ISSS, Portland, 7/9/91

ENGINEERING PHILOSOPHY OF COMBINING TOP-DOWN AND BOTTOM-UP SYSTEMS ANALYSES OF CLIMATE CHANGE.

FRED B. WOOD, Sr. (or III)
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Abstract

The problem is what is happening to the climate, and what can we do about it to preserve the food supply for the five billion people who inhabit the Earth?

Philosophy. Using both a top-down and a bottom-up approach to the climate change problem, we predict that the elapsed time to solve the problems of climate change could be reduced by breaking the problems up into six section.

Science. From the Science perspective, we review the structure of cycles of ICE ERA's, ICE EPOCH's, ICE AGE CYCLES, INTERGLACIAL WARM PERIODS, and LITTLE ICE AGES. We identify numerically which ERA, EPOCH, CYCLE, and PERIOD we are in, and translate both the simple greenhouse warming thesis and the soil nutrition glacial cycle thesis into terms of where are we on the levels of glaciation time charts.

Decision & Strategy. This discussion leads to the need for people concerned over the environment and climate change to develop three types of consciousness: Individual, Social and Geophysical. These form a triple pentagon for coevolution with the biosphere.

Engineering. This section includes a comparison of present temperature data with trends predicted by the nutrition-glacial cycle thesis.

Production. This discussion accounts for the materials needed for reforestation and remineralization such as seedlings and rock dust, and the equipment needed such as tree planting machines and rock grinders plus alternative energy technologies.

Emergency Action. This discussion relates to calculations of the rate of reforestation needed to reduce the CO/2 level fast enough to prevent world-wide crop losses that would bring massive starvation to our planet.

Philosophy

Using both a top-down and a bottom-up approach to the climate change problem, we predict that the elapsed time to solve the problems of climate change could be reduced by breaking the problems up into six sections described above. From the Philosophy perspective, we review thirteen different hypotheses on climate change, not just the simple greenhouse warming thesis. These alternative hypotheses and the forty-five experiments against which they should be checked are listed in the 1987 ISGSR Conference Proceedings [19].

Science.

Glaciation History

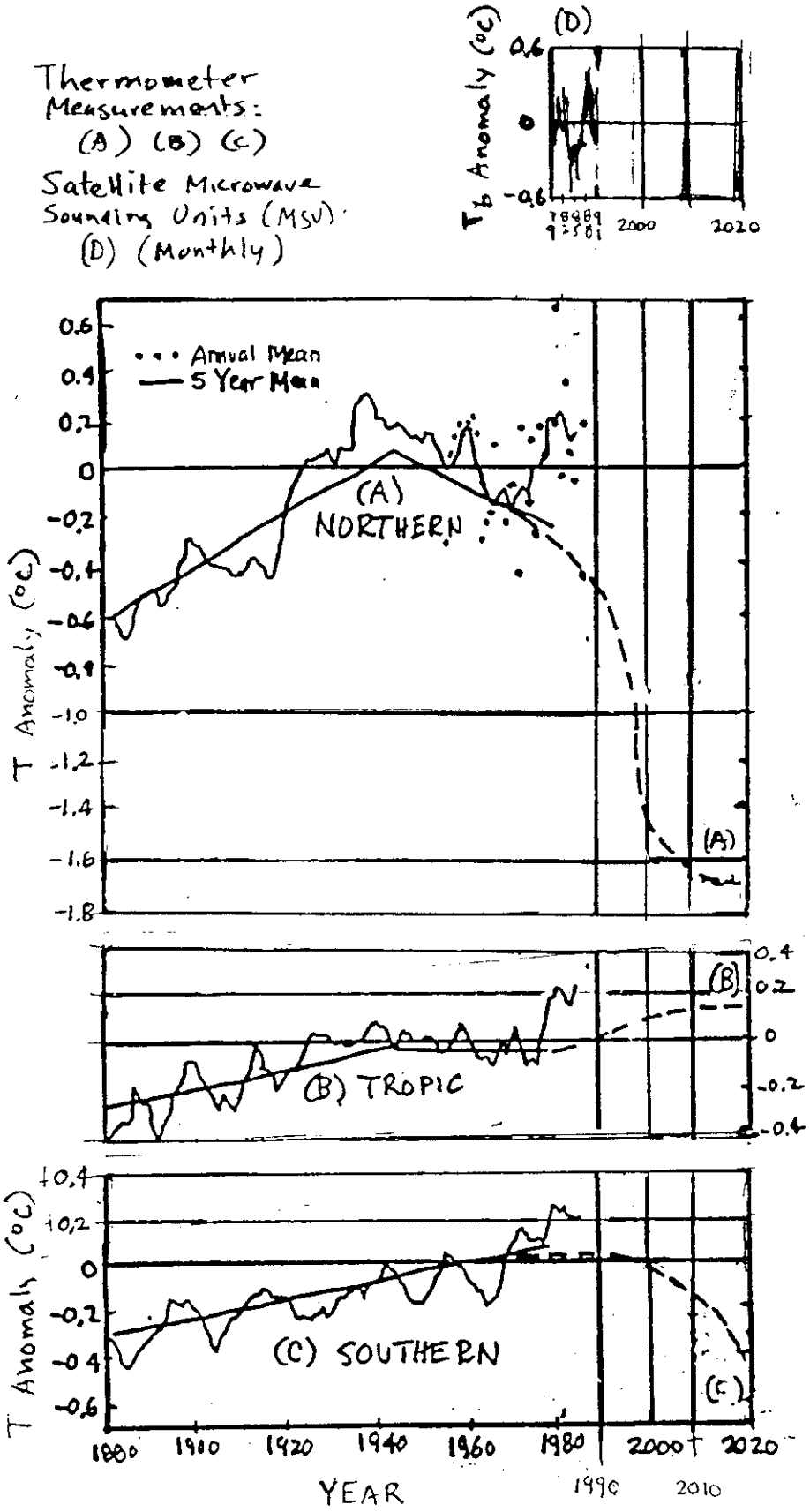

Fig. 3. Hansen's data [8] on Temperature Anomaly from 1880 to 1987: (A) for Northern Latitudes (90 N - 23.6 N), (B) for Tropic Latitudes (23.6 N to 23.6 S), (C) for Southern Latitudes (23.6 S to 90 S). Hamaker's projections [7] of these temperatures for 1970 to 2020 shown in dashed lines. Spenser and Christy's satellite microwave sounding unit data [13] for 1979 to 1989 added at top.

environment and climate change to develop three types of consciousness: Individual, Social and Geophysical. These form a triple pentagon for coevolution with the biosphere as shown in Fig. 2.

Individual Consciousness

For the individual to be effective, either doing research on climate change, or as a political activist taking emergency action, he or she must review a number of areas within the scope of his or her individual consciousness: Ethics; Sub-Conscious Script [10]; Nutrition & Exercise; Psychological Awakening; Resolution of Codependency.

Social Consciousness

For groups of people to develop a successful political action plan for the protection of the environment, for climate stabilization, or for a more narrow sphere of interest such as women's rights, they need to understand a group of social concepts such as: The Partnership Way [5,6] (Male & Female Cooperative decision Making); Business Decision Theory including the Regret Matrix [21]; Reconstructive Knowledge [22]; Cooperation between Nations through the UN and UNEP; and the Perception of Tools of Production.

It is particularly important for special groups such as those working for women's rights develop a Geophysical Consciousness to enable them to understand how climate change could disturb the social institutions that protect their rights.

Geophysical Consciousness

Alden Bryant has defined the "Environmental Pentagon" [3] as the five major components of climate change: Soil, Forests, CO/2, Oceans and Ice.

Engineering.

There has been discussion as to whether the Hamaker Thesis on Soil-Nutrition Driven Glacial Cycles should go in the science or engineering sections. It now appears that it should be treated in both sections. The Hamaker Thesis is a science hypothesis in which parts are still in the qualitative stage of development that makes it difficult to apply the usual quantitative tests in testing scientific hypotheses. However the Hamaker Thesis is valuable as an engineering guide in estimating possible future states of nature to use in business management type decision theory under uncertainty.

This section includes a comparison of present temperature data with trends predicted by the nutrition-glacial cycle thesis. In Fig. 3 the top right square (D) shows that we have ten years of satellite microwave sounding unit measurements of the Earth's surface temperature [8]. Since there is an irregular cyclic variation of varying period from ten to fifteen years it may take thirty years of data to obtain

reforestation and compared the results with the rate of which the CO/2 is rising [2,3].

Conclusions

Engineering, Production, and Emergency Action components of the program lead to the conclusion that even the opposing groups of environmentalists can agreed on a common plan of reforestation, stopping the logging of tropical and temperate rain forests, stopping the burning of fossil fuels, developing of alternative energy sources, remineralization of the soil, etc.

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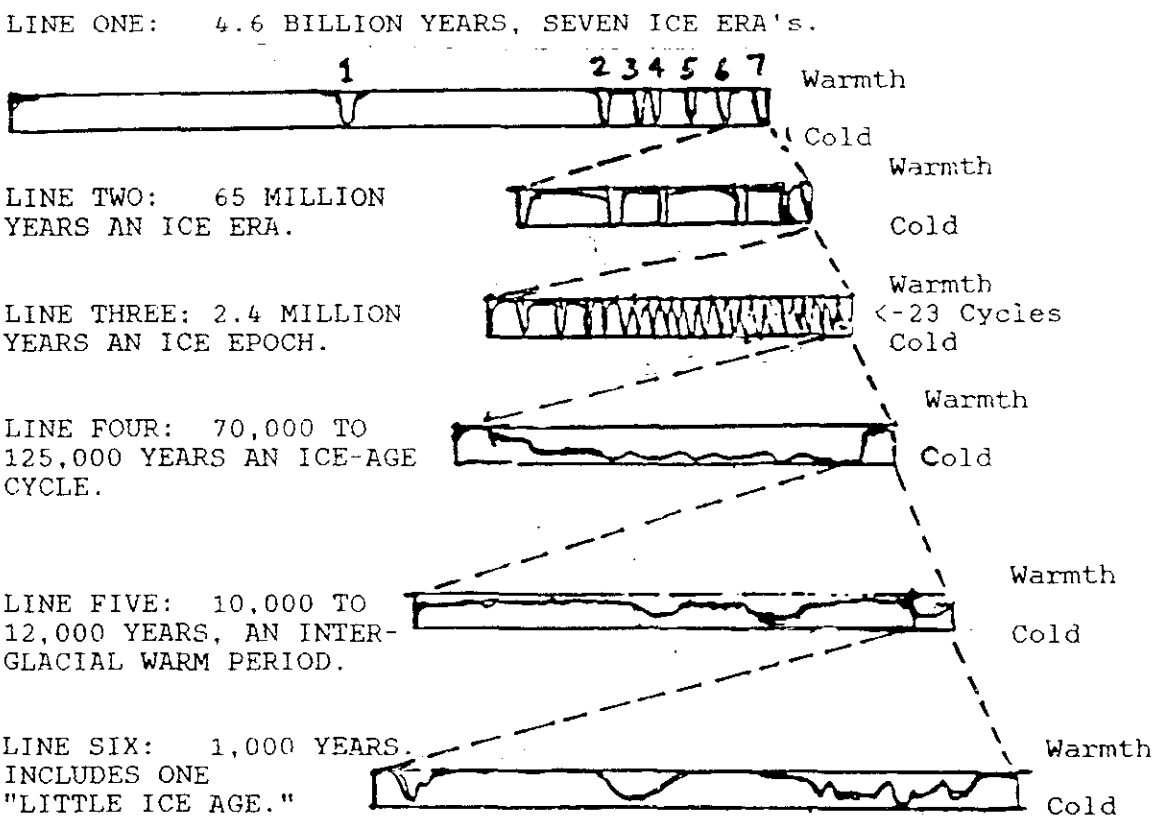

Fig. 1. A series of time charts, each one embracing a fraction of the one above, depicts the swings between cold and warmth that have characterized the climate of the earth for billions of years. Adapted from Chorlton and Editors of Time-Life Books [ ].

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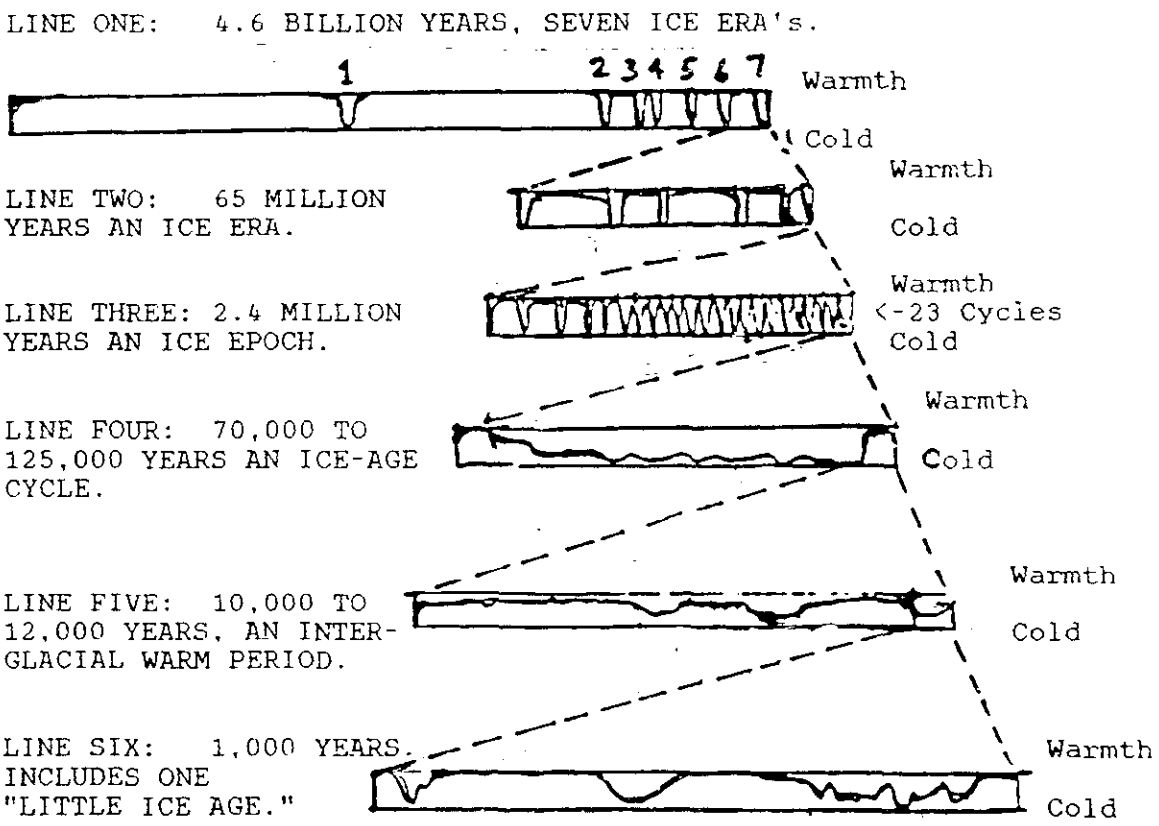

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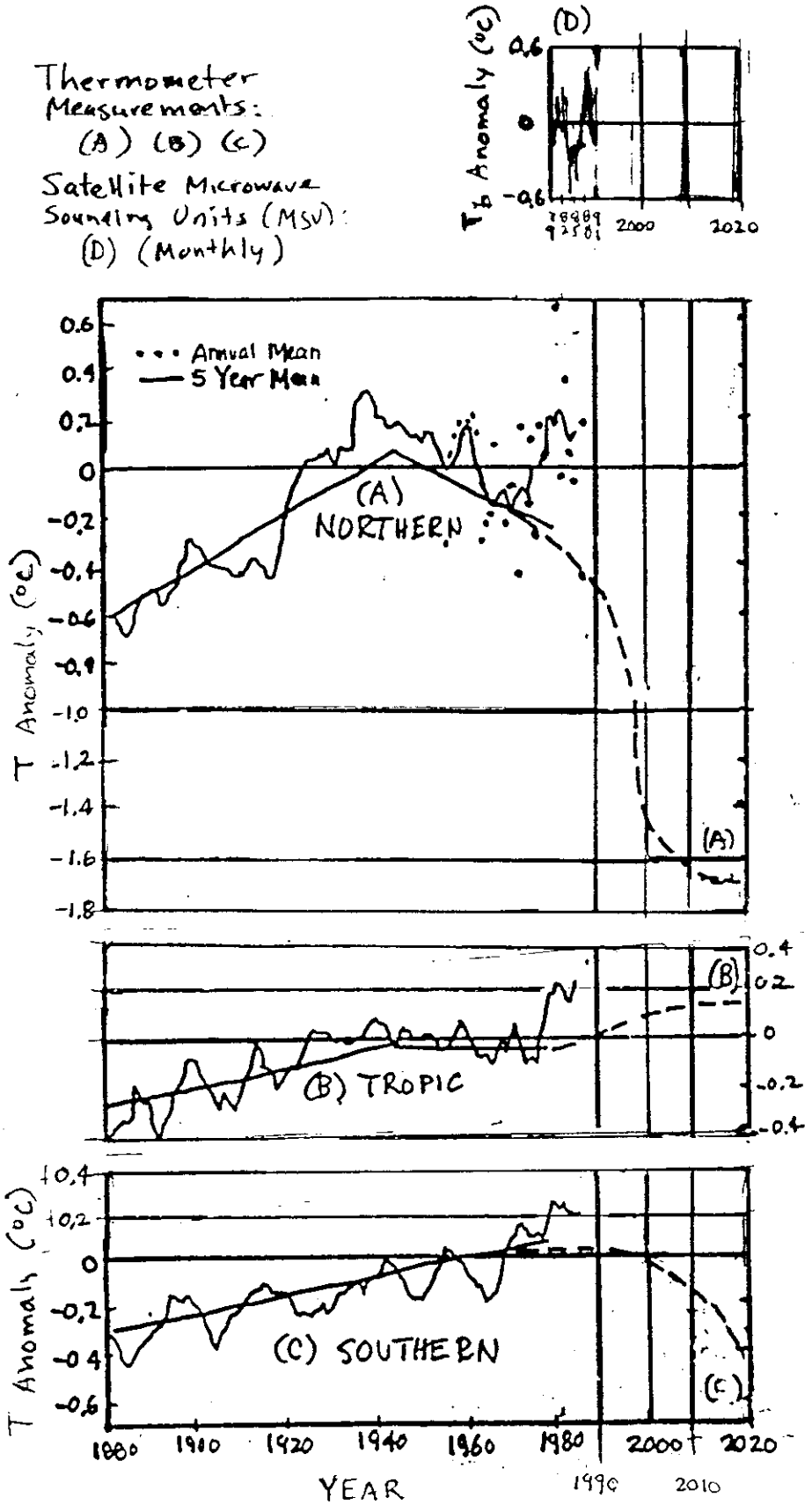

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