
NATION BRIEFLY

The Register 3/31/90

Study doesn't find evidence of greenhouse effect

Ten years of weather-satellite data show no evidence of global warming from the greenhouse effect, but scientists said it will take at least another decade of measurements to draw a firm conclusion.

The data, collected from 1979 through 1988 by the TIROS-N series of weather satellites, proved that the Earth's temperature can be measured accurately by instruments probing the atmosphere from space, two scientists said in a paper published Friday in *Science*.

"We found that the Earth's atmosphere goes through fairly large year-to-year changes in temperature, and over that 10-year period we saw no long-term warming or cooling trend," said Roy W. Spencer, of the Marshall Space Flight Center in **Huntsville, Ala.**

CFC substitutes might warm planet

The New York Times

The Register 4/5/90
Chemicals counted on as substitutes for chlorofluorocarbons — widely used substances that are destroying the Earth's protective ozone layer — could contribute significantly to long-term global warming, scientists say.

Chlorofluorocarbons, or CFCs, have two important but entirely separate environmental effects: By depleting the stratospheric ozone layer, they allow harmful ultraviolet rays to penetrate the atmosphere.

And they are a powerful contributor to the greenhouse effect, in which a number of gases trap the sun's heat in the atmosphere.

Some of the chemical substitutes, called hydrohalocarbons, are about one-tenth as destructive to ozone as CFCs on average, and others do not destroy it at all, the scientists report.

But like CFCs, carbon dioxide and other gases, all the hydrohalocarbons trap the sun's heat in the atmosphere.

They trap only about one-tenth as much as CFCs do, but their "unbounded use" could nevertheless contribute significantly to the greenhouse effect, the scientists said.

Unrestrained use of some of the substitutes also could erode future

gains made by eliminating CFCs, said one of the chief researchers, Donald A. Fisher of the E.I. du Pont de Nemours & Co. Experimental Station at Wilmington, Del.

He described the hydrohalocarbons as an interim measure pending a more ideal but still unknown solution.

The research was described in two reports today in the British journal *Nature*.

Chlorofluorocarbons, industrial chemicals widely used as refrigerants, aerosol sprays and cleaning agents, rise to the upper atmosphere, where they break down ozone molecules.

Under an international treaty reached in Montreal, most of the developed nations have agreed to reduce the production of CFCs.

Some have decided to eliminate them entirely by the end of the century, often by replacing them with hydrohalocarbons.

The calculations of the effect of hydrohalocarbons on global warming were performed by Fisher and Charles H. Hales, also of the Du Pont experimental station in Wilmington, and Wei-Chyung Wang, Malcolm K.W. Ko and N. Dak Sze of Atmospheric and Environmental Research Inc. of Cambridge, Mass.

Study calls global warming major threat

Greenhouse effect might be worse than previously thought

The Boston Globe
The Register 12/18/89

A new study appears to confirm the view that global warming is a major threat and could possibly be worse than computer models are now predicting.

The study, published in today's edition of the journal *Nature*, is likely to fuel the debate about the magnitude of the global warming threat.

Skeptics have been highlighting the uncertainties in computer models used to predict how the greenhouse problem will affect temperatures and climate and some have suggested that the future may hold little if any warming.

This debate has centered on two areas of uncertainty: whether clouds might offset any warming and whether increasing water vapor in the atmosphere will make the warming even worse.

MIT meteorologist Richard Lindzen has suggested that water vapor may not intensify greenhouse warming as current-scientific theory suggests. He argues that increased temperatures could dry the upper atmosphere rather than make it more moist.

If this happens, he notes, it would counteract greenhouse warming

from carbon dioxide and other greenhouse gases and the climate would not warm as much as computer models now predict.

The new study by Veerabhadran Ramanathan, however, supports the prevailing theory that water vapor will greatly intensify greenhouse warming.

Ramanathan's findings were published two months after he outlined his theory during a lecture at the University of California, Irvine.

Using satellite measurements and ocean-temperature data, Ramanathan was the first to test whether water vapor is behaving in the Earth's atmosphere the way scientists have theorized.

In a telephone interview, Ramanathan, a professor of geophysical sciences at the University of Chicago, explained that warmer air holds more water vapor. So as temperatures rise the atmosphere is expected to be more humid, he said.

He noted that water vapor is "the most powerful greenhouse gas," so its presence would greatly increase any warming caused by carbon dioxide and other greenhouse gases.

"I think this study ... offers strong support to greenhouse-effect theories. Frankly," he added, "I didn't expect that our work would support theories so strongly."

According to current theory, wa-

ter vapor will operate as a "positive feedback" as the greenhouse problem drives temperatures upward. Higher temperatures will cause more water vapor in the atmosphere. This water vapor will trap more heat and drive temperatures higher. And this will lead to more water vapor, etc.

Ramanathan said he found it difficult to make an informed com-

ment on Lindzen's theory because "he has never put his argument down on paper." With this caution, he noted that his study did find evidence of the drying that Lindzen had suggested in certain regions, but "we find that the temperature effect dominates."

Register staff writer Gary Robbins contributed to this report.

Greenhouse Warming and Freezing Threaten Us Now

Larry Ephron

There is a grave misunderstanding in all the public discussions of the greenhouse effect. By looking only at global warming as the greenhouse "signal," scientists can still argue whether the predicted consequence of the greenhouse effect has in fact arrived. The recent report that there has been no warming in the continental U.S. since 1895 adds fuel to the debate. Even those who maintain that the unusually hot 1980s and the extremely hot summer of 1988 is a clear signal are still focusing on what the climate is going to be like in the middle of the next century (perhaps in part because their computer models are arbitrarily set for a doubling of carbon dioxide, expected about 2030).

When the greenhouse effect heats up the atmosphere, more water is evaporated from the surface of the oceans, forming more clouds. Using computer modelling, Wetherald and Manabe at Princeton estimated that increased CO₂ greatly increases cloud cover in the middle and higher latitudes, and decreases it in the tropics. Recent empirical research shows the climatic effects of increased cloud cover.

V. Ramanathan of the University of Chicago and others have just reported that satellite data show existing cloud cover over the mid- and high-latitude oceans to have a substantial net cooling effect -- a cooling, in fact, four times as large as the predicted warming from a doubling of carbon dioxide. The greatest cooling was in winter. And Ray Bradley at the University of Massachusetts and others found "marked increases" in Northern Hemisphere mid-latitude precipitation over the last 30 to 40 years, with the greatest increases occurring in winter (mainly, one presumes, as increased snowfall). They also found increasing drought in the lower latitudes during the same time period, especially in the summer and fall.

In other words, the greenhouse effect is not only doing some major warming (the tropics, and higher latitude summers), it is at the same time doing some major cooling (mid- and high-latitude winters) -- and has already been doing both for *decades*. The unprecedented drought that has killed millions of people in northern Africa during the last 17 years is primarily the result of greenhouse warming. Many North American winters have been extremely cold during precisely this same time period. The record Alaskan cold front (with the heaviest pool of cold air ever recorded in North America), which recently moved down across the United States and suddenly turned an unusually warm winter into a very cold one, is not evidence against the greenhouse effect's presence, it is dramatic evidence for it. And like its summer counterpart, it is also

killing our food crops.

Some climatologists will argue that because of the great natural variability in the climate, we cannot be sure that the record cold winters and hot summers of recent decades are anything other than normal fluctuations. But Weisburd and Raloff calculated the possibility that the long, severe north African drought was a random fluctuation of dry years at about 1 in 130,000.

By continuing to look only at global averages, in which the warming and cooling effects cancel each other out, and inexplicably to ignore the kinds of research described above, climatologists who project a greenhouse warming into the middle of the next century are doing us a terrible disservice. We are being lulled into an utterly false sense of security that the worst consequences of the greenhouse effect are decades away, and that we have adequate time to take appropriate action. Any insistence that we must act immediately is likely to fall on deaf ears when the most serious consequences are predicted for a time so far in the future that most of us do not expect to be alive.

The three increasingly severe U.S. droughts of the 1980s, culminating in the devastating summer of 1988, should be sufficient evidence that we may well be in serious trouble now. We could not grow enough grain to feed ourselves in 1988. It's not a question of what the world will be like for our grandchildren; if we don't act fast, it's a question of whether we ourselves will survive the next five or ten years.

Most of what needs to be done is already well known, and well within our capabilities. Only remineralizing forest soils with finely ground gravel dust is still not yet widely known. It's somewhat comparable to liming lakes killed by acid rain. The evidence for it is presented in my book *The End: The imminent ice age and how we can stop it* (Celestial Arts), and in an hour-long video. The growth-rate of existing and newly-planted forests can thus be increased 300-500%, which will consume large quantities of atmospheric carbon dioxide. (It's well known that that's how the glaciers revitalize the earth during a major ice age: by grinding up rocks into a fine dust that remineralizes the soil.) Remineralizing farm soils will increase agricultural output similarly, replace all the chemicals, and increase our food reserves substantially at this most critical time.

So we know what to do. Whether it gets done in time is up to each of us.

Larry Ephron, PhD, is director of People For A Future in Berkeley, California.

His book The End: The imminent ice age and how we can stop it (Celestial Arts), \$8.95, and video Stopping the Coming Ice Age, \$29.95, are available from People For A Future, 2140 Shattuck Ave., Berkeley CA 94704. 1-800-441-7707. In Calif.: (415) 524-2700. Copyright 1989, Larry Ephron. May be published at standard rates, and xeroxed freely. Glossy photos available.

REMINERALIZING THE SOIL

Most of us are aware that the greenhouse effect is rapidly becoming a serious threat to our climate. There is widespread agreement that it is the reason we lost almost one-third of all our grains in 1988, and were not able to produce enough wheat, corn, etc. to feed ourselves.

The greenhouse effect is caused partly by human activities -- burning fossil fuels, cutting down the rainforests, etc., which put into the atmosphere carbon dioxide and other gases that trap additional heat from the sun, creating a kind of greenhouse. It is also happening because many of the earth's forests are dying; they not only stop consuming their great quantities of carbon dioxide, the carbon that makes up their substance goes back into the atmosphere and forms additional greenhouse gases.

The earth's forests are dying from both man-made (pollution, acid rain) and natural causes. It is well known that much of the minerals in the earth's soil has been gradually eroded away since the last ice age. Since minerals (iron, calcium, etc.) are essential nutrients for every form of life, the world's forests have been weakening and dying for hundreds of years.

When the glaciers build up during each ice age, they grind up the rocks in their path into a fine dust, called "loess." This rock dust is then carried by water and wind to many parts of the earth. Since rocks are made of minerals, this is how the essential minerals are returned to the soil, and the forests become revitalized once again.

THE KEY TO OUR SURVIVAL

Experimental studies have shown that remineralizing the soil with finely ground gravel dust triples or quadruples the growth rate of plants!

By grinding up mixed gravels (which contain the full spectrum of minerals) into a dust as fine as talcum powder so they can be made use of quickly by the plants, and by spreading this dust by airplane, blower-truck and every conceivable means over most of the world's remaining forests, the forests will become rejuvenated. We also need to plant vast quantities of new, fast-growing species of trees on remineralized soil.

As the revitalized forests thrive and spread, they will consume much of the excess carbon dioxide in the atmosphere, reducing the greenhouse effect substantially. This will decrease the threat of a global food emergency which is now threatening us, and give us time to develop ways of conserving energy, much more efficient machines, and nonpolluting energy sources.

Remineralizing agricultural soils will enable us to grow much more

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food, enough to stockpile to get us through the coming climate crisis. It will also replace all the chemical fertilizers and pesticides which are poisoning the earth, the rivers, the farmers and ourselves. Remineralizing the soil produces plants so well-nourished and hardy they can resist most insects all by themselves. They are also better able to withstand climatic extremes, including heat, cold and drought, all the things which now threaten our ability to grow enough food.

Remineralizing most of the forests of the world and planting billions of new trees is obviously a major project, but it is well within our industrial capabilities. It will cost about what the world spends on weapons and military activities every two years. There is evidence that it must be done quickly if we want to maximize our chances of stabilizing the climate before millions more of us starve to death, this time in every region of the earth.

We know what to do, and we can afford it. Have we got the will to live?

The scientific evidence for remineralizing the soil can be found in The End: The imminent ice age and how we can stop it (Celestial Arts), \$8.95. Some visual evidence of the dramatic effects of remineralization and the experiences of some of the people working in this area can be found in the video Stopping the Coming Ice Age, \$29.95.

Both are available from the People For A Future, 2140 Shattuck Ave., Berkeley CA 94704. 1-800-441-7707. In Calif.: (415) 524-2700.

This perspective has been endorsed by several prominent scientists, including the following:

"I consider this completely valid. It requires immediate action."

*-- Victor Kovda, former President,
Scientific Committee for Environmental
Problems, International Council of
Scientific Unions*

"An astonishing service for humanity. A complete world view which has been sitting under the noses of many scientists, and which all of them seem to have overlooked."

*-- Kenneth E.F. Watt, Professor of
Environmental Studies, University of
California, and author of the "Annual
Review of the Environment" for the
Encyclopedia Britannica*

"This is very important."

*-- Wibjorn Karlen, climatologist, University
of Stockholm*

THE SOLUTION TO OUR PESTICIDE PROBLEM

Larry Ephron

Most of us now want our food to be grown without toxic pesticides. But many farmers are afraid they will not be able to grow enough food without chemicals. Or that most people will not really buy organically grown produce if enough of it doesn't have that perfect, blemish-free appearance that pesticides seem to provide. More tropical areas like Florida, where insects proliferate, are afraid they will not be able to compete organically with desert regions such as Southern California and Arizona.

Fortunately, the solution seems to be at hand. A hundred years ago a German agricultural chemist, Julius Hensel, discovered that adding finely ground rock dust to the soil had remarkable effects on crop plants. They not only grew faster and larger, they seemed to be almost entirely resistant to insects and free of diseases. In 1893 he wrote a small book, *Bread from Stones*, in which he explained that rock dust provides a wide spectrum of minerals needed by growing plants, comparable to the long-term weathering that turns mountains into soil.

Since then, university scientists in several European countries have confirmed these findings and quantified them. Plants grown on soil well-mineralized with rock dust grow much faster than plants grown with chemicals, need no chemical fertilizers or pesticides whatever, and produce yields on the order of 200-300% that of control plots. The best results are obtained with very finely ground dust from a mixture of many types of rocks, such as is found in glacial or river gravel, which contains the full spectrum of minerals. The inexpensiveness of gravel dust compared to chemicals will enable many family farms to stay in business.

The crops grown on such soil seem to be much hardier, more likely to survive climatic extremes such as heat, cold, and drought. That alone seems sufficient reason to remineralize our farmlands quickly, with the climate already worsening from the rapidly increasing greenhouse effect. Any surpluses can replenish our dwindling reserves, and be stockpiled by governments against expected climatic disasters. Food grown on remineralized soil has been found to contain substantially more nutrients than chemically grown food (almost 50% more calcium, 80% more potassium in one study) -- so those of us who eat it should be hardier as well.

Studies show rock dust also produces a comparable effect on trees -- greatly increased resistance to insects, disease and climatic extremes, and much faster growth. Massive tree-planting has been proposed as the one thing we can do to actually reduce the greenhouse effect rather than simply slowing its rise, since trees consume one of the most prevalent greenhouse gases, carbon dioxide. By remineralizing the soil of newly planted forests as well as existing ones, we can magnify the effectiveness

of these efforts several-fold, gaining some crucial time to phase in a less-polluting way of life.

The simplest thing may solve not only our pesticide problem but our survival problem as well. We have detailed information and scientific references for anyone who may be interested.

Larry Ephron is director of People For A Future in Berkeley, California.

(519 words total)

SOME FREQUENTLY ASKED QUESTIONS ABOUT THE ICE AGE THEORY

ISN'T THE ICE AGE SCENARIO COMPLETELY AT ODDS WITH THE GREENHOUSE WARMING THEORY?

No -- it's a variation of it. To the extent that the greenhouse warming theory focuses on global averages, it is more or less correct as far as it goes, at least in the short run: the greenhouse gases do warm up the atmosphere. The question is what actually happens to the world's climate in different regions as a result.

Climatological theory and research suggest that the greenhouse effect evaporates more moisture from the surface of the oceans, forming more cloud cover, especially in the mid- to high-latitudes, and especially in winter. Very recent research (Ramanathan et.al., *Science* 243:57, January 6, 1989), based on new satellite data, has finally resolved the debate about whether clouds warm or cool the earth. Different types of clouds do different things, but the kinds of clouds that are found in the mid- to high-latitudes have a very pronounced cooling effect -- a cooling four times as large as the expected warming from a doubling of carbon dioxide (not expected until sometime well into the next century). This paper seems to supply the last important piece of evidence linking the greenhouse effect to colder winters.

Research published a year and a half ago (Bradley et.al., *Science* 237:171 (1987) found "marked increases" in Northern hemisphere mid-latitude precipitation over the last 30 to 40 years, again especially in winter. Since their mid-latitude zone extended all the way up to the middle of Baffin Island in northern Canada, one assumes that much of this markedly increased winter precipitation must have been snowfall, leading to colder winters.

Bradley and his colleagues were not willing to attribute these long-term increases to the greenhouse effect: "Although these large-scale trends are consistent with general circulation model projections of precipitation changes associated with doubled concentrations of atmospheric carbon dioxide, they should be viewed as defining large-scale natural climatic variability." Yet the marked decrease in low-latitude precipitation they also found for the past 30 to 40 years is clearly not attributable to natural climatic variability. Comparing the unprecedented 17-year drought in northern Africa with the natural fluctuations of dry years in that lower latitude region, Weisburg and Raloff (*Science News* 127:282, 1985) calculated the likelihood that such a long drought might have occurred by chance at about 1 in 130,000.

The "differential greenhouse effect" presented in *The End* -- heating and drying in the tropics (and in higher latitude summers for a while) along with colder mid- and high-latitude winters -- is also consistent with what we now know about the major ice ages. In their book *The Coevolution of Climate and Life* (Sierra Club, 1984), Schneider and Londer

report that tropical sea surface temperatures at the height of the last major ice age 18,000 years ago were significantly warmer than they are today (p.66ff). Thus a continuous source of evaporative moisture would have been available to build the ever-increasing glaciers of the last major ice age, along with the strong winds to carry it -- winds resulting from the greatly increased pole-to-tropics temperature difference on a globe with warmer tropical oceans and spreading ice sheets at the poles.

ISN'T IT RIDICULOUS TO SUGGEST THAT A MAJOR ICE AGE COULD BEGIN IN LESS THAN FIVE OR TEN YEARS?

If you're thinking of glaciers invading New York City, of course it's absurd. We're talking about changes that are small compared to mile-high ice sheets, but that would be enough to destroy our existence. The book presents evidence that Northern hemisphere winters have gotten substantially colder in the last 50 to 100 years, and there have been record cold winters again and again in the last couple of decades. It may only take a short freeze to destroy an entire crop, like the winter wheat crop that provides all our bread; or the corn that's planted in April but freezes one night in a freak early-June cold spell; or the millions of fruit trees that are completely destroyed as far south as Florida by unprecedented freezes.

French pollen specialist Genevieve Woillard, studying undisturbed beds of pollen that were gradually deposited over the last 150,000 years, concluded that the final transition at the beginning of the last major ice age some 100,000 years ago, from a warm climate to a climate so cold that fruit- and nut-bearing trees no longer grew (and therefore agriculture would be impossible), incredibly took "less than 20 years." (*Nature* 281:558, 1979). Other scientists have made similar findings. Moreover, based on her observation that European forests seem to be precipitously dying now (from a variety of natural conditions including soil demineralization, drought and colder winters, in addition to such man-made causes as acid rain and pollution), she concluded -- ten years ago -- that we may now be in a similarly rapid transition period, and only a few years from the end of Northern hemisphere temperate-region agriculture.

WHY HAVEN'T MORE MAINSTREAM CLIMATOLOGISTS ENDORSED THE DIFFERENTIAL GREENHOUSE EFFECT AND THIS THEORY OF THE ICE AGE CYCLES?

The differential greenhouse theory is slowly gaining ground. Up until the last year or so, climatologists' general circulation models of the atmosphere have left water vapor and cloud cover completely out of the picture, and such model results were admittedly primitive and incomplete. Recent models are including cloud formation and its warming or cooling effects, and empirical data are still being gathered, as described above.

University and government scientists tend toward skepticism or at least caution about new theories, for a number of reasons. Most of their work is supported by government grants, which could be jeopardized by statements that might appear foolish. There is also a great deal of

competition in science, for prestige and for grants; there may be much more than intellectual risk in supporting a competing theory. And scientists, being human, have a natural attachment to their own ideas and research programs.

Competitiveness might be expected to be much more pronounced when a challenging theory comes from outside the field entirely, as this one does. John Hamaker's book was virtually ignored by the profession, and the two times it was cursorily reviewed it was not only trashed but misrepresented, his actual ideas badly garbled. One can find no more clear evidence of an emotional, defensive response rather than an intellectual one.

My own experience has been similar. Not a single one of the eleven prominent proponents of the Milankovitch theory (the only competing explanation of the major ice age cycle, discredited for several years now by prominent climatologists not associated with it) whom I wrote to, even deigned to reply. More importantly, Stephen Schneider, director of interdisciplinary studies at the National Center for Atmospheric Research in Boulder, a frequent public spokesman and a relative generalist in the field, did finally reply after six months with his comments on a well-documented article of mine, but when I answered his criticisms and provided some very new data, he never replied again.

We have recently gained some support from two young climatologists in prestigious institutions. Lee Klinger is also at NCAR (Schneider brought him there), where he has been doing research and writing articles on soil and vegetation as precursors of climate change. He came across Hamaker's work two years ago, and writes that he "was struck by the similarity of his work with my own ideas." He says that Hamaker's work is the closest to his own of anything going on in climatology.

Skip Walker at the Institute for Arctic and Alpine Research at the University of Colorado is studying loess (glacially ground rock dust) and its effects on soil and vegetation change. He also finds Hamaker's work quite interesting and useful -- and says that there are few open-minded people in climatology.

EVEN SO, SHOULDN'T NON-SCIENTISTS BE SKEPTICAL OF SUCH A MINORITY VIEW AS THIS UNLESS MORE MAINSTREAM CLIMATOLOGISTS COME TO SUPPORT IT?

The main problem is that there are two kinds of risks involved in this global crisis. I stated quite clearly in *The End* that this theory may not yet be fully proven, but that there seems to be a tremendous amount of evidence to support it. Most of the connections that make up the theory are fully accepted by scientists in the relevant fields: soil demineralization during interglacial periods (paleogeologists), the resultant succession and dieback of temperate forests (paleobotanists), the resultant increase in atmospheric carbon dioxide (botanists), the greenhouse effect that ensues (climatologists), the increased evaporation and cloud cover that results (climatologists), and the remineralization of forests by glacially ground rock dust during an ice age (paleogeologists and paleobotanists). An objective, fair-minded scientist would have to

virtually no opposition. Since most scientists now recognize that tree planting is an essential part of our response to the greenhouse effect, so that new trees can consume some of the excess carbon dioxide in the atmosphere, remineralizing the soils of existing and newly created forests should make sense to almost everyone. It's simple and relatively inexpensive.

What's urgently needed now is for the media to help get the word out about this, so that it can be considered by the scientific community and the body politic, and if it continues to make sense to most people, so that we can get on with it quickly. We may really have very little time left to begin to turn this global crisis around.

Larry Ephron

May 1, 1989

FILM

VIDEO PICK OF THE WEEK



A blower-truck spreads finely ground gravel dust on dying forests in Austria.

STOPPING THE COMING ICE AGE

Noticed that your heating bills tripled this winter? Well, get out your parkas, folks, because we may be in for more than just an idiosyncratic Northridge snowfall in the years ahead. According to author Larry Ephron (*The End: The Imminent Ice Age and How We Can Stop It*), the next ice age is just around the corner, and could begin as soon as 1993. With this sobering thought in mind, EZTV has become part of a nationally coordinated campaign to raise public consciousness about the possible "greenhouse effect" that could cause a "holocaust unlike anything that has been conceived," and is screening Ephron's video based on his book. *Stopping the Coming Ice Age* is a terrifying compendium of scientific evidence illustrating how the earth's atmosphere, suffering from increased carbon dioxide and other gasses thanks to the death of rain forests, is falling prey to a greenhouse effect, in which the

excess heat trapped by the sun leads to the evaporation of moisture, more clouds, and increased snow and ice in the polar regions. This, in turn, leads to more earthquakes and volcanic eruptions due to increased pressure on the earth, which then unleashes more carbon dioxide in a cyclical nightmare of destruction. Many scientists and environmentalists believe that we are hastening the Ice Age by wantonly destroying our tropical rain forests and excessively burning fossil fuels and incinerating garbage, to name just a few sins. Ephron posits that the Ice Age can be prevented by ceasing the rape of the land, planting vast quantities of new trees and remineralizing the earth's soil ourselves, but unless MacDonald's and other global offenders take the hint soon, our future thoughts may be chilling indeed. At EZTV, Fri.-Sat., 8 p.m.

—Mary Beth Crain

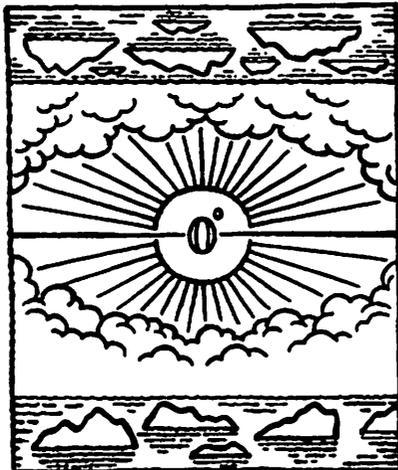
"Everybody has to see this."

--Sting

Warming and Cooling

To the Editor:

There is a grave misunderstanding in public discussions of the greenhouse effect, and it threatens our survival. When the greenhouse effect



Bob Gale

heats up the atmosphere, more water is evaporated from the surface of the oceans, forming more clouds. R. T. Wetherald and S. Manabe estimate that increased carbon dioxide greatly increases cloud cover in the middle and higher latitudes, and decreases it in the tropics.

V. Ramanathan and others have just reported that satellite data show cloud cover over the mid- and high-latitude oceans to have a substantial net cooling effect — a cooling four times as large as the predicted warming from a doubling of carbon dioxide. The greatest cooling effect was in winter. And Ray Bradley and others found “marked increases” in Northern Hemisphere mid-latitude precipitation over the last 30 to 40 years, with the greatest increases occurring in winter (mainly, one presumes, as increased snowfall). They also found increasing drought in the lower latitudes during the same period, especially in summer and fall.

In other words, the greenhouse effect is not only doing some major warming (the tropics, and higher latitude summers), but it is at the same time doing some major cooling (mid- and high-latitude winters) — and has been doing both for decades. The drought that has killed millions of people in northern Africa in the last 17 years is the result of greenhouse warming. (The likelihood that it was caused by normal variability has been calculated as one in 130,000.) Many North American winters have been extremely and increasingly cold during precisely this period.

By continuing to look only at global averages, in which warming and cooling effects cancel each other out, and inexplicably to ignore the kinds of research described above, climatologists who project a greenhouse warming into the middle of the next century are doing us a terrible disservice. We are being lulled into a false sense of security that the worst consequences of the greenhouse effect are decades away, and that we have time to take appropriate action.

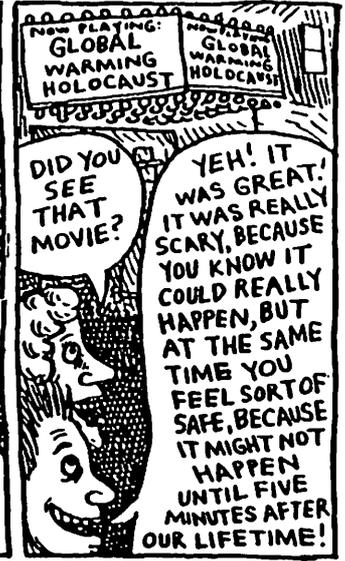
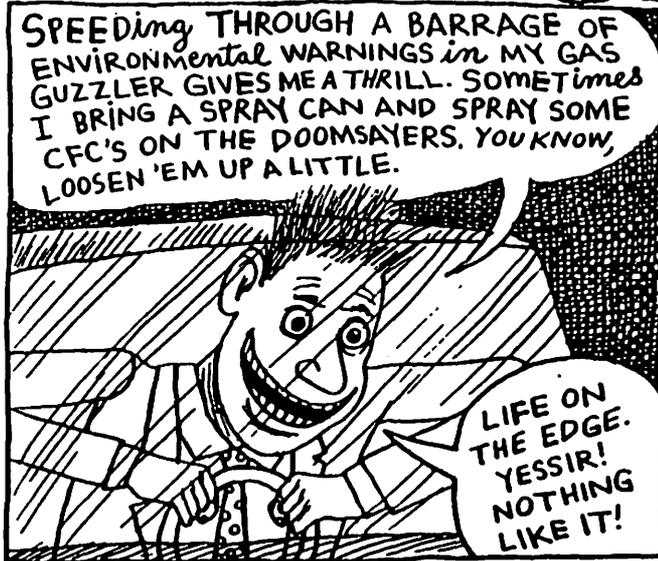
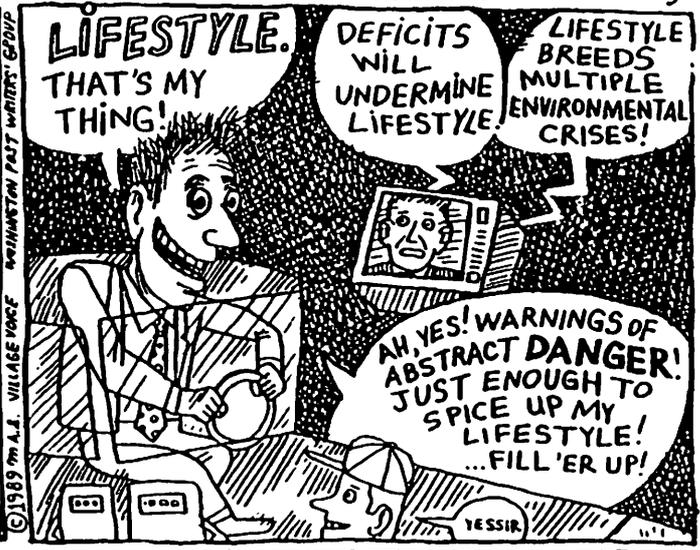
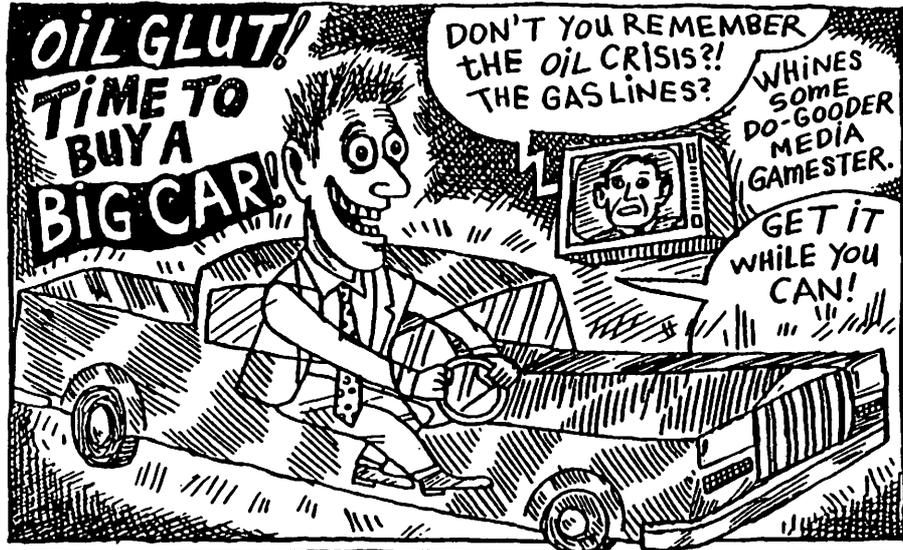
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The growth rate of existing and newly planted forests can thus be increased 300 percent to 500 percent, which will consume large quantities of atmospheric carbon dioxide. (That's how the glaciers revitalize the earth during a major ice age: by grinding up rocks into a fine dust that remineralizes the soil.) Remineralizing farm soils will increase agricultural output similarly, replace all the chemicals and increase our food reserves substantially at this most critical time.

LARRY EPHRON
Berkeley, Calif., March 1, 1989

WASHINGTON

Mark Alan Stamaty



New Ice Age by 1995?

To the Editor:

Some climatologists are beginning to see a significant rise in global temperature in the 1980's, and attribute it to a greenhouse effect from carbon dioxide and other gases ("Global Warming Has Begun, Expert Tells Senate," front page, June 24). In looking at global temperature averages, however, most climatologists ignore dramatic increases in regional and seasonal differences. While lower latitudes and midlatitude summers are becoming hotter and drier, the higher latitudes of the Northern Hemisphere and Northern Hemisphere winters have been getting colder and wetter — with record cold winters — during this decade of record global warmth. What could be going on?

Since the greenhouse effect magnifies heat radiated back by the earth from the sun's warmth, it will be much more pronounced in the tropics than at the poles, which get little sunlight to magnify. Thus the temperature difference between the poles and the tropics is increased by the greenhouse effect, magnifying global pressure differences (warm air rises, cold



air sinks) and creating higher winds. Indeed, hurricanes and tornadoes have been increasing dramatically in the last 50 years.

As the tropical oceans heat up, more of their moisture is evaporated to form clouds. The increasing pole-tropic wind systems move some of these additional clouds toward the poles, resulting in increased winter rainfall, longer and colder winters and the gradual buildup of the polar ice sheets. This phenomenon has come to be widely recognized by climatologists in recent years.

What most of them do not recognize

is that this process may be the engine that drives the 100,000-year cycle of major ice ages, for which there is no other plausible explanation. Before our species came along, to dig up and burn fossil fuels and create a climate-altering greenhouse effect, nature may have been doing it periodically on its own: as soil minerals are eroded or leached away, the earth's vegetation loses these essential nutrients and dies back significantly. Carbon is meanwhile returned to the atmosphere, where it becomes carbon dioxide, creating a greenhouse effect, with all its climatic consequences.

The final piece of the puzzle is this: As the glaciers slowly cover large sections of the earth over tens of thousands of years, they grind the rocks in their path into a fine dust. This rock dust is then carried by wind and water over many widespread areas of the globe. Because rocks are composed of minerals, this mixture of dust from many types of rocks remineralizes many of the earth's forests, rejuvenating them. As they thrive and spread, they consume the excess carbon dioxide, and nature's greenhouse effect subsides, shutting off the wind and evaporation engine that built up the glaciers. Though this scenario has been accepted by only a few scientists so far, every element of it is fully supported by the scientific literature.

In 1979, Genevieve Woillard, a pollen specialist in France, concluded from detailed studies that the shift from a warm interglacial climate to ice age conditions at the beginning of the last ice age, some 100,000 years ago, took "less than 20 years." Her observations of the decline of European forests led her to conclude we may be in a similar period of rapid climatic change and only a few years from the start of the next major ice age. By her reckoning, and that of John Hamaker, who developed the theory I've outlined, we may be less than seven years away, and our climate may continue to deteriorate rapidly until life on earth becomes all but unupportable.

We know how to reverse the greenhouse effect: stop clear-cutting the earth's remaining forests, reduce fossil-fuel burning dramatically in favor of nonpolluting energy sources, plant billions of acres of new fast-growing trees and remineralize much of the earth's forests with rock dust. There may be time to stop the cycle, if we recognize the problem right away and act quickly.

LARRY EPHRON
Berkeley, Calif., July 15, 1988

The writer is director of the Institute for a Future.

GLOBAL WARNING

Greenhouse or Ice Age?

THE END

By Larry Ephron, *Celestial Arts*, 1988.
144 pp., paperback, \$2.95.

Reviewed by Anna Bond

If you believe the popular wisdom, we're in for a gradual, or perhaps not so gradual, global warming. The greenhouse effect, triggered by high levels of atmospheric carbon dioxide and other gases absorb-

ing the sun's infrared energy will, we are told, bring drought to much of the world's agricultural lands, destroy many fragile ecosystems, and cause widespread flooding of coastal areas. The consequent need for food supplies and massive relocation are obviously serious social and political problems.

This widely accepted scenario is based on highly sophisticated computer models. But many people are wondering why we are experiencing record cold winters as well as scorching summers. And a growing number of scientists of divergent disciplines are suggesting another, quite different scenario.

Larry Ephron's *The End* is an articulate and updated presentation of the ideas of John Hamaker. Hamaker's explanation of the mechanism of glaciation and his thesis that the warming we are experiencing is temporary, are well worth examination. Sir H. H. Lamb, the grand old man of climatology, points out that the increased cloud cover likely to be generated by any warming resulting from carbon dioxide would at least cancel out such warming and probably produce lower temperatures and increased precipitation in the middle latitudes. Stephen Schneider, director of the National Center for Atmospheric Research, writes, "It is conceivable that about a 10 percent sustained change in cloud cover... could bring on... an ice age." Satellite photos reveal that cloud cover with a high albedo (reflectivity) now blankets most of Canada in August.

The global *Waldsterben* (death of the forests) throws up another doubt: Would not the trees be thriving and spreading with the increased carbon dioxide, and thus regulating the earth's atmosphere? Instead our trees are more susceptible to insects, blights, cold weather, drought, and disease. Forest ecologists indicate that demineralized soils are a primary cause of that weakening.

Ephron recounts numerous geological and climatological studies that show the succession of tree types and conditions during the past glacial and interglacial



periods. These studies all indicate that at the end of an interglacial period there is a natural lack of available minerals in the soil, the work of the glaciers being to remineralize it by grinding rocks to a fine dust (loess) that is then deposited all over the earth by 200 mph winds, creating once again conditions that are propitious for the luxuriant growth of vegetation able to fulfill its role of guardian of the atmosphere. We have gone through twenty-five of these 100,000-year cycles, consisting of 90,000 years of glaciation followed by 10,000 years \pm 2,000 years warm interglacial. We are now 10,800 years into the present interglacial period. Based on the rapidly rising carbon dioxide curve, the universal death of the forests, and extensive personal study of climate extremes, Hamaker (and Ephron) puts the time of rapid shift to severe cold, drought, and conditions inhospitable to maturing grain crops in the temperate zone at 1995!

Following Hamaker's intrinsic hopefulness, Ephron presents the radical yet possible ways we can avert the imminent ice age, which Ephron claims we have hastened by approximately 500 years through our shortsighted agricultural practices, deforestation, and burning of fossil fuels. His proposed revolution in agriculture directly assures our physical and spiritual health. His coverage of the political climate suggests a massive cover-up perpetrated by the United States government representing the oil, coal, and natural gas conglomerates, as well as the economic realities behind the clear-cutting of tropical rainforests. Finally and most important, Ephron gives clear directions and sources for the remineralization of the Earth's lands and forests. For if we are to reverse the unfolding of the crisis we have created we must do the work of the glaciers now.

ANNA BOND teaches "the way of food as spirit" at the Quern in Vermont through cooking classes, wild plant exploration, and natural farming.

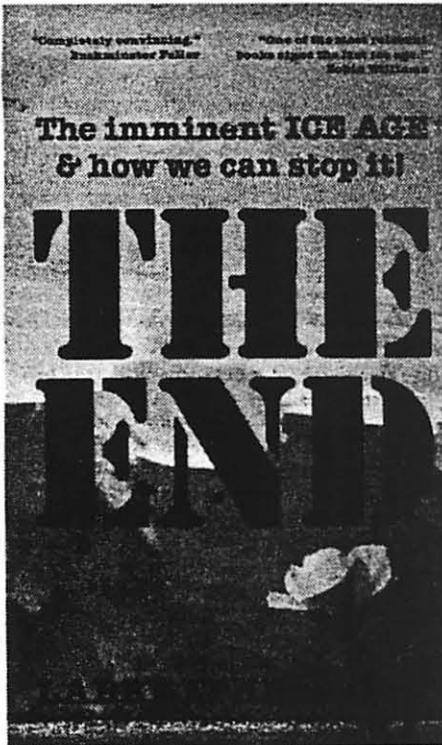


BOOK REVIEWS

by Richard Myers

The End: The Imminent Ice Age and How We Can Stop It by Larry Ephron, Celestial Arts, 1988, \$8.95 paper and *Stopping the Coming Ice Age*, video produced and directed by Larry Ephron, Institute for a Future, 1988.

Grab your winter coat, stock up on food supplies and get ready to head south—a new ice age is on the way. Our planet is rapidly moving toward ice age conditions which could lead to massive starvation within 5 to 7 years according to scientist John Hamaker. Hamaker's intriguing ideas,



based on extensive research on global climatic change and revealing another side to the more popularly accepted greenhouse effect, are thoroughly presented by Larry Ephron in both book and video formats.

Although Hamaker and Ephron make a sobering and convincing case for the rapid development of ice age conditions and exhort us to take responsibility for our planet's future, they are not alarmists in the Chicken Little ("the sky is falling") sense.

Both the book and the video provide sound scientific reasoning backed by theoretical and empirical research which shows that the popular presentations of global warming (the greenhouse effect), now being given much media play, are incomplete and misleading. Hamaker's major discovery is that the warming trend is not equal worldwide. It occurs primarily in the tropics and lower latitudes which receive the most sun. The temperature differential between the tropics and the poles thus increases, leading to a complex set of developments including shifting air masses, ocean evaporation and changes in precipitation (both rain and snow) patterns. The visible result which we experience is an increase in hurricanes and other wind patterns, episodes of drought and flood, changes in temperature patterns, and an increase in snow and ice in the northern latitudes where glaciers and ice sheets are building up.

Ephron points out that ice ages are normal occurrences in earth history. In fact, they take place on regular 100,000 year cycles (which include an approximately 10,000 year warm interglacial period) linked to the planet's need for soil remineralization (glaciers grind up rocks, releasing minerals necessary for healthy plant growth) and the build up of carbon dioxide. Carbon dioxide, a major contributor to the greenhouse effect, builds up when plants, especially trees, can't process the carbon dioxide quickly enough. This occurs when trees are not healthy (because the soil becomes severely demineralized) or, as is an additional stress today, humans are both dumping huge amounts of carbon dioxide into the atmosphere from burning of fossil fuels and cutting down the planet's tree cover at an ever increasing rate. The end result—carbon dioxide builds up, precipitating the next ice age.

The concern for us today, living at the end of a warm interglacial period, is that scientific research has shown that the transition from warm to cold climate took only 150 years during the last glacial period. The main shift in vegetation took place in less than 20 years. According to Hamaker and

continued on next page

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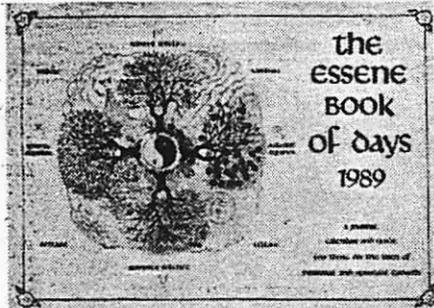
Books

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Ephron, we may already be well into that 20 year period, hence their estimate that we have from 5 to 7 years to take effective action.

This sobering and crucial situation is not without opportunities, however. Hamaker and other scientists feel that we can control the earth's climate and prevent the next ice age from ever occurring. How? By remineralizing the earth's soil ourselves, rather than waiting for glaciers to grind up the rocks. By planting billions of trees. And by cutting back on fossil fuels and replacing them with renewable energy sources. When must we take this action? Immediately. As both the book and the video make clear—once the ice age begins, there is nothing humans can do to stop it.

We humans face a choice which may well be crucial in our evolutionary development. Will we listen to the earth's messages and act in harmony with our planet? Will we have the courage to move into a higher level of consciousness which will allow the inter-human cooperation which will be necessary for the tasks we face? These may be the most momentous steps ever taken by conscious life on planet Earth. As *The End* and *Stopping the Coming Ice Age* make clear—the choice is ours.



The Essene Book of Days, 1989, by Danaan Perry, Sunstone Publications, 1988, \$12.95.

Essene spiritual communities spread over the deserts of the Middle East more than 2,000 years ago. Preserving ancient teachings and living in simple harmony with nature, they followed the wisdom of their inner voices and channeled the healing powers of the living planet. According to Essene teachings, as discovered in the Dead Sea Scrolls, Essene masters, including John the Baptist, initiated Jesus into the ancient wisdom. The example of the Essenes' attunement to subtle, natural spirituality based on their harmony with all life and their love for one another and the Spirit offers us an opportunity for reattunement today.

The Essene Book of Days, 1989 is a "journal, calendar and guide for those on the path of personal and spiritual growth." It contains many Essene teachings that can aid

our reattunement to the earth's natural rhythms and cycles. These teachings are presented in the form of daily meditations and blessings harmonized with the seasons. The page for each day provides an opportunity to focus your energy for that day and the space to record your feelings. Supplemented by drawings and information on spiritual practice and the Essenes, the book can become an opportunity for daily and seasonal awareness.

The Future Now: How to Use All Methods of Prediction From Astrology to Tarot to Discover Your Future by Derek and Julia Parker, Prentice Hall Press, 1988, \$14.95 paper.

When it was recently revealed that Nancy Reagan's regular consultations with an astrologer may have influenced the timing of important national and international policy, much media and public discussion arose over the issue. One interesting aspect of this publicity over future gazing in the White House was the large number of Americans who admitted that they, too, had made use of astrology or other methods of predicting the future.

Given this broad interest, there is bound to be a great deal of enthusiasm for *The Future Now*. This latest book from the authors of *The Complete Astrologer* and *Dreaming* is an interesting and beautifully designed guide to the many methods of future prediction. It covers a wide range of predictive techniques: astrology, tarot, I Ching, dice, palmistry, biorhythms, phrenology, cards, runes, crystals, dreaming, graphology and tea leaves. The history of prediction and a comparison of techniques rounds out the discussion.

There is much more than a mere discussion of each technique, however. Color illustrations and diagrams fill the book, catching the eye and adding an extra dimension to the text. The discussion of each method also includes step-by-step guidelines to allow you to try each method for yourself. It is, for those of you interested in palmistry as well as the other techniques, a hands-on experience. *The Future Now* is an informative and fun introduction to a fascinating body of knowledge.

Other Lives, Other Selves: A Jungian Discovers Past Lives by Roger J. Woolger, Bantam Books, 1988, \$9.95.

Past-lives therapy is becoming an increasingly effective psychotherapeutic technique for promoting spiritual, emotional and physical healing. Drawing on Eastern knowledge, Western science and transformational psychology, Jungian therapist Roger Woolger has developed a technique that does not require acceptance of reincarnation to be effective.

Woolger discusses numerous case histories

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WORKSHOP VACATIONS

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ONGOING

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Video Review:

"Stopping the Coming Ice Age"

Directed by Larry Ephron

Produced by the Institute for a Future (57 minutes)

Looking back, it seems that 1988 was the year for important, "new" environmental issues and concerns to surface. In particular, this was the year in which the so-called "greenhouse effect" finally gained public acceptance, if not notoriety-- a year that saw record-breaking drought, hurricanes, and forest fires. Suddenly, the idea of global warming was appearing everywhere in the media, and it seemed that concerned scientists and politicians were unanimous in their support for the global warming scenario.

However, this unanimity is an illusion, media coverage to the contrary. In fact, there is much controversy within the scientific community as to the climatic effects and socio-political ramifications of the greenhouse effect. It is far from certain that the climate changes we're seeing are leading to/caused by global warming. In fact, there is actually considerable evidence that points to a very different conclusion: that the planet may be teetering on the brink of another Ice Age.

One of the foremost proponents of this latter view is John Hamaker, a mechanical engineer who has extensively analyzed climate and ecological patterns, and has developed a comprehensive and holistic approach to understanding global climate change. His theories, expressed in his book *The Survival of Civilization*, are now being supported and disseminated by a foundation called "Institute For A Future", which recently created a remarkable video presentation: "Stopping the Coming Ice Age".

This video is inspiring, frightening, challenging, and very informative, as it takes us around the world in search of answers. While Hamaker agrees that the greenhouse effect is a very real threat, he believes - and backs this up with hard data and expert opinion -- that it will not warm the Earth uniformly, but instead will increase the temperature differential between the equator and the poles, causing increased thermal convection, atmospheric turbulence, and rapidly shifting and bizarre weather patterns. In this scenario, high winds moving from the equator towards the poles will drop their abundant moisture in the higher latitudes in the form of snow and ice, often creating drought conditions in the temperate regions. He believes that the tropical and sub-tropical zones will indeed get hotter, but the temperate zones are likely to get cooler and drier.

Hamaker's understanding of the greenhouse effect takes us far beyond the popularized, watered-down information available through the mass media because he explores deeper levels of cause and effect, process and purpose. The most profound information presented in this video concerns the connections between the greenhouse effect and the development of an ice age, and the importance of understanding long-term cycles (100,000 years!) of climate change. The video demonstrates the causal connections linking together all the different environmental/atmospheric phenomena that combine to bring on an ice age:

- 1) soil erosion and demineralization
- 2) the subsequent weakening and dying of the forests
- 3) the resulting increase in insect infestations, forest decay, and massive forest fires
- 4) the dramatic increase in CO₂ released into the atmosphere by these *natural* causes, which induces the greenhouse effect
- 5) and in the 20th century - as opposed to 100,000 years ago man-made pollution and our destructive tampering with the natural balance of life are intensifying and hastening the process.

According to Hamaker, an ice age performs a vitally necessary natural function. As the glaciers advance and then retreat, they move and grind up immense quantities of rock, thus spreading gravel and rock dust over much of the temperate zones. This process, along with the winds that help distribute this rock dust even further, gradually remineralizes the soil - which feeds the plants and forests, promoting rapid and healthy growth - during which time the plants breathe in much of the excess CO₂ in the atmosphere - which gradually stops the greenhouse effect! The plants of the world breathe in CO₂, use the carbon, and release the oxygen back into the air - which we, and all other animals, breathe!

Thus, a primary function of glaciation is to remineralize and help reforest the Earth. The reason this video is called "Stopping the Coming Ice Age" is that Hamaker thinks we humans can - indeed must, if we want our civilization to survive - remineralize the Earth *ourselves*. We ourselves can fulfill the vital role played by an ice age, rendering such a geological event obsolete.

This means, however, that the governments and peoples of all countries and regions would need to make it a top priority to remineralize our depleted soils, and also to engage in massive reforestation projects, planting billions of trees worldwide. Without healthy forests, we have no chance at all of slowing the tremendous CO₂ buildup which fuels the greenhouse effect. As the video puts it, "The trees of the world are our best friends now, and only they can save us". Obviously, then, we also need to stop clear-cutting our forests, both here and in the tropics, and to limit our fossil fuel burning, which has been accelerating the greenhouse process. Only by doing all these things, says Hamaker, can we avoid horrific consequences for humanity in the very near future.

The audacity of this theory and this proposal lies in its utter simplicity and common-sense quality. Yet many people may not heed Hamaker's message and information because we have become so enamored of "high-tech" solutions and short-term planning, gratification, and profit. Hamaker's plan demands a clear understanding of our planetary dilemma, and a deep commitment to creating a viable future, as well as some sacrifice of comfort and convenience. The video concludes with these questions: "Have we got the guts to do it? How much do we really want to be here?"

Whether or not Hamaker's proposal is ever implemented on a large scale, we can all do things individually and collectively to help educate people and help heal the planet. The video points out that even if these theories aren't totally "provable", or even completely accurate, we should still do the things that Hamaker suggests, for the sake of ecological balance, conservation, and planetary sanity.

In addition to the ideas discussed in this review, this video explores many other aspects of our ecological and social dilemmas - many more than can be dealt with here. There is so much vital information presented, within such a comprehensive framework, that this video ranks as a definite "must see" for anyone at all concerned about environmental issues and social change.

STOPPING THE COMING ICE AGE

THIS IS A DOCUMENTARY ABOUT THE GREENHOUSE EFFECT AND WHAT IS HAPPENING TO OUR CLIMATE.

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“The coming ice age”? I thought the greenhouse effect warms up the climate.”

It does at first. But by evaporating more moisture from overheated oceans, the greenhouse effect also creates more clouds—which drift northward on prevailing winds and cool the earth more, especially in winter. So the tropics get hotter and drier. Temperate region summers get hotter (like 1988) while winters get colder and icier.

These large-scale greenhouse-effect changes have already been going on for 30 to 40 years! The long African drought in which so many people have starved to death was caused by this. And now severe drought has arrived in force in North America, Europe and Asia, threatening most of the world's food.

IN THE U.S. WE LOST ALMOST ONE-THIRD OF ALL OUR GRAINS IN 1988! IF THIS TREND KEEPS UP AND INCREASES — AS IT IS EXPECTED TO — MOST OF OUR ABILITY TO GROW FOOD MAY BE DESTROYED WITHIN THE NEXT FIVE TO TEN YEARS, AND WE WILL BEGIN TO STARVE.



BUT SURPRISINGLY, “STOPPING THE COMING ICE AGE” IS A VERY HOPEFUL FILM. STING, THE ROCK STAR, SAID HE WAS “DEPRESSED AND ELATED” BY IT — BECAUSE IT FOCUSES ON WHAT WE CAN DO TO TURN THIS AROUND BEFORE IT’S TOO LATE. A DOZEN PROMINENT SCIENTISTS AND ENVIRONMENTALISTS HAVE ENDORSED IT.

One of the things we can do, presented here for the first time, is revitalize the earth's forests—and new forests we quickly plant—by remineralizing their soils with finely ground gravel dust. Where this has been done the trees become completely rejuvenated and grow three to four times as fast! Revitalized in this way, the earth's forests will consume much of the excess carbon dioxide in the atmosphere (the major greenhouse gas). The greenhouse effect will subside and we will hopefully have time to create a nonpolluting way of life for ourselves.

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BOOKS

The Survival of Civilization

John D. Hamaker and Donald A. Weaver
Paperback \$12.00

Environmentalists have long warned that continued abuse of our ecosystem would ultimately threaten our life support system and human survival as well. Authors Hamaker and Weaver have now sounded the most ominous and awesome warning of all. Their research reveals that a global climate shift is now underway which will make the temperate zone part of the subarctic zone by 1995 and soon deprive humanity of its food supply. The equatorial zones will not cool as much but even now deforestation and drought are taking a dreadful toll there too. The entire process is accompanied by greater climate extremes, increasing crop losses and a dying ecosystem. The authors describe corrective measures and urge their adoption before it is too late.

But how could this be and what causes it? We are in this fix due to a coincidence between a natural cycle and human folly. Scientists have discovered a 100,000-year climate cycle with about 90,000 years of glacial (cold) and 10-12,000 years of interglacial (warm) temperatures. We are about 10,800 years into the present interglacial period, and would be due for glaciatio:n within a few hundred years had man not accelerated the process.

Glacial periods grind rocks beneath the moving ice and then distribute the particles globally via water and high winds thus remineralizing the earth with a new, available mineral supply for renewal of abundant vegetation. After 10-12,000 years of interglacial vegetation, the deposited minerals are used up to the point where vegetation diminishes and a new glacial period is automatically triggered which again remineralizes the earth and the natural cycle repeats. (Thus far 25 cycles were identified as occurring during the last 2,500,000 years!) Life on earth diminished but survived previous glacial cycles and then regenerated during interglacials. But for most of earth's 4.5

billion people, with our present societal structures, a blow of this magnitude is not survivable.

The climate shift is triggered by the rise in atmospheric carbon dioxide which initially warms the lower latitudes ("greenhouse effect") but eventually brings global cooling. The extra warming at lower latitudes evaporates extra water which then rises and moves toward the cold poles. More clouds form on the way, blocking the sun at higher latitudes (more global cooling) and the increased water va-

A global climate shift is now underway which will make the temperate zone part of the subarctic zone by 1995 and soon deprive humanity of its food supply.

por precipitates more snow at the poles. The warm air rising at lower latitudes is replaced by ground-level patterns. This process may make summers temporarily hotter (and drier) at lower latitudes but the winters are increasingly longer and colder and the polar ice caps expand.

Two factors raise the CO² (carbon dioxide) level. First, after 10,000 years the soil minerals are near depletion, growth slows and carbon that was locked into living biomass is liberated naturally into atmospheric CO². Second, the consumption of fossil fuels, destruction of forests, and other acts of human folly are adding 40,000 tons per minute of CO² into the atmosphere. The present level of CO² is far more than enough to cause a rapid shift toward glaciation but the level is also rising exponentially (compounding) and is at the point of going out of control. This is why human folly is triggering glacial onset, hundreds of years ahead of nature's own schedule.

But are Hamaker and Weaver correct in their thinking? Consider what we have been experiencing globally in

recent years: colder winters, hotter summers, spreading drought and deserts, dying forests, escalating forest fires, dying lakes, increase in plant and human disease, increase of insect attacks on crops, increase in volcanic and earthquake activity, increase in soil erosion, acid rain, more violent flooding, etc. Drought and starvation in Africa are not limited to Ethiopia. More than two dozen other African states are in the same fix and this process is intensifying. These are not separate, unrelated events but rather diverse manifestations of one underlying process of a global climate shift.

Can anything be done to change this process? Nature remineralizes the earth in 90,000 years. We may have a last chance to do it ourselves and reverse the process. A massive, worldwide effort is urgently needed to grind rocks, remineralize the earth, restore the forests and switch from fossil fuels to biomass fuels. Evidence is overwhelming that gravel (mixed rock) dust can increase crop yields two to four times with large, healthy plants that resist disease, drought and cold. Such plants have higher mineral content and superior taste which promotes healthier animal and human life. Dr. Herbert Shelton, both in his books and in the *Hygienic Review*, also emphasized the importance of soil remineralization in creating a Hygienic Agriculture. The potential benefits to humanity of global remineralization could be the dawn of a new era of health, abundance and a higher quality of life. It is no exaggeration to say humanity is now poised on the knife edge between a glorious rebirth and the final abyss.

What can you do about all this? Start by sending for the book and also inquire about the update bulletins issued since publication in 1982. Then become part of a growing, planetary network of individuals who are working to get the word out to promote remineralization before it is too late.

Review by Bertram Cohen

The Survival of Civilization is available for \$12.00 postpaid from Hamaker-Weaver Publishers, Box 1961, Burlingame, CA 94010. □

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The Survival of Civilization

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— SOLAR AGE or ICE AGE? BULLETIN —
(The Survival of Civilization Crisis Report)

Issue No. 10, October 1989

Edited by: Don Weaver

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Solar Age or Ice Age? Bulletin is a product of a deep love & respect, in the editor & many others, of Life & its miraculous expression on Earth. One of those others seems a unique genius in this time of fragmentary, non-ecological thinking & acting. John Hamaker has given much of 3 decades to understanding Earth's operation as a Biosphere & how we can live constructively, co-creatively, healthfully, sympiotically as the sane alternative to the time-tested ways of 'living' unconsciously, irresponsibly, unnaturally &, sorry, parasitically. We might all share a 'moment' of sorrow for the destructivity which our collective 'unconsciousness' has brought forth ... before moving ahead, our 'face toward the Sun', with the Earth Regeneration Work we'll share should we honestly desire to prove ourselves a viable & enlightened part of Creation. The work of the 1990s, friends, & we're all invited! In fact, attendance appears mandatory... Like John Hamaker's warning to us that not 'Global Warming' but a new Glacial Period is knocking loudly at the door, this Bulletin is essentially a gift which the editor & all who help as co-publishers give to as many 'key' people as possible in government/science/environment/health/business/etc. It attempts to provide a comprehensive picture of our accelerating ecological-climatic life support system breakdown & to awaken the totally unprecedented RESPONSE needed to Regenerate the Earth & restore an Interglacial Balance of Climate - as explained in The Survival of Civilization (TSOC). Suggested minimum donation for this issue is \$10 to cover costs. \$100 will send at least 10 copies to people of your or my choosing, & so on. I'm giving the few \$1000 I can; please accept the challenge to courageously absorb the contents & consider its worth, how you'd like to help. (Checks best made to Solar Age or Ice Age? Bulletin) Note even more strong evidence for the Hamaker Thesis - and to help spread awareness the additional great tools of Larry Ephron's film & book. I've been assisting People for a Future in their wide distribution; we're trying to put them in the hands of all hopefully open-minded scientists, members of Congress, etc! as funds allow. I see future Bulletins largely focused on helping coordinate work efforts: tree nurseries, gravel grinder & dust production, forest remineralization/replanting, new regeneration farms producing abundant genuine health food, comprehensive Earth Regeneration Centers, etc. I invite you to help accomplish this work while we still have the opportunity. Your response, ideas?? If you received but don't want this (or wish to recycle) please return it - postage reimbursed on request. Editor's comments again in [] .

THE COMING ICE AGE?

By Joanna Campe



Have you noticed that almost every evening on the news there is a report of a weather related disaster, one record breaking incident after another? They seem like isolated events. What does snow on the Riviera have to do with the drought in Ethiopia, or the inability of Russia to sustain a wheat crop with the citrus losses in Florida? What does a recent forest fire in Borneo, an area of 13,000 sq. miles of woodland the size of Connecticut and Massachusetts combined, the largest forest fire in recorded history, have to do with the dying Black Forest in Germany?

Plenty!, according to John Hamaker, author of *The Survival of Civilization*, and scientists such as leading climatologist George Kukla of Columbia's Lamont-Doherty Observatory. Worldwide weather patterns are being altered as increasing amounts of carbon dioxide are released into the atmosphere.

The Earth Regeneration Society of Berkeley, Ca. writes that "the present well publicized 'greenhouse' warming theory is in fact only the first step in a longer process which is beginning to cool the planet; and that we are very close to the critical point where rapid glaciation—the next Ice Age—will wreak havoc, causing worldwide famine and related conditions. This is a most critical issue of our times."

Warming is taking place at the mid-latitudes as the droughts of Africa and north-east Brazil indicate. Because 70% of the earth's surface is ocean, the extreme heat releases moisture into the atmosphere. The moisture travels poleward, so the snow of the north is the drought of the tropics.

It is actually a differential greenhouse effect. Sir George Simpson pointed out that the glaciation which characterizes an Ice Age cannot come about by a general cooling of the earth's atmosphere—because some source of increased energy is required to transport poleward the huge amounts of moisture which make up the glaciers. The recent findings of Nicholas Shackleton and associates at the University of Cambridge accept CO₂ as the "forcing agent" for glaci-

ation and the data gives strong corroboration for *The Survival of Civilization* thesis.

We can compare the CO₂ curve of previous interglacial transitions with today. To maintain an ideal interglacial climate we need to hold CO₂ levels at 270-280 ppm (parts per million) compared with the current 345 ppm. As CO₂ climbs, the glaciation trend may well become irreversible.

We live in a 100,000 year glacial-interglacial cycle, 90,000 years Ice Age and 10-11,000 years interglacial. In the last 3 million years there has been remarkably little variation in this cycle, especially the length of interglacial periods. We are 10,800 years into the present interglacial period. A 1974 CIA report notes, "Climate change at the end of these interglacial periods is rather sharp and dramatic." Palynologist G. Woilard has shown there is a 20 year changeover to intensely glacial conditions. (Nature 281, 10/18/79)

During an Ice Age, according to Hamaker, the glaciers crush rock onto the earth's surface and loess, crushed rock powder, blows to all parts of the globe. At the end of an interglacial period a critical stage is reached in which the available minerals become so scarce that most of the minerals in the soil are used up. As co-author of the Hamaker book Don Weaver explains, "this gradual process over 10,000 years leaves a shrinking, sickening, very fragile worldwide plant/forest cover which grows increasingly susceptible to and victim of insects, disease, acid rain, climate extremes, and fire—and loses its capacity to utilize carbon dioxide as it could earlier in the interglacial..." Florida, an extremely demineralized area, has experienced a devastating freeze, canker disease, another freeze and now fire in the Everglades! The biomass dieoff accelerates the rise of CO₂, and the whole destructive cycle is accelerated.

Mineral rich soils create healthy forest and crops which absorb CO₂. Soil remineralization is the key to reduce CO₂ levels and maintain the current interglacial climate.

The balanced 90 elements and trace minerals in ground glacial rock further the growth of microorganisms, and fertilize the soil to give us, "bread from stones." To quote nutritionist Kent Crawford, "Trace mineral deficiency is one of the major causes in our declining level of health."

Ground rock from a glacial deposit and ordinary glacial and river gravels can give the Garden of Eden back to us. The marvelous productivity, hardiness and beauty of the Findhorn garden is aided by it's situation on a coastal glacial outwash. The Hunza's

remarkable health comes from the glacier rock dust fed lakes and valleys.

We must remineralize the soils of the world, to rejuvenate forests and crops so they will consume the excess CO₂. We can plant huge tree plantations to consume CO₂ and provide biomass fuel. We must cut back drastically on the use of fossil fuels and eliminate chemical fertilizers and pesticides. Healthy plants are relatively untouched by insects and disease.

Adding ground glacial rock and glacial gravels to forests, farms and gardens will give us health, a strong and resistant ecosystem, stabilize weather and hold off the next Ice Age. Perhaps we can earn back the Garden of Eden. Or as Betsan Coats puts it, "Mother Earth gives us the opportunity, quite simply, gratefully and thankfully, to give as we have received."

Buckminster Fuller, one of the clear thinkers of our time found Hamaker's findings "Completely convincing." Becoming aware of the urgency of the challenge we face, remineralizing our own land and acting politically so that the necessary changes can take place on a global scale—is a beginning. We don't have a moment to lose.

Joanna Campe is the Northampton, MA area contact person for Hamaker Coordination. See their listing under the "Community & Global Change" section of the directory.

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The book THE SURVIVAL OF CIVILIZATION (\$12) and bulletins through Hamaker Weaver Publishers P.O. Box 1961 Burlingame, Ca. 94010

BOOKS

The Survival of Civilization

John D. Hamaker and
Donald A. Weaver
Paperback \$12.00

Environmentalists have long warned that continued abuse of our ecosystem would ultimately threaten our life support system and human survival as well. Authors Hamaker and Weaver have now sounded the most ominous and awesome warning of all. Their research reveals that a global climate shift is now underway which will make the temperate zone part of the subarctic zone by 1995 and soon deprive humanity of its food supply. The equatorial zones will not cool as much but even now deforestation and drought are taking a dreadful toll there too. The entire process is accompanied by greater climate extremes, increasing crop losses and a dying ecosystem. The authors describe corrective measures and urge their adoption before it is too late.

But how could this be and what causes it? We are in this fix due to a coincidence between a natural cycle and human folly. Scientists have discovered a 100,000-year climate cycle with about 90,000 years of glacial (cold) and 10-12,000 years of interglacial (warm) temperatures. We are about 10,800 years into the present interglacial period, and would be due for glaciation within a few hundred years had man not accelerated the process.

Glacial periods grind rocks beneath the moving ice and then distribute the particles globally via water and high winds thus remineralizing the earth with a new, available mineral supply for renewal of abundant vegetation. After 10-12,000 years of interglacial vegetation, the deposited minerals are used up to the point where vegetation diminishes and a new glacial period is automatically triggered which again remineralizes the earth and the natural cycle repeats. (Thus far 25 cycles were identified as occurring during the last 2,500,000 years!) Life on earth diminished but survived previous glacial cycles and then regenerated during interglacials. But for most of earth's 4.5

billion people, with our present societal structures, a blow of this magnitude is not survivable.

The climate shift is triggered by the rise in atmospheric carbon dioxide which initially warms the lower latitudes ("greenhouse effect") but eventually brings global cooling. The extra warming at lower latitudes evaporates extra water which then rises and moves toward the cold poles. More clouds form on the way, blocking the sun at higher latitudes (more global cooling) and the increased water va-

A global climate shift is now underway which will make the temperate zone part of the subarctic zone by 1995 and soon deprive humanity of its food supply.

por precipitates more snow at the poles. The warm air rising at lower latitudes is replaced by ground-level patterns. This process may make summers temporarily hotter (and drier) at lower latitudes but the winters are increasingly longer and colder and the polar ice caps expand.

Two factors raise the CO² (carbon dioxide) level. First, after 10,000 years the soil minerals are near depletion, growth slows and carbon that was locked into living biomass is liberated naturally into atmospheric CO². Second, the consumption of fossil fuels, destruction of forests, and other acts of human folly are adding 40,000 tons per minute of CO² into the atmosphere. The present level of CO² is far more than enough to cause a rapid shift toward glaciation but the level is also rising exponentially (compounding) and is at the point of going out of control. This is why human folly is triggering glacial onset, hundreds of years ahead of nature's own schedule.

But are Hamaker and Weaver correct in their thinking? Consider what we have been experiencing globally in

recent years: colder winters, hotter summers, spreading drought and deserts, dying forests, escalating forest fires, dying lakes, increase in plant and human disease, increase in insect attacks on crops, increase in volcanic and earthquake activity, increase in soil erosion, acid rain, more violent flooding, etc. Drought and starvation in Africa are not limited to Ethiopia. More than two dozen other African states are in the same fix and this process is intensifying. These are not separate, unrelated events but rather diverse manifestations of one underlying process of a global climate shift.

Can anything be done to change this process? Nature remineralizes the earth in 90,000 years. We may have a last chance to do it ourselves and reverse the process. A massive, worldwide effort is urgently needed to grind rocks, remineralize the earth, restore the forests and switch from fossil fuels to biomass fuels. Evidence is overwhelming that gravel (mixed rock) dust can increase crop yields two to four times with large, healthy plants that resist disease, drought and cold. Such plants have higher mineral content and superior taste which promotes healthier animal and human life. Dr. Herbert Shelton, both in his books and in the *Hygienic Review*, also emphasized the importance of soil remineralization in creating a Hygienic Agriculture. The potential benefits to humanity of global remineralization could be the dawn of a new era of health, abundance and a higher quality of life. It is no exaggeration to say humanity is now poised on the knife edge between a glorious rebirth and the final abyss.

What can you do about all this? Start by sending for the book and also inquire about the update bulletins issued since publication in 1982. Then become part of a growing, planetary network of individuals who are working to get the word out to promote remineralization before it is too late.

Review by Bertram Cohen

The Survival of Civilization is available for \$12.00 postpaid from Hamaker-Weaver Publishers, Box 1961, Burlingame, CA 94010. □

UCD focuses on 'greenhouse effect'

By Deborah Blum *Sacramento Bee*
Bee Science Writer July 11, 1989

DAVIS — U.S. Rep. Vic Fazio has introduced a resolution in Congress that urges the drastic energy controls needed to battle global warming, the so-called "greenhouse effect."

"But there's not enough support to move the bill onto the floor," the West Sacramento Democrat said at a University of California workshop on the planet's troubled climate.

"The public is going to be greatly inconvenienced by changes in energy policy, and I think there's going to have to be a lot more evidence on the record before public officials will act."

That dilemma — balancing the need for action against scientific uncertainty — was a major focus of Monday's meeting at UC Davis, the start of a three-day symposium sponsored by the university, the U.S. Department of Energy and the Save the Earth Foundation.

"I think the greenhouse effect could be the greatest challenge in the history of this beautiful planet," Fazio said. "And I don't think we have the luxury of waiting until we can forecast the future with complete accuracy. We need a national energy policy now. For the same reason that you buy life insurance — because you're not sure of the future."

The greenhouse effect refers to the rising levels of certain gases, all with a tendency to trap heat in the atmosphere much as the glass walls of a greenhouse can hold in warmth. The main greenhouse gas is carbon dioxide, released by burning fossil fuels. Researchers estimate that man's activities put about 7 billion tons of carbon dioxide into the atmosphere each year.

But researchers have learned that other gases can add to the planetary warming. The trace

'The public is going to be greatly inconvenienced by changes in energy policy, and I think there's going to have to be a lot more evidence on the record before public officials will act.'

— Rep. Vic Fazio

greenhouse gases include methane, from cattle feedlots, landfills and rice paddies; chlorofluorocarbons, used as coolants and insulators; and the poisonous ozone that forms in hazy, brown layers over cities as automobile pollutants react with sunlight.

"We're absolutely certain that the greenhouse effect exists," said Roger Revelle, director emeritus of the Scripps Institution of Oceanography in La Jolla. "What we're not certain is how big it's going to be. Unfortunately, we have to rely on mathematical models, and they don't give us enough information on the effects."

Computer models of future weather are one of the main ways of predicting the course of a greenhouse effect. Scientists working with those models

have warned that during the next 50 years the planet could warm as much as 10 degrees Fahrenheit, melting the icy arctic regions and triggering a flooding rise of sea levels. Predictions for California have included a dwindling snowpack and loss of useable water, vanishing Sierra forests and enough ocean water spilling into the bay-Delta to create an inland sea.

But climate experts like Michael MacCracken, leader of the atmospheric sciences division at Lawrence Livermore National Laboratory, say that the computer models remain clumsy tools. Model builders are only just beginning to take into account shifts in ocean conditions. They have not been able to accurately add water vapor and clouds into their calculations, and they rely on a system that divides the planet into grids so large that the Sierra range essentially disappears.

"Our models are getting better," MacCracken said. "And I believe that they can show the overall results of a greenhouse effect pretty well. We have four modeling groups, and they all tend to agree that a doubling of carbon dioxide, for instance, would cause a temperature rise between three and five degrees. But we haven't gotten to the point where we can say how specific regions might be impacted."

Joseph Knox, assistant to the associate director for physics at Livermore, said, however, that scientists were unlikely to ever be completely satisfied with their data.

"There will always be people who argue that the models are incomplete, that the measurements are flawed," he said. "There will always be uncertainty, even in the year 2000. But I think we have to start making some decisions now. We're talking about water resources, and that's an issue that needs long-term planning."

Experts revise figures on greenhouse effect, sea level

The Associated Press

SAN FRANCISCO — If the greenhouse effect warms the Earth, sea levels will rise only about one-third as much as previously believed, reducing the severity of predicted coastal flooding during the next century, a panel of scientists concluded Thursday.

A major reason is that the south polar ice sheet will get bigger, instead of melting as commonly believed, because a warmer atmosphere carries more moisture and will dump more snow on Antarctica, the researchers said.

"We have destruction along our coasts now even with a modestly rising sea level. There are going to be more and more problems, but they won't be as bad as we thought a few years ago," said glaciologist Mark Meier, director of the Institute of Arctic and Alpine Research at the University of Colorado, Boulder.

A 1985 National Academy of Sciences report concluded global warming would cause about a 39-inch rise in sea level by about the year 2050 — enough to allow storm surges to devastate low-lying areas along the US Gulf Coast, Florida, Bangladesh and the Maldives, Meier said.

But nine studies presented during the American Geophysical Union's fall meeting led to a new consensus that the rise in sea level will total about 14 inches, although a great deal of uncertainty remains. That means the sea level could do anything between dropping 2 inches and rising as much as 30 inches.

Many of the same scientists helped write the 1985 report, which said sea level could rise from 20 to 59 inches.

Meier and others said their new forecast only holds true until about 2050 or a bit later, and rising sea levels could become more severe after that.

The sea level now is rising about one-tenth of an inch annually, but

scientists do not know why. They have been unable to pin blame on the greenhouse effect theory, which says carbon dioxide and other automotive and industrial pollutants will warm Earth's atmosphere by trapping solar heat like glass in a greenhouse.

Many scientists said Wednesday that they cannot find evidence that the greenhouse effect has started, although "The broad agreement among scientists is there will be global warming," said hydrologist Jeff Dozier of the University of California, Santa Barbara. "But there is disagreement about precisely how much warming."

The new series of studies estimated that by about 2050, sea level will rise 6 inches because of melting of small glaciers, 3 inches because of melting of Greenland's ice sheeting, 8 inches because ocean water expands as it warms up and 8 inches because of groundwater humans pump and then let drain into the seas. But that overall rise

of about 25 inches will be partly counteracted by a 12-inch fall in ocean levels caused by enlargement of the Antarctic ice cap.

The net result is a predicted sea level rise of about 14 inches.

Meier said every 12-inch rise in sea level means low-lying shorelines retreat inland by 100 feet. The more the sea level rises, the more frequent will be destructive storm surges such as the one that recently swept over the barrier islands in the Carolinas during Hurricane Hugo. Modest sea level increases also may destroy wetlands and let saltwater ruin fresh water aquifers and kill plants and animals in coastal estuaries.

The study showing global warming will enlarge, not shrink, Antarctic ice and thus remove water from the sea was presented by glaciologist Charles Bentley of the University of Wisconsin at Madison. The polar ice cap contains about 70 percent of Earth's water.

Why Are Du Pont, ICI Pushing Ban on CFCs?

The four companies that control 60 percent of the world supply of chlorofluorocarbons—du Pont, Allied Chemical, ICI (U.K.), and Atochem (France)—are now leading the campaign to ban CFCs.

Why are these giants so eager to phase out their product? Reports are that the old CFC patents are running out and that du Pont and ICI have already secured patents on a substitute that is more expensive. As one analyst in a leading London stock brokerage put it: "There are billions of dollars at stake. ICI is positioning itself to corner an extremely lucrative market."

People who know the chemical industry in developing countries say du Pont, ICI, and a tiny handful of companies realized a while back that their domination of the world market on CFCs was threatened. Countries like Brazil, Taiwan, South Korea, and certain OPEC countries are rapidly developing independent, nationally owned chemical industries that are becoming self-sufficient in CFCs and other basic chemicals.

"For these large companies, elimination of a few percent in their market share can destroy their entire price structure. These Third World producers have become a

serious threat to them on the margins, and that is critical," the London analyst said. He continued: "The ban on CFCs will be a big, big problem for especially Third World countries. The big chemical multinationals want binding legal sanctions internationally to enforce the ban. . . . They aren't about to let Third World producers take this market away from them."

According to U.S. government sources, du Pont—the U.S.-Canadian conglomerate controlled by Edgar and Charles Bronfman of Seagram's—played a decisive role in shaping the 1987 Montreal Protocol. "We had input into the Protocol," a du Pont spokesman said in an interview.

"In 1986, du Pont called for strict controls on CFC use. By 1988, we declared that we would phase out all CFC production by the end of the century." This is also ICI's timetable as well as the exact program adopted by the Helsinki monitoring conference.

ICI expects to charge five times as much for its CFC replacement—quite a substantial reason for a corporate giant to suddenly help the environmentalists ban a less lucrative substance.

—William Engdahl

slash-and-burn agriculture and the policy of the international banking agencies (the International Monetary Fund, for example) to force developing nations to burn wood and other biomass for fuel instead of developing the more efficient and energy-dense systems, like nuclear power.

Vast amounts of this naturally occurring chlorine find their way to the

volcanic activity and biomass burning is occurring in areas of the world where the greatest amounts of atmospheric water vapor and gases are pumped up to the stratosphere and its ozone layer.

Specifically, the two greatest "stratospheric fountains" are found over the Amazon rainforest and the Indonesian archipelago. In 1985 and 1987, the American Boundary Layer Ex-

Ocean Water Vapor Amplifies Warming Trend, Scientists Say

By MAURA DOLAN
TIMES ENVIRONMENTAL WRITER

Scientists at the University of Chicago reported Wednesday they have confirmed for the first time that water vapor from the oceans can amplify global warming caused by man-made gases and perhaps could trigger a "super-greenhouse" effect above the warmest part of the Earth's oceans.

The scientists, who used temperature and radiation measurements from satellites, buoys and ocean-going ships, said they confirmed computer models indicating that as more water vapor accumulates, more energy is trapped on Earth. The study, published today in the journal *Nature*, also suggests that above the warmest oceans—where the water vapor would be greatest—the trapping of gases is increased at a much higher rate than models had predicted.

"I think this study is important because it offers strong support to greenhouse effect theories," said Veorabhadran Ramanathan, one of the nation's leading climate experts, who did the study with his graduate student, Ameet Raval. "Frankly, I didn't expect that our work would support the theories so strongly."

The study, coming at a time of increasing debate over the accuracy of global warming predictions, represents the most extensive testing yet of computer models.

The confirmation of what scientists describe as an essential fea-

ture of the greenhouse theory is likely to instill more public confidence in such computer modeling, but it is not expected to quell debate among scientists over the amount of warming that will occur and the precise role of industrial gases.

Scientists believe that carbon dioxide and other gases trap heat from the sun in the Earth's atmosphere, much like the panes of a greenhouse. Eventually, such trapping could produce major changes in climate, triggering more droughts, hurricanes or other cataclysmic events.

Ramanathan, interviewed by telephone, noted that relatively little warming is caused by such industrial gases as carbon dioxide. But theories developed over many decades show that atmospheric warming caused by such gases would be exaggerated by water vapor, "the most powerful greenhouse gas," coming primarily from evaporation of the Earth's oceans.

"The basis of the theory was simply pointing out that we all know from common experience that when it gets hotter, it gets more humid, and when it gets colder, it gets dry," Ramanathan said. "What is new in this study is that we went beyond that and computed the actual trapping" of the sun's infrared energy in the Earth's atmosphere.

He said he and Raval found that the trapping of such energy varies

Please see GREENHOUSE, A40

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GREENHOUSE: Warming

Continued from A3

from the models by only 10% to 20%.

If the researchers had found that warm ocean temperatures had little effect on the rate of trapping of infrared energy, "that would have been sufficient cause to dismiss the entire greenhouse effect," Ramanathan said. "On the contrary, we found the theory confirmed, or one aspect of the theory, an extremely critical aspect."

The University of Chicago scientists computed the difference between the energy emitted from the ocean and the amount that escapes into space.

"So we know what is leaving at the surface and what is leaving at the top, and the difference is always positive, that is, the atmosphere is always trapping," Ramanathan said.

The major departure from models detected by the researchers occurred over the western tropical Pacific Ocean, where the rate at which energy was trapped was much higher than models have predicted. The researchers noted, however, that they could not be certain that the increased trapping was a result of the higher ocean temperature.

"We need to understand this super-greenhouse effect because it could mean that greenhouse

warming will become exponentially greater after we reach a certain threshold of temperature," Ramanathan said.

He said the threshold appears to be about 82 degrees Fahrenheit, the temperature of slightly less than 5% of the world's oceans. But if global warming increases as predicted, about three times as much of the Earth's oceans would exceed that temperature.

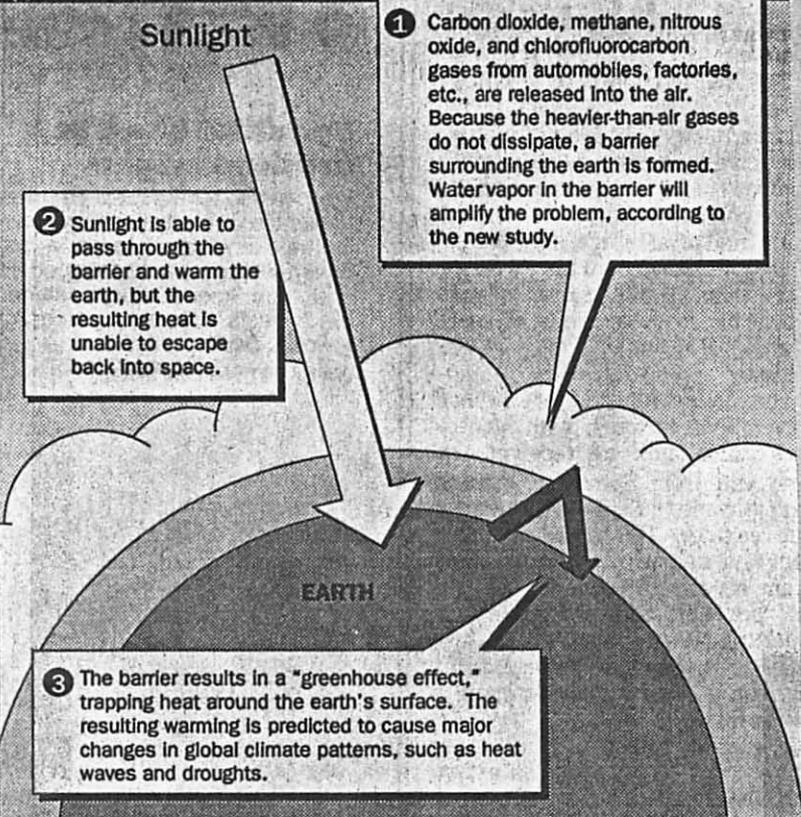
Ramanathan, a professor of geophysical sciences, said his measurements are consistent with predictions that the planet's temperature will rise 2 to 3 degrees Fahrenheit in the next 50 years. He cautioned, however, that the role of clouds is not yet well understood. Some scientists believe that clouds could diminish the effect of greenhouse gases.

Richard S. Lindzen of the Massachusetts Institute of Technology, a leading skeptic of many greenhouse predictions, said the Chicago study does not change his reservations about temperature predictions. "That picture does not tell you how the system would respond if you added more gases," he said.

However, John Firor, director of advance studies at the National Center for Atmospheric Research in Boulder, Colo., called the study a "very interesting piece of work."

"I'm sure it's going to keep all of

GREENHOUSE EFFECT



Los Angeles Times

us busy trying to see see what impact it will have on the model calculations," Firor said. "One needs to keep an eye on the speculation that the process he found in the Western Pacific could accelerate the greenhouse effect after large parts of the ocean reach a certain temperature."

In terms of scientific advancement, the study "puts two new bricks" on top of a wall scientists are building on the greenhouse effect. It is significant largely because it is "probably the most extensive and solidly based survey in existence" and instills credibility in the models, he said.

Some chilling facts about global warming

The scientist-doomsayers just haven't proved their case

The Register 6/13/90

By Joanne Jacobs

'WORLD NOT GOING TO END.'

That "doesn't sell as many papers as 'WORLD TO END SOON'," said climatologist Patrick Michaels, so the media have failed to report the "dirty little secret" of global warming: It's not getting warmer.

Michaels, an associate professor of environmental sciences at the University of Virginia, spoke on "Science and Politics of Global Warming" at a forum sponsored by the Pacific Research Institute.

He vastly underestimated the scientific naivete of journalists. What we know is what scientists tell us. And most of them seem to be saying that global warming is a big deal, and a very bad thing, and if it's not happening yet, it's going to happen, and we'd better do something.

We know scientists disagree on whether temperatures have gone up yet or not. Cities, which are always hotter than the boonies, have grown larger, which skews temperature records. Also we know the models of climate change aren't very good, because, by anybody's measurements, it's nowhere near as hot as it was predicted to be.

But is global warming simply an environmentalists' power play? Mass hysteria? What's the emperor wearing?

"All scientists agree that the greenhouse effect exists," said Michaels, "but not that it's apocalyptic.... We've gone halfway to a doubling of carbon dioxide in the atmosphere since the industrial revolution.... Where's the warming? We should be four degrees Fahrenheit warmer than we were, without considering the oceans."

In fact, there's been no net warming in the northern hemisphere in 50 years, Michaels said, and most of the warming in the southern hemisphere occurred before the big buildup of greenhouse gases.

Michaels' statistics show the daytime highs aren't higher, but the nights are a bit warmer. "The apocalypse is predicated on daytime warming.... If warming takes place at night, that sce-

nario does not unfold."

He predicted, "Almost all significant warming will occur at night, affecting 2.7 percent of the planet, primarily at the Arctic and Antarctic. It won't melt the ice." Instead of sun-scorched fields, "You get a longer growing season, increased rainfall, and better plant production due to increased carbon dioxide in the atmosphere."

Some scientists think the oceans are slowing the start of global warming, but Michaels has a different theory: clouds.

In Australia, Europe, and China, scientists have observed a dramatic increase in daytime cloudiness, he said. The '80s were the wettest decade on record, and the '70s the second wettest. (That's talking globally: Our drought is a "local effect.")

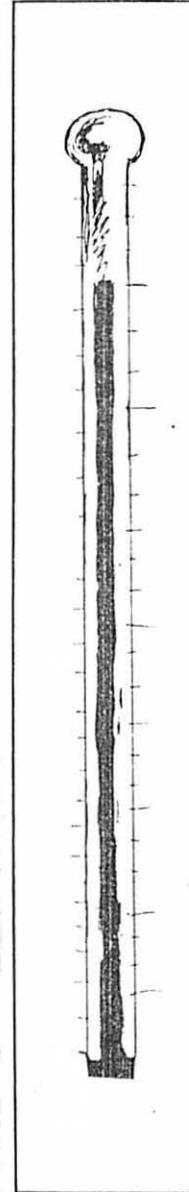
Along with carbon dioxide, he theorized, we're "putting something else in the air that's causing change."

Talk about every cloud having a silver lining: He seemed to be saying that air pollution causes clouds (remember nuclear winter?), which saves us from doing a slow burn.

It sounded a little like "don't worry; be happy," but Michaels didn't say we should cut down rain forests, ignore energy efficiency, and pollute the air. What he said was: We're about to spend an enormous amount of money — perhaps 4 to 6 percent of US GNP — to try to do something that may be impossible, unnecessary, and destructive to our economy. Before we do, we ought to spend more on research to figure out why the rise in carbon dioxide hasn't warmed us yet. If countervailing factors, like clouds, are negating the greenhouse effect, there may be a "far less expensive hedge against climate change."

Politically, the threat of apocalyptic global warming is convenient for statists, charged Michaels, because it requires "massive central planning" and for debt-burdened Third World countries. "They're pushing global warming for all it's worth as a wealth-transfer mechanism."

There is "considerable personal risk" in opposing the conventional wisdom, Michaels said. "The



few people speaking out are retired or tenured. For a lot of people, this is their bread and butter.... There is too much money and power front-loading this issue before the science gets done."

Poor ignorant folks like me don't know what to look forward to: hot, hungry doom, with coastal cities flooded and withered crops? Or balmy nights on a green planet? I found 118 stories in our computer system with the words "global warming" for 1990. When I asked for stories with "temperature" and "global warming," I got 12.

A United Nations panel released a report predicting that global temperatures could rise 5 degrees Fahrenheit by the end of the next century, melting polar ice and raising the sea level by 2 feet.

There was a May 23 story: "Temperatures in the United States have declined slightly over the past 70 years, a US Department of Agriculture scientist said."

I don't know if Michaels is right in saying that the preponderance of evidence does not point toward disastrous global warming. I'm just a journalist.

But I do think we need to listen to the skeptics in the scientific community and think about what's doable and at what cost and to what effect.

Michaels showed a slide of a melting woman, a promo for an HBO movie called "The Greenhouse Effect."

As the world burns, he said, the beautiful congressional staffer flashes back to her past in the '90s when she was torn between her love for two men: the NASA scientist, who warned of global warming, and the "professor from a moderately respectable mid-Atlantic university," who lulled the world to its torrid doom.

At one point, said Michaels, the beautiful staffer emerges from a hearing to complain of the non-apocalyptic prof, "He doesn't care about the environment! All he cares about is science!"

Ms. Jacobs is a columnist for the *San Jose Mercury News*.

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