EXHIBIT 35

The Only Thing This Treaty Cools Down Is America's Economy.

This could really hurt.

On December 1st there will be a United Nations meeting in Kyoto, Japan. The U.S. will be asked to sign a global climate treaty that could increase our energy costs by 20% or more. According to independent economic analysts we could pay 50 cents more for every gallon of gasoline and 25 to 50% more for electricity and natural gas.

Higher energy prices mean higher costs for manufacturing, farming, and transportation. American goods would be more expensive, here and abroad. This treaty could make us less competitive in the global economy and cost America jobs.

If it's not global, it won't work.

If they get their way, countries responsible for almost half the world's greenhouse gas emissions won't cut back on energy use at all. 134 of 168 countries, including China, India and Mexico, would be entirely exempt. So we'll pay the price for reducing emissions while countries with rapidly growing economies get a free ride.

That won't help the environment, but it will hurt America's economy.

Mr. President, don't sign a treaty that hurts our economy.

The U.S. doesn't have to rush into signing this treaty. We can continue negotiations, and come up with an agreement that requires the whole world to be involved and doesn't hurt our economy.

To get more information and find out how you can get involved, call toll free or log on today:

1-888-54 FACTS
www.climatefacts.org

Paid for by: A. Philip Randolph Institute, American Automobile Manufacturers Association, American Corn Growers Association, American Farm Bureau Federation, American International Automobile Dealers Association, American Iron and Steel Institute, American Petroleum Institute, American Plastics Council, The American Portland Cement Alliance, American Sheep Industry Association, American Trucking Associations, Association of American Railroads, The Center for Energy and Economic Development, Chemical Manufacturers Association, Coalition for Vehicle Choice, Edison Electric Institute, The Fertilizer Institute, Global Climate Coalition, National Association of Farmer Elected Committeemen, National Association of Manufacturers, National Automobile Dealers Association, National Black Chamber of Commerce, Inc., The National Cattlemen's Beef Association, National Farmers Union, National Grange, National Mining Association, National Rural Electric Cooperative Association, The Seniors Coalition, The Small Business Survival Committee, Texas Conference of Black Mayors, Inc., United Brotherhood of Carpenters, AFL-CIO, United Mine Workers of America, AFL-CIO, United States Hispanic Chamber of Commerce, United Transportation Union, AFL-CIO, U.S. Chamber of Commerce

THE U.N. GLOBAL CLIMATE TREATY ISN'T GLOBAL

CHECK IT OUT FOR YOURSELF: 1-888-54FACTS or www.climatefacts.org

Americans Will Pay the Price

The United Nations is negotiating a climate treaty that will require severe restrictions on the amount of energy we use. And it puts the entire burden on the U.S. and a few other countries.

50 Cents More for Every Gallon of Gasoline

Economists predict that reducing our energy use by more than 20% will require price increases for most types of energy. Natural gas could go up 45%, electricity costs could increase by 20%, and gasoline prices could go up by 50 cents a gallon.

Most Countries Are Exempt

Americans will pay more for everything that requires energy to transport or manufacture, while 132 of 166 countries, including India, China and Mexico, are exempt.

It's Not Global and It Won't Work.

Paid for by A. Philip Randolph Institute, American Automobile Manufacturers Association, American Corn Growers Association, American Farm Bureau Federation, American International Automobile Dealers Association, American Petroleum Institute, American Plastics Council, American Portland Cement Alliance, American Trucking Associations, American Sheep Industry Association, Association of American Railroads, Center for Energy and Economic Development, Chemical Manufacturers Association, Coalition for Vehicle Choice, The Fertilizer Institute, Global Climate Coalition, National Association of Farmer Elected Committeemen, National Association of Manufacturers, National Automobile Dealers Association, National Black Chamber of Commerce, Inc., National Cattlemen's Beef Association, National Farmers Union, National Grange, National Mining Association, National Rural Electric Cooperative Association, The Seniors Coalition, The Small Business Survival Committee, United Brotherhood of Carpenters, AFL-CIO, United Mine Workers of America, AFL-CIO, United States Hispanic Chamber of Commerce, United Transportation Union, AFL-CIO.

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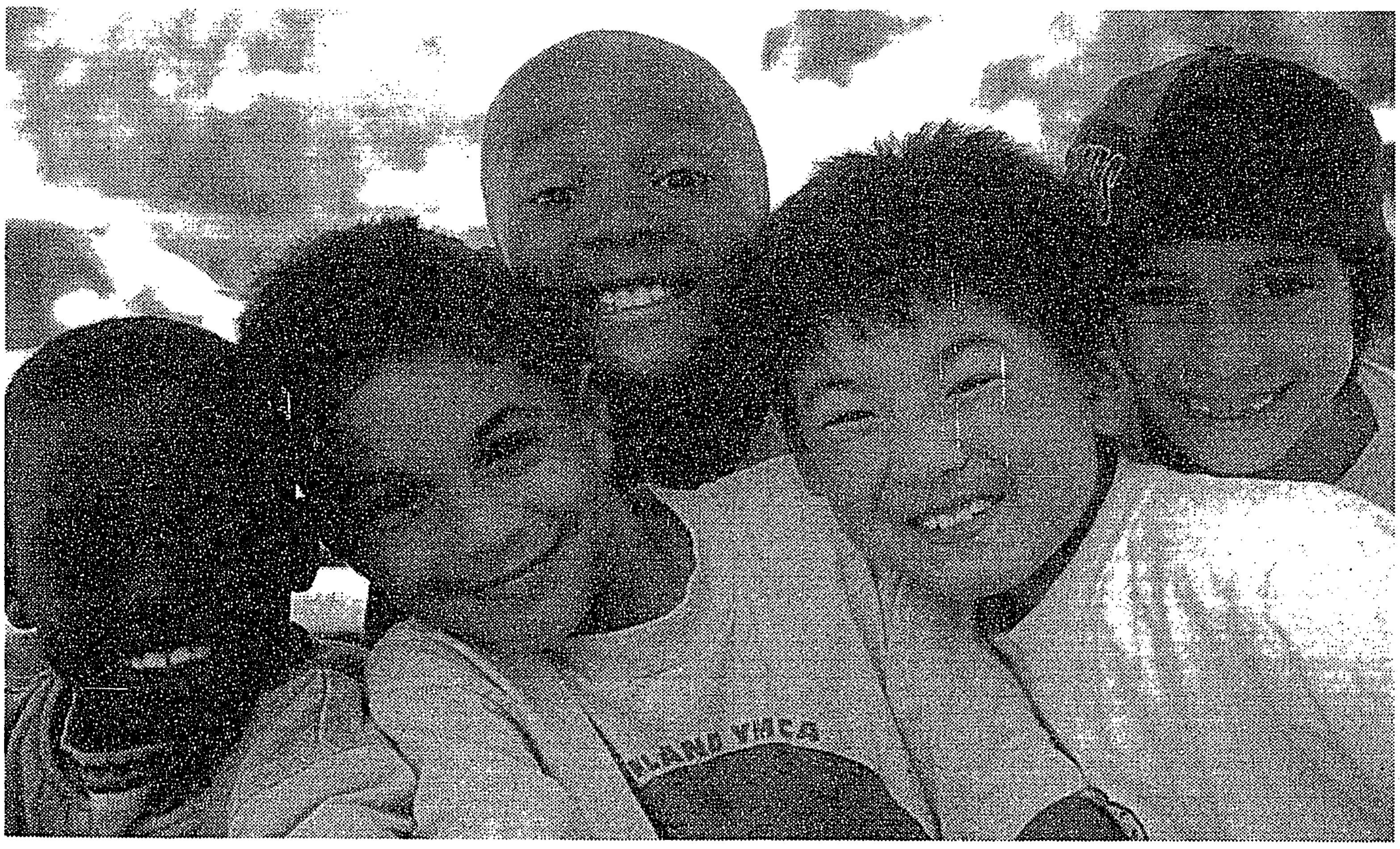
New York Times (1923-Current file); Jun 19, 1997;
ProQuest Historical Newspapers: The New York Times (1851-2007) with Index (1851-1993)
pg. B5

Americans Work Hard For What We Have, Mr. President.



Don't Risk Our Economic Future.

Generations of American families have worked hard to make America's economy the strongest in the world.

But that success – and the economic security of our future generations – is suddenly at great risk.

Because right now, our world competitors – countries like China, India, Mexico, and Brazil – are pressuring the United States to support a U.N. global climate agreement that would force American families to restrict our use of the oil, gasoline, and electricity – that heats and cools our homes and schools, gets us to our jobs, and runs our factories and businesses. We'd have to pay more for energy, and, in turn, prices for goods and services would rise.

The big countries that compete with America for jobs, trade, and economic security have everything to gain and nothing to lose. Because according to a prior agreement, they won't have to make the sacrifices Americans are expected to make. This also means America's sacrifices will not produce environmental gains.

That simply isn't fair, or effective.

The climate agreement that President Clinton is under pressure to sign has a big price tag – mostly for American families.

It's a bad deal for America. Today. *And* tomorrow.

A message from members of **The Global Climate Coalition**

1331 Pennsylvania Ave., N.W., Suite 1500 North Tower, Washington, DC 20004 (202) 637-3162 www.globalclimate.org

EXHIBIT 36

Joe Walker

TO: Global Climate Science Team
CC : Michelle Ross: Susan Moya
Subject: Draft Global Climate Science Communications Plan

As promised attached is the draft global climate science Communication Plan that we developed during our workshop last Friday. Thanks especially to those of you who participated in the workshop, and in particular to join Adams for his very helpful though following up our meeting, and Alan Caurdill for tuning around the notes from our workshop so quickly

Please review the plan and get back to me with your comment as soon as possible.

As those of you who were at the workshop know we have scheduled a follow-up team meeting to review the plan in person on Friday, April 17, from 1 to 3 pm. at the API headquarters. After we hope to have a "Plan champion" help us move it forward to potential funding sources, perhaps starting with the global climate "Coordinating Council - that will be an item for discussion on April 17.

Again thanks for your hard work on this project. Please email, call or fax me with your comment. Thanks

Regards,
Joe Walker

Global Climate Science Communications

Action Plan

Project Goal

A majority of the American public including industry leadership, recognizes that significant in certainties exit in climate science, and therefore raises questions among those (e.g, Congress) who chart the future U. S. courts on global climate change.

Progress will be measured towards the goal. A measurement of the publics perspective on climate science will be taken, before the plan is launched, and the same measurement will be taken at one or more as yet-to-be-determined intervals as the plan is implemented

Victory Will Be Achieved When

- Average citizens "understand" (recognize) uncertainties in climate science; recognition of uncertainties becomes part of the "conventional wisdom"
- Media " understands" (recognizes) uncertainties in climate science
- Media coverage reflects balance on climates science and recognition of the validity viewpoints that challenge the current "conventional wisdom"
- Industry senior leadership understands uncertainties in climates science, making them stronger ambassadors to those who shape climate policy
- Those promoting the Kyoto treaty on the basis of extant science appear to be out of touch with reality.

Current Reality

Unless "climate change" becomes a non-issue, meaning that the Kyoto proposal is defeated and there are no further initiatives to thwart the threat of climate change, there may be no in comment when we can declare victory for our effort. It will be necessary to establish measurement for the science effort to track progress toward achieving the goal and strategic success

Because the science underpinning the global climate change theory has not been challenged effectively in the media or through other vehicles reaching the Amen can public; there is widespread ignorance, which works in favor of the Kyoto treaty and against the best interests of the United States. Indeed, the public has been highly receptive to the Clinton Administration's plans. There has been little, if any, public resistance or pressure applied to Congress to reject the treaty, except by those "inside the Beltway" with vested interests.

Moreover, from the political viewpoint, it is difficult for the Unites States to oppose the treaty solely on economic grounds, valid as the economic issues are. It makes it too easy for other to portray the Unites States as putting preservation of its own lifestyle above the greater concerns of mankind. this argument in turn forces our negotiators to make concessions that have not been well thought through, and in the end may do far ,more harm than good. This is the process that unfolded at Kyoto, and is very likely to be repeated in Buenos Aires in November 1998.

The advocates of global warming have been successful on the basis of skillfully misrepresenting the science and the extent of agreement on the science, while industry and its partners ceded the science and fought on the economic issues. Yet if we can show that science does not support the Kyoto treaty — which most true climate scientists believe to be the case — this puts the United States in a stronger moral position and frees its negotiators from the need to make concessions as a defense against perceived selfish economic concerns.

Upon this tableau, the Global Climate Science Communications Team (GCSCT) developed an action plan to inform the American public that science does not support the precipitous actions Kyoto would dictate, thereby providing a climate for the right policy decisions to be made. The team considered results from a new public opinion. survey in developing the plan.

Charlton Research's survey of 1,100 "informed Americans" suggests that while Americans currently perceive climate change to be a great threat, public opinion is open to change on climate science. When informed that "some scientists believe there is not enough evidence to suggest that [what is called global climate change] is a long-term change due to human behavior and activities," 58 percent of those surveyed said they were more likely to oppose the Kyoto treaty. Moreover, half the respondents harbored doubts about climate science.

GCSCT members who contributed to the development of the plan are A- John Adams, John Adams Associates; Candace Crandall, Science and Environmental Policy Project; David Rothbard, Committee For A Constructive Tomorrow; Jeffrey Salmon, The Marshall Institute; Lee Ganigaru Environmental Issues Council; Lynn Bouchey and Myron Ebell, Frontiers of Freedom; Peter Cleary, Americans far Tax Reform; Randy Randol, Exxon Corp.; Robert Gehrl, The Southern Company; Sharon Kneiss, Chevron Carp; Steve Milloy, The Advancement of Sound Science Coalition; and Joseph Walker. American Petroleum Institute.

The action plan is detailed on the following pages.

April 3,1998

Global Climate Science Communications

Action Plan

Situation Analysis

In December 1997, the Clinton Administration agreed in Kyoto, Japan, to a treaty to reduce greenhouse gas emissions to prevent what it purports to be changes in the global climate caused by the continuing release of such emissions. The so-called greenhouse gases have many sources. For example, water vapor is a greenhouse gas But the Clinton Administration's action, if eventually approved by the U5.Senate, will mainly affect emissions from fossil fuel (gasoline, coal, natural gas, etc.) combustion.

As the climate change debate has evolved, those who oppose action have argued mainly that signing such a treaty will place the U.S. at a competitive disadvantage with most other nations, and will be extremely expensive to implement. Much, of the cost will be borne by American consumers who will pay higher prices for most energy and Transportation.

The climate change theory being. advanced by the treaty supporters is based primarily on forecasting models with a very high degree of uncertainty. In fact, it not known for sure whether (a) climate change actually is occurring, or (b) if it is, whether humans really have any influence on it.

Despite these weaknesses in scientific understanding, those who oppose the treaty have done little to build a case against precipitous action on climate change based on the scientific uncertainty. As a result, the Clinton. Administration and environmental groups essentially have had the field to themselves. They have conducted an effective public relations program to convince the American public that the climate is changing, we humans are at fault, and we must do something about it before calamity strikes.

The environmental groups know they have been successful. Commenting after the Kyoto negotiations about recent media coverage of climate change, Tom Wathen, executive vice president of the National Environmental Trust, wrote:

“.. As important as the extent of the coverage was the tone and tenor of it- In a change from just six months ago, most media stories no longer presented global warming as just a theory over which reasonable scientists could differ. Most stories described predictions of global warming as the position of the overwhelming number of mainstream scientists. That the environmental community had, to a great extent, settled the scientific issue with the U.S. media is the other great success that began perhaps several months earlier but became apparent during Kyoto.

Strategies and Tactics

I. **National Media Relations Program: Develop and implement a national media relations program to inform the media about uncertainties in climate science; to generate national, regional and local media coverage on the scientific uncertainties, and thereby educate and inform the public, stimulating them to raise questions with policy makers**.

Tactics: These tactics will be undertaken between now and the next climate meeting in Buenos Aires, Argentina, in November 1998, and will be continued thereafter, as appropriate. Activities will be launched as soon as the plan is approved, funding obtained, and the necessary resources (e.g., public relations counsel) arranged and deployed. In all cases, tactical implementation will be fully integrated with other elements of this action plan, most especially Strategy II (National Climate Science Data Center).

- Identify, recruit and train a team of five independent scientists to participate in media outreach. These will be individuals who do not have a long history of visibility and/or participation in the climate change debate. Rather, this team will consist of new faces who will add their voices to those recognized scientists who already are vocal.

- Develop a global climate science information kit for media including peer-reviewed papers that undercut the "conventional wisdom" an climate science. This kit also will include understandable communications, including simple fact sheets that present scientific uncertainties in language that the media and public can understand.

- Conduct briefings by media-trained scientists for science writers in the top 20 media markets, using the information kits. Distribute the information kits to daily newspapers nationwide with offer of scientists to brief reporters at each paper. Develop, disseminate radio news releases featuring scientists nationwide, and offer scientists to appear on radio talk shows across the country.

- Produce, distribute a steady stream of climate science information via facsimile and e-mail to science writers around the country.

- Produce, distribute via syndicate and directly to newspapers nationwide a steady stream of op-ed columns and letters to the editor authored by scientists.

- Convince one of the major news national TV journalists (e.g., John Stossel) to produce a report examining the scientific underpinnings of the Kyoto treaty.

- Organize, promote and conduct through grassroots organizations a series of campus / community workshops/debates on climate science in 10 most important states during the period mid-August through October, 1998.

- Consider advertising the scientific uncertainties in select markets to support national, regional and local (e.g., workshops/debates), as appropriate.

National Media Program Budget — $600,000 plus paid advertising

II. Global Climate Science Information Source: Develop and Implement a program to inject credible science and scientific accountability into the global climate debate, thereby raising questions about and undercutting the "prevailing scientific wisdom." The strategy will have the added benefit of providing a platform for credible, constructive criticism of the opposition's position on the science.

Tactics: As with the National Media Relations Program, these activities will be undertaken between now and the next climate meeting in Buenos Aires, Argentina, in November 1998, and will continue thereafter. Initiatives will be launched as soon as the plan is approved, funding obtained, and the necessary resources arranged and deployed.

- Establish a Global Climate Science Data Center. The GCSDC will be established in Washington as a non-profit educational foundation with an advisory board of respected climate scientists. It -will be staffed initially with professionals on loan from various companies and associations with a major interest in the climate issue These executives will bring with them knowledge and experience in the following areas:
  - Overall history of climate research and the IPCC process;
  - Congressional relations and knowledge of where individual Senators stand on the climate issue;
  - Knowledge of key climate scientists and where they stand;
  - Ability to identify and recruit as many as 20 respected climate scientists to serve on the science advisory board;
  - Knowledge and expertise in media relations and with established relationships with science and energy writers, columnists and editorial writers;
  - Expertise in grassroots organization; and
  - Campaign organization and administration.

The GCSDC will be led by a dynamic senior executive with, a major personal . commitment to the goals of the campaign and easy access to business leaders at the CEO level. The Center will be run on a day-to-day basis by an executive director with responsibility for ensuring targets are met The Center will be funded at a level that will permit it to succeed, including funding for research contracts that may be deemed appropriate to fill gaps in climate science (e-g., a complete scientific critique of the EPCC research and its conclusions).

- The GCSDC will become a one-stop resource on climate science for members of Congress, the media, industry and all others concerned. It will be in constant contact with the best climate scientists and ensure that their findings and views receive appropriate attention. It will provide them with the logistical and moral support they have been lacking. In short, it will be a sound scientific alternative to the IPCC Its functions will include:
  - Providing as an easily accessible database (including a website) of all mainstream climate science information.
  - Identifying and establishing cooperative relationships with all major scientists whose research in this field supports our position.
  - Establishing cooperative relationships with other main stream scientific organizations (e.g. meteorologists, geophysicist) to bring their perspectives to bear on the debate, as appropriate.
  - Developing opportunities to maximize the impact of scientific views consistent with ours with Congress, the media and other key audiences.
  - Monitoring and serving as and early warning system for scientific developments with the potential to impact on the climate science debate, pro and con.
  - Responding to claims from the scientific alarmists and media.
  - Providing grants for advocacy on climate science, as deemed appropriate.

Global Climate Science Data Center Budget — $5,000,000 (spread over two years minimum)

III. National Direct Outreach and Education: Develop and implement a direct outreach program to inform and educate members of Congress, state officials, industry leadership, and school teachers/students about uncertainties in climate science. This strategy will enable Congress, state officials and industry leaders will be able to raise such serious questions about the Kyoto treaty's scientific underpinnings that American policy-makers not only will refuse to endorse it, they will seek to prevent progress toward implementation at the Buenos Aires meeting in November or through other way Informing teachers/students about uncertainties in climate science will begin to erect a barrier against further efforts to impose Kyoto-like measures in the future.

Tactics: Informing and educating members of Congress, state officials and industry leaders will be undertaken as soon as the plan is approved, funding is obtained, and the necessary resources are arrayed and will continue through Buenos Aires and for the foreseeable future. The teachers/students outreach program will be developed and launched in early 1999. In all cases, tactical implementation will be fully integrated with other elements of this action plan.

- Develop and conduct through the Global Climates Science Data Center science briefings for Congress, governors, state legislators, and Industry leaders by August 1998.

- Develop information kits on climate science targeted specifically at the needs of government officials and industry leaders, to be used in conjunction, with and "Separately from the in-person briefings to further disseminate information on climate science uncertainties and thereby arm these influentials to raise serious questions on the science issue.

- Organize under the GCSDC a "Science Education Task Group" that will serve as the point of outreach, to the National Science Teachers Association (NSTA) and other influential science education organizations. Work with NSTA to develop school materials that present a credible, balanced picture of climate science for use in classrooms nationwide.

- Distribute educational materials directly to schools and through grassroots organizations of climate science partners (companies, organizations that participate in -this effort).

National Direct Outreach Program Budget — $300,000

IV. Funding/Fund Allocation: Develop and implement program to obtain funding, and to allocate funds to ensure that the program it is carried out effectively.

Tactics: This strategy will be implemented as soon as we have the go-ahead to proceed.

- Potential funding sources were identified as American Petroleum Institute (API) and its members; Business Round Table (BKT) and its members, Edison Electric Institute (EE3) and its members; Independent Petroleum Association of America (IPAA) and its members; and the National Mining Association (NMA) and its members.
- Potential fund allocators were identified as the American Legislative Exchange Council (ALEC), Committee For A Constructive Tomorrow (CFACT), Competitive Enterprise Institute, Frontiers of Freedom and The Marshall Institute.

Total Funds Required to Implement Program through November 1998 - $2,000,000 (A significant portion of funding for the GCSDC will be deferred until1999 and beyond)

Measurements

Various metrics will be used to track progress. These measurements will have to be determined in fleshing out the action plan and may include:

- Baseline public/government official opinion surveys and periodic follow-up surveys on the percentage of Americans and government officials who recognize significant uncertainties in climate science.

- Tracking the percent of media articles that raise questions about climate science.

- Number of Members of Congress exposed to our materials on climate science.

- Number of communications on climate science received by Members of Congress from their constituents.

- Number of radio talk show appearances by scientists questioning the "prevailing

- Number of school teachers/students reached with our information on climates science.
- Number of science writers briefed and who repeat upon climate science uncertainties.
- Total audience exposed to newspaper radio, television coverage of science uncertainties.

EXHIBIT 37

A Cleaner Canada

Imperial Oil's chairman examines the state of the environment and finds much to applaud. The fact is, he says, substantial progress has been made

BY ROBERT PETERSON

IT WILL COME AS A SURPRISE TO MANY PEOPLE TO LEARN THAT THE QUALITY OI the environment in Canada has been steadily improving for a long time anc continues to do so. Surveys indicate that a majority of Canadians believe that the environment in this country is deteriorating rapidly. In fact, the historical record shows just the contrary. During the past three decades, air quality, water purity and other important indicators of environmental health have all improved – some of them very substantially

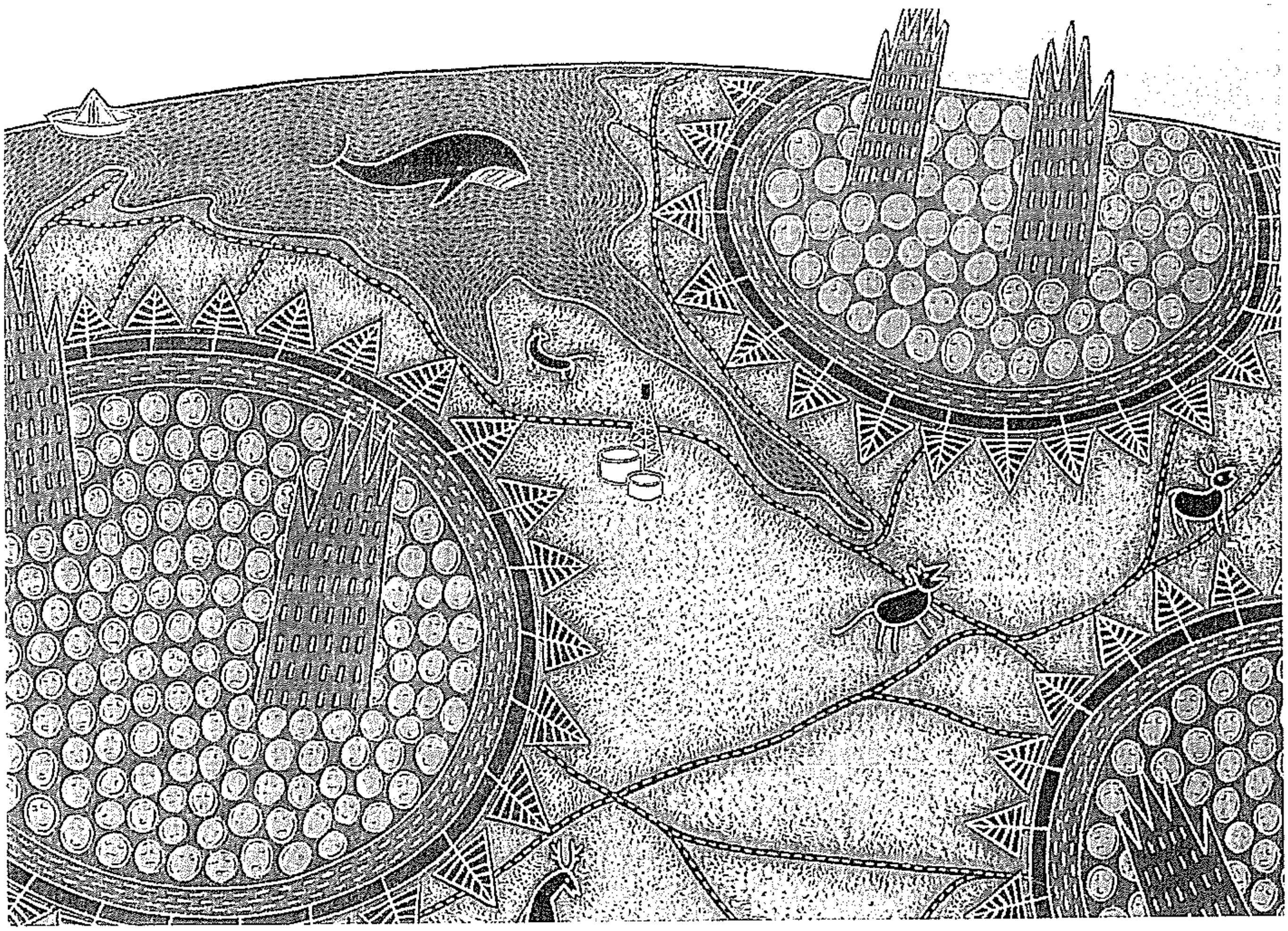
Personally, I would have been very surprised if this had not been the case. Whenever I visit the various sectors of Imperial Oil's operations, I see evidence all around me of what our company is doing to eliminate or minimize pollution and to improve efficiency in its use of resources. In Western Canada, our crude oil and natural gas production operations now generate less waste. Our refineries, which process crude oil into gasoline and many other oil-based products, have substantially improved the quality of the water discharged from operations into sewers as well as their energy efficiency (energy use per unit of output at Imperial refineries has been reduced by more than 20 percent since the mid-seventies). They have also reduced waste. As for the gasoline we manufacture, that too has been changed considerably to minimize atmospheric emissions while, at the same time, providing the motorist with the best possible product.

Over the past 10 years, Imperial has invested $472 million in new processes and procedures designed to be more efficient, use fewer resources and have less effect on the ecology than those used previously. This year alone, Imperial has earmarked $30 million for capital investment directed toward: improving the environment. Like any other investment we make, we expect these expenditures to produce measurable results.

And here, of course, I'm speaking of only one company. In total, Canada's petroleum industr) spent more than $600 million between 1993 anc 1995 on environmental protection. The country': resource industries as a whole committed a total o $3.4 billion over the same period. If this kind o spending hadn't resulted in an improved environment, we'd have been squandering an awful lot o our shareholders' money.

But this considerable investment on the part o Canadian industry *has* produced results. Let's take a quick look at what has happened in some of the more important sectors of the environment.

Among all the environment categories, air quality shows the clearest trend of improvement. The ai we breathe today in this country is, without a doubt cleaner than it was 25 years ago. According to a 199 study produced by the Fraser Institute, an independent Canadian economic and social research organization, five of the six major contributors to atmos



STEPHAN DAIGLE / SIS

pheric pollution, measured in terms of "ambient pollution" (that is, the actual concentration of a pollutant in the air), have shown decreases over the years. For example, levels of sulphur dioxide, a major contributor to acid rain, decreased by 54 percent from 1975 to 1993, while ambient levels of lead in the air decreased by no less than 97 percent between 1975 and 1992, mainly as a result of the phasing out of leaded gasoline. Ground-level ozone, which contributes to urban summer smog, was the only identified substance to show an increase in ambient levels, but even these levels are lower than those indicated as acceptable in federal guidelines. (Ground-level ozone is formed partly as a result of emissions associated with gasoline use.)

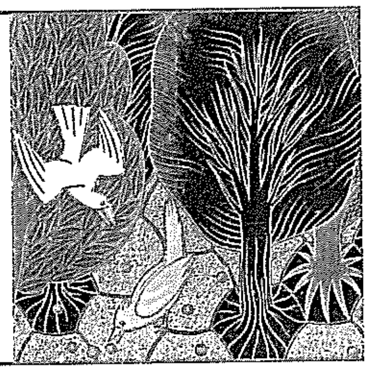
In recent years, Imperial and other companies have worked actively to help governments find practical, cost-effective answers to Canadian air-quality concerns. To help reduce smog, Imperial and other Canadian refiners have progressively lowered the volatility of gasoline sold during the summer. In addition, systems have been installed at fuel distribution facilities to capture emissions caused by evaporation. Refiners have also invested heavily in equipment to produce low-sulphur diesel fuel and to reduce the benzene content of gasoline. All these actions have contributed to the measured improvement in Canadian air quality.

Of course, car manufacturers have also made significant improvements to their products to improve air quality. Since 1970, tailpipe emissions of hydrocarbons and nitrogen oxides – both contributors to ground-level ozone – from new vehicles have been reduced by more than 90 percent. In fact, the situation today is that half of all exhaust pollution comes from 10 percent of vehicles – those that were made in 1988 and before or are poorly tuned. The Ontario government, with the support of the petroleum industry, recently announced the introduction of a motor vehicle inspection and maintenance program, while British Columbia has been operating a pilot program since 1996 to provide financial incentives to get high-polluting vehicles off the road.

Progress in improving water quality is more difficult to measure. While comprehensive statistics for all provinces are unavailable, a 1996 federal government report states that water quality in Canada in general, compared with most countries, remains relatively high. This is particularly true of drinking water – about 87 percent of all Canadians receive treated municipal tap water. (Most problems arise from human consumption of water from untreated sources, such as private wells.)

In recent years, there has also been a greater awareness of the polluting effect of human activities on large bodies of water. The Great Lakes are a case in point. The International Joint Commission, which administers water treaties between Canada and the United States, believes that there is still much work to be done in improving water quality in the lakes. Nevertheless, there are some encouraging trends. While levels of nitrogen have increased in the Great Lakes, they are still well below the threshold for safe drinking water. Levels of phosphorus (which generally enters the water in detergents and fertilizers) have declined by one-third in Lake Ontario and have remained static in Lake Huron and Lake Superior. In fact, I read recently that some people are complaining that Lake Erie has become too clean and that fish stocks are diminishing as a result (phosphorus and nitrogen promote the growth of algae and other plant life, an important link in the Great Lakes food chain).

SINCE 1970, TAILPIPE EMISSIONS OF HYDROCARBONS AND NITROGEN OXIDES FROM NEW CARS HAVE BEEN REDUCED BY MORE THAN 90 PERCENT



One important area in which we have seen a major improvement in water quality is that associated with industrial activities. For example, the petroleum and chemical plants that stretch along the St. Clair River (which connects Lake Huron to the Lower Great Lakes) near Sarnia, Ont., constitute one of the largest industrial concentrations in Canada. A key reason they are located there is so they can draw their water supplies from the river. Imperial's refinery at Sarnia is one such plant, and the workforce there takes great pride in the fact that the water returned to the river after being used is actually cleaner than when it was taken out. In fact, despite all this industrial activity, the water of the St. Clair is today among the cleanest river water in the Great Lakes system, and to keep it that way, industry spends millions of dollars a year on pollution control. Scott Munro, the general manager of the Lambton Industrial Society, which constantly monitors the quality of the water in the St. Clair, says that the river water has shown a steady improvement over the years.

In other key environmental areas, the news is also encouraging. A 1997 joint study by the Fraser Institute and the Pacific Research Institute for Public Policy in the United States found that "in most instances objectives for protecting human health and the environment are being met, pollution and wastes are being controlled, and resources and land are being sustainably and effectively managed. Environmental quality in both Canada and the United States is *improving*, not deteriorating."

The overall conclusion of this comprehensive study was that "fears about increasing environmental degradation in Canada and the United States are unfounded."

Does this kind of report card provide us with any room for complacency? Of course not; there is still much to be done. But I *do* think that we can, as Canadians, take the time to recognize what has been achieved so far. In fact, I think we need to do this so that we can arrive at a realistic assessment of where we stand.

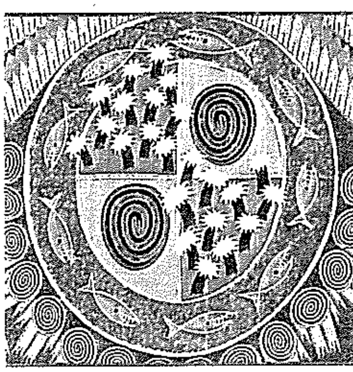
Unfortunately, Canadians rarely get the opportunity to hear the good news. Human nature being what it is, the fact that Canada's air quality has been steadily improving is unlikely to make front-page news. Nor are we likely to hear that kind of good news from those individuals who are convinced that no aspect of the environment is improving and for whom every pronouncement on the subject must be couched in terms of a doomsday scenario. Despite the substantial progress that has been achieved in such key areas as air and water pollution, toxic discharges, acid rain emissions, waste reduction and the recycling of many kinds of material, nearly every statement on the state of the environment appears to be wrapped in gloom and doom. It seems to be politically incorrect to say anything good about it. Little wonder that most Canadians think that things are getting worse even though they are getting better.

This is not meant to be an attack on environmentalists. I respect many of their beliefs and salute their achievements. I think the world as a whole would be in a much sorrier state today if it were not for the efforts of a group of dedicated people who have devoted their time and energy to increasing public awareness of ecological matters and to pushing governments to give priority to the protection of the environment. They have had some notable successes.

I do, however, regret the polarization that has come to characterize relations between the business community and some segments of the environmental movement. Too often, it seems to me, they resemble islands shouting across a sea of misunderstanding, unable – or, perhaps, unwilling – to see each other's point of view.

I believe there is a clear and positive connection between strong economic growth and a healthy environment. Indeed, I view economic growth as a prerequisite for fulfilling the aspirations of all Canadians by providing a better standard of living, advances in education and improved public health, and by generating the funds for the protection of the environment. Some environmental activists, on the other hand, are more inclined to view continuing economic growth as a destructive force, resulting in the depletion of our country's natural resources and damage to the environment.

The link between economic growth – driven largely by fossil fuel consumption – and environmental quality continues to be a subject of great debate. Recently, a major study conducted at Princeton University in the United States attempted to define the link between these two factors. The study found that initially environmental quality declines as a result of economic growth. But as people's incomes rise, a turnaround occurs. At a certain level of per capita income, the quality of the environment improves and continues to improve as incomes rise. This suggests that economic growth and environmental improvement are compatible.



IN FACT, DESPITE ALL THIS INDUSTRIAL ACTIVITY, THE WATER OF THE ST. CLAIR IS TODAY AMONG THE CLEANEST RIVER WATER IN THE GREAT LAKES SYSTEM

FINALLY, I WOULD LIKE TO TURN TO A TOPIC THAT MANY people think is related to air quality and pollution. I refer to global warming. The debate over this controversial issue centres around whether the burning of fossil fuels, by emitting so-called heat-trapping "greenhouse" gases (primarily carbon dioxide), will cause temperatures around the world to rise to the point where we will be faced with a planetary disaster.

It is important to understand that this issue has absolutely nothing to do with pollution and air quality. Carbon dioxide is not a pollutant but an essential ingredient of life on this planet – the plant world cannot live without it. Furthermore, the question of whether or not the trapping of "greenhouse" gases will result in the planet's getting warmer – and I will comment on this shortly – has no connection whatsoever with our day-to-day weather.

Nevertheless, it seems to have become fashionable for some media and environmental groups to lay the blame for every unusual variation in normal weather patterns – whether it be floods in California, tornadoes in Florida or ice storms in eastern Ontario and Quebec – on global warming. This is, quite simply, a fallacy. In fact, the Intergovernmental Panel on Climate Change, which is made up of a group of international scientists, has found no indications that instances of extreme weather have increased in a global sense through the 20th century.

One thing is clear in this debate. There is absolutely no agreement among climatologists on whether or not the planet is getting warmer or, if it is, on whether the warming is the result of man-made factors or natural variations in the climate. As an article in the May 1998 issue of *National Geographic* stated: "If the [warming] trend continues, it could alter climate patterns worldwide....

"Or it might not. Global climate depends on combinations of factors interacting in subtle and complex ways that we do not yet fully understand. It is possible that the warming observed during this century may have resulted from natural variations...."

Nor is there any agreement on whether or not the impact – if the planet does get warmer – will be serious and what should be done about it. There has been no shortage of experts willing to testify for either side in this debate. Space does not allow me to summarize the various scientific arguments that have been marshalled for and against the case for global warming. I will say that given the amount of money and scientific resources that are being allocated to this matter in many countries, I believe that, over time, an answer will emerge that will meet with general consensus among the international scientific community. However, we are a long way from that answer today and, at this stage, I feel very safe in saying that the view that burning fossil fuels will result in global climate change remains an unproved hypothesis.

This thought, however, is not shared by the government of Canada. At an international conference on climate change held in Kyoto, Japan, at the end of last year, the federal government undertook to reduce Canadian emissions of carbon dioxide and

EXHIBIT 38

Petition

We urge the United States government to reject the global warming agreement that was written in Kyoto, Japan in December, 1997, and any other similar proposals. The proposed limits on greenhouse gases would harm the environment, hinder the advance of science and technology, and damage the health and welfare of mankind.

There is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gases is causing or will, in the foreseeable future, cause catastrophic heating of the Earth's atmosphere and disruption of the Earth's climate. Moreover, there is substantial scientific evidence that increases in atmospheric carbon dioxide produce many beneficial effects upon the natural plant and animal environments of the Earth.

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THE WALL STREET JOURNAL THURSDAY, DECEMBER 4, 1997

Science Has Spoken: Global Warming

By ARTHUR B. ROBINSON
And ZACHARY W. ROBINSON

Political leaders are gathered in Kyoto, Japan, working away on an international treaty to stop "global warming" by reducing carbon dioxide emissions. The debate over how much to cut emissions has at times been heated—but the entire enterprise is futile or worse. For there is not a shred of persuasive evidence that humans have been responsible for increasing global temperatures. What's more, carbon dioxide emissions have actually been a boon for the environment.

The myth of "global warming" starts with an accurate observation: The amount of carbon dioxide in the atmosphere is rising. It is now about 360 parts per million, vs. 290 at the beginning of the 20th century, Reasonable estimates indicate that it may eventually rise as high as 600 parts per million. This rise probably results from human burning of coal, oil and natural gas, although this is not certain. Earth's oceans and land hold some 50 times as much carbon dioxide as is in the atmosphere, and movement between these reservoirs of carbon dioxide is poorly understood. The observed rise in atmospheric carbon dioxide does correspond with the time of human release and equals about half of the amount released.

Carbon dioxide, water, and a few other substances are "greenhouse gases." For reasons predictable from their physics and chemistry, they tend to admit more solar energy into the atmosphere than they allow to escape. Actually, things are not so simple as this, since these substances interact among themselves and with other aspects of the atmosphere in complex ways that are not well understood. Still, it was reasonable to hypothesize that rising atmospheric carbon dioxide levels might cause atmospheric temperatures to rise. Some people predicted "global warming," which has come to mean extreme greenhouse warming of the atmosphere leading to catastrophic environmental consequences.

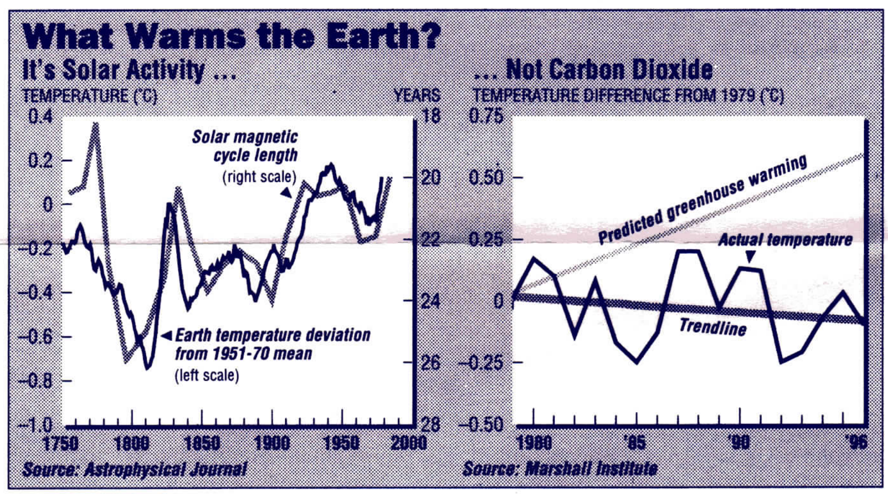
Careful Tests

The global-warming hypothesis, however, is no longer tenable. Scientists have been able to test it carefully, and it does not hold up. During the past 50 years, as atmospheric carbon dioxide levels have risen, scientists have made precise measurements of atmospheric temperature. These measurements have definitively shown that major atmospheric greenhouse warming of the atmosphere is not occurring and is unlikely ever to occur.

The temperature of the atmosphere fluctuates over a wide range, the result of solar activity and other influences. During the past 3,000 years, there have been five extended periods when it was distinctly warmer than today. One of the two coldest periods, known as the Little Ice Age, occurred 300 years ago. Atmospheric temperatures have been rising from that low for the past 300 years, but remain below the 3,000-year average.

Why are temperatures rising? The first chart nearby shows temperatures during the past 250 years, relative to the mean temperature for 1951-70. The same chart shows the length of the solar magnetic cycle during the same period. Close correlation between these two parameters—the shorter the solar cycle (and hence the more active the sun), the higher the temperature—demonstrates, as do other studies, that the gradual warming since the Little Ice Age and the large fluctuations during that warming have been caused by changes in solar activity.

During the 20 years with the highest carbon dioxide levels, temperatures have decreased.



The highest temperatures during this period occurred in about 1940. During the past 20 years, atmospheric temperatures have actually tended to go down, as shown in the second chart, based on very reliable satellite data, which have been confirmed by measurements from weather balloons.

Consider what this means for the global-warming hypothesis. This hypothesis predicts that global temperatures will rise significantly, indeed catastrophically, if atmospheric carbon dioxide rises. Most of the increase in atmospheric carbon dioxide has occurred during the past 50 years, and the increase has continued during the past 20 years. Yet there has been no significant increase in atmospheric temperature during those 50 years, and during the 20 years with the highest carbon dioxide levels, temperatures have decreased.

In science, the ultimate test is the process of experiment. If a hypothesis fails the experimental test, it must be discarded. Therefore, the scientific method requires that the global warming hypothesis be rejected.

Why, then, is there continuing scientific interest in "global warming"? There is a field of inquiry in which scientists are using computers to try to predict the weather—even global weather over very long periods. But global weather is so complicated that current data and computer methods are insufficient to make such predictions. Although it is reasonable to hope that these methods will eventually become useful, for now computer climate models are very unreliable. The second chart shows predicted temperatures for the past 20 years, based on the computer models. It's not surprising that they should have turned out wrong—after all the weatherman still has difficulty predicting local weather even for a few days. Long-term global predictions are

Is a Myth

beyond current capabilities.

So we needn't worry about human use of hydrocarbons warming the Earth. We also needn't worry about environmental calamities, even if the current, natural warming trend continues: After all the Earth has been much warmer during the past 3,000 years without ill effects.

But we should worry about the effects of the hydrocarbon rationing being proposed at Kyoto. Hydrocarbon use has major environmental benefits. A great deal of research has shown that increases in atmospheric carbon dioxide accelerate the growth rates of plants and also permit plants to grow in drier regions. Animal life, which depends upon plants, also increases.

Standing timber in the United States has already increased by 30% since 1950. There are now 60 tons of timber for every American. Tree-ring studies further confirm this spectacular increase in tree growth rates. It has also been found that mature Amazonian rain forests are increasing in biomass at about two tons per acre per year. A composite of 279 research studies predicts that overall plant growth rates will ultimately double as carbon dioxide increases.

Lush Environment

What mankind is doing is moving hydrocarbons from below ground and turning them into living things. We are living in an increasingly lush environment of plants and animals as a result of the carbon dioxide increase. Our children will enjoy an Earth with twice as much plant and animal life as that with which we now are blessed. This is a wonderful and unexpected gift from the industrial revolution.

Hydrocarbons are needed to feed and lift from poverty vast numbers of people across the globe. This can eventually allow all human beings to live long, prosperous, healthy, productive lives. No other single technological factor is more important to the increase in the quality, length and quantity of human life than the continued, expanded and unrationed use of the Earth's hydrocarbons, of which we have proven reserves to last more than 1,000 years. Global warming is a myth. The reality is that global poverty and death would be the result of Kyoto's rationing of hydrocarbons.

Arthur Robinson and Zachary Robinson are chemists at the Oregon Institute of Science and Medicine.

Environmental Effects of Increased Atmospheric Carbon Dioxide

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January 1998

ABSTRACT A review of the research literature concerning the environmental consequences of increased levels of atmospheric carbon dioxide leads to the conclusion that increases during the 20th Century have produced no deleterious effects upon global weather, climate, or temperature. Increased carbon dioxide has, however, markedly increased plant growth rates. Predictions of harmful climatic effects due to future increases in minor greenhouse gases like CO_2 are in error and do not conform to current experimental knowledge.

SUMMARY

World leaders gathered in Kyoto, Japan, in December 1997 to consider a world treaty restricting emissions of "greenhouse gases," chiefly carbon dioxide (CO_2), that are thought to cause "global warming" – severe increases in Earth's atmospheric and surface temperatures, with disastrous environmental consequences.

Predictions of global warming are based on computer climate modeling, a branch of science still in its infancy. The empirical evidence – actual measurements of Earth's temperature – shows no man-made warming trend. Indeed, over the past two decades, when CO_2 levels have been at their highest, global average temperatures have actually cooled slightly.

To be sure, CO_2 levels have increased substantially since the Industrial Revolution, and are expected to continue doing so. It is reasonable to believe that humans have been responsible for much of this increase. But the effect on the environment is likely to be benign. Greenhouse gases cause plant life, and the animal life that depends upon it, to thrive. What mankind is doing is liberating carbon from beneath the Earth's surface and putting it into the atmosphere, where it is available for conversion into living organisms.

RISE IN ATMOSPHERIC CARBON DIOXIDE

The concentration of CO_2 in Earth's atmosphere has increased during the past century, as shown in figure 1 (1). The annual cycles in figure 1 are the result of seasonal variations in plant use of carbon dioxide. Solid horizontal lines show the levels that prevailed in 1900 and 1940 (2). The magnitude of this atmospheric increase during the 1980s was about 3 gigatons of carbon (Gt C) per year (3). Total human CO_2 emissions – primarily from use of coal, oil, and natural gas and the production of cement – are currently about 5.5 GT C per year.

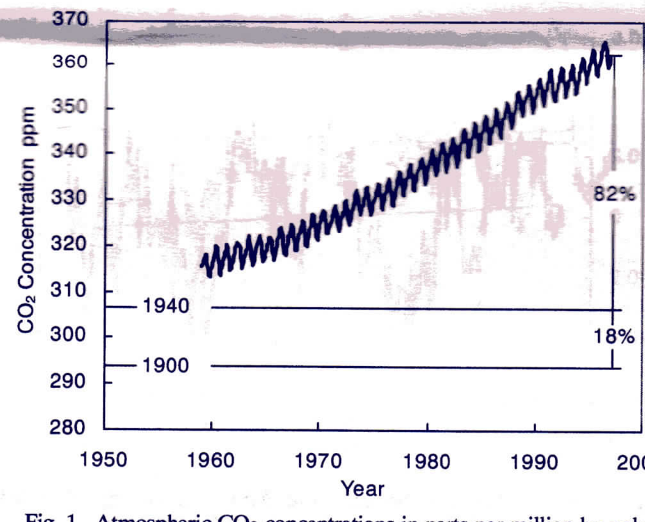

Fig. 1. Atmospheric CO_2 concentrations in parts per million by volume, ppm, at Mauna Loa, Hawaii. These measurements agree well with those at other locations (1). Periodic cycle is caused by seasonal variations in CO_2 absorption by plants. Approximate global level of atmospheric CO_2 in 1900 and 1940 is also displayed (2).

To put these figures in perspective, it is estimated that the atmosphere contains 750 Gt C; the surface ocean contains 1,000 Gt C; vegetation, soils, and detritus contain 2,200 Gt C; and the intermediate and deep oceans contain 38,000 Gt C (3). Each year, the surface ocean and atmosphere exchange an estimated 90 Gt C; vegetation and the atmosphere, 60 Gt C; marine biota and the surface ocean, 50 Gt C; and the surface ocean and the intermediate and deep oceans, 100 Gt C (3).

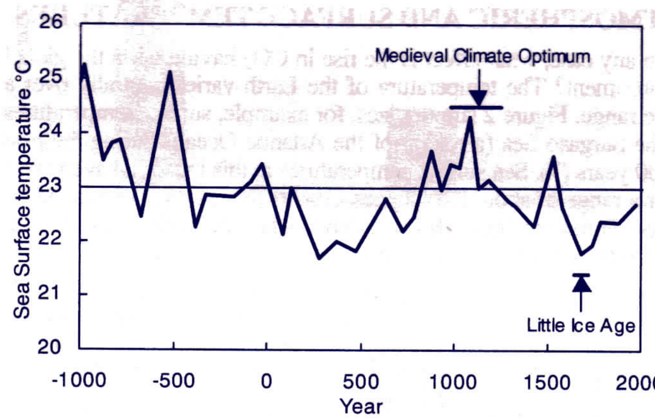

Fig. 2. Surface temperatures in the Sargaso Sea (with time resolution of about 50 years) ending in 1975 as determined by isotope ratios of marine organism remains in sediment at the bottom of the sea (7). The horizontal line is the average temperature for this 3,000 year period. The Little Ice Age and Medieval Climate Optimum were naturally occurring, extended intervals of climate departures from the mean.

So great are the magnitudes of these reservoirs, the rates of exchange between them, and the uncertainties with which these numbers are estimated that the source of the recent rise in atmospheric carbon dioxide has not been determined with certainty (4). Atmospheric concentrations of CO_2 are reported to have varied widely over geological time, with peaks, according to some estimates, some 20-fold higher than at present and lows at approximately 18th-Century levels (5).

The current increase in carbon dioxide follows a 300-year warming trend: Surface and atmospheric temperatures have been recovering from an unusually cold period known as the Little Ice Age. The observed increases are of a magnitude that can, for example, be explained by oceans giving off gases naturally as temperatures rise. Indeed, recent carbon dioxide rises have shown a tendency to follow rather than lead global temperature increases (6).

There is, however, a widely believed hypothesis that the 3 Gt C per year rise in atmospheric carbon dioxide is the result of the 5.5 Gt C per year release of carbon dioxide from human activities. This hypothesis is reasonable, since the magnitudes of human release and atmospheric rise are comparable, and the atmospheric rise has occurred contemporaneously with the increase in production of CO_2 from human activities since the Industrial Revolution.

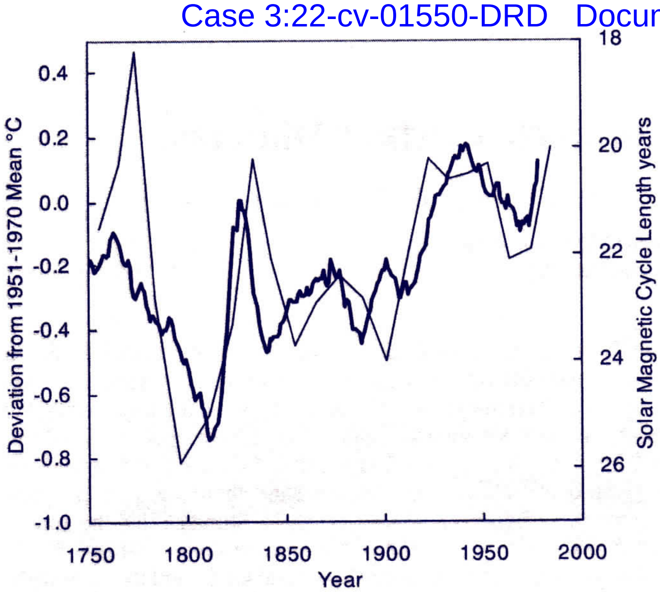

Fig. 3. Moving 11-year average of terrestrial Northern Hemisphere temperatures as deviations in °C from the 1951-1970 mean – left axis and darker line (8,9). Solar magnetic cycle lengths – right axis and lighter line (10). The shorter the magnetic cycle length, the more active, and hence brighter, the sun.

ATMOSPHERIC AND SURFACE TEMPERATURES

In any case, what effect is the rise in CO_2 having upon the global environment? The temperature of the Earth varies naturally over a wide range. Figure 2 summarizes, for example, surface temperatures in the Sargaso Sea (a region of the Atlantic Ocean) during the past 3,000 years (7). Sea surface temperatures at this location have varied over a range of about 3.6 degrees Celsius (°C) during the past 3,000 years. Trends in these data correspond to similar features that are known from the historical record.

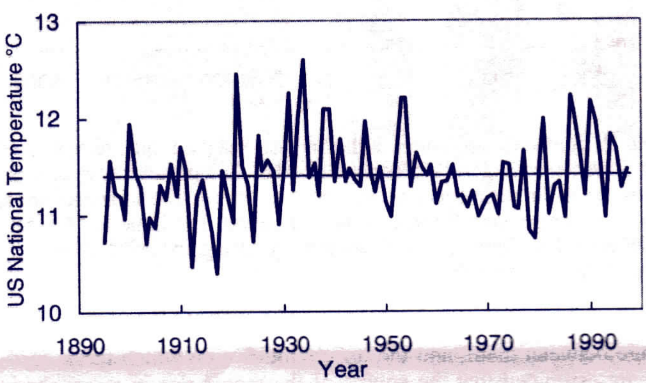

Fig. 4. Annual mean surface temperatures in the contiguous United States between 1895 and 1997, as compiled by the National Climate Data Center (12). Horizontal line is the 103-year mean. The trend line for this 103-year period has a slope of 0.022 °C per decade or 0.22 °C per century. The trend line for 1940 to 1997 has a slope of 0.008 °C per decade or 0.08 °C per century.

For example, about 300 years ago, the Earth was experiencing the "Little Ice Age." It had descended into this relatively cool period from a warm interval about 1,000 years ago known as the "Medieval Climate Optimum." During the Medieval Climate Optimum, temperatures were warm enough to allow the colonization of Greenland. These colonies were abandoned after the onset of colder temperatures. For the past 300 years, global temperatures have been gradually recovering (11). As shown in figure 2, they are still a little below the average for the past 3,000 years. The human historical record does not report "global warming" catastrophes, even though temperatures have been far higher during much of the last three millennia.

What causes such variations in Earth's temperature? The answer may be fluctuations in solar activity. Figure 3 shows the period of warming from the Little Ice Age in greater detail by means of an 11-year moving average of surface temperatures in the Northern Hemisphere (10). Also shown are solar magnetic cycle lengths for the same period. It is clear that even relatively short, half-century-long fluctuations in temperature correlate well with variations in solar activity. When the cycles are short, the sun is more active, hence brighter; and the Earth is warmer. These variations in the activity of the sun are typical of stars close in mass and age to the sun (13).

Figure 4 shows the annual average temperatures of the United States as compiled by the National Climate Data Center (12). The most recent upward temperature fluctuation from the Little Ice Age (between 1900 and 1940), as shown in the Northern Hemisphere record of figure 3, is also evident in this record of U.S. temperatures. These temperatures are now near average for the past 103 years, with 1996 and 1997 having been the 42nd and 60th coolest years.

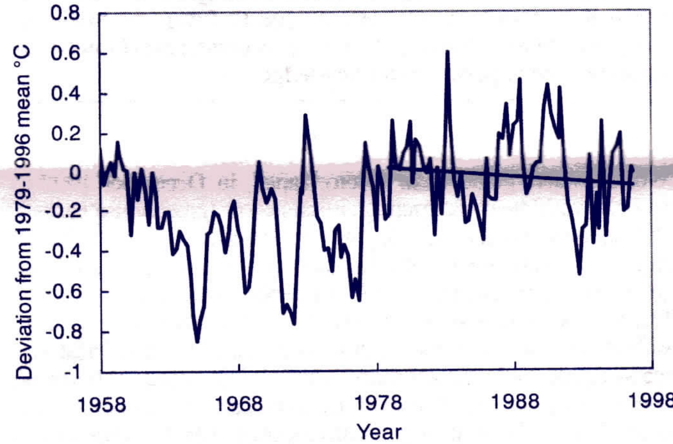

Fig. 5. Radiosonde balloon station measurements of global lower tropospheric temperatures at 63 stations between latitudes 90 N and 90 S from 1958 to 1996 (15). Temperatures are three-month averages and are graphed as deviations from the mean temperature for 1979 to 1996. Linear trend line for 1979 to 1996 is shown. The slope is minus 0.060 °C per decade.

Especially important in considering the effect of changes in atmospheric composition upon Earth temperatures are temperatures in the lower troposphere – at an altitude of roughly 4 km. In the troposphere, greenhouse-gas-induced temperature changes are expected to be at least as large as at the surface (14). Figure 5 shows global tropospheric temperatures measured by weather balloons between 1958 and 1996. They are currently near their 40-year mean (15), and have been trending slightly downward since 1979.

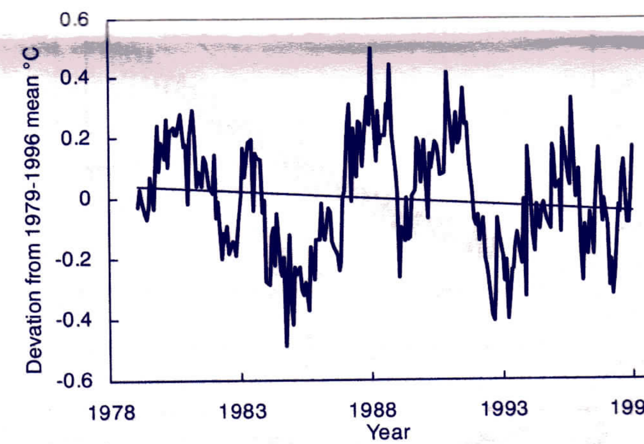

Fig. 6. Satellite Microwave Sounding Unit, MSU, measurements of global lower tropospheric temperatures between latitudes 83 N and 83 S from 1979 to 1997 (17,18). Temperatures are monthly averages and are graphed as deviations from the mean temperature for 1979 to 1996. Linear trend line for 1979 to 1997 is shown. The slope of this line is minus 0.047 °C per decade. This record of measurements began in 1979.

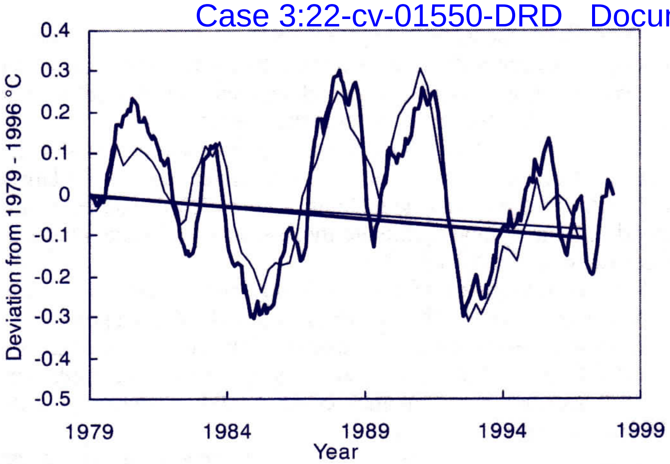

Fig. 7. Global radiosonde balloon temperature (light line) (15) and global satellite MSU temperature (dark line) (17,18) from figures 5 and 6 plotted with 6-month smoothing. Both sets of data are graphed as deviations from their respective means for 1979 to 1996. The 1979 to 1996 slopes of the trend lines are minus 0.060 °C per decade for balloon and minus 0.045 for satellite.

Since 1979, lower-tropospheric temperature measurements have also been made by means of microwave sounding units (MSUs) on orbiting satellites (16). Figure 6 shows the average global tropospheric satellite measurements (17,18) – the most reliable measurements, and the most relevant to the question of climate change.

Figure 7 shows the satellite data from figure 6 superimposed upon the weather balloon data from figure 5. The agreement of the two sets of data, collected with completely independent methods of measurement, verifies their precision. This agreement has been shown rigorously by extensive analysis (19, 20).

While tropospheric temperatures have trended downward during the past 19 years by about 0.05 °C per decade, it has been reported that global *surface* temperatures trended upward by about 0.1 °C per decade (21, 22). In contrast to tropospheric temperatures, however, surface temperatures are subject to large uncertainties for several reasons, including the urban heat island effect (illustrated below).

During the past 10 years, U.S. surface temperatures have trended downward by minus 0.08 °C per decade (12) while global surface temperatures are reported increased by plus 0.03 °C per decade (23). The corresponding weather-balloon and satellite tropospheric 10-year trends are minus 0.4 °C and minus 0.3 °C per decade, respectively.

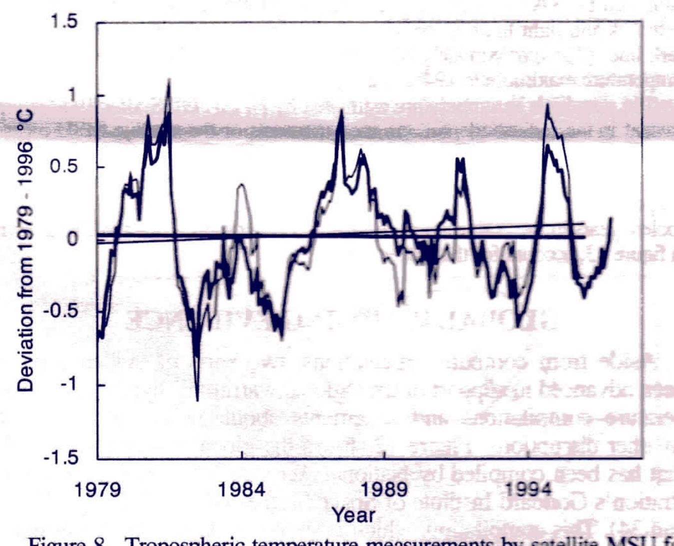

Figure 8. Tropospheric temperature measurements by satellite MSU for North America between 30° to 70° N and 75° to 125° W (dark line) (17, 18) compared with the surface record for this same region (light line) (24), both plotted with 12-month smoothing and graphed as deviations from their means for 1979 to 1996. The slope of the satellite MSU trend line is minus 0.01 °C per decade, while that for the surface trend line is plus 0.07 °C per decade. The correlation coefficient for the unsmoothed monthly data in the two sets is 0.92.

Disregarding uncertainties in surface measurements and giving equal weight to reported atmospheric and surface data and to 10 and 19 year averages, the mean global trend is minus 0.07 °C per decade.

In North America, the atmospheric and surface records partly agree (20 and figure 8). Even there, however, the atmospheric trend is minus 0.01 per decade, while the surface trend is plus 0.07 °C per decade. The satellite record, with uniform and better sampling, is much more reliable.

The computer models on which forecasts of global warming are based predict that tropospheric temperatures will rise at least as much as surface temperatures (14). Because of this, and because these temperatures can be accurately measured without confusion by complicated effects in the surface record, these are the temperatures of greatest interest. The global trend shown in figures 5, 6 and 7 provides a definitive means of testing the validity of the global warming hypothesis.

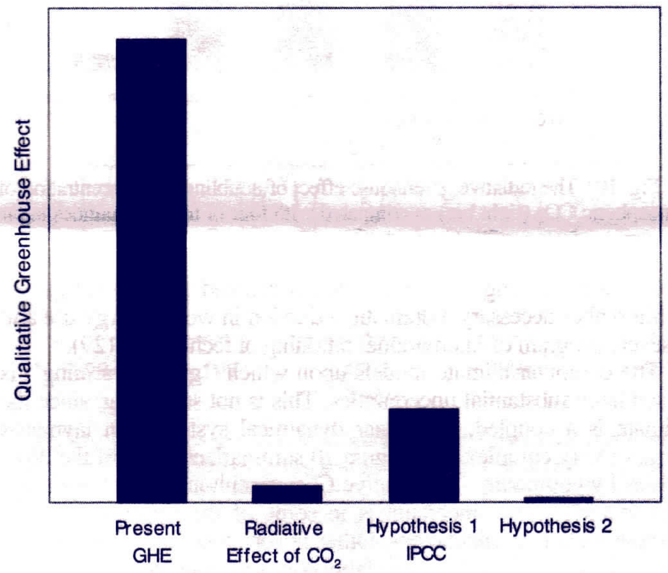

Fig. 9. Qualitative illustration of greenhouse warming. Present: the current greenhouse effect from all atmospheric phenomena. Radiative effect of CO_2: added greenhouse radiative effect from doubling CO_2 without consideration of other atmospheric components. Hypothesis 1 IPCC: hypothetical amplification effect assumed by IPCC. Hypothesis 2: hypothetical moderation effect.

THE GLOBAL WARMING HYPOTHESIS

There *is* such a thing as the greenhouse effect. Greenhouse gases such as H_2O and CO_2 in the Earth's atmosphere decrease the escape of terrestrial thermal infrared radiation. Increasing CO_2, therefore, effectively increases radiative energy input to the Earth. But what happens to this radiative input is complex: It is redistributed, both vertically and horizontally, by various physical processes, including advection, convection, and diffusion in the atmosphere and ocean.

When an increase in CO_2 increases the radiative input to the atmosphere, how and in which direction does the atmosphere respond? Hypotheses about this response differ and are schematically shown in figure 9. Without the greenhouse effect, the Earth would be about 14 °C cooler (25). The radiative contribution of doubling atmospheric CO_2 is minor, but this radiative greenhouse effect is treated quite differently by different climate hypotheses. The hypotheses that the IPCC has chosen to adopt predict that the effect of CO_2 is amplified by the atmosphere (especially water vapor) to produce a large temperature increase (14). Other hypotheses, shown as hypothesis 2, predict the opposite – that the atmospheric response will counteract the CO_2 increase and result in insignificant changes in global temperature (25-27). The empirical evidence of figures 5-7 favors hypothesis 2. While CO_2 has increased substantially, the large temperature increase predicted by the IPCC models has not occurred (see figure 11).

The hypothesis of a large atmospheric temperature increase from greenhouse gases (GHGs), and further hypotheses that temperature increases will lead to flooding, increases in storm activity, and catastrophic world-wide climatological changes have come to be known

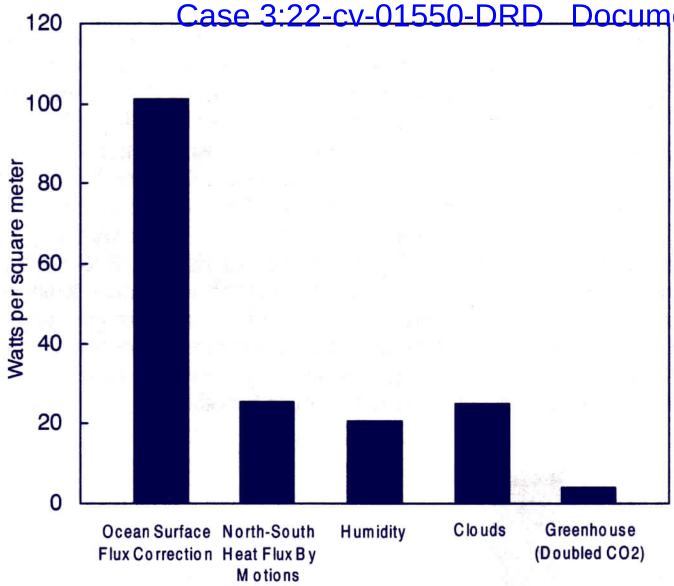

Fig. 10. The radiative greenhouse effect of doubling the concentration of atmospheric CO_2 (right bar) as compared with four of the uncertainties in the computer climate models (14, 28).

as ''global warming'' – a phenomenon claimed to be so dangerous that it makes necessary a dramatic reduction in world energy use and a severe program of international rationing of technology (29).

The computer climate models upon which ''global warming'' is based have substantial uncertainties. This is not surprising, since the climate is a coupled, non-linear dynamical system – in layman's terms, a very complex one. Figure 10 summarizes some of the difficulties by comparing the radiative CO_2 greenhouse effect with correction factors and uncertainties in some of the parameters in the computer climate calculations. Other factors, too, such as the effects of volcanoes, cannot now be reliably computer modeled.

Figure 11 compares the trend in atmospheric temperatures predicted by computer models adopted by the IPCC with that actually observed during the past 19 years – those years in which the highest atmospheric concentrations of CO_2 and other GHGs have occurred.

In effect, an experiment has been performed on the Earth during the past half-century – an experiment that includes all of the complex factors and feedback effects that determine the Earth's temperature and climate. Since 1940, atmospheric GHGs have risen substantially. Yet atmospheric temperatures have not risen. In fact, during the 19 years with the highest atmospheric levels of CO_2 and other GHGs, temperatures have fallen.

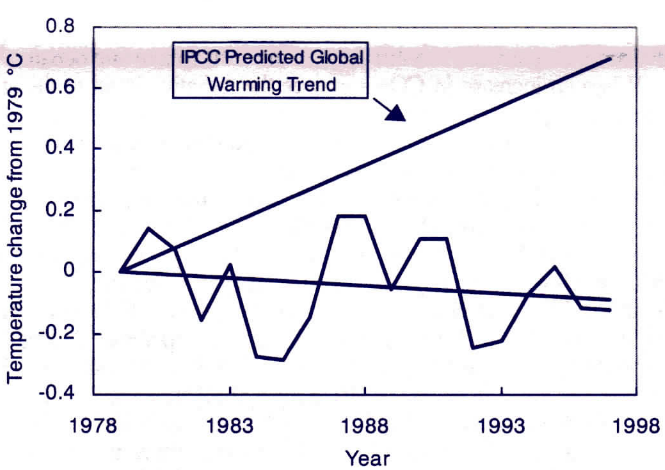

Fig. 11. Global annual lower tropospheric temperatures as measured by satellite MSU between latitudes 83 N and 83 S (17, 18) plotted as deviations from the 1979 value. The trend line of these experimental measurements is compared with the corresponding trend line predicted by International Panel on Climate Change (IPCC) computer climate models (14).

Not only has the global warming hypothesis failed the experimental test; it is theoretically flawed as well. It can reasonably be argued that cooling from negative physical and biological feedbacks to GHGs will nullify the initial temperature rise (26, 30).

The reasons for this failure of the computer climate models are subjects of scientific debate. For example, water vapor is the largest contributor to the overall greenhouse effect (31). It has been suggested that the computer climate models treat feedbacks related to water vapor incorrectly (27, 32).

The global warming hypothesis is not based upon the radiative properties of the GHGs themselves. It is based entirely upon a small initial increase in temperature caused by GHGs and a large theoretical amplification of that temperature change. Any comparable temperature increase from another cause would produce the same outcome from the calculations.

At present, science does not have comprehensive quantitative knowledge about the Earth's atmosphere. Very few of the relevant parameters are known with enough rigor to permit reliable theoretical calculations. Each hypothesis must be judged by empirical results. The global warming hypothesis has been thoroughly evaluated. It does not agree with the data and is, therefore, not validated.

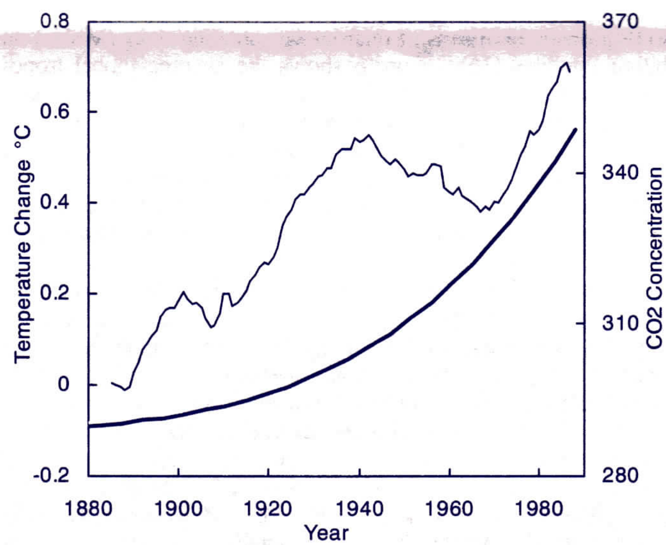

Figure 12. Eleven-year moving average of global surface temperature, as estimated by NASA GISS (23, 33, and 34), plotted as deviation from 1890 (left axis and light line), as compared with atmospheric CO_2 (right axis and dark line) (2). Approximately 82% of the increase in CO_2 occurred after the temperature maximum in 1940, as is shown in figure 1.

The new high in temperature estimated by NASA GISS after 1940 is not present in the radiosonde balloon measurements or the satellite MSU measurements. It is also not present in surface measurements for regions with comprehensive, high-quality temperature records (35). The United States surface temperature record (see figure 4) gives 1996 and 1997 as the 38th and 56th coolest years in the 20th century. Biases and uncertainties, such as that shown in figure 13, account for this difference.

GLOBAL WARMING EVIDENCE

Aside from computer calculations, two sorts of evidence have been advanced in support of the ''global warming'' hypothesis: temperature compilations and statements about global flooding and weather disruptions. Figure 12 shows the global temperature graph that has been compiled by National Aeronautic and Space Administration's Goddard Institute of Space Studies (NASA GISS) (23, 33, and 34). This compilation, which is shown widely in the press, does not agree with the atmospheric record because surface records have substantial uncertainties (36). Figure 13 illustrates part of the reason.

The urban heat island effect is only one of several surface effects that can confound compiled records of surface temperature. Figure 13 shows the size of this effect in, for example, the surface stations of California and the problems associated with objective sampling. The

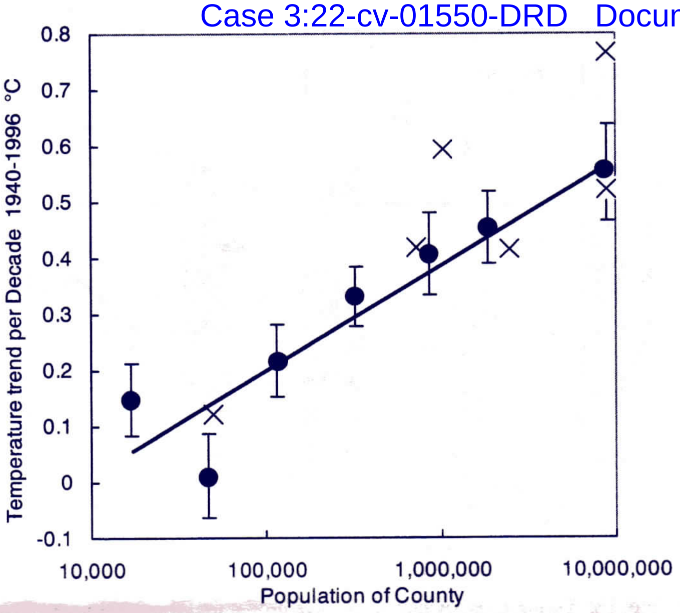

Fig. 13. Surface temperature trends for the period of 1940 to 1996 from 107 measuring stations in 49 California counties (39, 40). After averaging the means of the trends in each county, counties of similar population were combined and plotted as closed circles along with the standard errors of their means. The six measuring stations in Los Angeles County were used to calculate the standard error of that county, which is plotted alone at the county population of 8.9 million. The "urban heat island effect" on surface measurements is evident. The straight line is a least-squares fit to the closed circles. The points marked "X" are the six unadjusted station records selected by NASA GISS (23, 33, and 34) for use in their estimate of global temperatures as shown in figure 12.

East Park station, considered the best situated rural station in the state (37), has a trend since 1940 of minus 0.055 °C per decade.

The overall rise of about plus 0.5 °C during the 20th century is often cited in support of "global warming" (38). Since, however, 82% of the CO_2 rise during the 20th century occurred after the rise in temperature (see figures 1 and 12), the CO_2 increase cannot have caused the temperature increase. The 19th century rise was only 13 ppm (2).

In addition, incomplete regional temperature records have been used to support "global warming." Figure 14 shows an example of this, in which a partial record was used in an attempt to confirm computer climate model predictions of temperature increases from greenhouse gases (41). A more complete record refuted this attempt (42).

Not one of the temperature graphs shown in figures 4 to 7, which include the most accurate and reliable surface and atmospheric temperature measurements available, both global and regional, shows any warming whatever that can be attributed to increases in greenhouse gases. Moreover, these data show that present day temperatures are not at all unusual compared with natural variability, nor are they changing in any unusual way.

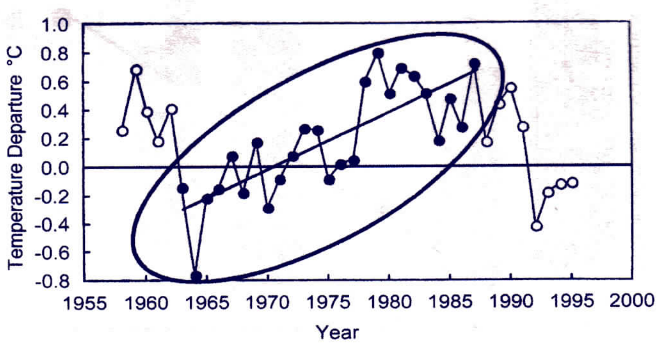

Fig. 14 The solid circles in the oval are tropospheric temperatures for the Southern Hemisphere between latitudes 30 S and 60 S, published in 1996 (41) in support of computer-model-projected warming. Later in 1996, the study was refuted by a longer set of data, as shown by the open circles (42).

SEA LEVELS AND STORMS

The computer climate models do not make any reliable predictions whatever concerning global flooding, storm variability, and other catastrophes that have come to be a part of the popular definition of "global warming." (See Chapter 6, section 6-5 of reference 14.) Yet several scenarios of impending global catastrophe have arisen separately. One of these hypothesizes that rising sea levels will flood large areas of coastal land. Figure 15 shows satellite measurements of global sea level between 1993 and 1997 (43). The reported current global rate of rise amounts to only about plus 2 mm per year, or plus 8 inches per century, and even this estimate is probably high (43). The trends in rise and fall of sea level in various regions have a

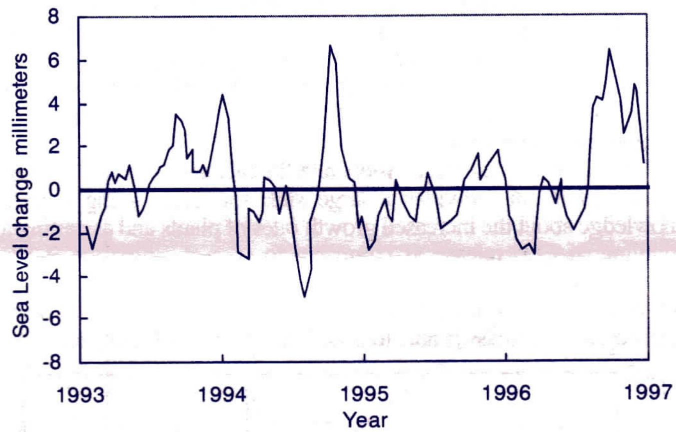

Fig. 15. Global sea level measurements from the Topex/Poseidon satellite altimeter for 1993 to 1997 (43). The instrument record gives a rate of change of minus 0.2 mm per year (43). However, it has been reported that 50-year tide gauge measurements give plus 1.8 mm per year. A correction of plus 2.3 mm per year was added to the satellite data based on comparison to selected tide gauges to get a value of plus 2.1 mm per year or 8 inches per century (43).

wide range of about 100 mm per year with most of the globe showing downward trends (43). Historical records show no acceleration in sea level rise in the 20th century (44). Moreover, claims that global warming will cause the Antarctic ice cap to melt and sharply increase this rate are not consistent with experiment or with theory (45).

Similarly, claims that hurricane frequencies and intensities have been increasing are also inconsistent with the data. Figure 16 shows the number of severe Atlantic hurricanes per year and also the maximum wind intensities of those hurricanes. Both of these values have been decreasing with time.

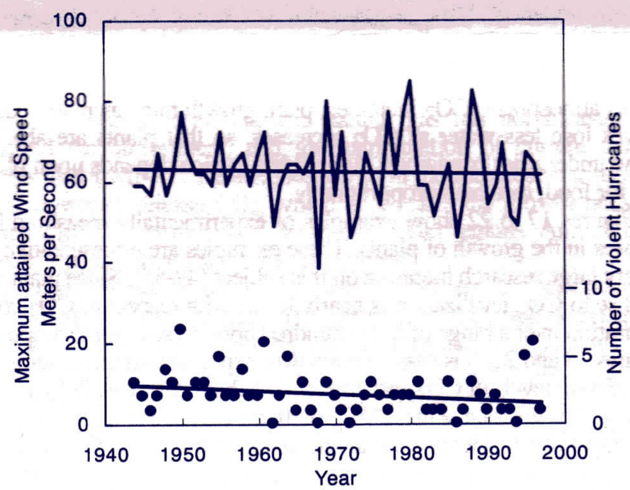

Fig. 16. Annual numbers of violent hurricanes and maximum attained wind speeds during those hurricanes in the Atlantic Ocean (46). Slopes of the trend lines are minus 0.25 hurricanes per decade and minus 0.33 meters per second maximum attained wind speed per decade.

As temperatures recover from the Little Ice Age, the more extreme weather patterns that characterized that period may be trending slowly toward the milder conditions that prevailed during the Middle Ages, which enjoyed average temperatures about 1 °C higher than those of today. Concomitant changes are also taking place, such as the receding of glaciers in Montana's Glacier National Park.

FERTILIZATION OF PLANTS

How high will the carbon dioxide concentration of the atmosphere ultimately rise if mankind continues to use coal, oil, and natural gas? Since total current estimates of hydrocarbon reserves are approximately 2,000 times annual use (47), doubled human release could, over a thousand years, ultimately be 10,000 GT C or 25% of the amount now sequestered in the oceans. If 90% of this 10,000 GT C were absorbed by oceans and other reservoirs, atmospheric levels would approximately double, rising to about 600 parts per million. (This assumes that new technologies will not supplant the use of hydrocarbons during the next 1,000 years, a pessimistic estimate of technological advance.)

One reservoir that would moderate the increase is especially important. Plant life provides a large sink for CO_2. Using current knowledge about the increased growth rates of plants and assuming a doubling of CO_2 release as compared to current emissions, it has been estimated that atmospheric CO_2 levels will rise by only about 300 ppm before leveling off (2). At that level, CO_2 absorption by increased Earth biomass is able to absorb about 10 GT C per year.

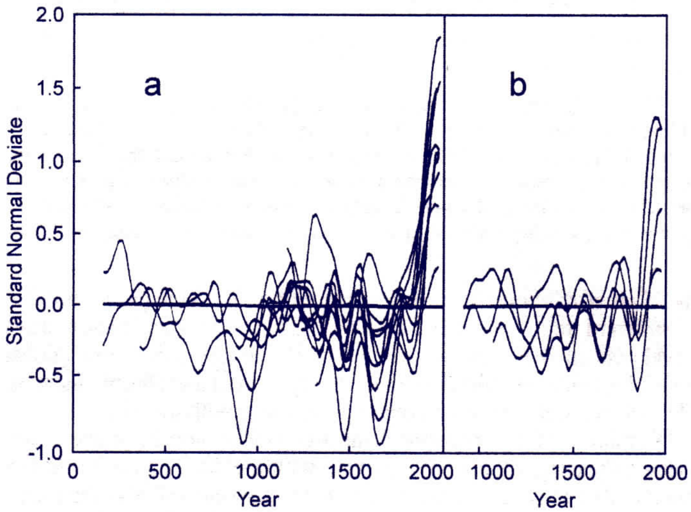

Fig. 17. Standard normal deviates of tree ring widths for (a) bristlecone pine, limber pine, and fox tail pine in the Great Basin of California, Nevada, and Arizona and (b) bristlecone pine in Colorado (48). The tree ring widths have been normalized so that their means are zero and deviations from the means are displayed in units of standard deviation.

As atmospheric CO_2 increases, plant growth rates increase. Also, leaves lose less water as CO_2 increases, so that plants are able to grow under drier conditions. Animal life, which depends upon plant life for food, increases proportionally.

Figures 17 to 22 show examples of experimentally measured increases in the growth of plants. These examples are representative of a very large research literature on this subject (49-55). Since plant response to CO_2 fertilization is nearly linear with respect to CO_2 concentration over a range of a few hundred ppm, as seen for example in figures 18 and 22, it is easy to normalize experimental measurements at different levels of CO_2 enrichment. This has been done in figure 23 in order to illustrate some CO_2 growth enhancements calculated for the atmospheric increase of about 80 ppm that has already taken place, and that expected from a projected total increase of 320 ppm.

As figure 17 shows, long-lived (1,000- to 2000-year-old) pine trees have shown a sharp increase in growth rate during the past half-century. Figure 18 summarizes the increased growth rates of young pine seedlings at four CO_2 levels. Again, the response is remarkable,

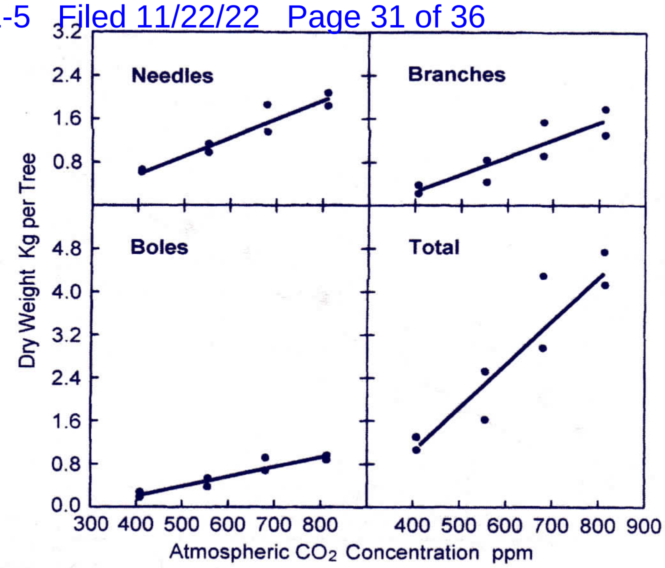

Fig. 18. Young Eldarica pine trees were grown for 23 months under four CO_2 concentrations and then cut down and weighed. Each point represents an individual tree (56). Weights of tree parts are as indicated.

with an increase of 300 ppm more than tripling the rate of growth.

Figure 19 shows the 30% increase in the forests of the United States that has taken place since 1950. Much of this increase is likely due to the increase in atmospheric CO_2 that has already occurred. In addition, it has been reported that Amazonian rain forests are increasing their vegetation by about 34,000 moles (900 pounds) of carbon per acre per year (57), or about two tons of biomass per acre per year.

Figure 20 shows the effect of CO_2 fertilization on sour orange trees. During the early years of growth, the bark, limbs, and fine roots of sour orange trees growing in an atmosphere with 700 ppm of CO_2 exhibited rates of growth more than 170% greater than those at 400 ppm. As the trees matured, this slowed to about 100%. Meanwhile, orange production was 127% higher for the 700 ppm trees.

Trees respond to CO_2 fertilization more strongly than do most other plants, but all plants respond to some extent. Figure 21 shows the response of wheat grown under wet conditions and when the wheat was stressed by lack of water. These were open-field experiments. Wheat was grown in the usual way, but the atmospheric CO_2 concentrations of circular sections of the fields were increased by means of arrays of computer-controlled equipment that released CO_2 into the air to hold the levels as specified.

While the results illustrated in figures 17-21 are remarkable, they are typical of those reported in a very large number of studies of the effect of CO_2 concentration upon the growth rates of plants (49-55).

Figure 22 summarizes 279 similar experiments in which plants of

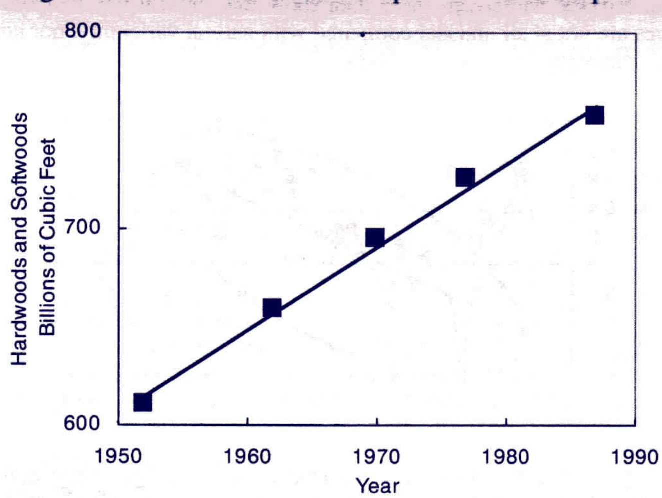

Fig. 19. Inventories of standing hardwood and softwood timber in the United States compiled from *Forest Statistics of the United States* (58).

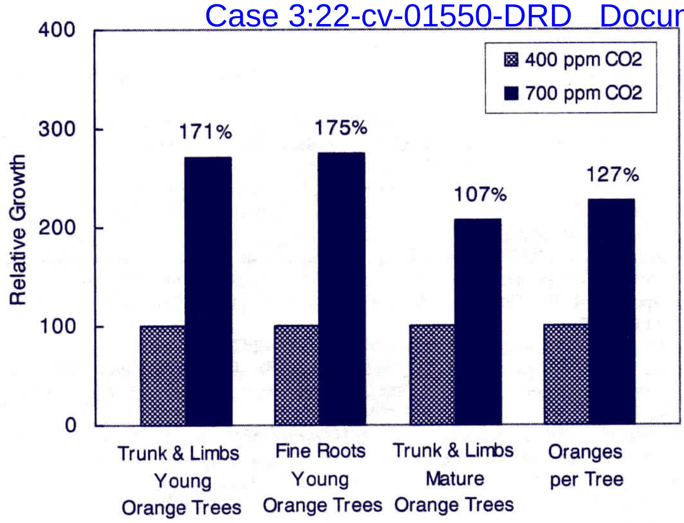

Fig. 20. Relative trunk and limb volumes and fine root biomass of young sour orange trees; and trunk and limb volumes and numbers of oranges produced per mature sour orange tree per year at 400 ppm CO_2 (light bars) and 700 ppm CO_2 (dark bars) (59, 60). The 400 ppm values were normalized to 100. The trees were planted in 1987 as one-year-old seedlings. Young trunk and limb volumes and fine root biomass were measured in 1990. Mature trunk and limb volumes are averages for 1991 to 1996. Orange numbers are averages for 1993 to 1997.

various types were raised under CO_2-enhanced conditions. Plants under stress from less-than-ideal conditions – a common occurrence in nature – respond more to CO_2 fertilization. The selections of species shown in figure 22 were biased toward plants that respond less to CO_2 fertilization than does the mixture actually covering the Earth, so figure 22 underestimates the effects of global CO_2 enhancement.

Figure 23 summarizes the wheat, orange tree, and young pine tree enhancements shown in figures 21, 20, and 18 with two atmospheric CO_2 increases – that which has occurred since 1800 and is believed to be the result of the Industrial Revolution and that which is projected for the next two centuries. The relative growth enhancement of trees by CO_2 diminishes with age. Figure 23 shows young trees.

Clearly, the green revolution in agriculture has already benefited from CO_2 fertilization; and benefits in the future will likely be spectacular. Animal life will increase proportionally as shown by studies of 51 terrestrial (63) and 22 aquatic ecosystems (64). Moreover, as shown by a study of 94 terrestrial ecosystems on all continents except Antarctica (65), species richness (biodiversity) is more positively correlated with productivity – the total quantity of plant life per acre – than with anything else.

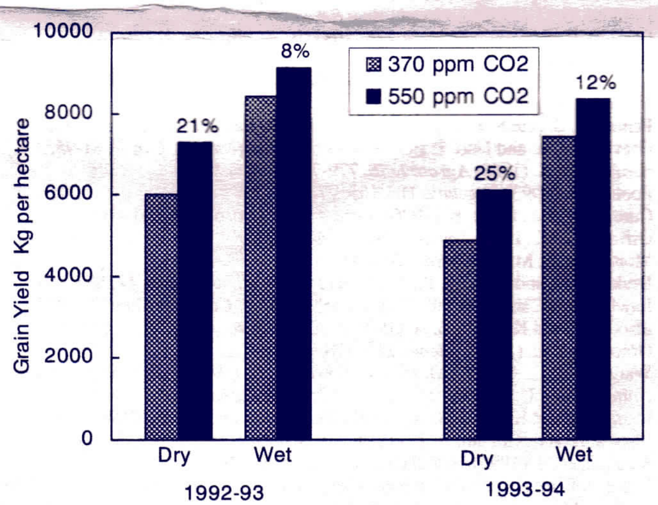

Fig. 21. Grain yields from wheat grown under well watered and poorly watered conditions in open field experiments (61, 62). Average CO_2-induced increases for the two years were 10% for wet and 23% for dry conditions.

DISCUSSION

There are no experimental data to support the hypothesis that increases in carbon dioxide and other greenhouse gases are causing or can be expected to cause catastrophic changes in global temperatures or weather. To the contrary, during the 20 years with the highest carbon dioxide levels, atmospheric temperatures have decreased.

We also need not worry about environmental calamities, even if the current long-term natural warming trend continues. The Earth has been much warmer during the past 3,000 years without catastrophic effects. Warmer weather extends growing seasons and generally improves the habitability of colder regions. "Global warming," an invalidated hypothesis, provides no reason to limit human production of CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 as has been proposed (29).

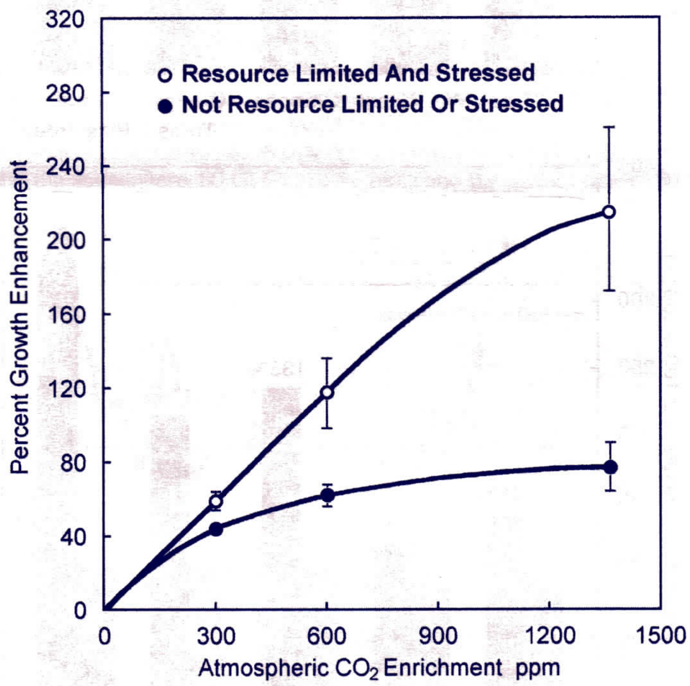

Fig. 22. Summary data from 279 published experiments in which plants of all types were grown under paired stressed (open circles) and unstressed (closed circles) conditions (66). There were 208, 50, and 21 sets at 300, 600, and an average of about 1350 ppm CO_2, respectively. The plant mixture in the 279 studies was slightly biased toward plant types that respond less to CO_2 fertilization than does the actual global mixture and therefore underestimates the expected global response. CO_2 enrichment also allows plants to grow in drier regions, further increasing the expected global response.

Human use of coal, oil, and natural gas has not measurably warmed the atmosphere, and the extrapolation of current trends shows that it will not significantly do so in the foreseeable future. It does, however, release CO_2, which accelerates the growth rates of plants and also permits plants to grow in drier regions. Animal life, which depends upon plants, also flourishes.

As coal, oil, and natural gas are used to feed and lift from poverty vast numbers of people across the globe, more CO_2 will be released into the atmosphere. This will help to maintain and improve the health, longevity, prosperity, and productivity of all people.

Human activities are believed to be responsible for the rise in CO_2 level of the atmosphere. Mankind is moving the carbon in coal, oil, and natural gas from below ground to the atmosphere and surface, where it is available for conversion into living things. We are living in an increasingly lush environment of plants and animals as a result of the CO_2 increase. Our children will enjoy an Earth with far more plant and animal life as that with which we now are blessed. This is a wonderful and unexpected gift from the Industrial Revolution.

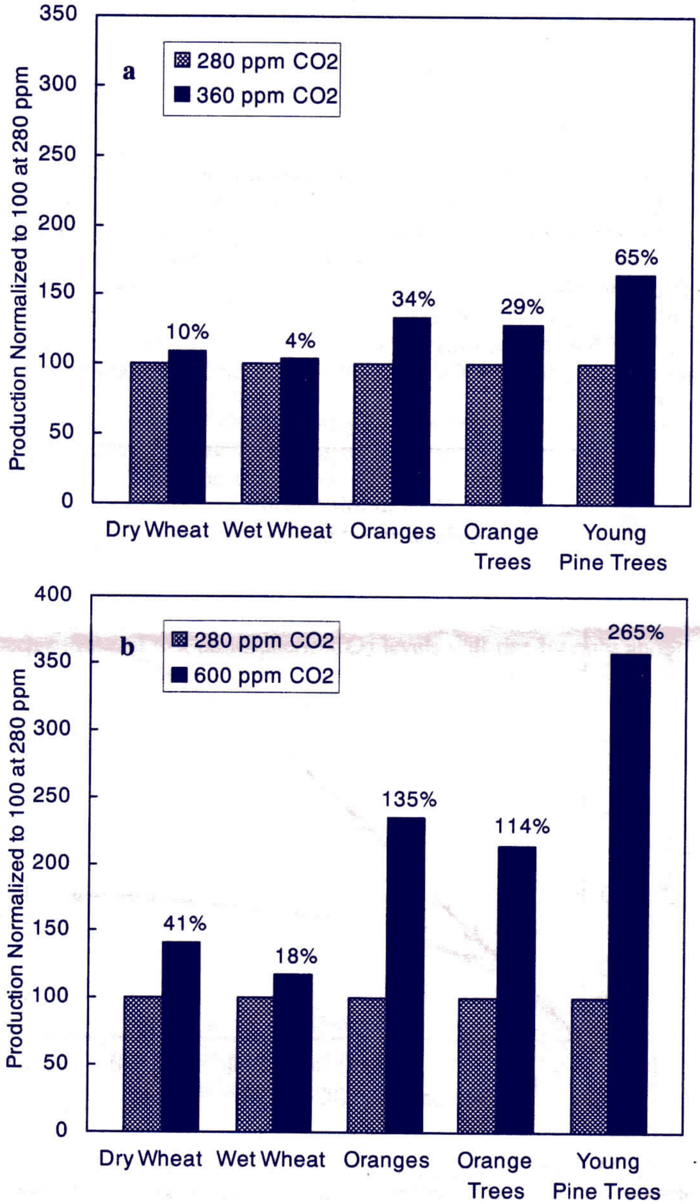

Fig. 23. Calculated growth rate enhancement of wheat, young orange trees, and very young pine trees already taking place as a result of atmospheric enrichment by CO_2 during the past two centuries (a) and expected to take place as a result of atmospheric enrichment by CO_2 to a level of 600 ppm (b).

In this case, these values apply to pine trees during their first two years of growth and orange trees during their 4th through 10th years of growth. As is shown in figure 20, the effect of increased CO_2 gradually diminishes with tree age, so these values should not be interpreted as applicable over the entire tree lifespans. There are no longer-running controlled CO_2 tree experiments. Yet, even 2,000 year old trees still respond significantly as is shown in figure 17.

REFERENCES

1. Keeling, C. D. and Whorf, T. P. (1997) *Trends Online: A Compendium of Data on Global Change*, Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory; [http://cdiac.esd.ornl.gov/ftp/ndp001r7/].
2. Idso, S. B. (1989) *Carbon Dioxide and Global Change: Earth in Transition, IBR* Press, 7.
3. Schimel, D. S. (1995) *Global Change Biology* **1**, 77-91.
4. Segalstad, T. V. (1998) *Global Warming the Continuing Debate*, Cambridge UK: Europ. Sci. and Environ. For., ed. R. Bate, 184-218.
5. Berner, R. A. (1997) *Science* **276**, 544-545.
6. Kuo, C., Lindberg, C. R., and Thornson, D. J. (1990) *Nature* **343**,709-714.
7. Kegwin, L. D. (1996) *Science* **274**, 1504-1508; [lkeigwin@whoi.edu].
8. Jones, P. D. et. al. (1986) *J. Clim. Appl. Meterol.* **25**, 161-179.
9. Grovesman, B. S. and Landsberg, H. E. (1979) *Geophys. Res. Let.* **6**, 767-769.
10. Baliunas, S. and Soon, W. (1995) *Astrophysical Journal* **450**, 896-901; Friis-Christensen, E. and Lassen, K. (1991) *Science* **254**, 698-700; [sbaliunas, wsoon@cfa.harvard.edu].
11. Lamb, H. H. (1982) *Climate, History, and the Modern World*, pub New York: Methuen.
12. Brown, W. O. and Heim, R. R. (1996) *National Climate Data Center, Climate Variation Bulletin* **8**, Historical Climatology Series 4-7, Dec.; [http://www.ncdc.noaa. gov/o1/documentlibrary/cvb.html/].
13. Baliunas, S. L. et. al. (1995) *Astrophysical Journal* **438**, 269-287.
14. Houghton, J. T. et. al. (1995) *Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press.
15. Angell, J. K. (1997) *Trends Online: A Compendium of Data on Global Change*, Oak Ridge National Laboratory; [http://cdiac.esd.ornl.gov/ftp/ndp008r4/].
16. Spencer, R. W., Christy, J. R., and Grody, N. C. (1990) *Journal of Climate* **3**, 1111-1128.
17. Spencer, R. W. and Christy, J. R. (1990) *Science* **247**, 1558-1562.
18. Christy, J. R., Spencer, R. W., and Braswell, W. D. (1997) *Nature* **389**, 342; Christy, J. R. personal comm; [http://wwwghrc.msfc.nasa.gov/ims-cgi-bin/mkdata?msu2rm190+/pub/data/msu/limb90/chan2r/].
19. Spencer, R. W. and Christy, J. R. (1992) *Journal of Climate* **5**, 847-866.
20. Christy, J. R. (1995) *Climatic Change* **31**, 455-474.
21. Jones, P. D. (1994) *Geophys. Res. Let.* **21**, 1149-1152.
22. Parker, D. E., et. al. (1997) *Geophys. Res. Let.* **24**, 1499-1502.
23. Hansen, J., Ruedy, R. and Sato, M. (1996) *Geophys. Res. Let.* **23**, 1665-1668; [http://www.giss.nasa.gov/data/gistemp/].
24. The Climate Research Unit, East Anglia University, United Kingdom; [http://www.cru.uea.ac.uk/advance10k/climdata.htm/].
25. Lindzen, R. S. (1994) *Ann. Review Fluid. Mech.* **26**, 353-379.
26. Sun, D. Z. and Lindzen, R. S. (1993) *Ann. Geophysicae* **11**, 204-215.
27. Spencer, R. W. and Braswell, W. D. (1997) *Bull. Amer. Meteorolog. Soc.* **78**, 1097-1106.
28. Baliunas, S. (1996) *Uncertainties in Climate Modeling: Solar Variability and Other Factors*, Committee on Energy and Natural Resources; United States Senate. Lindzen, R. S. (1995), personal communication.
29. *Kyoto Protocol to the United Nations Framework Convention on Climate Change* (1997). Adoption of this protocol would sharply limit GHG release for one-fifth of the world's people and nations, including the United States.
30. Idso, S. B. (1997) in *Global Warming: The Science and the Politics*, ed. L. Jones, The Fraser Institute: Vancouver, 91-112.
31. Lindzen, R. S. (1996) in *Climate Sensitivity of Radiative Perturbations: Physical Mechanisms and Their Validation, NATO ASI Series* **I34**, ed. H. Le Treut, Berlin-Heidelberg: Springer-Verlag, 51-66.
32. Renno, N. O., Emanuel, K. A., and Stone, P. H. (1994) *J. Geophysical Research* **99**, 14429-14441.
33. Hansen, J. and Lebedeff, S. (1987) *J. Geophysical Research* **92**, 13345-13372.
34. Hansen, J. and Lebedeff, S. (1988) *Geophys. Res. Let.* **15**, 323-326.
35. Christy, J. R. (1997) *The Use of Satellites in Global Warming Forecasts*, George C. Marshall Institute.
36. Balling, Jr., R. C. *The Heated Debate* (1992), Pacific Research Institute.
37. Goodridge, J. D. (1998) private communication.
38. Schneider, S. H. (1994) *Science* **263**, 341-347.
39. Goodridge, J. D. (1996) *Bulletin of the American Meteorological Society* **77**, 3-4; Goodridge, J. D. private communication.
40. Christy, J. R. and Goodridge, J. D. (1995) *Atm. Envir.* **29**, 1957-1961.
41. Santer, B. D., et. al. (1996) *Nature* **382**, 39-45.
42. Michaels, P. J. and Knappenberger, P. C. (1996) *Nature* **384**, 522-523; [pjm8x,pck4s@rootboy.nhes.com]; Weber, G. O. (1996) *Nature* **384**, 523-524; Also, Santer, B. D. (1996) *Nature* **384**, 524.
43. Nerem, R. S. et. al. (1997) *Geophys. Res. Let.* **24**, 1331-1334; [nerem@csr.utexas.edu]; Douglas, B. C. (1995) *Rev. Geophys. Supplement* 1425-1432.
44. Douglas, B. C. (1992) *J. Geophysical Research* **97**, 12699-12706.
45. Bentley, C. R. (1997) *Science* **275**, 1077-1078; Nicholls, K. W. (1997) *Nature* **388**, 460-462.
46. Landsea, C. W., et. al. (1996) *Geophys. Res. Let.* **23**, 1697-1700; [landsea@aoml.noaa.gov].
47. Penner, S. S. (1998) *Energy – The International Journal*, January, in press.
48. Graybill, D. A. and Idso, S. B. (1993) *Global. Biogeochem. Cyc.* **7**, 81-95.
49. Kimball, B. A. (1983) *Agron. J.* **75**, 779-788.
50. Poorter, H. (1993) *Vegetatio* **104-105**, 77-97.
51. Cure, J. D. and Acock, B. (1986) *Agric. For. Meteorol.* **8**, 127-145.
52. Gifford, R. M. (1992) *Adv. Bioclim.* **1**, 24-58.
53. Mortensen, L. M. (1987) *Sci. Hort.* **33**, 1-25.
54. Drake, B. G. and Leadley, P. W. (1991) *Plant, Cell, and Envir.* **14**, 853-860.
55. Lawlor, D. W. and Mitchell, R. A. C. (1991) *Plant, Cell, and Envir.* **14**, 807-818.
56. Idso, S. B. and Kimball, B. A. (1994) *J. Exper. Botany* **45**, 1669-1692.
57. Grace, J., et. al. (1995) *Science* **270**, 778-780.
58. Waddell, K. L., Oswald, D. D., and Powell D. S. (1987) *Forest Statistics of the United States*, U. S. Forest Service and Dept. of Agriculture.
59. Idso, S. B. and Kimball, B. A., (1997) *Global Change Biol.* **3**, 89-96.
60. Idso, S. B. and Kimball, B. A. (1991) *Agr. Forest Meteor.* **55**, 345-349.
61. Kimball, et. al. (1995) *Global Change Biology* **1**, 429-442.
62. Pinter, J. P. et. al., (1996) *Carbon Dioxide and Terrestrial Ecosystems*, ed. G. W. Koch and H. A. Mooney, Academic Press.
63. McNaughton, S. J., Oesterhold, M., Frank. D. A., and Williams, K. J. (1989) *Nature* **341**, 142-144.
64. Cyr, H. and Pace, M. L. (1993) *Nature* **361**, 148-150.
65. Scheiner, S. M. and Rey-Benayas, J. M. (1994) *Evol. Ecol.* **8**, 331-347.
66. Idso, K. E. and Idso, S. (1974) *Agr. and Forest Meteorol.* **69**, 153-203.

EXHIBIT 39

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Enclosed is an eight page review of information on the subject of "global warming," a petition in the form of a reply card, and a return envelope. Please consider these materials carefully.

The United States is very close to adopting an international agreement that would ration the use of energy and of technologies that depend upon coal, oil, and natural gas and some other organic compounds.

This treaty is, in our opinion, based upon flawed ideas. Research data on climate change do not show that human use of hydrocarbons is harmful. To the contrary, there is good evidence that increased atmospheric carbon dioxide is environmentally helpful.

The proposed agreement would have very negative effects upon the technology of nations throughout the world, especially those that are currently attempting to lift from poverty and provide opportunities to the over 4 billion people in technologically underdeveloped countries.

It is especially important for America to hear from its citizens who have the training necessary to evaluate the relevant data and offer sound advice.

We urge you to sign and return the enclosed petition card. If you would like more cards for use by your colleagues, these will be sent.

Frederick Seitz

Frederick Seitz
Past President, National Academy of Sciences, U.S.A.
President Emeritus, Rockefeller University