REDUCE ATMOSPHERIC CARBON CO_2 DIOXIDE
SOIL · FOREST · ENERGY · WORK

WHOSE WORLD TO LOSE?

"WHEN HISTORIANS OF THE FUTURE LOOK BACK ON 1986, THEY MAY WELL CONCLUDE THAT THE BIGGEST NEWS STORY OF THE YEAR THE ONE THAT BARELY MADE IT ONTO THE FRONT PAGE: A SUDDEN INCREASE IN GLOBAL CONCERN ABOUT THE 'GREENHOUSE EFFECT.' ... SUDDENLY THE GLOBAL COMMUNITY IS IN THE BUSINESS OF MANAGING THE BIOSPHERE, A COLLECTIVE ENTERPRISE OF A KIND THAT POLITICAL LEADERS HAVE NEVER DEALT WITH BEFORE AND THAT PRESENT INSTITUTIONS WERE NOT DESIGNED TO HANDLE. A NEW ITEM MOVES QUICKLY TOWARD THE TOP OF THE WORLD AGENDA, AND DEMANDS UNPRECEDENTED EFFORTS IN INTERNATIONAL COOPERATION."

Walter Truett Anderson, writer for Pacific News Service
Berkeley Tri-City Post January 11, 1987

WHOSE WORLD TO LOSE?

OURS

Volume I

Election Edition

At this time

It is essential to have

Environmental action and full employment

In

The last years of this interglacial period

When

Human survival is at stake

By

Alden Bryant and Fred Bernard Wood

Earth Regeneration Society, Inc.

Second Printing October 1992

WHOSE WORLD TO LOSE?

OURS

Who will benefit from the election?

What will be the result?

Will we have a better chance to survive as a human society?

This book describes the required comprehensive and central position of every serious candidate for public office

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Description

Earth Regeneration Society, Inc., (ERS) is a nonprofit public benefit corporation, established in California April 22, 1983, with a five member Board of Directors, a Board of Advisors, and appropriate mailing lists for members and public outreach. It is organized to educate and inform the general public about environmental issues that affect social, economic, and political systems and to develop, support and promote scientific methods and research to address these environmental concerns for the preservation and betterment of all living things. Our primary responsibility is now to contribute to understanding and implementing climate stabilization before it is too late to achieve by human efforts.

ERS issues a Newsletter "CO/2 & Climate," numerous special purpose publications and distributes a broad selection of climate related material.

WHOSE WORLD TO LOSE?

OURS

Our survival is in doubt in the face of climate change

Climate change means extremes in this century of:

- heat
- drought
- freezing
- floods
- fires
- tornadoes
- hurricanes
- earthquakes
- volcanoes

SOLUTION

ONE PACKAGE

Require that the U.S.:

- Stop pollution and clean up hazardous wastes
- Do its share to protect the (high) ozone layer
- Take the lead for global climate stabilization

On a foundation of full employment and meeting the basic needs for food, health care, housing, education and social justice.

PROPOSED PLATFORM MATERIAL

For any candidate running for public office in 1992

We demand that Congress and the Executive Office carry out their constitutionally mandated responsibilities to the American people in this time of environmental, jobs and social crisis. The people of the United States, as well as the rest of the world, have to respond to conditions that human society has never faced before.

We call for an environmental/jobs/social crisis program which must be made central to the platform of any serious political candidate for public office.

The three basic environmental conditions of our lives (pollution, ozone, climate) are out of control, beyond what the public has been told in the media. Our survival depends on a combined program. The accelerating destructiveness of toxic materials, ozone depletion, and climate destabilization, are all acting on each other -- and on human life. Their solution must now be combined into one massive jobs, alternative technology and investment program.

This is a global action, which must be backed up with global attention to the life needs of all populations: housing, food, health, education, land, jobs, peace and justice.

We call for tremendous U.S. and global programs of (a) reforestation, combined with (b) soil improvement where forests are dying due to lack of necessary minerals in the soil, and in agricultural areas to eliminate the need for pesticides, and reduce water needs, plus (c) rapid replacement of fossil fuels with alternative energy technology development (not nuclear or waste incinerators), and (d) phytoplankton increase in the mid-Pacific and Antarctic oceans.

We support the first piece of legislation to include this overall focus, introduced into the U.S. House of Representives February 4, 1992, H.R. 4154, "Emergency Climate Stabilization and Earth Regeneration Act of 1992" by Rep. Ronald V. Dellums of California. The bill calls for a CO/2 Budget, the basic regional soil, forest, energy work program to reduce the CO/2 level.

We emphasize the need for full employment, transition, retraining, new technology, re-investment in most sectors of industry, and funding from (a) military budgets, (b) utility energy technology construction, (c) reduced welfare, unemployment, illness and crime costs, and (d) a necessary revised tax structure.

WHOSE WORLD TO LOSE? OURS

INTRODUCTION

FOOD!

The end of an interglacial period means the beginning of glaciation, a time of changes and extremes.

We have been experiencing climate destabilization, which is evidenced by the early destruction of our lives and property through accelerating heat, drought, freezing, fires, hurricanes, tornadoes, earthquakes and volcanoes.

Our food supply is at stake. And our homes, places of work, electricity, water and transportation are under attack.

Right now we are seeing the growing intensity of heat and fires in the western part of the country, hurricanes in the southeast and snow in Montana.

Our job is to bring back the balance between the earth and its atmosphere.

Our work is cut out for us. Reforest the earth through human labor, on soil replenished with needed minerals, and change our energy technology from oil and coal to benign alternatives of solar, wind, hydrogen, alcohol fuel, and more.

FOOD! Above all, the climate destabilization all over the world is bringing famine, shorter growing seasons, and climate extremes killing crops before they can mature.

Our food supplies were best with the CO/2 (atmospheric carbon dioxide) level at or below 280 parts per million (ppm) -- up to 1900. After 120,000 years (since the last interglacil period) it is only in this century that CO/2 has increased above 280 ppm. Now, it is 356 ppm or more. This century is the turning point toward extinction, or the time for us through massive human labor to re-establish the balance between the soil, the forests, the atmosphere and the CO/2 level.

Our combined mutual goal worldwide is to survive through tremendous soil, forest and energy work.

Let's go for it.

The November election in the U.S. is a time of decision for all human life. It can be a new beginning. Those who cannot provide leadership toward this comprehensive and central goal should leave public office. Those who stay face a heavy challenge to deepen and update their understanding. A first step is to support and pass the Emergency Climate Stabilization and Earth Regeneration Act of 1992, H.R. 4154 with its provision for a CO/2 Budget in the U.S.

WHOSE WORLD TO LOSE? OURS

SUMMARY

Over the next fifteen years we are all in a final desperate effort to preserve our food supply, some areas being hit worse than others by climate change destabilization.

Get our country back

Any serious candidate running for public office, from now on, has the responsibility of working for one solid and complete program of jobs and environment. This means full employment and an environmental survival program. ONE PACKAGE.

Rebuild America — a sick America, a disintegrating America, an apathetic America

Consider the Full Employment Act of 1946. The President of the United States is required in January of each year to put forward a plan for full employment, with allowance for about three percent unemployment, which refers primarily to people changing jobs. This means public programs, planning for people to do the most essential work, to make up for the inadequacies of private industry which cannot take care of the basic needs of the people of this country.

Elevate the consciousness of the public

How can we find out about the extent of environmental danger? Pollution, ozone, and climate are all changing fast. Pollution and ozone depletion are now seriously acting on climate change. For survival, our goal is to stop the production of hazardous wastes, clean up the pollution already out there, stop the production of material that ends up depleting high level ozone, and bring down the level of carbon dioxide in the world's atmosphere in order to stabilize climate.

Healing

Our goal, for human survival, is one massive combined program of pollution abatement and cleanup, ozone protection, and climate stabilization, all on the foundation of basic care of people, their jobs, food, housing, health, education, peace and conditions of social justice. ONE PACKAGE.

The real "cold war" is the all-out work program to stop glaciation

We are racing against time. We are at the end of the interglacial period (starting 10,000 to 11,000 years ago).

Stewardship or extinction

International cooperation. Everywhere we turn, there are so many destructive forces tearing at our very existence. The move toward cooperation must include a central goal, which is CO/2 reduction from 356 ppm to 280 ppm, a central work program, CO/2 Budget for each country and each region within a country, a 15-year time schedule, and a central demand and political action by the public as a whole.

Members of the International Society for The System Sciences (ISSS), meeting in Sweden in 1991, sent the following expression in a statement to the United Nations for the Earth Summit Conference at Rio in June 1992: S = 170*15. Survival in the temperate zones, having food to live on, requires removal of 170 billion tons of carbon from the world's atmosphere in fifteen years (356 ppm to 280 ppm), by means of reforestation and soil remineralization to support the forest growth.

[S = 170*15]

Primarily the destruction is coming from those multinational corporations pushing military and economic action to control land, natural resouces and cheap labor of the world's population. A number of corporate power centers seem to take the position that these are unneeded populations that can die out from illness and starvation. The unemployed and homeless are no longer a market for manufactured goods from industrial areas.

Ethnic wars, struggles for land, food and housing, are going through a final stage representing hundreds or thousands of years of threat and conflict. This is only made worse by the actions of some multinational corporations and their course of near total destruction of resources and people's standard of living.

We know that the California Democratic Party platform includes much of the above call for action, starting in 1983. The California Democratic Party Environmental Caucus, the Labor Caucus, and others, helped put it there.

People have been put on the scrap heap, when in reality they are a tremendous resource. Every citizen can exercise involvement.

A NEW ERA in human society began on February 4, 1992, with the introduction of the "Emergency Climate Stabilization and Earth

Regeneration Act of 1992," (H.R. 4154) by Representative Ronald V. Dellums (D, California). This is the first comprehensive government document in the world describing the full climate cycle, with its heat and drought coming up from the lower latitudes, with its freezing coming down from the increased snow and ice in the polar areas, and the weather going crazy in the middle. Survival of most of the human species depends on reducing the amount of carbon dioxide (CO/2) in the world's atmosphere. This means re-establishing the balance between the soil, the world's forests and the amount of CO/2.

Representative Ronald V. Dellums sent out a "Dear Colleague" letter, for support of H.R. 4154, on August 18, 1992, and deserves a positive response from all members of the U.S. House of Representatives. We will see who will take the lead in the Senate.

Labor, transition and full employment

Labor response in the U.S. includes action by the AFL-CIO National Convention, 1987 in Miami, Florida, where climate, food and jobs was included in the Environmental section of the Platform. H.R. 4154 provides for Labor to participate in planning and implementing a CO/2 Budget for the U.S. and local areas within the country -- through CO/2 Councils. It is the workers in each area, and the communities in which they live, that are the most concerned with all aspects of soil, forest, energy, and pollution cleanup programs: new jobs, job training, resources and technology to be used, additional investment in buildings and equipment, and support -- where necessary -- during transition from one type of work to another.

This bill has an international record. Copies, with supplemental information, went to every member of the United Nations on March 18, 1992. The proposal was that the expression S = 170*15 be a central theme in the treaties and work programs coming out of the Earth Summit meeting in Rio. In Russia, several months ago, this bill was personally given to the Minister of Ecology by Dr. Alexander M. Tarko of the Russian Academy of Sciences Computing Center (their long run planning center, located in Moscow).

A CO/2 budget is the working tool for each region (national, state, local).

The next 15 years are probably the critical ones to determine whether we make it or not. What does it mean to not make it? It means that the present soil conditions, lack of essential minerals, the forest conditions, dying, burning faster, more pest infested, add up to the basic conditions increasing CO/2. CO/2 level above the 280 parts per million at the beginning of this century means more evaporation of moisture in the lower latitudes, more moisture carried to the polar regions, and the more cloud cover and snow and ice buildup.

We have had over 100 feet of ice increase in the Antarctic during the last 25 years, similar ice buildup on northern Greenland, on Baffin Island near Greenland, snow lasting longer South of Hudson Bay, the heaviest snows of known time in parts of Alaska, and record cold temperatures getting worse winter after winter in the U.S.

Rebuilding the forests

Rebuilding the forests takes out the CO/2. A tree is about 45% carbon in the trunk and branches. An average tree takes in a certain amount of CO/2, keeps the carbon, and gives back oxygen. A person is about equal to an average tree -- the tree takes in carbon dixoide and gives back oxygen, the person takes in oxygen and gives back carbon dioxide.

In the energy area there are activities like production of gasoline combined with alcohol fuel. This has progressed in the US to the degree that on September 30 in Washington D.C. there will be a meeting entitled "The 1992 National Conference on Clean Air Act Implementation and Reformulated Gasolines." Burning some alcohol fuel is still marginal to the problem of reducing CO/2 but it is becoming an established part of U.S. farm life and fuel production.

Let us become more clear about military expenditure, and about the degree to which the expenditures are for weapons and systems that either don't work or are no longer needed. Almost all of these resources have to be transferred to the survival ONE PACKAGE or we don't make it.

We need conscious behaviour, based on full and truthful information

The U.S. public has been treated to the greatest distortion of information in the history of the country. There has been an inundation of partial and/or false information, or late information in government documents. The form has been changed in critical series of data so that comparison can no longer be made with previous years. An important reference for this type of problem is Kenneth E.F. Watt, Professor of Environmental Sciences, University of California, Davis, and colleagues.

There is a growing movement around race, poverty and the environment -- organizations, national and local meetings, publications. One of the leaders in this area of citizen action for community protection from enterprises envolved in environmental destruction is Carl Anthony. He serves as Chair of the Board of Earth Island Institute, based in San Francisco, Chair of the City of Berkeley Planning Commission, editor of the main magazine in this field and, as an environmental consultant to Representative Ronald Dellums, was a participant in the final formulation of H.R. 4154.

Will the indigenous peoples of the world have a chance to

participate in environmental decision making, including the use of their land and way of making a living?

The movement toward full rights and participation by women in our society is gaining momentum. Will women and men have a chance to work in a partnership way to decide how the public as a whole can exercise democratic control of the tools of production and sources of nutrition?

A balance of earth and atmosphere is not an automatic process which would include the human species at its present level. Gaia is not a concept providing automatic answers. Humans have to initiate the massive program of work needed to reduce the CO/2 level back to around 280 ppm.

Part of the social disintegration, in the area of education, is the elimination of over 20 university integrative science departments and programs, for example, general systems theory and cybernetics. This represents pressure to eliminate broad public analytical ability, in the destructive pattern of reducing the U.S. public to a third world status in jobs, food, health, housing, and education. It has been brought to our attention that MIT, the Massachusettes Institute of Technology, is a partial exception as systems analysis is reborn in a limited way in Business Administration, but without reference to the history of this field since the 1930s.

Will the people and the large corporations benefit from our knowledge of cybernetic system theory and computer simulation?

Victims turned powerful participants

The American public has been for years the victim of a downward spiral of social and environmental conditions. The destructiveness of recent administrations, often with the acquiescence of the majority of Congress, have had a disastrous role beyond description. We are facing our greatest challenge to replace the people in public office who are pandering to the worst of corporate destructiveness and to encourage a change in position of those remaining in office.

There are growing numbers of private companies, however, that are either issuing public relation statements about environmental improvement, or are actually making significant contributions.

Rebuilding the soil

With over twenty years of experience by some farmers who remineralize their soil with rock flour, we have sufficent evidence that it is time to replace completely the use of pesticides and chemical fertilizers. Additional improvement has been obtained by farmers using enzyme, microbial and organic supplements to the soil. Canada is moving in this direction somewhat ahead of the U.S. Major transition by the U.S. and Canada will, of course, contribute to progress internationally.

SURVIVAL OR EXTINCTION: CLIMATE STABILIZATION

Whose Election? Who gets elected is critical!

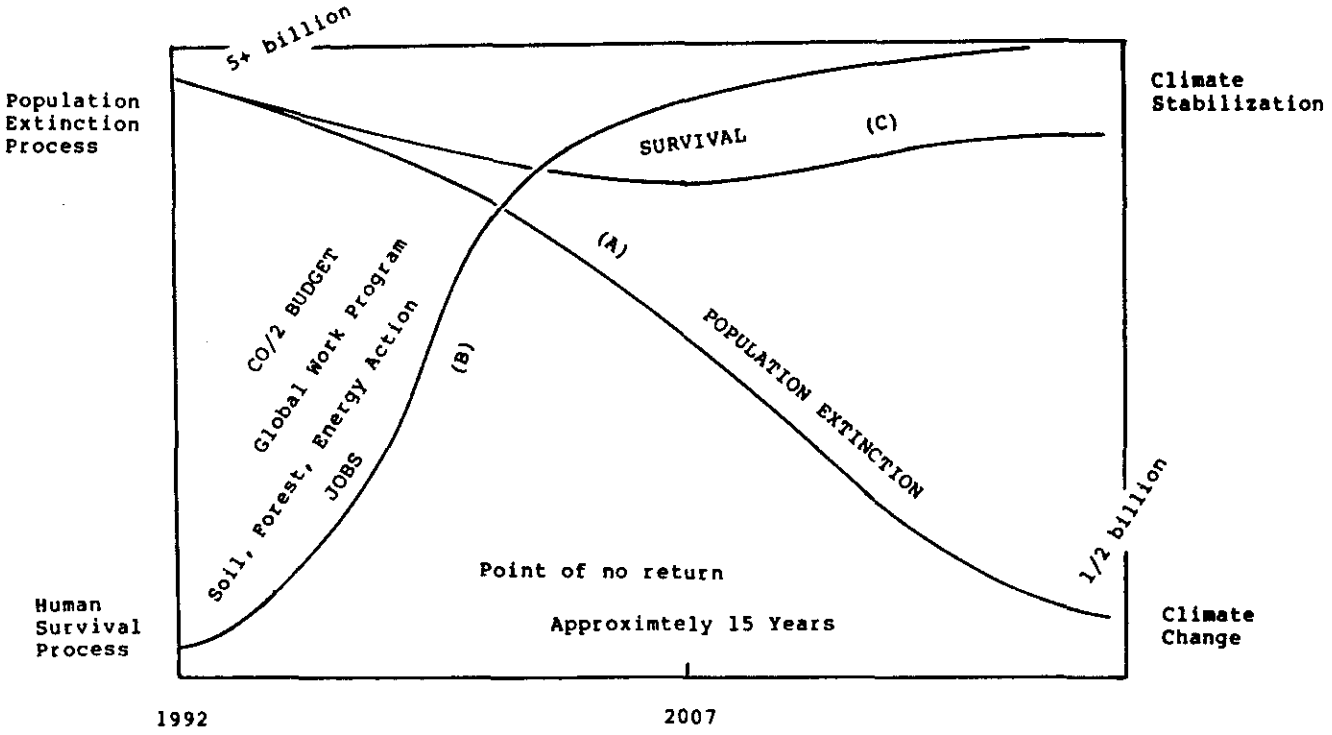


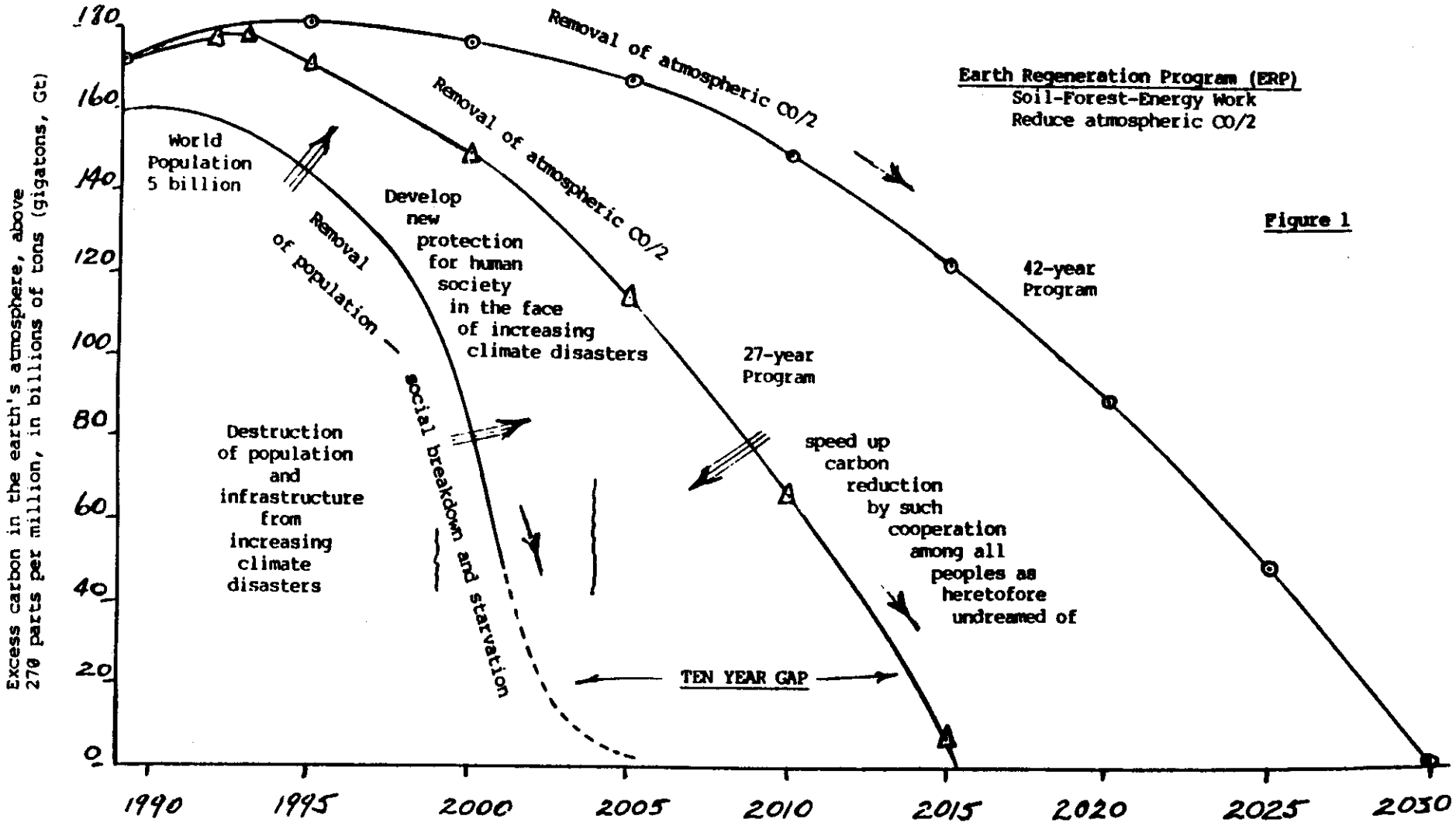
DIAGRAM DESCRIPTION

Population Extinction Process. In 1992 the world's population is over five billion people. If no action is taken to reduce atmospheric carbon dioxide (CO/2), and other greenhouse gases, then the Climate Change will proceed, the world's food supply will be mostly eliminated in the temperate latitudes, and the world's population will starve, leaving a small population surviving around parts of the equatorial zones (say half a billion people). (A)

Human Survival Process. If a super CO/2 Budget program is carried out on soil remineralization, reforestation, and alternative energy technology development, with full employment and essential supporting food, health care, housing, education, and social justice, (B), then

Population will drop under the impact of climate extremes until the CO/2 level is down to about 280 parts per million again, as it was at 1900. If and when that is achieved, then survival conditions may be in effect and the world's population may start back up (C). Under these new conditions, indicated as Climate Stabilization, there may be planned parenthood such that the total population will stay under five billion people.

The point of no return, when the snow and ice keep coming down from the polar areas, and can no longer be stopped, is estimated to be in the next fifteen years based on the accelerating climate extremes in summer and winter, and general destabilization of weather patterns. This is the picture if the Climate Change is allowed to proceed. If the CO/2 level is not brought back to around 280 ppm then the climate extremes will continue to get more destructive to our food supplies, homes, and entire technological way of life, and continue into the next glaciation cycle (of 70,000 to 120,000 years).



42-yr. program ERP at 0.3 Gt C/yr net removal; with 2.5 Gt net C increase/yr for 8 yrs. and 2.0 for 34 yrs. Carbon removal (new forest, marsh and swamp growth) and carbon increase activities (fossil fuel, forest dying, cutting and burning) are treated as separate activities.

27-yr. program ERP at 0.5 Gt C/yr net removal; with 2.5 Gt net C increase/yr for four yrs., 2.0 for one yr., zero for 22 yrs. Primarily, transition to (benign) alternative energy technology within five years.

Two climate stabilization programs are indicated on Figure 1. These programs are based on simple assumptions, but the main point is highlighted, i.e., that a "best possible" biospheric program (using Ø.3 Gt C reduction/yr. and then Ø.5) still leaves us approximately ten years short of the goal of stabilizing climate. The critical conditions have to do with rapidly increasing disasters from flooding, hurricanes, tornadoes, heat and drought, freezing spells in the winter and spring, dying and burning forests, and more. There is at least a ten year time gap between our climate needs and environmental possibilities.

On Figure 1 move the "population" curve and the "27-year program" curve towards each other, and close the gap. This is what survival means from now on, "close the gap".

Action: Attempt to move the "population" curve outward and upward -- protect against climate disasters. Try to speed up still further the "27-year Program" curve -- remove the excess CO/2 before it is too late. This would be reflected in Figure 1 as a shift to the left. Enough shift and much of the world's population would be saved from being wiped out.

Figure 1 is developed in a simple format in order to focus on the basic conditions, the basic problem, and the direction that research, planning and action must take from this time forward.

Close the gap from two sides

The point of this paper is urge that future work on climate analysis, planning and stabilization efforts focus on the two sides of this gap: (1) how regional societies can support themselves and help each other as conditions get rapidly worse; and (2) how we can speed up the CO/2 reduction, given the time frame indicated [13]. We consider that Figure 1 is the best indicator of what we are facing.

Appendix 10

Alden Bryant wrote to Dr. Fred Bernard Wood on August 6, 1984: "In a recent discussion with Dr. Paul Zinke, Department of Forestry, University of California, Berkeley, he suggested that we keep in mind the very approximate figures for forest net growth rate as follows:

Near the equator -- 15 cubic meters per hectare per year

High latitudes,
such as Finland -- 2 cubic meters per hectare per year

Working average for a global
reforestation program in mid-latitude
appropriate areas -- 10 cubic meters per hectare per year

We can use these guideline figures in a first cut estimate of the amount of forest growth required to reduce CO/2 from 356 pars per million back to 280 ppm."

BACKGROUND ANALYSIS

Introduction

We have a human right to survive. This right is to be expressed by bringing back a balance between the earth and its atmosphere [Bryant 1989]. This right calls upon us to understand a few things in our own interest:

1. For the last two million years, around 90% of the time there have been glacial periods (70,000 to 120,000 years) with ice coming down to New York, Illinois, Southern France, Southern USSR [Appendix 1].

2. For about 10% of the time we have had interglacial periods, the climate we know.

3. We are at the end of the present one [Appendix 2]: C. Bertrand Schultz (USA) [Associated Press 1985], Alexis Dreimanis (Canada) [Appendix 3], George Kukla (USA) [Kukla 1972], Gifford Miller (USA) [Miller 1977].

4. The turn around can happen in a short period of 20 to 40 years [G. Woillard (France)].

The Problem of Climate Change

Primary physical processes It is essential to look at the primary physical processes of our earth: soil demineralization, forests dying and being overcut, CO/2 increase, cloud increase, snow and ice increase, and climate intensities by season and latitude. We hear about temperature data. Temperature is a reflection of the primary physical conditions of the soil, biota (forests, swamps, plankton in the ocean), CO/2, clouds, snow/ice, oceans, and the changing processes taking place. Temperature data is, of course, limited in how much it can tell us about the primary processes themselves [Appendix 4].

The structure of the problem of climate stabilization is: remove a quantity of carbon from the world's atmosphere in a certain number of years, or it will be too late [Miller 1992]. Crops will be too badly destroyed and the permanent snows will be coming too far down and will not melt back in the summer.

Our estimate is that in the next 15 years the reduction of CO/2 can be brought about through reforestation (75%), marshlands and wetlands (5%), ocean phytoplankton (20%). This means: remove 170 billion tons of carbon worldwide in 15 years. Do so by remineralizing forests to bring them back to life and speed their growth, as in Austria -- Gernot Graefe, Austrian Academy of Science program [Appendix 5] -- in Australia, New Zealand, FRG, GDR, and some in the USA and the USSR. Add in expansion of marshlands and wet lands, and phytoplankton in the oceans where possible -- John H. Martin (USA), English, German and other marine research laboratories [Appendix 6].

Human actions add to the natural processes Kenneth E.F. Watt, of the US, is finding a lack of correlation between the amount of fossil fuel used and the rise in atmospheric CO/2, and a strong case for the relation of CO/2 increase to soil mineral depletion, forests dying and more susceptible to fires and pests, and the impact of increasingly irregular freezing spells on northern and mid-latitude forests [Watt 1987].

Jet stream moving south This has been New York's coldest summer on record. It has had an effect on agriculture in the area. The jet stream has moved south of New York City, blocking out the hot usual summer weather. There is a climate

change impact on agriculture as well as people's behaviour. "On Long Island, where corn, tomato and pumpkin crops are at risk and the grape crop is two weeks behind schedule, farmers say they may have to ask the Government to declare their industry a disaster. New Jersey farmers are worried about their peppers and blueberries" [Henneberger 1992].

Late August 1992 "summer snow" in eastern Canada left a foot of snow on a large area, destroying much of the barley crop, and resulting in price increases.

Jacques-Yves Cousteau has said "In the next decade people must completely change the way they grow food. Reliance on damaging pesticides, for example, must give way to revolutionary agricultural methods." [Viets 1991]

Antarctic to Australia An example of climate change extremes is the the freezing storm that came in off the Antarctic, hitting about 180 miles West of Melbourne, Australia December 2, 1987, and freezing to death over 30,000 sheep. They had been sheared, but no one had ever experienced such a storm before in the summer. One farmer said "I've never seen anything like this -- and I hope I never do again." [Trompf 1987]

Accelerating climate change Compare the startling size and suddenness of this devastation with events such as the August 1992 hurricane Andrew hitting the southeastern U.S., and the hurricane blasting the London and southeast England area October, 1987 [Associated Press 1987]. Events in countries in Asia and Africa have caused far greater losses. This is what we mean by accelerating climate change extremes.

System of Problems

1. The atmospheric CO/2 level, now at 355 parts per million or above, is apparently as high or higher than it was during the last turn-around from interglacial to glacial conditions about 120,000 years ago [N.J. Shackleton (England); Vostok Antaractic ice-core drilling analysis (USSR and France)].

2. Heat and drought increase in the lower latitudes is associated with clouds, snow and increased freezing in the higher latitudes, a continuous warming and cooling process -- Kenneth E.F. Watt (USA) [Appendix 4], Victor Kovda (USSR) [Appendix 7]. For cloud, snow and ice conditions see sections below.

3. The heat and drought, as well as the more intense freezing and shorter growing seasons, are destroying crops in the U.S. (as well as many other countries). The U.S. is faced with cutting back on exports -- U.S. Department of Agriculture, Statistics Office. Other countries hardest hit have been Africa, China, USSR, Iran, Australia [Trompf 1987], England [Associated Press 1987] and France (Paris flooded in 1990).

The effect on crops coming from heat, drought, storms, flooding, tornadoes, freezing, and unusual alternating warm and freezing weather, has hit much of the U.S. particularly Maine, Arkansas, Carolinas, Texas [Associated Press 1989], Ohio and California [the great flood of 1986, 50,000 people flooded out].

4. Buckling of the jet stream causes regional drought, heat waves, freezes, and flooding, depending on a region's position relative to the jet stream loops. Excessive looping in the jet stream is associated with cooling climates; and jet stream expansion (moving further south) is promoted by action of increased CO/2 in increasing low altitude to high altitude temperature differences, and low latitude to high latitude temperature differences.

5. Cloud cover over some parts of the world is increasing and causing more cooling than the additional heating that is caused by the increased "greenhouse" effect -- E. Roeckner et. al. (Federal Republic of Germany) [Roeckner 1987], Hubert H. Lamb (England).

In some areas, such as the western U.S., the change in jet stream action plus the increased atmospheric pollution has meant lower cloud formation, and far less rain reaching the earth's surface. "Polluted clouds are forming lower, icing over, and dying in mid-air. Our autos are literally 'exhausting' the atmosphere." [Thompson 1992] "...when our relatively shallow atmosphere is choked annually by billions of tons of CO/2, nitrous oxides, smog hydrocarbons and deadly carbon monoxide, the sunlight that reaches the surface is greatly reduced.

"Reducing the sun's evaporative power on ocean surfaces reduces convection -- the 'water lifting' activity that begins the planet's life-sustaining hydrological cycle. These weakened vertical jets of air next affect the lateral jet streams, so worldwide water distribution declines. The results can already be seen: a steady disappearance of upper clouds (the weakened, rising jets can no longer push cloud vapor high enough, except during thunderstorm conditions) and a similar breakdown in upper lateral winds. ... There is mounting evidence that the speeds of the jet streams are faltering."

Twenty years ago, in 1972, "scientists interested in Quaternary research gathered ... to review the possibility that their data concerning climates of the past might be valuable for long-term global climate forecasting." (Kukla 1972) "It is hard to envision how our modern economy and social structure would react to widespread droughts several decades long, should they occur in the near future."

The climate change extremes are now here with a vengeance. ERS has, for ten years, been contributing its efforts for all of us to face the full extent of the glaciation process, and start a crisis work program to achieve a balance of the earth and its atmosphere, and stabilize our world's climate. H.R. 4154, the climate bill, now in the U.S. Congress, is to be the basis of this work program.

6. Permafrost is moving downward from the north and the cooling mode is dominant -- Victor Kovda (USSR) [Kovda 1985], Kenneth E.F. Watt (USA) [Appendix 4].

7. Snow has been increasing significantly in Northern hemisphere coverage -- North America, Europe and Asia showed an 18% increase in snow cover November 1985 compared to the previous peak which was in 1973 [Associated Press 1985]. There has been an increase in depth in Alaska and Tibet -- Maynard Miller (USA); in Eastern Canada and Baffin Island -- Gifford Miller (USA); in Antarctica (reported by returning workers). Ice depth has been increasing in parts of the Antarctic an average of approximately four feet per year for 25 years [ERS, Antarctic, 1989].

The snow line in parts of Canada is now 90 to 150 miles further south, comparing the 1980s with the 1970s [Discover 1990]. Parts of Canada have not had enough frost free days to grow wheat -- stated by C. Bertrand Schultz (USA) in Philadelphia in 1986 at the AAAS (American Association for the Advancement of Science), at the meeting of the member association ISGSR (International Society for General Systems Research), and now common knowledge in Canada according to Peter Petronek, Coordinator of Special Projects for Earth Day Canada [Appendix 8].

Snow depth is increasing in Tibet and on the glaciers in Alaska -- Maynard Miller (USA) -- in Northeast Canada and Baffin Island -- Gifford Miller (USA) -- in Greenland, in the USSR, and in parts of the Antarctic [ERS Antarctic Photographs 1989].

8. In the period of 1960 to 1980, advancing glaciers increased from 6% to 55% of observed glaciers -- Fred Bruce Wood (USA) [Wood 1988]. Glaciers are changing depending on where they are in the world, with a majority of those monitored showing expansion over those 20 years. Since then some glaciers in equatorial and temperate latitudes have been retreating, whereas in the higher latitudes they have been increasing.

9. The increase of snow and ice over the last 20 years in the Antarctic, on the glaciers of Alaska, Eastern Canada, Baffin Island, Greenland, the USSR, are the rough equivalent of an inch or two drop in ocean level -- it has been recommended that this whole question be given more analytical attention.

Ships have fewer ice-free days during the summer to go around Alaska to the north slope and return; and some harbors in the Antarctic are now too iced over to be used by ships.

10. Forest and grass fires have taken an increasing tole over the last ten years. Forests have been impacted by demineralized soils, heat and drought, high winds, and therefore burning with greater devastation. Major examples include Borneo (mid 1980s), Australia, the U.S., Canada and elsewhere. The largest of all was the 1987 fire in China with one across the border in the USSR, burning April and May. The Chinese fire, by May 10, was a wall of flame 110 miles wide and 25 miles deep, in the Daxingan Mountain range in Heilongjiang Province, about 800 miles northeast of Beijing, near the Soviet border [Miles 1987]. 20,000 or more fire fighters were involved, facing a fire that aburned about 1.5 million acres of forest and left over 50,000 people homeless.

11. We are in transition into the next glacial period -- C. Bertrand Schultz (USA), Alexis Dreimanis (Canada) [Appendix 3], Gifford Miller (USA), Fred Bernard Wood (USA) [Appendix 9]. The National Geographic discussed the two million years of the ice age, the end of the present interglacial period, and our present condition of being in transition into the next glacial period [Matthews 1987].

"Schultz concurs with other geologists who say that by the year 2010 an Ice Age will engulf the Northern Hemisphere, resulting in Canada's inability to grow grain and the Soviet Union's inability to feed itself" [Associated Press, Schultz, 1985].

System of Solutions

12. The trunk and branches of trees are about 45% carbon. The health and growth of trees is enhanced by soil with sufficient minerals and trace minerals. Forest net growth rate information is provided by Paul Zinke (USA) [Appendix 10]. Due to mineral depleted soils, forests are drying out, burning faster [Miles 1987], are more subject to pest infestation, and are less able to take in CO/2 and put back oxygen.

Forests are dying back also from cold conditions [Watt 1987], as well as from drought and acid rain. Over half of the world's forests have been cut down over the last 2500 years.

13. Remineralization of forests with rock dust plus organic material is bringing them back to life -- Gernot Graefe (Austria) [Appendix 5], Australia [Appendix 11 and 12] and other countries. Large areas of the USA and other countries have mineral and trace mineral depletion in the range of 25% to 40% -- Mark A. Flock, Agronomist (Brookside Farms Laboratory, New Knoxville, Ohio, testing approximately a million soil samples per year, from various countries).

The soil minerals and trace minerals are essential for forest, crop, animal and human health. Most soils are lacking minerals after 10,000 years of leaching and erosion (Brookside Farms Laboratory, Ohio) [Appendix 13].

The best solution is the fertilization of soil by fine rock dust, with a broad natural cross section of minerals (i.e., inorganic material) [Kovda 1987]. This is soil remineralization. There is another gain, and that is elimination of the need for most pesticides when the soil is sufficiently remineralized [Gibson 1989]. Cannard's soil care with rock dust remineralization produces vegetables and fruit that resist pests, and withstood 17 degree winter cold with almost no loss (surrounding farms had severe losses) [Appendix 14].

Victor Kovda, the grand old man of Russian soil science, wrote to us that "if organic materials are collected, composted and regularly inserted in arable soils, the soil fertility will be upgraded/stabilized, and a considerable quantity of CO/2 from the atmosphere will be annually fixed in the form of humus and fresh photosynthetic organic material. ...

"So, I am certain that global reafforestation of mountainous regions and tropics, regular rehumification of arable soils, control of soil erosion, remineralization of acid soils, and reasonable fertilization of all arable soils will very much improve the planetarian balance of CO/2 in the biosphere.

"Of course, every continent, natural region and particular country requires its own concrete program and sequence of actions. But general theoretical principles and technology must be coordinated to be complementary to each other.

"I am very much impressed with your own and your colleagues' intention to suggest the "Problem of Earth Regeneration" as the global super problem to the governments and scientific circles, as a vital subject of peaceful international cooperation in the interests of humanity of the XXIst century. Best regards and wishes, Victor Kovda" [Kovda 1987]

14. Solar thermal electric power can replace most of oil burning for power plants, and provide electricity for electric vehicles (mass transit and cars) to replace fossil fuel [Wald 1989], [Smith 1991] and [Appendix 15].

15. Ocean remineralization can increase phytoplankton, and significantly add to atmospheric CO/2 reduction -- John H. Martin (USA) [Appendix 6]. Oceans can be remineralized with iron particles in areas primarily lacking this mineral; but further research and investigation into environmental effects is necessary. This may produce as much as one fifth of global CO/2 reduction over the next 15 years.

Ocean level drop The amount of snow increase over the last 40 years (Alaska, Canada, Greenland, USSR, and Antarctica) suggests a drop in ocean levels of one to two inches; oceans are not rising, but tides and storms are becoming more violent -- E. Bryant (Australia), William F. Tanner (USA) [Appendix 16], Stephen Rattien (USA) [Appendix 17].

General information

Emergency Climate Stabilization and Earth Regeneration Act of 1992 The full text of H.R. 4154, as introduced into the U.S. House of Representatives by Ronald V. Dellums (Democrat, California) on February 4, 1992, is included in Appendix 18.

Representative Dellums issued a letter to his colleagues in the House on August 18, 1992, requesting response or for them to become a co-sponsor [Appendix 19]. Now is the time to urge members of Congress not only to support this bill but to get work going on a national and international emergency basis [Appendix 20 and 21].

US elections and climate destabilization One of this countries knowledgeable writers -- engineer, farmer and analyst on climate change -- has distributed an open letter to the public [Hamaker 1992]. "One very important fact is being left out of the election. Nature has radically changed her course. If we are to survive, we, too, must radically change our ways. The establishment's brush-off of Jerry Brown is one thing. Brushing off nature is attempted only by fools. In a few years even the fools will undertand that the laws of nature are far more powerful than any human laws."...

"Glaciation ... has begun. The increasing temperature differential between the equator and the poles has changed the wind pattern to carry the bulk of the clouds to the upper latitudes. Much of the temperate zone around the world now suffers from drought and severe storms of all kinds. ...

"...With the proteins in grains down to half or less of what they were sixty years ago, the reason the world is suffering from the diseases of malnutrition is obvious. We must remineralize the world's soils if we want to survive.

"The nonbiodegradable synthetic organic chemicals which have brought us the plague of cancers must be outlawed as well as the exploitation of fossil fuels which have filled the atmosphere with greenhouse gasses. ...

"We are technically able to do the things we must do for a chance of survival. Politically we are not able to do those things. ...

"The people who run this country have had twenty years to act on the real problems and avert the crisis conditions we now face. They have done nothing which would adversely affect their accumulation of wealth and therefore nothing of consequence. I don't think they will ever be useful to the survival effort. ...

"The message is clear. When the glaciers start surging down from the mountains, they do so because the weight of snow and ice has built up enough to force the downward movement. As can be plainly observed from the weather satellite pictures, the bulk of the clouds are moving to the upper latitudes. The ... glaciation has begun. Only massive human effort can bring the clouds back to the temperate zone. We must begin that effort NOW. The longer we procrastinate, the less likely we are to succeed."

Top selling current environmental book Senator Al Gore has a program for the environment in his book Earth in the Balnce [Gore 1992]. The introduction features the exponential rise in concentration of carbon dioxide in the atmosphere and the exponential rise of population.

Part I: Balance at Risk: notes that most of the earth is dependent on churning, fertilizing glaciers for restoration of the soil minerals, while the Amazon rain forest gets 95% of its minerals airborne and receives 100 pounds of rock dust minerals (sand windblown from Africa) per acre per year.

Part II: The Search for a Balance: "...our new story must describe and foster the basis for a mutual and healthy relationship between human beings and the earth."

Part III: Striking the Balance: contains chapters on A New Common Purpose, and A Global Marshall Plan. He concludes with "I have come to believe that we must take bold and unequivocal action: we must make the rescue of the environment the central organizing principle for civilization."

Fortunately the initial steps in Senator Gore's Global Marshall Plan are almost the same as for other plans based on more complex concepts than the simple global warming, so we don't have to spend time this year arguing over different plans. Even during the period from now to January, 1993, we should be trying to get the large scale soil, forest and energy work under way. Pass H.R. 4154. We can all get together to elect the people who will cooperate on Senator Gore's plans.

Later next year we can plan what computer simulation programs need to be developed to do some fine tuning on the "global warming" theory to give us a more accurate description of our planet's climate cycles. The proposed computer simulation programs should include both 'top-down' and 'bottom-up' strategies and be reviewed by the Society for Computer Simulation, the American Society for Cybernetics, International Society for the Systems Sciences, and the Worldwide Indigenous Science Network.

Call for action since 1984 There have been calls for action around climate change and for climate stabilization since the 1970s. ERS started issuing evaluation and calls for a massive soil, forest and energy program starting in 1984. Publications were distributed to Congress (members and Committees), the Administration, and numerous public organizations. There was a high degree of refusal to respond, and to cover up the full situation, by the Administration and a number of Congressional bodies. The Administration — Presidents, and their respective cabinet officers, share the main responsibility and accountability for the intensity of the hurricanes, fires, floods, heat, drought, and freezing, since 1984. An eight year serious climate stabilization program, leadership on an international scale, could have reduced the intensity of these extremes brought on by climate destabilization, and could have prepared the country better for what has happened and what is coming in the future.

Computer modelling: resources, environment, and social One computer model, using a broad range of physical variables, is that by Meadows, Meadows and Randers. Their recent book [Meadows 1992] updates their 1972 publication, "The Limits to Growth." They conclude that the job of transition to a sustainable way of life in this world must now take place within approximately the next 40 years, given the human impact on natural resources.

When you broaden the analysis to include the soil, forest and energy requirements to work toward climate stabilization, then the fifteen year objective comes into view. S = 170*15 [Appendix 22]. Some computer models, given considerable publicity, omit aspects that are significant for climate stabilization, such as soil remineralization and snow and ice buildup [ERS, computer models, 1989], [Wood 1990].

International CO/2 Budgets. Russia Dr. Alexander M. Tarko, of the Computing Center (including long-run planning), Russian Academy of Sciences (40 Vavilov Street, Moscow 117967, Russia) October 25, 1991, wrote to ERS: "I am sending you a short description of my spatially distributed model of global CO/2 cycle in land biota. The size of one cell in the model is 4x5 degrees of geographical grid. Using such model, or other spatially distributed models, makes it possible to calculate the CO/2 budget for different countries: the difference between anthropogenic carbon flows to the atmosphere (fossil fuel combustion, deforestation and soil erosion) and flows from atmosphere (absorption of carbon by land ecosystems of these countries)."

The title of his paper is "Calculation of Carbon Dioxide Budget for Countries and Regions." The abstract states: "Parameters of CO/2 cycle for several countries and regions are calculated using a spatially distributed model. Effects of fossil fuel burning, deforestation and soil erosion are taken into consideration." A balance of carbon flows in the world in 1980 was given as follows (in gigatons of carbon per year, billions of tons):

Industrial releases	5.26	Land ecosystems absorption	4.80
Deforestation	1.60	Ocean absorption	1.10
Soil erosion	1.85	Atmospheric increase	2.81
	8.71		8.71

World Bank and IMF Environmental Impact A recent news article refers to a two-year study by the World Resources Institute, regarding the IMF and World Bank policies causing an environmental crisis in third world countries. These policies, when pushing industry and exports resulting in environmental and natural asset destruction, become self-defeating [Ross 1992]. This type of destructive dynamic is discussed further by Bill Wason [Wason 1992].

Food and climate change The relation of meat and grains to health, many aspects of the environment, and agriculture, has been researched and reported on by John Robbins and co-workers, EarthSave Foundation, for years (EarthSave 1992). "The increased demand for animal products has resulted in a vast re-allocation of resources, has promoted the degradation of global ecosystems and has had a devastating impact on human health. Many of the main environmental issues — desertification, fresh water availability, ocean pollution, biological diversity, rainforest destruction, topsoil erosion and climate change — are directly and severly impacted by the Western world's current animal-based diet with its intensive agriculture."

Food, spirulina Here is a basic nutritional food supplement, or even a basic food in times of food shortage. According to Bruce Tainio, one of the countries outstanding microbiologists, "the resources we choose to consume will make all the difference in the rebalancing of our earth's delicate ecology." He offers information such as: spirulina is 1.4 times more energy efficient than corn; 3.5 times soy; 100 times beef. The production of protein from Spirulina requires 1/3 the water of soy production; 1/5 of corn; and 1/50 of beef. Spirulina does not result in loss of topsoil, and is able to produce 20 times more protein per acre than soybeans; 40 times corn; and 200 times beef. When it comes to CO/2 reduction, 1,000 kg of spirulina consumes 450 kg of carbon and releases 1,200 kg of oxygen while it is growing. 2.5 acres of desert can produce 14 tons of spirulina per year while pulling 6.3 tons of carbon out of the air and putting back 16.8 tons of oxygen. One acre of spirulina will fix nearly three times as much carbon as the average acre of forestland. All of this suggests that a CO/2 Budget for a region should consider what areas would be best for growing spirulina, in balance with the other land use requirements.

Temperature as an indicator of climate change First, it is important to point out that temperature (thermometer readings) is a reflection of the physical realities of (1) soil conditions, (2) forest cover, (3) CO/2 level in the atmosphere, (4) ocean absorption of CO/2 and (5) snow and ice buildup. Weather, in turn, reacts upon these five basic conditions.

As to temperature, ERS has run a few preliminary sample studies of New York Times daily temperature reports, compared to long-run average temperatures, for 65 international cities. The samples are small, but it is the method that is important for our understanding of the climate destabilization, and the type of conditions to look for. [New York Times 1991-92]

November 6-21, 1991, 21 days: for the 65 cities the sum of the degrees (+ and -), compared to the long run average, showed 2.5 times as much cooling as warming. Coldest compared to average were: Winnipeg (-105), Taipei (-81), Havana (-79), Dublin (-70), Cairo (-65), New Delhi (-60). Warmest compared to average were: Moscow (+69), Vienna (+47), Helsinki (+45), Lima (+43), Bermuda (+37). A week in December 1991 showed 3.2 times as much cooling.

The 12-day sample June 2-13, 1992, showed the five coldest cities, compared to the long-run average to be: Madrid, Guadalajara, Manila, Mexico City, Rome. The warmest cities were: Oslo, Stockholm, Helsinki, Amsterdam, Merida (Venezuela). The total degrees of warming for the 65 cities were slightly more than the cooling. One of the most significant features

was the spread over the twelve days. Warsaw went from -22 to +11 (a spread of 33 degrees); Winnipeg -20 to +12 (32); Buenos Aires -8 to +22 (30), Berlin -11 to +17 (28); Beijing -15 to +11 (26); Moscow -16 to +7 (23). Some of this may reflect rapid shifts in the jet stream. The important thing here is the type of data, in order to understand the rapidity and irregularity of climate destabilization.

Employment An ERS "U.S. Employment Plan — Earth Regeneration Program" shows an estimated distribution by sector for 20 million additional jobs in the U.S. required for work on soils, forests, alternative energy technology development, oceans, and cleaning up pollution [Appendix 23]. Discussion of plant closings and leaving the U.S., training and transfer of workers, and impact on communities, is presented as a seven-point program in Appendix 2. Organized Labor has acted on climate, food and jobs [Appendix 24]. Organizing around the combined issues of race, poverty and environment is gaining strength [Holmes 1992].

International participation on climate stabilization A summary of events and meetings in Europe, the United Nations, and the U.S., during the critical time of November and December 1988, is provided in Appendices 25 and 26.

The Earth Summit meeting in Rio, June 1992, originated three years before in the work of Dr. Alexander Borg Olivier, Malta, with the United Nations General Assembly. The Rio meeting was intended to become the basis for climate stabilization programs, but this was almost entirely kept out of the deliberations and decision making.

Some of the work of the United Nations with the longest history is the development of covenants. The International Covenant on Civil and Political Rights is a treaty including: "The States Parties to the present Covenant ... Agree upon the following articles:" ... Article 4 "1. In time of public emergency which threatens the life of the nation and the existence of which is officially proclaimed..." This article again heightens the protection under existing law. Article 4 should be considered by every country in terms of the global crisis around climate change extremes, and climate stabilization efforts. Article 51, on amendment, may provide an avenue for consolidating international cooperation around mutual assistance in climate stabilization programs.

The Covenant was ratified by the U.S. Senate April 2, 1992, signed by President Bush and presented to the United Nations on June 5, 1992. It takes effect on September 5, 1992. It is now time to act on these new possibilities.

Oil and coal transition to alternatives Within the goal of 15 years to bring the atmospheric CO/2 level from 356 parts per million to near 280 ppm, the international community is faced with the problem of working with employees and owners of the oil and coal industries to carry through a process, that might take 30 years under other conditions, in three, four, five and up to 10 years. Most human life is at stake. It is now time for a turn-around from the position described by Dr. Irving Kaplan, in which some leading members of the oil industry decided in 1976 to repress any discussion of the full climate cycle, put out partial and misleading information, and hold off serious pressure for change [Kaplan 1984].

The role of CO/2 budgets in climate stabilization To summarize the Background Analysis: a CO/2 Budget is a statement of the increases and decreases of atmospheric carbon dioxide (CO/2), shown in units of carbon, in a region over the short and long run (one year and ten years respectively are recommended) [Bryant 1990]. It is presented as a working tool to measure the changes required for stabilization of climate. The biospheric conditions must be stabilized before reaching a point of no return in snow buildup, and climate intensities in summer and winter, knocking out food supplies in the temperate latitudes. The world is well into the transition from interglacial to glacial conditions; and it is questionable to what extent human society can carry out a sufficient soil, forest, ocean and energy program to stabilize climate conditions in time [Watt 1992].

Climate change will increasingly impact all social and economic problems and conflicts. The move toward climate stabilization potentially can become the world's greatest unifying force.

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