after its inventor, Carmen Dioxide, who made the fizz in Coca-Cola possible.) This CO_2 goes into the air, where at least half of it stays and forms a blanket that keeps us all from freezing to death because it traps the sun's reflected warmth. The other half is absorbed into the ocean and the forests mostly in the Northern Hemisphere. But looking at the half that stays around gives you these results:

- In 1100 AD, until about 1800 AD, there were 280 parts per million of CO_2 in the atmosphere. By 1950 there were 370 parts per million. The scientific name for this is "big increase." The head of the PEW Foundation (perhaps named that way because of the air in Philadelphia) says that, for years, people were alarmed that the concentration might reach double the pre-industrial revolution number by this mid-century. But they now think it could triple by the end of the century.

- This got foreigners so upset they went to Kyoto, Japan to have a convention. As you know, Japan has been in a 10-year slump and needed the business. They drafted a treaty called, not too creatively, the Kyoto Treaty and then went home. The treaty said everybody agreed to get their carbon dioxide emissions down to levels that were prevalent in 1990. This would not reverse the trend of rising CO_2, but it would slow it. So they hoped.

  Because foreigners have been involved, the United States, under the leadership of the Bush Administration, failed to endorse it.

- Then a surprising thing happened. Even though the Bush Administration had opposed it, people of liberal persuasion began to agree that it wasn't any good anyhow. The reasons were threefold:

  1. There was an exemption for poorer, less developed nations for whom many felt sorry. But the result would be that many things that created carbon dioxide would simply be moved to those nations. So worldwide carbon dioxide would not be reduced, but maybe your friendly neighborhood steel mill would move even quicker to China and you might have to go to Sierra Leone to barbeque hamburgers.

  2. Even if people were willing to play the Jimmy Carter role and go around in sweaters and jog to work ... it wouldn't make much difference in the rate of increase of global temperature. Because the momentum is so great. That is the scary part.

  3. By setting severe seeming deadlines for CO_2 reduction, Kyoto made it seem likely that useful things like older cars and existing power plants would need to be scrapped, which flies in the face of economic practicality.

Still, Kyoto got the issue more on the table. It is argued that if we don't do something, it isn't just the polar bear that will be impacted. For instance, much of the world's land, due to poor urban planning, was located in northern Canada and Russia where it is enveloped by permafrost. Good news, you might think. As the world gets warmer we will turn this land into farms and subdivisions. Maybe not. The permafrost contains a lot of methane and peat. And it is pretty dry. So if it thaws you can get peat fires, which are hard to put out and that means more Co_2 and methane is an even worse greenhouse gas than Co_2 so you make things maybe worse. Even more frightful news is that environmental groups like World Watch are running vacation tours to view this permafrost melt and your wife's friends may talk you into one of these trips.

Mankind is superior to all the other animals in inventiveness. Which means man alone is best able to come up with non-solutions to real problems.

We will explore six of these:

1. The California friendly hydrogen car. The idea here is to create a small, slow car that runs on a fairly explosive fuel (which is why America West or anybody else is not running the Hindenburg Zeppelin anymore). But to get the hydrogen you have to use electricity, which we mainly make from coal, which is worse than burning gasoline. Of course, if ... if you use electricity made from solar power and your car doesn't get hit by a semi, it would slow the rate of CO_2 increase by a little bit.

2. Solar energy itself, which actually is now almost economically competitive in remote areas. Some think it could compete in 30 years. If so, in theory, a square 200 miles on a site in the middle of Saudi Arabia or Death Valley might produce enough energy to meet most of our needs. And there are graphs that show this might work in *theory* if the price of fossil fuel goes up enough to make such a scheme competitive. And maybe if the Red Seas can be parted again to string lines. Or if you go to live in a place called "In Theory."

3. Nuclear power, which is perhaps the best idea if we can first get rid of two groups: (A) hysterical people who think the nuclear power plants are more dangerous than digging coal and breathing smoke and (B) foreigners who are likely to do unpleasant things with the leftover fuel.

4. It is said that nuclear fusion, combining two atoms of hydrogen to make helium, could supply even more power than we can safely use. But we are reportedly only 10% of the way to getting lasers powerful enough to make it happen.

5. Windmills which, besides being capital intensive and loud, draw forth protestors who object to the birds being killed by the hundreds. But more importantly, they are not terribly efficient from a cost standpoint.

6. Go for simple ideas like sequestering much more CO_2. Sequestering is a word you will hear more about. It means capturing more of the CO_2 by locking it in the ocean or in forests. Actually, about half of the CO_2 we produce each year is absorbed in some fashion, but only half. Although forests are increasing in northern latitudes (and this is good because tropical rain forests don't help you much with all their decay), they can't do the job alone. And nobody is very confident about the ocean, except they know it takes a long time to lock up CO_2. Meanwhile, the ocean is slowly heating up, which could divert the Gulf Stream and make France and Germany less habitable. Which would not cause Secretary Rumsfeld to shed any tears. However, it could have all sorts of consequences for sea life. You must remember that many scientists believe that if you go back far enough all of us are descended from sea life. Even those few of you whose ancestors came from good families.

   Many of you think that the ocean was invented by Realtors to sell higher priced ocean front condos. But that's only partially true. It has other uses. Since we are talking about the ocean, it should be mentioned that the rising sea is another major fear. And projections vary quite a bit from ho-hum to panicky. But not here in Ohio. On the coast, beach erosion is already prevalent, but most of the sea rise to date is simply due to warm water being more expansive than cold. The much feared glacier runoff hasn't yet had much impact. But it will. For instance, Glacier National Park probably won't have any glaciers 70 years from now.[2] Only the surface of the ocean has been warmed so far ... as warmth penetrates deeper we could lose lower Manhattan and Florida, which might or might not be a good idea. The rule of thumb is ... for every inch of sea rise, the beach loss is 50 to 200 times larger.[3]

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[2] A question from the Kit Kat audience was ... "What should we call the park if all the glaciers go away?" Upon reflection, I think a good title could be the Hillary R. Clinton Empty Place.

[3] Nothing engenders more vivid controversy than sea level issues. That's because you can't see a degree of centigrade, but 16 feet of seawater is something you can envision. Especially if it is envisioned as moving like the intro shots on "Hawaii Five-O". The water stored as ice is in Greenland and Antarctica. Ice in the ocean doesn't count because it is already displacing seawater. Estimates vary from article to article, ranging from a few centimeters a year to meters per year. (A meter is a thing mostly used by foreigners, so maybe it wouldn't affect us anyhow.) Obviously, the minimizers focus on the low number and the alarmists on the higher. Let's look at the alarmists view. Just because they are alarmists doesn't make them wrong. When a big slab of the Larsen B ice shelf in Antarctic collapsed a few months ago, they got new courage. They noted that when even sea ice breaks off it could hasten the melt of land ice that lies behind it. West Antarctic ice, if it all melted, would raise the sea level by five meters. A scientist from University of Wisconsin (a place that has won few Big Ten football titles, we add) says that this would cause two billion people to retreat inland. That's more people than there were when I was born. So you may want to keep your car gassed pretty full. However, the Future Society folk conclude that melt is more likely to add one meter over 500 years. (If you can't yet decide about gassing up, read The *Scientific American* Dec. 2002.)

The seemingly preferred solution is to address the problem in two ways:

1. Quibbling with the supporting theory; or

2. If you sort of believe the supporting theory, start now to take small measures that partly satisfy protestors and advocates and divert attention. But this approach does get public policy started along a constructive track.

Quibblers can always say that science isn't yet conclusive. That is a good thing to say because it is usually true. Cigarette companies, for instance, argued this successfully for about two decades. Of course, they were successfully arguing this in courts, which are dominated by lawyers. In the real world, your high school coach knew the answer on smoking a long time ago. But nobody ever put "the coach says don't smoke" in all the ads.

However, there is an emerging consensus that warming really is a problem and that at least some of it is man made. There is a debate over how much because the world has always gone through climate cycles and because there is a possibility that sunspots may account for some climate change.

Giant computers have helped the science and the controversy about it along. By putting in more data than the normal mind can comprehend, and projecting it far enough, some bewildering array of future projections is possible. The biggest computer is at Headley in England, and the USA has been criticized for not investing in comparable research facilities. The feeling being that since we produce a plurality of the world's Co_2 with only a sliver of its population, we should act as though we care more. And because we don't, the foreigners have ganged up and formed an international organization called the International Panel on Climate Change (IPCC). If you look at their reports over the last 10 years, there is a rising emotional trend of alarm.

Country	Cars Owned per 1000 Population	Population Millions	Per Capita Energy Consumption Kg coal equivalent
USA	486.0	274.0	11,487
China	3.2	1,256.7	1,012
India	4.5	982.2	424
Hungary	229.0	10.1	3,661

Source: The Economist

Coincidentally, the rising trend of alarm went on in the hottest decade that has been recorded since thermometers became fashionable. Perhaps not coincidentally.

The crux of the argument seems to be when and whether the world temperature will rise nine degrees. To make it sound better, they talk about it in centigrade, five degrees. Over five degrees centigrade worldwide, even the skeptics admit that the wheels may begin to come off the climate car. In some northern latitudes, average temperatures have already risen that much. But not worldwide. So when might this happen? Some of the more pessimistic projections show it happening by the end of this century, commonly called the 21st Century for those of you who have been out of town. But the base projection shows that it is probably 240 years from now, if we do nothing much. The EPA says Ohio could be two degrees or more centigrade warmer by 2100. For increases above five degrees centigrade, the studies indicate that agriculture cannot adapt well. And there is a chorus of those who claim the weather patterns will get very messy because of El Nino, hurricanes, more floods in Bangladesh, and more drought elsewhere.

The trend is not reversible short term even if we go back and adopt the Kyoto limit on CO_2 --- nor even if we go beyond that, as Tony Blair says we must. Because the CO_2 is already in the air and the deep ocean temperature change will maybe not reverse for centuries. So you can put anti-SUV stickers on your car, stop eating meat, wear sweaters all winter, and turn off the air conditioner in the summer, and this is no more than tokenism. But you aren't going to even do that much and you know it, and neither is your neighbor.

One of the potential benefits of environmental activism is that it has raised public consciousness. Still, by exaggerating possible dangers, some credibility is lost. What follows below is a quite recent real life example of the debate between colleagues of Jack Welch, former chair of General Electric and a recognized spokesman on Domestic Relations, and some of his Catholic shareholders.

• Shareowner Proposal No. 3

Catholic Healthcare West, 1700 Montgomery Street, Suite 300, San Francisco, CA 94111-1024, and other filers have notified us that they intend to submit the following proposal at this year's meeting:

"Whereas: The Environmental Protection Agency has stated that electricity generation is responsible for 40% of man-made carbon dioxide, the leading greenhouse gas, as well as 25% of nitrous oxides, 67% of sulfur dioxide, and 34% of mercury emitted annually nationwide. (2000)

"The Intergovernmental Panel on Climate Change has found 'new and stronger evidence that most of the warming observed over the last 50 years is attributed to human activity.' (IPCC, 2001):

"Growing evidence indicates that environmental damage from fossil fuel burning will be major and worldwide. Threats to human health and habitats include (IPCC, 2001):

– widespread increase in the risk of floods inundating the homes of tens of millions of people, resulting in an increased drowning, disease and, in developing countries, hunger and malnutrition;
– increases, in some geographic areas, in droughts, floods, landslides, intense storms, heat waves and incidences of water-borne (cholera) and vector-borne diseases (malaria); and
– irreversible damage to vulnerable ecosystems, with increased risk of extinction of some more vulnerable species and a loss of biodiversity.

"In July 2001, 178 nations signed the Bonn agreement, requiring industrialized nations to reduce greenhouse emissions to 5.2% less than 1990 levels, by 2008. (*Wall Street Journal*, 7/24/01)

"Companies with top-rated environmental records are faring significantly better financially than those with worse records. From 1997-2000, they had 3.53% higher annual returns on investment than a broader universe of companies and 7.80% higher annual returns than companies with low-rated environmental records. (QED International, 2001) Between 1998-2000, 'the stock price of the more environmentally friendly top half outperformed the bottom half by ... 17.2% in U.S. petroleum and 12.4% in U.S. electric utilities.' (*Barrons*, 8/6/01)

"Addressing the President, 39 top religious leaders have written, '... global warming is a scientific fact ... More investment in renewable energy and fuel efficiency is now a moral imperative, especially because these are technologically feasible and economically viable.' (National Council of Churches, 5/21/01)

"We believe that good stewardship of our resources requires that we reduce polluting emissions when possible and prudent.

"Resolved: that the Board of Directors report (at reasonable cost and omitting proprietary information), to shareholders on the greenhouse gas emissions from our company's own operations and products sold, including; steps the company can take to reduce emissions of greenhouse gases substantially; recommendations for steps the appliance ~~manufacturing industry~~ can take to collectively reduce emissions of greenhouse gases substantially, and plans, if any, to support energy-efficient appliance standards.

"Supporting Statement: The Intergovernmental Panel on Climate Change has found that the world must reduce its carbon fuel emissions significantly to re-stabilize the climate. We believe this will require the Company's support of (a) increasing energy-efficient appliance standards; (b) asking DOE not to roll back the increased federal energy-efficiency standard; and (c) strong energy codes for residential and commercial buildings."

Our board of directors recommends a vote against this proposal.

GE is a leader in developing and implementing energy efficient, emission reducing technologies in our products and facilities. Our gas turbines are one of the most highly efficient means of generating electricity. Our new series of locomotive is the most efficient diesel electric locomotive ever, and meets 2005 federal air emissions standards two years before they become effective. We are one of the leading suppliers of "Energy-Star", energy-efficient lighting products and home appliances. GE Lighting was named as the 2002 Energy Star "Partne of the Year" by the U.S. Department of Energy. Our most powerful aircraft engine, the GE 90, burns less fuel for each pound of thrust than previous generation engines, and we are involved in developing an even more fuel efficient engine. In 2002, we entered the wind power business and continue to be a leader in research and development of fuel cells. We also have committed $50 million over ten years to fund a Stanford University research project on new energy supply options to reduce carbon emissions. In addition, we are conducting an inventory of GE's greenhouse gas emissions in 2003. We also are participating in industry initiatives in the United States to voluntarily reduce the intensity of greenhouse gas emissions from our operations over the next decade. Because we are already addressing the issues raised in this proposal, and energy efficiency is a key goal of our products and our operations, we do not believe that creating the type of report requested by the proponents would help us reduce our emissions or improve our environmental performance. Therefore, we recommend a vote against this proposal. "

- Excerpt from GE's Notice of 2003 Annual Meeting and Proxy Statement

From Whence Cometh Hope?

To put it simply ... it depends on whether you assume the long term projection curves are linear, going ever upward, or if they peak at some point in this century and start a gradual descent. Growing environmental awareness and action can cause some retarding in the rate. Plant more oak trees, make gasoline engines more efficient, and figure out how to make coal burning cleaner for power plants.

But part of the answer must come from economics. That alone should concern you because it means we will all have to listen to more guys like Alan Greenspan.

It does seem clear that a meaningful start should be made. It is also clear that it will take world cooperation.

Conservative folk bet that world economic progress is more of the answer than the problem. That's also what underdeveloped nations argue. They want to build smoky plants to improve their economy. And even if you don't, it is hard to cure the desire of humans to live economically better, so they will push in that direction. By mid-century, the Chinese economy will be bigger than ours, and a couple decades later the Indian economy. By the end of this century, the average world citizen will perhaps be economically as well off as the Europeans are today. And it is only the well off who can afford the seeming luxury of investing in long term solutions that put no rice in the bowl now.[4]

Moreover, prosperity, which increases production of many things that hurt the environment, also brings about helpful behavioral changes. For instance, the UN projections are now showing that even in undeveloped nations the birthrate is falling to levels that are more like America in the early 1900s. Europe is not even replacing its population; and the non-Hispanic white population in this country probably isn't either. But more importantly, other world populations are following the same trend:

- In Europe, as recently as 1960, the average fertility rate -- mostly among women -- was 2.6. Whereas in underdeveloped countries it was 6.0. Now the rate in underdeveloped countries is 2.9, almost down to where Europe was in our lifetime. (The U.N. does not keep data on the fertility rate among men, which is just one of the U.N. problems.)[5]

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[4] If you want to minimize the problem, view the paperback version of The Skeptical Environmentalist by statistician Bjorn Lomborg, a Dane (but not the kind that jumps up on you and licks your face). The book has a lot of data, graphs and opinions. But you should know that his Danish colleagues accuse him of being misleadingly selective in his source selections. Conservatives appointed him head of Denmark's Institute for Evaluating the Environment. I had never known Denmark was big enough to have an environment. But the Danish science community got together and issued a report saying his study was sort of dishonest. And an economist from St. Andrews said it was "a scam." (Note: Academics are not always nice to each other.) But it is interesting.

Then if you want a potentially more panicky view, read Al Gore's stuff. As you may recall, Al Gore is a man who, simply due to the voters of New York City, went over the top on the nationwide popular Presidential vote. But as we say in the South, on occasion the blinded hog finds the acorn of truth.

[5] The End of Polish Jokes? The USA has projected population trends quite different from the rest of the developed world. By 2050, the U.S. is projected to grow to 420 million; an increase from today's 288 million (and the 132 million I recall from Georgia grade school textbooks). By contrast, the population of Poland is expected to decrease by 12.8%. Not to mention Russia and Japan, both of which may see 18.5% decreases. Racial and ethnic minorities contribute 42% of all U.S. births, whereas Poland and Japan have very low Hispanic immigration, among other things.

Once it was feared that the growth in population could outrun the food supply. This was not just Malthusians ... it has been a more recent revival because per acre yields were leveling off. Generally, mankind appropriates about 40% of the biomass of photosynthesis on earth. We eat the food, kill the cattle that also eat the food, write on the tree paper and pick and smell the flowers. So it was feared that if population doubled and yields plateaued, we could be taking up 80% of the biosphere's photosynthesis production, and about 20% you can't get or use. But if population levels out, then this fear recedes.

Meanwhile, technology, which responds to economics, will bring down the price of fuel cells and other forms of energy and demand will raise the price of fossil fuels, which will spur conservation. As the price goes up, the incentive to technically conserve increases. So some would advocate taxing fossil fuel more to accelerate this trend. And maybe nuclear power can be managed and developed.

What's lacking is a rationale for assessing the value of tradeoffs. How much does an environmental restriction on World Citizen A postpone the eventual prosperity of World Citizen B? This can be measured in two ways: (1) dollars or, to some extent, (2) impact on human life. We have all read of things like the snail darter holding up a supposedly useful dam for several years. What we lack is a good policy framework for resolving these tradeoff issues. The answer lies in the direction of recognizing both the problem and also getting world prosperity up to a level where the luxury of investing in the future of the environment will seem more affordable.

When we calculate costs in terms of human life, things get even fuzzier than when we use money. Which is a good reason to use money. **Which 5/3 Bank will lend to you** if you want some. But some scientists have calculated that if one were rational they might look at the odds of, say, reducing one's lifespan by one millionth. There are some published estimates of how to reduce one's life by one millionth. For instance, living within 20 miles of a nuclear power plant for 150 years. Or traveling 300 miles by car. Or spending three hours in a coalmine. Or, and I hate to tell you this, living just two days in New York. Or eating 40 tablespoons of peanut butter. Or smoking two cigarettes.

In sum, there is an undeniable problem. It is also clear that any major solution will take more international cooperation than the world has been able to muster so far. Even when we get treaties on simple things such as stop killing whales, major powers like Iceland and Norway don't go along. Those of you who own television sets may have noticed that lately world cooperation seems to be a little tattered. But some starts need to be made. Whether it is better to start with a grand design and tiptoe toward it, or start in small ways and build, is debatable.

So, to return to the title, there is an alarming long term but accelerating problem out there. You will hear more about it as the oil fields catch fire. The global warming issue will cost the global purse money to fix. How we get the money and the international cooperation, and how we establish priorities to spend it on our environment, are major issues for you to ponder as you drive home in your SUV.

Other Readings

We would confess to having read some East Coast publications (an essay in Harvard Magazine by an editor named Shaw, and an interesting speech by Eileen Claussen, a very capable woman who is a leader of the PEW Foundation). PEW also has a paper on some practical near term steps America could take to start moving ... such as speeding up the use of natural gas and making engines more efficient.