SUPPLEMENT ADDED 08/13/83
INCLUDES BLOCK DIAGRAM OF
P.C. WORKSHOP, JUNE 1983

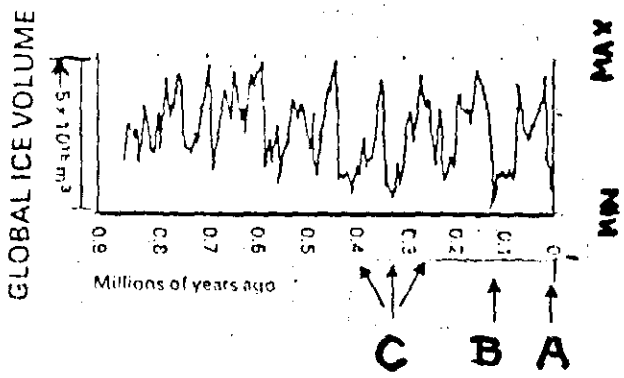
To:
First Planetary Congress
Toronto, Canada
Ecology Workshop Section
June 17-21, 1983

From:
EARTH REGENERATION SOCIETY, INC.
470 Vassar Ave., Berkeley, CA 94708
(415) 525-4877

The following graphs are made available to aid in the understanding of the complex interrelationships between the rising carbon dioxide level in the atmosphere, the killing of trees and destruction of fish in lakes due to acid rain, the potential weather changes leading to the loss of the temperate zone which produces most of our food, the weather destabilization that has made food production worldwide problematical, the demineralization of the soil, and the potential development of the next glacial period.

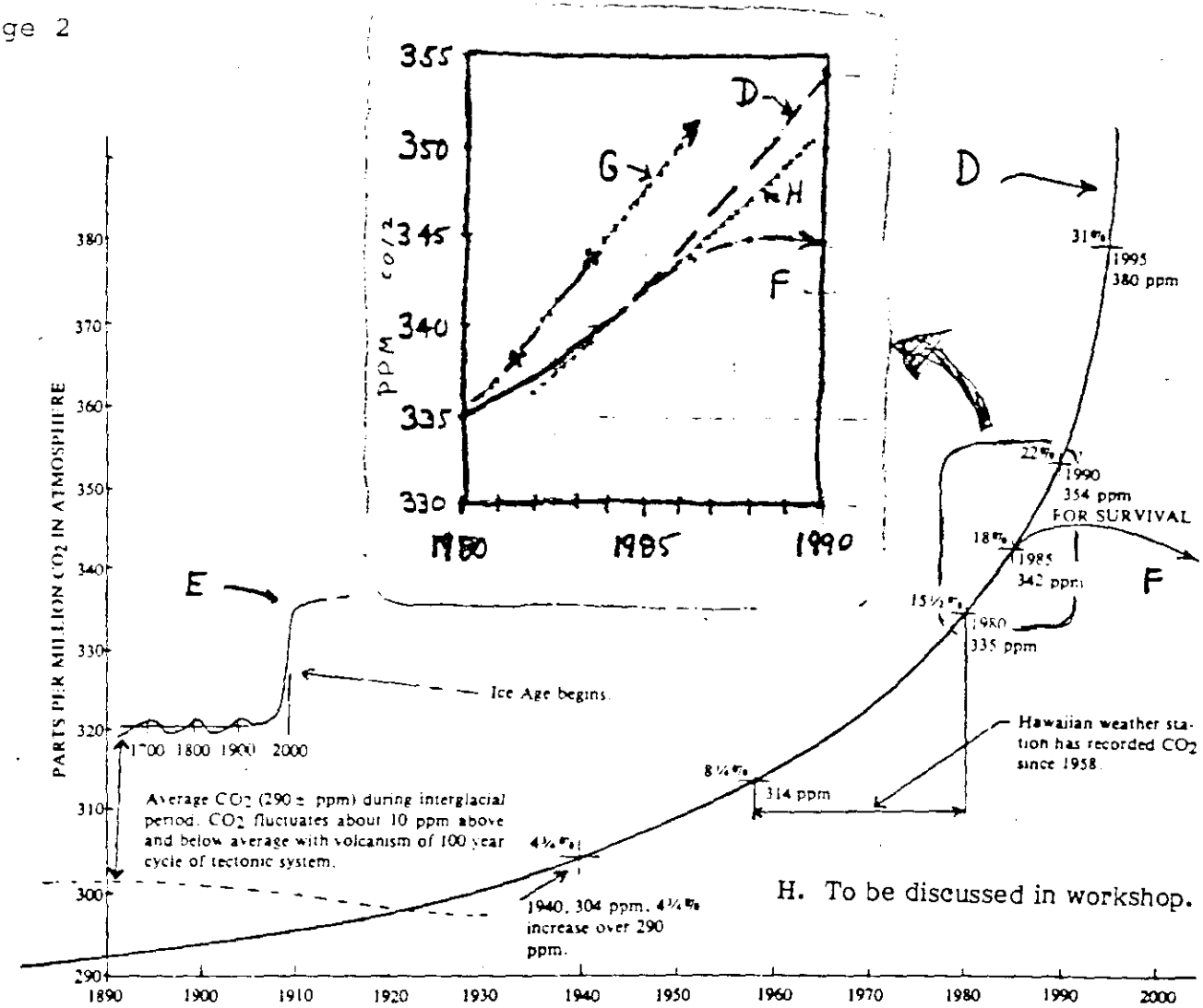
On the right is a plot (fig. 1) of variation of the volume of ice in glaciers on the surface of the Earth for the last million years. Point A shows the present interglacial period that we are in. Point B shows the last previous interglacial period of about 10,000 years duration that ended 100,000 years ago. C points to earlier interglacials. Unless conditions have radically changed, we should expect another glacial period of 90,000 years duration to start soon. (Source: John Gribbin, Ph.D., Cambridge University, What's Wrong With our Weather, copyright 1979.)

A. Present Interglacial (Holocene)
B. Last previous interglacial (Eemian)
C. Earlier Pleistocene interglacials



Scientists do not agree on exactly how the next glacial period will start. Some scientists believe that we can prevent or delay weather changes that lead to bringing the next glaciers by controlling the carbon dioxide level in the atmosphere. The part of curve D (fig. 2, p. 2) prior to 1982, is the experimentally observed parts per million of carbon dioxide in the atmosphere. The part of curve D after 1982 is the future trend predicted by John Hamaker in 1977 and reprinted in The Survival of Civilization (1982). Curve E shows the CO_2 levels for the historical period 1700 to 2000. Curve F shows how mankind must reduce the increase in carbon dioxide in order to prevent catastrophic changes in weather on our planet.

In the blown-up inset for the period of 1980-1990, curves D and F have been drawn on a larger scale. Data from Mauna Loa Observatory for 1981 and 1983 have been added to form Curve G. From this we can see that the level of CO_2 is already higher than that predicted by Hamaker, and is also rising faster. A possible cause of the curve rising faster is the trees that have died in Northeastern U.S.A., Canada, and Europe due to acid rain falling on extremely demineralized forest soils. (Add other causes.)



H. To be discussed in workshop.

Fig. 2, CO_2 Increase, source, John D. Hamaker, The Survival of Civilization

These curves indicate a need to reduce sources of sulphuric acid from coal burning power plants to save trees from acid rain destruction, to reduce the use of fossil fuels in general to lower sulphur dioxide and carbon dioxide emissions, and to plant huge forests after suitable remineralization of the soil so that optimal soil microorganisms can exist. Optimal growth of microorganisms must occur first because they supply most plants and trees with nutrients.

The Earth Regeneration Society, Inc. offers additional papers in support of Hamaker and Weaver's thesis presented in The Survival of Civilization, (a few copies of which are also available for this workshop) to: initiate discussion in this workshop to further an overall systems understanding of the Earth as Gaia.

We suggest that we might start with an introduction to John Hamaker's thesis by utilizing papers written and edited by his coworker, Don Weaver. Further reprints of articles by other writers offer corroborating evidence. Other reprints show conflicting ideas which lead to questions which need to be resolved. We propose that this workshop be used to improve the Carbon Dioxide Research Plan developed by the United States' Carbon Dioxide Research Division at Germantown, Md., U.S.A., and published April, 1983. (This plan gives a good starting point to further discussion and understanding of the complex interrelationships among many Earth systems.) The work done by this workshop has the potential to accelerate the formulation and initiation of a plan to reverse present trends which will otherwise certainly take Homo sapiens and myriad other species to the oblivion of extinction.

Fred Bernard Wood and Kathleen Clement of the Earth Regeneration Society, Inc., (a non-profit educational group) would like to get this section's Ecology Workshop participants' feedback about our proposal to use at least part of our time here in Toronto to write a vastly improved carbon dioxide research plan to promote implementation of much-needed solutions.

The graph of global ice volume was revised on 7/26/83.

Pages 3, 4, 5 added on 08/13/83.

The graph below is added to show how approximtely half of the carbon dioxide generated by the burning of fossil fuels stays in the atmosphere, while we do not know accurately where the other half goes. The principal absorbers of carbon dioxide are the forests and the ocean, but we do not have accurate data to make a precise balance sheet.

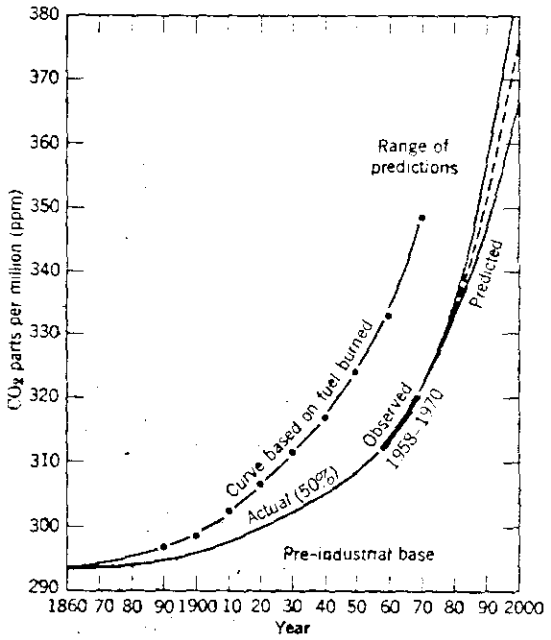
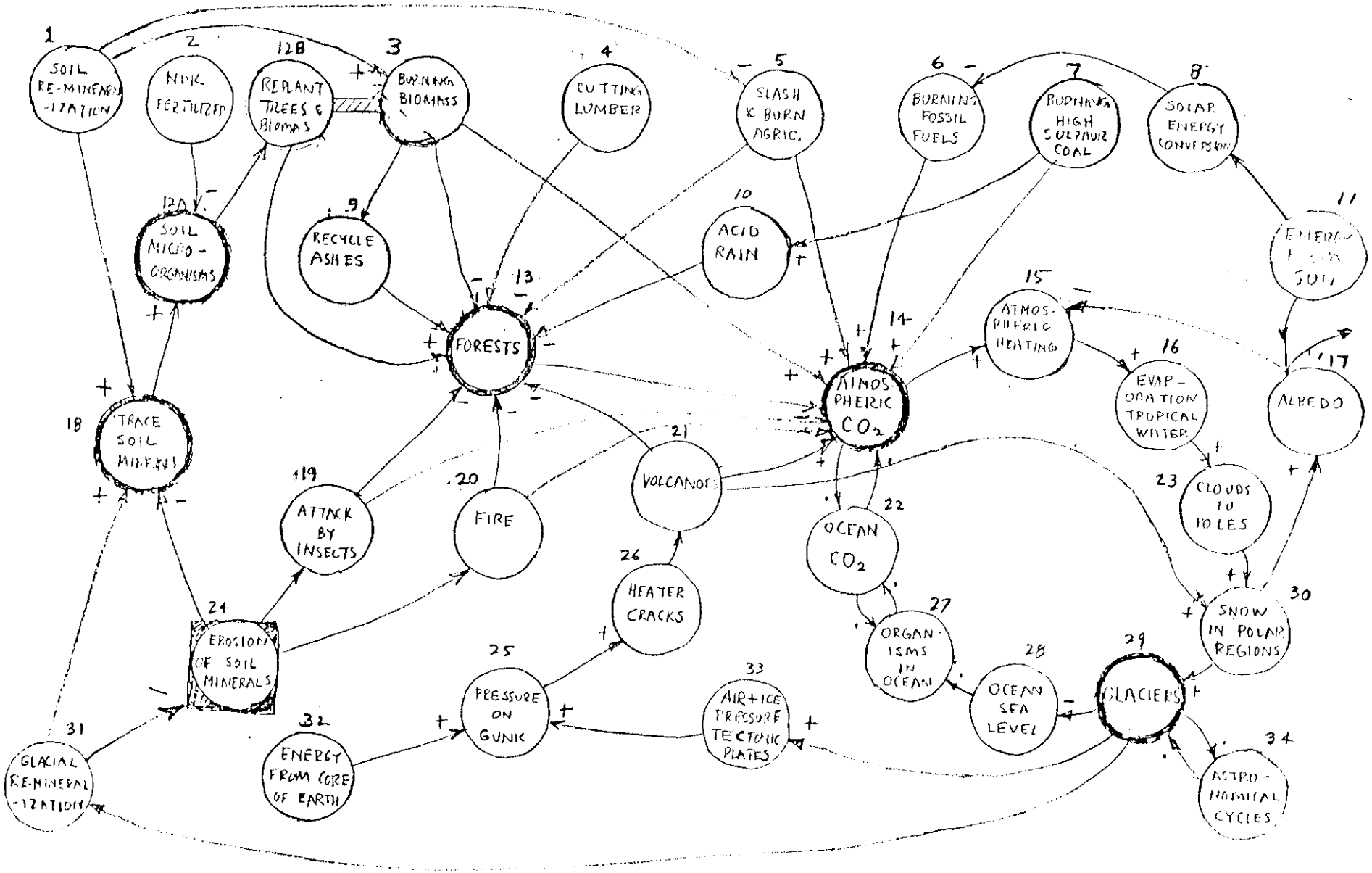


Figure 6.1 Increase in atmospheric carbon dioxide since 1860, with projections to the year 2000. (Data of L. Machta, 1971, as given in *Inadvertent Climate Modification*, SMIC. The MIT Press, Cambridge and London, p. 237, Figure 8.13.)

The above curve is from ENVIRONMENTAL GEOSCIENCE: INTERACTION BETWEEN NATURAL SYTEMS AND MAN, Arthur N. Strahler and Alan H. Strahler, Santa Barbara: Hamilton Publishing Co.(1973), P. 145.

The block diagram on page 4 is an update of the chart used in the workshop of 6/19/83 at the Planetary Congress in Toronto, Canada. A description of the interconnections of the block diagram is on page 5.



8-2-83

BLOCK DIAGRAM of the RELATIONSHIPS between FORESTS, SOIL MINERALIZATION, MICRO-ORGANISMS, CO_2 & GLACIERS.

The above diagram has been expanded from a diagram developed by Dr. Charles Francois of Buenos Aires, Argentina, for explaining John Hamaker's theory about the process by which the rising percentage of carbon dioxide in the atmosphere leads to extreme weather changes and eventually accelerates the coming of the next glacial period on our planet.

Carbon Dioxide is transparent to the visible light from the sun, but blocks infra-red radiation, so that the CO/2 molecules in the air reduce the amount of infra-red radiation that is re-radiated into outer space.

At this stage of analysis, no attempt is made to put numerical values on the connecting arrows. The function of this diagram is to attempt a completeness test to be as sure as possible that no major factors in this complex system have been omitted.

In the diagram above, the major factors are shown as heavy circles. Each factor has a word descriptor and a number for ease of locating and ingentifying. The amount of FORESTS (13) on our planet, and the parts per million of ATMOSPHERIC CO/2 (14) are shown near the center of the diagram. Arrows with plus(+) signs indicate the source factor for that arrow increases the factor being pointed to. Similarly a minus sign(-) indicates the source factor decreases the destination factor. The SOIL MICRO-ORGANISMS (12A) and TRACE SOIL MINERALS (18) are shown in the upper left part of the diagram. The amount of GLACIERS (29) is shown in the lower right of the diagram. The EROSION OF SOIL MINERALS (24) is shown in the lower left of the diagram.

The factors resulting from human activities are grouped on the top row of the diagram, with the exception of EROSION OF SOIL MINERALS (24) which is a combinston of natural caused of erosion plus human caused processes. This diagram includes both factors that can cause disaster to come to our civilization, and factors that can be used to prevent disaster.

Near the end of an inter-glacial period of about 10,000 years the EROSION OF SOIL MINERALS (24) has used up the topsoil so that there is little TRACE SOIL MINERALS (18) left for the soil micro-organisms (12A) to process for the effective replant of TREES & BIOMASS (12B). This reduces the increase of FORESTS (13). This also leads to the forests being more susceptible to ATTACK BY INSECTS (19) and forest FIRE (20). The ATTACK BY INSECTS (19) and forest FIRE (20) also increase directly the the ATMOSPHERIC CO/2.

The increase of ATMOSPHERIC CO/2 (14) holds more infra-red energy from being re-radiated back into outer space, so that ATMOSPHERIC HEATING (15) occurs. This leads to an increase in the evaporation of tropical water (16), producing more clouds, and changes in weather conditions which generate changes in wind directions which move more CLOUDS TO the POLES (23). These clouds arriving near the poles result in more SNOW IN POLAR REGIONS (30) which builds up the GLACIERS (30). The increased snow increases the ALBEDO (17) which increases the amount of ENERGY FROM SUN (11) that is reflected. This process gradually increases the GLACIERS (31) so that a large part of the earth is covered for 90,000 years. During the 90,000 years the glacial ice grinds up rocks and moves the gravel back and forth over the continents during the variations in the amount of glacial ice. When the glaciers recede to the poles a GLACIAL REMINERALIZATION (31) of the soil is completed. This remineralization supplies the soil with trace minerals to last approximately 10,000 years.

Part of the ATMOSPHERIC CO/2 (14) is absorbed by the oceans so there is a resevoir of OCEAN CO/2 (22). ORGANISMS IN OCEAN (27) interact with the carbon dioxide in the ocean. The nutrients in the ocean available to the organisms is modified by the change in the OCEAN SEA LEVEL (28) as the amount of GLACIERS (29) changes. Some of the sub cycles of ASTRONOMICAL CYCLES (34) line up with the lesser variations in the amount of ice in the polar ice caps.

There is a second source of energy in adition to the SUN (11) namely ENERGY FROM THE CENTER OF THE EARTH (32) which keeps the PRESSURE ON THE GUNK (25) under the tectonic plates. The weight of the GLACIERS (29) and the AIR above them generate PRESSURE on the TECTONIC PLATES (33). Some of heat and pressure on the gunk leads to HEATER CRACKS (26), which in turn lead to more active VOLCANOES (21). The volcanoes generate volcanic ash into the atomosphere and also CO/2.

The volcanoes may destroy parts of the forest and agricultural land as indicated by arrows to FORESTS (13) and ATMOSPHERIC CO/2 (14). The volcanic ash suspended in the air will reduce the ENERGY FROM the SUN (11) causing less melting of the SNOW IN the POLAR REGIONS (30).

The following human activities contribute to the increase of CO/2 in the atmosphere: Use of NPK FERTILIZER (2) disables the natural fertilization processes by killing off the SOIL MICRO-ORGANISMS (12A); CUTTING of LUMBER (4) which reduces the amount of FORESTS (13) and hence the reduction of processes that absorb CO/2 (14); and the BURNING of FOSSIL FUELS (6).

The BURNING of HIGH SULPHUR COAL (7) has a compound effect in that first it increases the ATMOSPHERIC CO/2 (14) and indirectly generates ACID RAIN (10) which in turn kills the FORESTS (13) which eliminates natural absorbers of ATOMOSPHERIC CO/2 (14). The SLASH AND BURN AGRICULTURE system (5) used in Central America also has a compound effect which both reduces the FORESTS (13) and directly increases the ATMOSPHERIC CO/2 (14).

Extensive use of SOLAR ENERGY CONVERSION (8) can reduce the BURNING of FOSSIL FUELS (8) to help reduce the rising CO/2 level in the atmosphere. Also the BURNING of BIOMASS (3) combined with REPLANTING TREES AND other BIOMASS (12B) can reduce the rate of increase of CO/2 in the atmosphere.

A major thing that humans can do to reduce the rate of increase of CO/2 in the atmosphere is SOIL RE-MINERALIZATION (1). John Hamaker has designed a rock grinder suitable for grinding rocks containing the major trace minerals needed by plants and trees. Fertilization of the soil with trace minerals combined with organic farming methods can greatly increase the rate of growth of trees and other plants used in BURNING of BIOMASS (3) to balance the CO/2 added by burning with the CO/2 absorbed by the growing replanted trees and other plants.