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Notes on POSTER Session A22B American Geophysical Union, San Francisco, California, Tuesday, December 6, 1988.
Session: Paleo Climate and Climate Impact.

Paper A22B-20 by F. B. Wood, Sr.

What Signal are We Looking for in Connection with the Carbon Dioxide "Greenhouse" Warming Effect?

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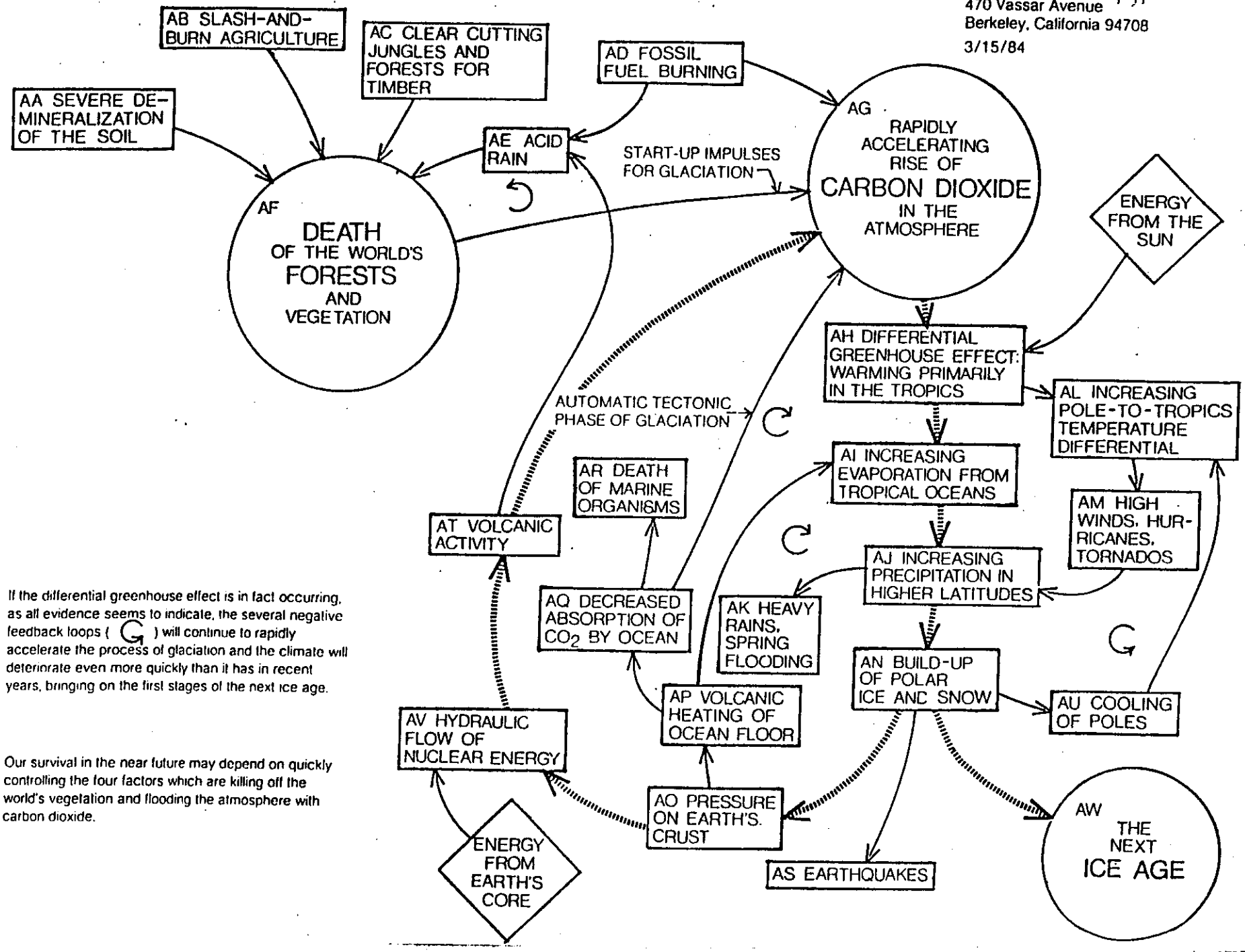
The 1985 Department of Energy "State-of-the-Art" reports on atmospheric carbon dioxide emphasize the search for the signal of the increasing temperature of the earth due to the "greenhouse" CO/2 warming. There are other theories such as the soil nutrition theory of ice age cycles that point to the depletion of soil nutrients and microorganisms as the trigger that reduces plant health, leading to insect invasions, forest fires, etc., that reduce the forest cover and increase the atmospheric carbon dioxide, leading to an ongoing process of biospheric deterioraton. Then more water is evaporated from the tropical oceans and carried into the northern polar region to form more snow and ice, eventually leading to the spread of glaciation.

A search for a way to include all the various branches of Earth Sciences needed to describe the climate system leads to the "Hammaker Thesis" as a first approximation. (J Hamaker & D Weaver, The Survival of Civilization 1982, 218 pp.) The Hamaker Thesis is an engineering synthesis that describes all the elements and their interconnection.

A block diagram of our present Earth System under present unstable conditons is shown below.

THE UNSTABLE PRESENT CONDITIONS

EARTH REGENERATION SOCIETY
470 Vassar Avenue
Berkeley, California 94708
3/15/84



If the differential greenhouse effect is in fact occurring, as all evidence seems to indicate, the several negative feedback loops (↻) will continue to rapidly accelerate the process of glaciation and the climate will deteriorate even more quickly than it has in recent years, bringing on the first stages of the next ice age.

Our survival in the near future may depend on quickly controlling the four factors which are killing off the world's vegetation and flooding the atmosphere with carbon dioxide.

Hamaker has made predictions as to what signals we should watch for as the atmospheric carbon dioxide increases on our planet. The figure below shows the zonal mean temperatures 1880 to 1980 for (a) Northern zone, (b) Tropic zone, and (c) Southern zone. The straight line trends are the ones added by S. Idso (1982) to the curves from Hansen et al (1981). The dashed lines are the predictions added by J. Hamaker (Solar Age or Ice Age? BULLETIN, P.O. Box 1961, Burlingame, CA 94010, No. 6/7, Aug 1984, pp. 7-16).

A typical glacial cycle based climate diagram is whown in the next diagram following the concepts of the Hamaker Thesis.

Section 2.1:

THE CLIMATE CYCLE, AN EXTRACT FROM THE HAMAKER THESIS ON SURVIVAL.

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SOLAR AGE or ICE AGE? BULLETIN
138 Valdeflores Dr.
Burlingame, CA 94010, 415/342-0329

ABSTRACT

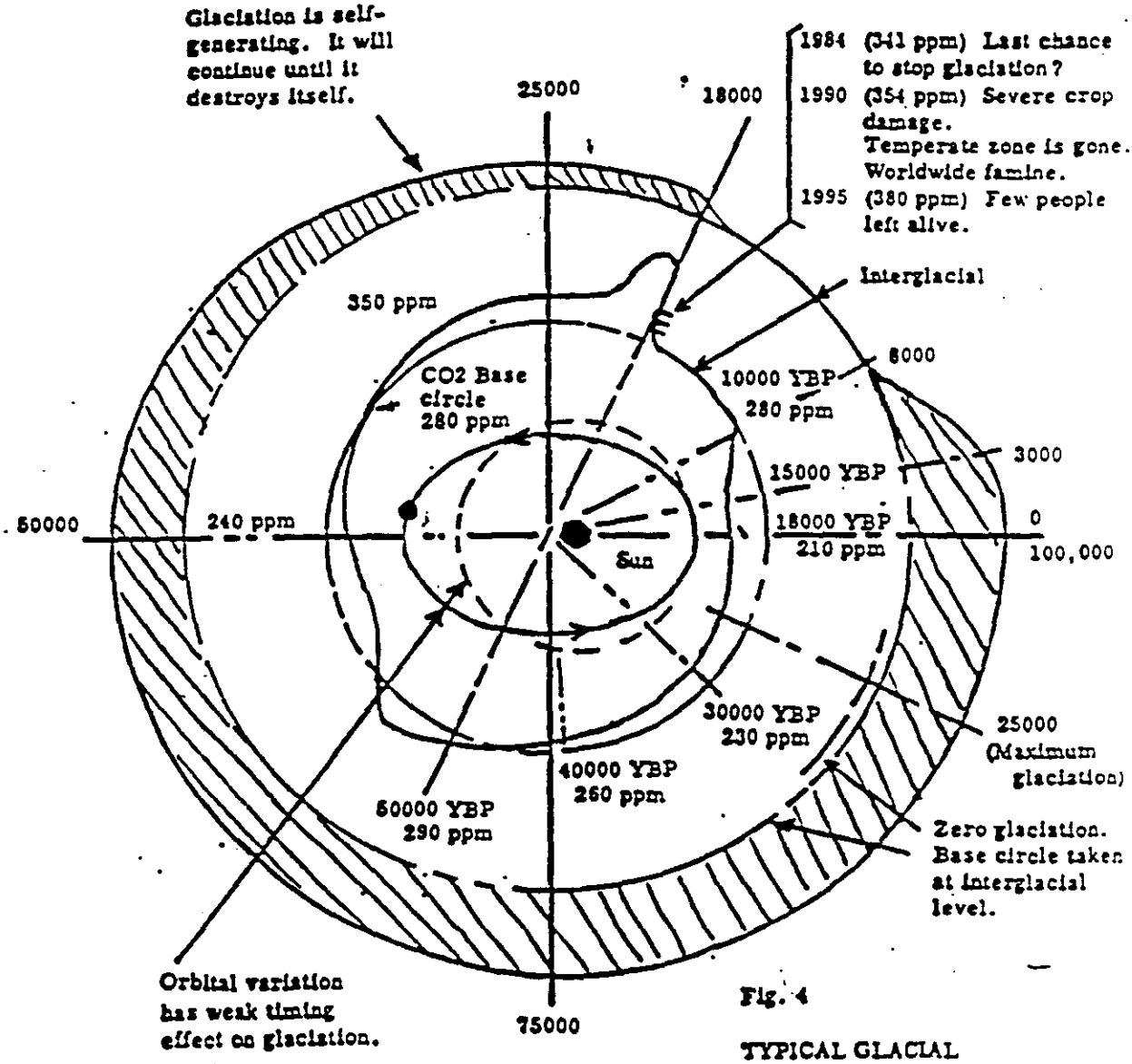
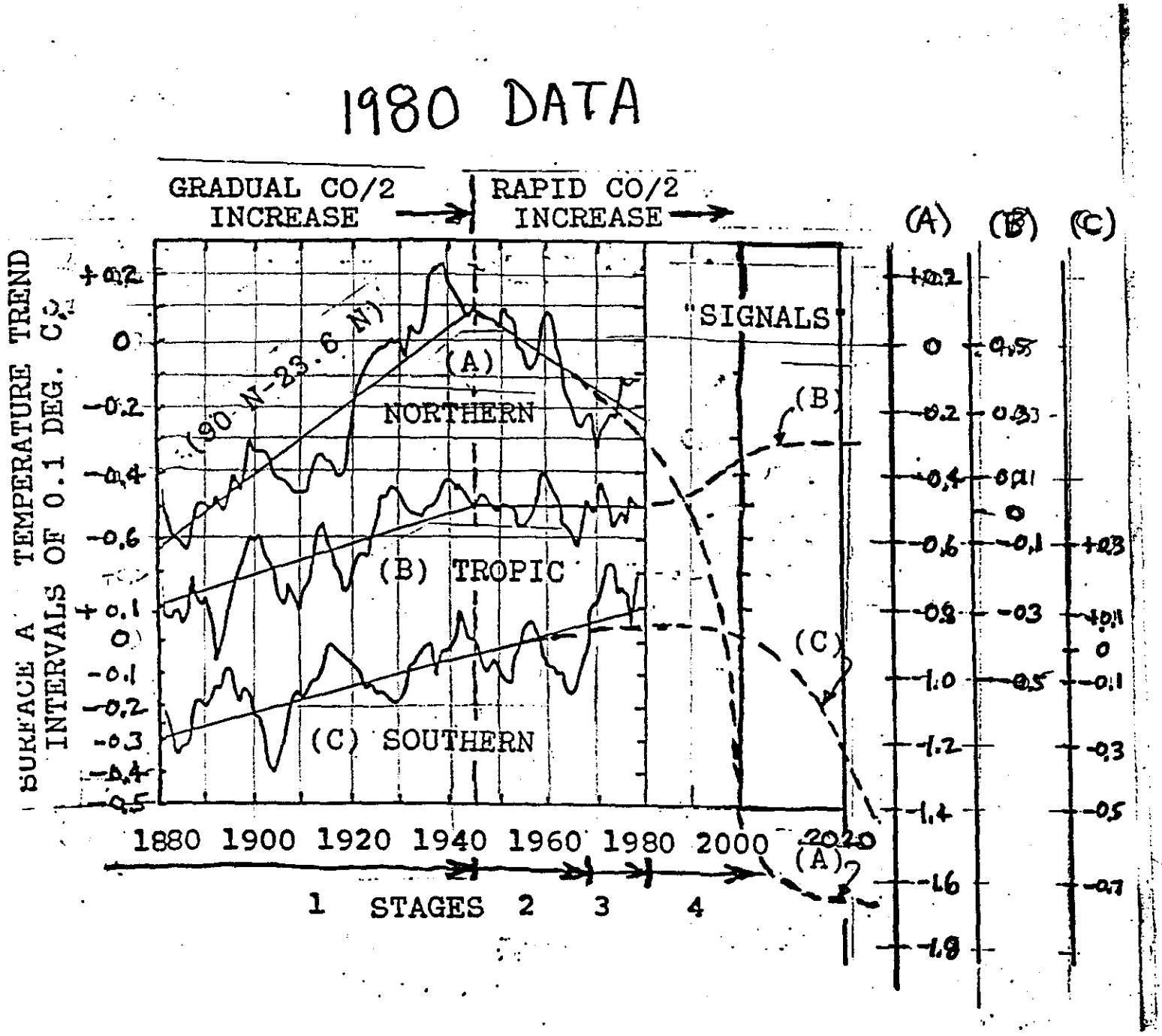


Fig. 4

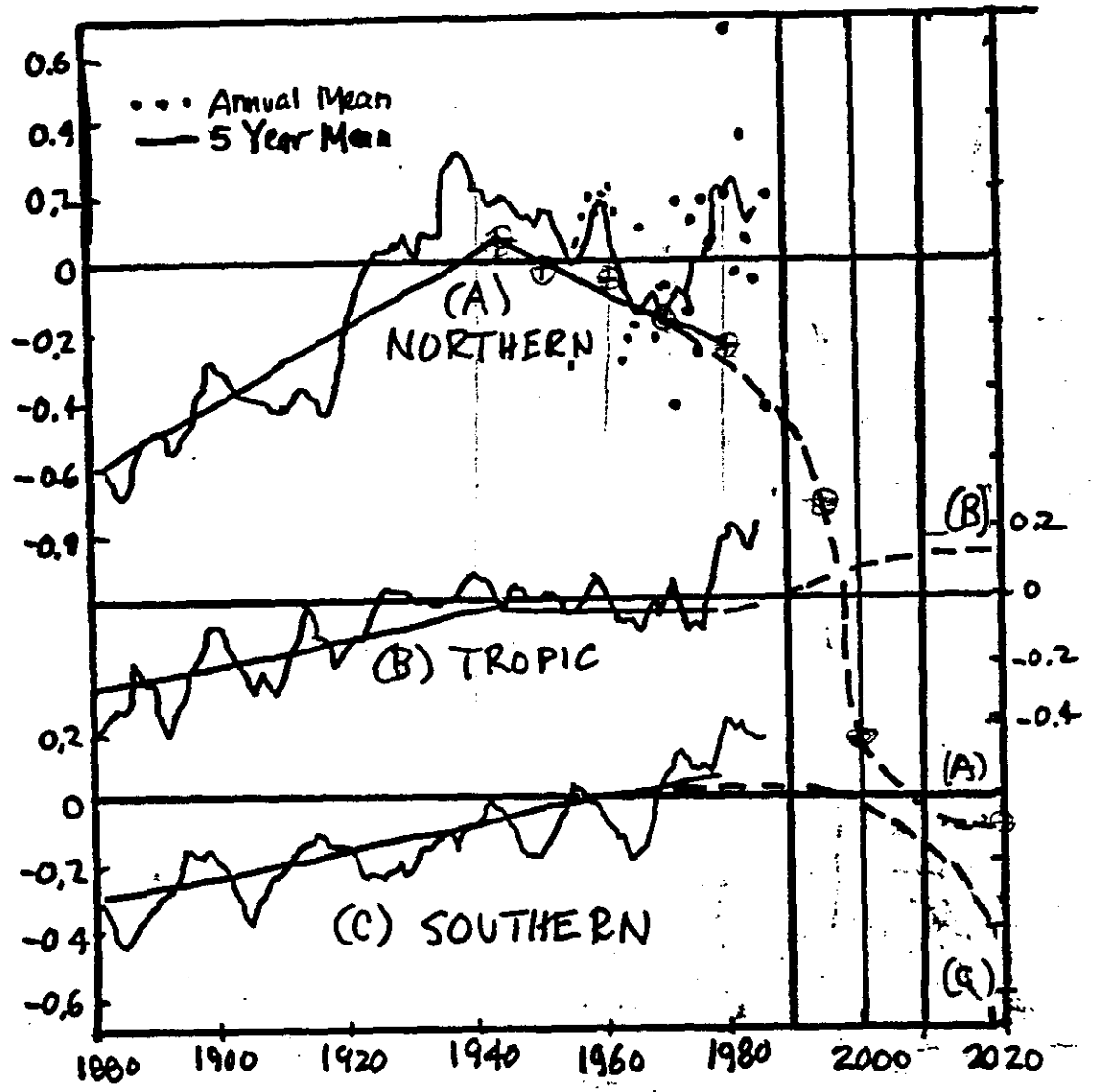
TYPICAL GLACIAL CLIMATE CYCLE

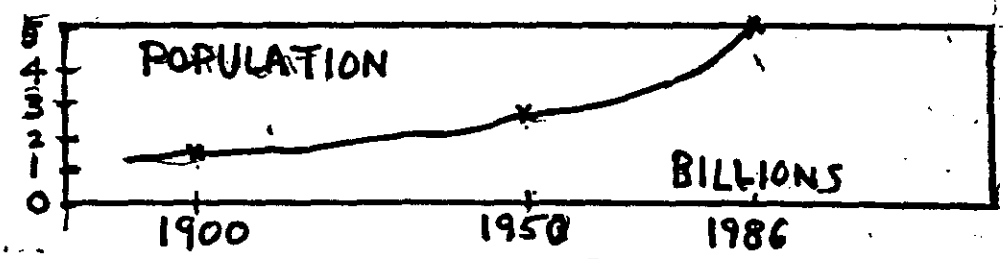
Hamaker's 1984 projection of the Arctic, Tropical, and Southern mean temperatures are shown as the dashed lines (A), (B), and (C).

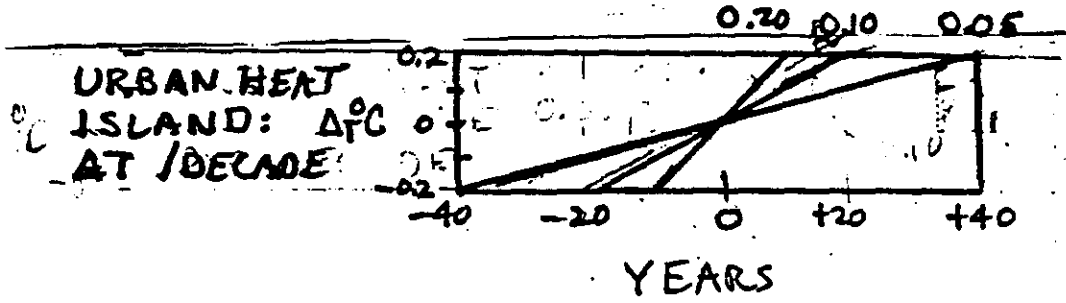


These projections have been reploted (different scale) on Hansen's 1987 temperature curves in the next diagram. The experimental five-year mean temperatures are showing a departure from the Hamaker projected curves. The effect of the urban heat island on the temperature curves has not been resolved. For an anlysis of the status of this urban heat island effect, see F. B. Wood, Jr., "Comment: On The Need for Validation of the Jones et al Temperature Trends with Respect to Urban Warming," Climatic Change 12

1987 DATA


0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
• • • Annual Mean
— 5 Year Mean
(A) NORTHERN
(B) TROPIC
(C) SOUTHERN
(A)
(B)
(C)
0.2
0
-0.2
-0.4
1880
1900
1920
1940
1960
1980
2000
2020


POPULATION
BILLIONS
5
4
3
2
1
0
1900
1950
1986


URBAN HEAT ISLAND: ΔT°C AT /DECADE
0.20
0.10
0.05
0.2
0
-0.2
-40
-20
0
+20
+40
YEARS

The world population trend is plotted below this curve. Further below that are sample curves within the range of urban warming observed for large cities in degrees centigrade per decade. It is possible that as the world population increases, that more of our temperature observing stations are becoming contaminated by the urban warming effect.

Since we can't draw solid conclusions from the present temperature curves, we must take on a more laborious job of tabulating the other 45 parameters that might give us clues as to whether the complete climate system is moving into glaciation. If research does not quickly prove that Earth is going into glaciation, we still have a massive malnutrition problem for the five billion people on our planet due to lack of nutritional trace minerals in the soil.

Figure 1a. Table of Hypotheses (Columns) vs. Experiments (Rows) on Climate Cycle.

Legend:

"A" = Hypothesis agrees with experiment
"D" = Hypothesis disagrees with experiment
"N" = Hypothesis not applicable to experiment
"?" = Insufficient experimental data
"." = Case not investigated yet

EXPERIMENTS	HYPOTHESES	A. CARBON DIOXIDE GREENHOUSE WARMING	B. SOIL NUTRITION GLACIAL CYCLE	C. ASTRONOMICAL SOLAR ENERGY INPUT VARIATION	D. ASTRON. SOLAR INPUT VAR. & CO/2 FORCING	E. 2500-YEAR LITTLE ICE AGE CYCLE
		A.	B.	C.	D.	E.
** MEAN GLOBAL LAND SURFACE AIR TERMPERATURE	1>	A	?	.	.	?
** MEAN REGIONAL LAND SURFACE AIR TEMP.	2>	?	?	.	.	?
** MEAN TROPOSPHERIC & STRATOPHERIC AIR TEMP.	3>	?	?	.	.	?
** RURAL AIR SURFACE TERMPERATURES	4>	D	A	.	.	A
** FOREST DETERIORATION	5>	N	A	.	.	A
** CARBON DIOXIDE & ICE HISTORY	6>	?	A	A	A	A
** EXPERIMENTAL REFRIGERATION CYCLE	7>	?	A	.	.	A
** EXPER. RESP. OF COLD TREES TO REMINERALIZATION	8>	N	A	.	.	A
** ATMOSPHERIC CARBON DIOXIDE	9>	A	A	.	.	?
**. CLOUD COVER	10>	?	A	.	.	A
** TORNADO ACTIVITY	11>	A	A	.	.	A
** PREVAILING WIND PATTERNS	12>	A	A	.	.	A
** TREE & FOREST COVER	13>	.	A	.	.	A
** AGRICULTURAL LAND USE	14>	.	A	.	.	A
** WILDLIFE MIGRATORY PATTERNS	15>	D	A	.	.	A
** ORGANISMS IN OCEAN	16>	.	?	.	.	?
** TOPSOIL AND SOIL MINERALS	17>	N	A	.	.	?
** SOIL MICRO-ORGANISMS	18>	N	A	.	.	?
** VARIANCE IN SOLAR OUTPUT	19>	.	.	.	.	.
** ORBITAL CHANGES & ASTRONOMICAL CYCLES	20>	.	A	.	.	A
** RADIACTIVE DECAY	21>	.	.	.	.	.
** NATURAL NUCLEAR FISSION REACTORS	22>	.	A	.	.	?
** MEAN GLOBAL SEA SURFACE TEMP.	23>	A	?	.	.	?
		A.	B.	C.	D.	E.

Figure 1b. Table of Hypotheses (Columns) vs. Experiments (Rows) on Climate Cycle.

Legend:

"A" = Hypothesis agrees with experiment
"D" = Hypothesis disagrees with experiment
"N" = Hypothesis not applicable to experiment
"?" = Insufficient experimental data
"." = Case not investigated yet

EXPERIMENTS	HYPOTHESES	A. CARBON DIOXIDE GREENHOUSE WARMING	B. SOIL NUTRITION GLACIAL CYCLE	C. ASTRONOMICAL SOLAR ENERGY INPUT VARIATION	D. ASTRON. SOLAR INPUT VAR. & CO/2 FORCING	E. 2500-YEAR LITTLE ICE AGE CYCLE
		A.	B.	C.	D.	E.
** MEAN GLOBAL SEA SUBSURFACE TEMPS.	24>	?	?	.	.	?
** RELATIVE SEA LEVEL	25>	?	?	.	.	?
** SEA WATER SALINITY AND DENSITY	26>	?	?	.	.	?
** SEA ICE	27>	?	?	.	.	?
** SNOW COVER	28>	?	A	.	.	A
** PERMAFROST	29>	D	A	.	.	A
** LAND ICE	30>	?	A	.	.	A
** MOUNTAIN GLACIERS	31>	.	A	.	.	A
** PRECIPITATION	32>	.	A	.	.	A
** LAKE LEVELS	33>	.	A	.	A	A
** PLATE TECTONIC ACTIVITY	34>	.	A	.	.	A
** EARTHQUAKE ACTIVITY	35>	.	A	.	.	A
** VOLCANIC ACTIVITY	36>	.	A	.	.	A
** MINI-MICRO SIMULATION SUB-SYST.	37>	.	.	.	.	.
** BLOCK SIMULATION OF MAIN CLIMATE LOOPS	38>	.	.	.	.	.
** DETAILED SIMULATION OF COMPLETE SYSTEM	39>	A	.	.	.	.
** CROP LOSSES	40>	.	A	.	.	A
** LOSS OF HUMAN LIFE	41>	.	.	.	.	.
** HUMAN MIGRATION PROBLEMS	42>	.	.	.	.	.
** PROPERTY LOSSES	43>	.	.	.	.	.
** STATE OF MINERALS IN SOIL	44>	.	A	.	.	?
** MINERAL CONTENT OF FOOD CROPS	45>	.	A	.	.	?
** CONSISTENT WITH GAIA HYPOTHESIS	46>	?	A	.	.	?
		A.	B.	C.	D.	E.

The hypotheses are defined in the references indicated. For economy of space only major books and U.S. Department of Energy "State-of-the-Art Reports" are given full bibliographic reference data.

HYPOTHESES

A. CARBON DIOXIDE GREENHOUSE WARMING (REVELLE, BUDYKO) Ref. 8, pp. 307-308
B. SOIL NUTRITION GLACIAL CYCLE (HAMAKER) Hamaker Thesis in Refs. 6 & 12.
C. ASTRONOMICAL SOLAR ENERGY INPUT VARIATION (MILANKOVITCH, IMBRIE) Ref. 8, p. 265.
D. ASTRON. SOLAR INPUT VAR. & CO/2 FORCING (SHACKleTON, PISIAS) Ref 8, p.254, spectral analysis of O-18 isotope ratio.
E. 2500-YEAR LITTLE ICE AGE CYCLE (SHULTZ) SGSR 1986 Proc.

Additional hypotheses are listed in a paper presented at the International Society for General Systems Research, Meeting, June 1-5, 1987, Budapest, Hungary: Fred Bernard Wood, "Philosophy of Testing Hypotheses and Matrix of Climate Theories vs. Evidence."

EXPERIMENTAL DATA

(1) MEAN GLOBAL LAND SURFACE AIR temperature.- Ref. 8, p. 275; Ref. 13, p. 257.
(2) MEAN REGIONAL LAND SURFACE AIR TEMP..- Ref. 8, p. 275.
(3) MEAN TROPOSPHERIC & STRATOspheric AIR TEMP..- Wigley in Ref. 11, pp. 54-90.
(4) RURAL AIR SURFACE TEmperatures.- Watt, Kenneth E.F. "The effect of local influences on the perception of climatic trends," unpublished report, U.C. Davis, July 27, 1985.
(5) FOREST DETERIORATION.- Ref. 13, pp. 101-102, 124; Misc. refs. in SAIA?Bulletin (supplements to Ref. 6)
(6) CARBON DIOXIDE & ICE HISTORY.- Schakleton in Ref. 9, p. 32.
(7) EXPERIMENTAL HEATING REFRIGERATION CYCLE.- Simpson in Ref. 8, p. 240 and Supplements to Ref. 6.
(8) EXPERIMENTAL RESPONSE OF COLD TREES TO REMINERALIZATION.- REMINERALIZATION NEWSLETTER , 152 South St., Northampton, MA 01060; SOLAR AGE or ICE AGE? BULLETIN , 138 Valdeflores Dr., Burlingame, CA 94010.
(9) ATMOSPHERIC CARBON DIOXIDE.- Ref 9, p. 32.
(10) CLOUD COVER.- Ref. 8, p. 216 for principles; insufficient data.
(11) TORNADO ACTIVITY.- Data complete up to 1979.
(12) PREVAILING WIND PATTERNS.- Ref. 4, pp. 81-139.
(13) TREE & FOREST COVER.- Ref. 9, pp. 123-125.
(14) AGRICULTURAL LAND USE.- Ref. 9, p. 128.

(15) WILDLIFE MIGRATORY PATTERNS.- Schultz in SGSR 1986 Proc.
(16) ORGANISMS IN OCEAN.- Ref. 9, p. 95-97.
(17) TOPSOIL AND SOIL MINERALS.- Ref. 6.
(18) SOIL MICRO-ORGANISMS.- Ref. 6.
(19) VARIANCE IN SOLAR OUTPUT.- Ref. 2, pp. 440-464.
(20) ORBITAL CHANGES & ASTRONOMICAL CYCLES.- Ref. 8, pp. 265-269.
(21) RADIOACTIVE DECAY.- "The energy budget of the earth" in Cambridge Encyl. of Earth Sciences (1982)
(22) NATURAL NUCLEAR FISSION REACTORS.- Strange Planet, Vol. E-2, Section ECN-008, Glen Arm, MD (1978).
(23) MEAN GLOBAL SEA SURFACE TEMP..- Ref. 11, pp. 96-101.
(24) MEAN GLOBAL SEA SUBSURFACE TEMPS..- Ref. 11, pp. 100-101.
(25) RELATIVE SEA LEVEL.- Ref. 11, pp. 104.
(26) SEA WATER SALINITY & DENsiTY.- Ref. 11, pp. 101-104.
(27) SEA ICE.- Ref. 10, pp. 152; Ref. 8, p. 178.
(28) SNOW COVER.- Ref, 8, pp. 181-182.
(29) PERMAFROST.- Letter from Victor Kovda, Acad.Sci.USSR
(30) LAND ICE.- Ref. 11, p. 134.
(31) MOUNTAIN GLACIERS.- DOE/EV/60235-1, Sept. 1985, pp. 216-231.
(32) PRECIPITATION.- Ref. 11, pp. 149-162.
(33) LAKE LEVELS.- See index in Ref. 3.
(34) PLATE TECTONIC ACTIVITY.- Cambridge Ency. Earth Sciences,pp. 177-188; and Ref. 4-6.
(35) EARTHQUAKE ACTIVITY.- Data search incomplete.
(36) VOLCANIC ACTIVITY.- Simkin et al, Volcanoes of the World (1981).
(37) MINI-MICRO SIMULATION SUB-SYSTEMS.- Howard T. Odum, Systems Ecology (1983).
(38) BLOCK SIMULATIONS OF MAIN CLIMATE LOOPS.- For Energy Balance and Radiative Convective Models, see Ref. 10, pp. 84-89.
(39) DETAILED STRUCTURE SIMULATION OF COMPLETE SYSTEM.- For General Circulation Models, see Ref. 10, pp. 89-147.
(40) CROP LOSSES.- Ref. 13,p. 394; SAIA?BULLETIN, news clips on crop losses.
(41) LOSS OF HUMAN LIFE.- Analysis incomplete.
(42) HUMAN MIGRATION PROBLEMS.-Analysis incomplete.
(43) PROPERTY LOSSES.- Analysis incomplete
(44) STATE OF MINERALS IN SOIL.- Sample soil test results in Earth Regeneration Society file.
(45) MINERAL CONTENT OF FOOD.- Reference tables need updating.

THEORETICAL BASE

(46) CONSISTENT WITH GAIA HYPOTHESIS.- Lovelock, GAIA - A new look at life on Earth (1979).

CONCLUSIONS

Five theories of climate change (columns) are tabulated against forty-six rows of experiments and data. The most significant three of the competing theories have been checked against as many of the forty-six sets of experimental data as was possible. Two columns have no disagreements (D), namely the SOIL NUTRITION GLACIATION CYCLE THESIS (Hamaker Thesis) and the 2500-YEAR LITTLE ICE AGE THEORY. The first of these has 29 agreements (A's) and the second has 22 A's. The SIMPLE GREENHOUSE WARMING THEORY has 7 A's and 3 D's. The SOIL NUTRITION GLACIAL CYCLE THESIS includes the Carbon Dioxide GREENHOUSE WARMING THeORY as a subsystem of the refrigeration cycle.

Both the SOIL NUTRITION GLACIATION CYCLE THESIS and the SIMPLE GREENHOUSE WARMing THEORY have in common the following action implications:

We must reduce the release of CO/2 into the atmosphere by reducing the burning of fossil fuels, reforesting the earth, and stopping the deforestation of tropical rainforests.

In addition the SOIL NUTRITION GLACIATION CYCLE THESIS points to the need for replenishing the natural distribution of minerals and trace minerals in the soil and protection of the natural microorganisms in the soil needed for transferring the minerals from the soil to tree roots.

Now we have a serious policy problem, in that if we wait until the temperature curves are verified, it could then be too late to change the glacial cycle by simple means of reforestation, remineralization of the soil, and stopping of the burning of fossil fuels. Policy-wise we must make decisions now to change the glacial cycle, so that we will not regret failing to take action to save our civilization when we had a chance.

REFERENCES

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3. Lamb,H.H. (1977) Climate: Present, Past and Future - V. 2 . London: Methuen.
4. Lockwood, John G. (1979) Causes of Climate . New York: Halsted Press Book, John Wiley & Sons.
5. Clark, William C., Editor (1982) Carbon Dioxide Review: 1982 . Oxford: Oxford University Press.
6. Hamaker, John and Weaver, Don (1982) The Survival of Civilization , Box 1961, Burlingame, CA: Hamaker-Weaver Publishers.
7. Jager, Jill. (1983) Climate and Energy Systems . Chichester, England: John Wiley & Sons.
8. Schneider, Stephen H. and Londer, Randi. (1984) The Coevolution of Climate and Life . San Francisco: Sierra Club Books.
9. Trabalka, John R., Editor. (1985) Atmospheric Carbon Dioxide and the Global Carbon Cycle . Washington, D.C.: U.S. Department of Energy, Report DOE/ER-0239.
10. MacCracken, Michael C. and Luther, Frederick M., Editors. (1985) Projecting the Climatic Effects of Increasing Carbon Dioxide . Washington, D.C.: U.S. Department of Energy, Report DOE/ER-0237.
11. MacCracken, Michael C. and Luther, Frederick M., Editors. (1985) Detecting the Climatic Effects of Increasing Carbon Dioxide . Washington, D.C.: U.S. Department of Energy, Report DOE/ER-0235.
12. Hamaker, John and Weaver, Don. (1986) The Climate Cycle, An Extract From The Hamaker Thesis On Survival . In: Proceedings of the International Conference on Mental Images, Values, & Reality. (John A. Dillon, Jr., ed.) Society for General Systems Research, Louisville, KY, Volume II, pp. L-31 to L-44.
13. Clark, W.C. and Munn, R.E., Editors. (1986) Sustainable Development of the Biosphere . Cambridge: Cambridge University Press for IIASA, Laxenburg, Austria.

EXAMPLE of URBAN HEAT ISLAND HERE IN SAN FRANCISCO.

TEMPERATURE (°F)

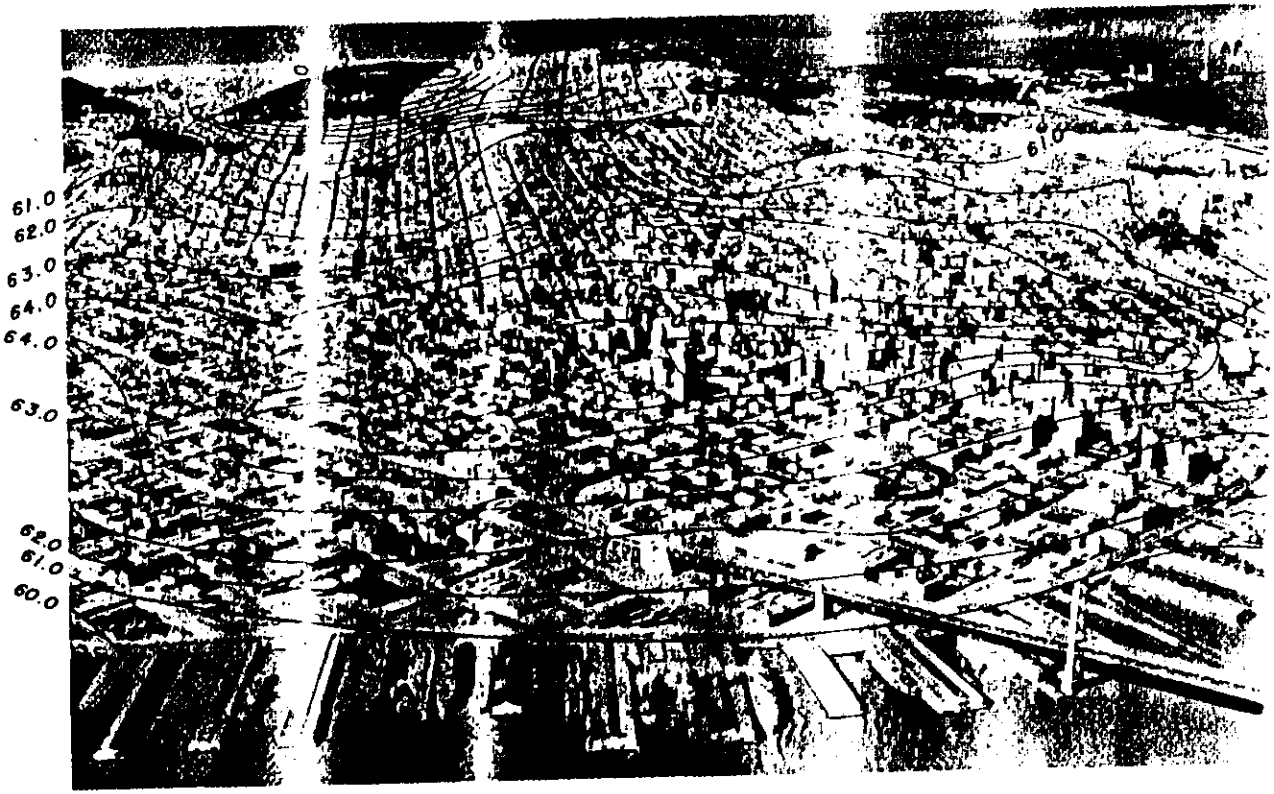

FIG. 7 Isotherm pattern (°F) at 2-meter level in San Francisco, 2320 PST, Apr. 4, 1952 [272].

From R.E. Munn (1966) from Duckworth and Sandberg (1954)