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REVIVING THE 1941 MIT RADIATION LABORATORY 'ZEITGEIST' TO ATTACK STARVATION AND CLIMATE CHANGE

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Abstract. In response to "Manifesto for the Systems Sciences: Outrage over the State of Science," by Mitroff and Churchman, [2] I propose a revival of the 'zeitgeist' of the MIT Radiation Laboratory of the period 1940-1945. I propose a method of looking at the problems of starvation and climate change that considers philosophy, mythology, science, decision making, engineering, production, and emergency action as a connected chain of related projects. I propose using the existing SIG's of ISSS and groups from other organizations such as Greenpeace, Sierra Club, Audubon Society to work together as learning organizations.

I also propose using the concepts in Prof. Senge's book, The Fifth Discipline, [3] with Carlos Aliaga's concept of involution and evolution of society, [1] and with Prof. Kenneth Watt's book, Taming the Future. [4]
Keywords Zeitgeist Radar scientists learning evolution climate starvation

MIT Radiation Laboratory

Starting in November 1940 scientists started coming from all over the USA to the MIT Radiation Laboratory, Cambridge, Massachusetts, to develop microwave RADAR to help defeat the Nazi German forces in Europe. I had badge 86 out of the 4000 employees there. The scientists changed from normal science to a goal oriented engineering science to speedily develop microwave RADAR to enable Allied Forces to locate and destroy submarines, ships, fighter planes, bombers, V-1 rocket bombs, and industrial plants. The V-2 missiles were too fast for our RADAR to shoot down, so we used the RADAR to track the V-2's to locate their launching pads for bombing. We organized cooperation between scientists, engineers, factory production managers, and the military to shorten the time from conception to production from five years to one year for many types of RADAR. This cooperation was possible on account of a kind of spirit or 'zeitgeist' that developed that facilitated our organization to learn quickly to get tasks done. We now have a developing starvation problem on our planet that needs an approach similar to that of the MIT Radiation Laboratory RADAR development. I am proposing a similar form of organization of work on starvation and climate change to get moving in the present situation.

Types of Consciousness Required

I propose that three types of consciousness are required to do the job of making a serious effort to solve the problems of world starvation. The three are INDIVIDUAL CONSCIOUSNESS, SOCIAL CONSCIOUSNESS, and GEOPHYSICAL CONSCIOUSNESS. For the last 10,000 years humankind could neglect geophysical consciousness, because we were in an interglacial warm period. We are near the transition to a glacial period of 70,000 to 120,000 years duration. A proposed slogan for this work is "Human Coevolution with the Biosphere." The major components are listed in Table I.

Table I
Human Coevolution with the Biosphere

INDIVIDUAL CONSCIOUSNESS
- Nutrition and Exercise
- Understanding One's Sub-Conscious Script
- Ethics
- Developing Cooperation and Understanding of Other Fields
- Psychological Awakening

GEOPHYSICAL CONSCIOUSNESS
- Soil Nutrients Via Tectonic System and Glaciation
- Forests
- Oceans
- Ice
- Atomsphere and Carbon Dioxide

SOCIAL CONSCIOUSNESS
- Perception of the Tools of Production
- Business Decision Theory
- Reconstructive Knowledge
- Partnership Way of Male and Female Decision Making
- Cooperation between Nations

Types of Research, Development and Action Required

The types of activities from philosophy to emergencey action are shown in the boxes in the top row of Fig. 1. Here we do not wait for science to come up with answers to the problem of starvation. We try to set up a systems analysis of the starvation problem, putting together components from all seven areas of work. We will have to work with probabilities of different processes going toward different goals.

Rows 2, 3, 4, and 5 have boxes for the different ISSS SIGs and other organizations involved. Row 6 shows a COORDINATING COUNCIL which doesn't exist yet. To keep these volunteer groups working every omonth of the year we need an electronic mail and electronic bulletin board system. The Information and Communications SIG can help select the system that would provide a balance between economy and satisfactory communications. There is an "en.climate" bulletin board (conference) on EcoNet of the Institute of Global Communication, San Francisco. Alternatively we might want to have our own "starvation and climate" electronic conference.

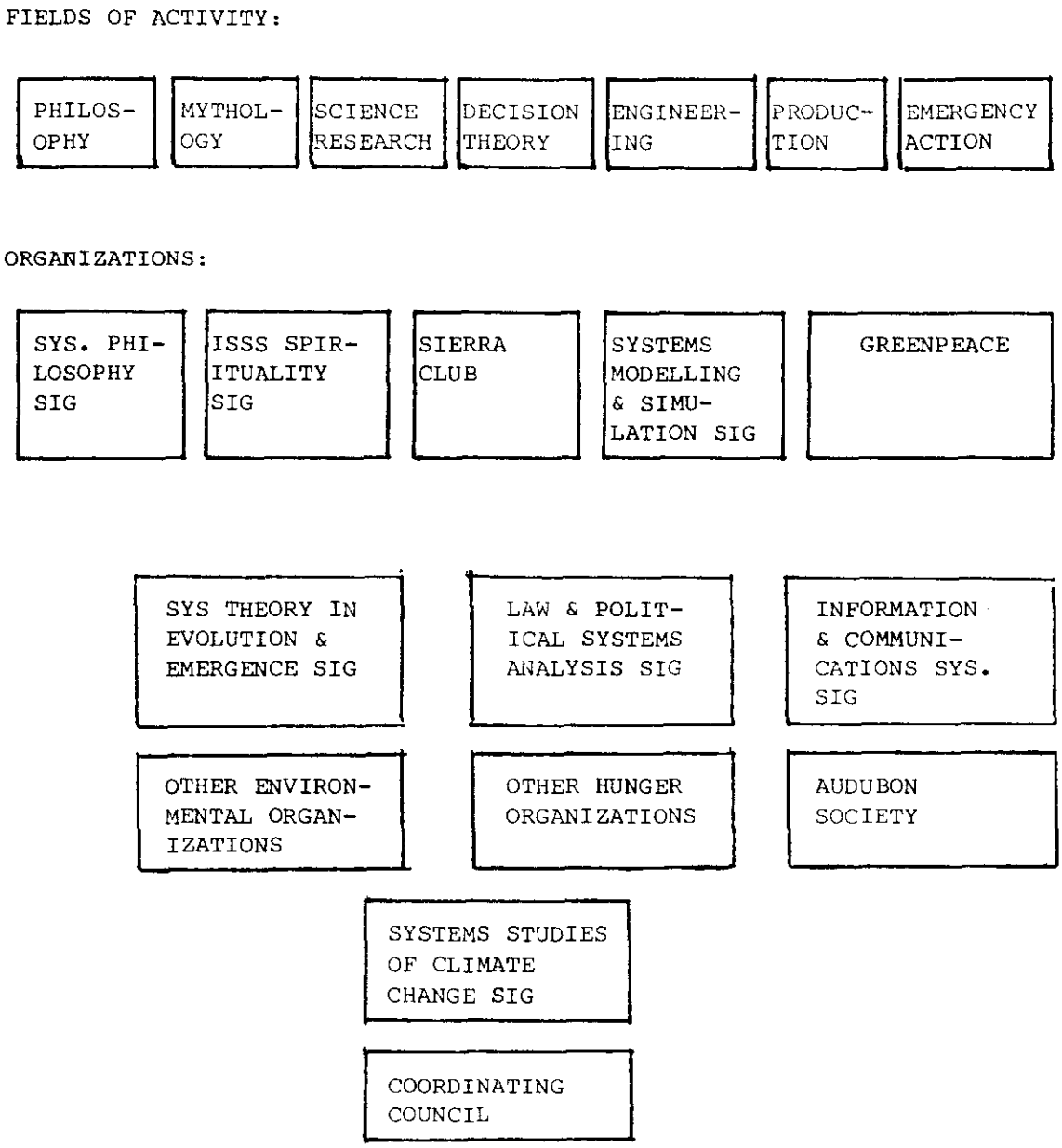


Fig. 1. Types of Work involved in dealing with Starvation and Climate Change (Top Row). ISSS SIGs and other organizations working on the problems (Rows 2,3, 4, 5) Coordinating Council (to be organized, Row 6).

REVIVING MIT ZEITGEIST

As a starter I suggest that the coordinating council be elected by the SIGs plus the President of ISSS and the Managing Director be ex-officio members of the COORDINATING COUNCIL. Also the other organizations such as Greenpeace, Sierra Club, etc., should elect one member each to the council.

Learning Organization Development

I propose that the key people in all the SIGs and other groups involved in the Starvation and Climate Project buy a copy of Dr. Senge's book, The Fifth Discipline. Then we could go through the relevant material on some schedule like a class to insure that we all know the best techniques for evolving into a learning organization.

A summary outline of the key principles in The Fifth Discipline is shown in Tables IIA and IIB. For each one of the five disciplines there is an outline grouped by essences, principles, and practices.

In Table IIB, Team Learning, there is an important concept, Dia-Logos, in which issues are discussed as long as is necessary get unanimous decision on what to do, instead of adopting a plan by majority vote. This is a procedure well developed by many North American Indian tribes.

Relationship to Evoluting or Involuting Civilization

To build a shared vision of the complex system of a civilization with severe problems of worldwide starvation and climate change, I propose using the graphical system proposed by Carlos Aliaga Uria at the Edinburgh ISSS Meeting in 1989. His sample curves of involution and evolution are illustrated by Fig. 2.

Relationship to Energy Sources and Prices

Since the cumulative fossil fuel usage of a country determines key parameters in the mathematical representation of some of the economic variables, it is important to have a model of such segments of the economic system. Prof. Kenneth Watt has developed new formulas and computer simulation programs for a number of economic indicators. [4] A sample curve for the projection of the price of crude oil is shown in Fig. 3. This important, since we may find that some countries are having to sell grain that used to feed their citizens to other countries to get the cash to pay for imported oil.

Prof. Watt's simulation of future world oil prices in terms of present dollars gives the price dropping to $4.36 in current dollars in 1993, increasing to $7423.00 a barrel by 2007, and dropping to $2.92 by 2013, and rising steeply again in 2024. What will happen to the people during these oil price fluctuations?

If the glacial cycle doesn't starve people to death, the price of oil will push many governments to sell all their wheat, rice, corn, and

barley to pay for oil, leaving most of their people to starve to death.

Group Communications

I propose that this project could be started by the use of two local electronic bulletin boards run by the Information & Communications Systems SIG and the Climate Change SIG. Summaries of what is on these indvidual bulletin boards could be regularly placed on the EcoNet conference "en.climate," which would be available over the whole USA and some foreign locations through SprintNet. Connections with foreign locations could be handled through the Institute for Global Communications, San Francisco. Retired systems specialists could spend down their retirement savings on computers and computer-communications systems costs, and then go on welfare after a few years. A more friendly way for participation of retired systems people would be to overlap the ISSS communications with the SeniorNet computer-communications system, whereby the retired systems-communications project member could be a SeniorNet center director and overlap Starvation-Climate Change work with teaching senior citizens to use computer-communications systems.

Conclusions

We can piece together a prototype of an approach to dealing with starvation and climated change problems by organizing a group of retired engineers and scientists to recapture the "zeitgeist" of the MIT Radiation Laboratory. The concepts in Dr. Senge's book, The Fifth Discipline, could help the organizers to develop a learning organization. The group can use Kenneth Watt's forcasting techniques to establish a perspective of what may happen in the future based on market history. Work from the geophysics area can help us understand the impact of the history of the planet's glacial cycles. Carlos Aliaga's concepts of a spiral path of sociological processes can help us focus on creating an evolving society.

[1] Carlos Aliaga Uria, 1989, "Spiral Involution and Reproductive Regeneration Models of the Biosphere in a Concptual and Illustrative Mode for the Bolivian Case," 33rd Annual Meeting of the International Society for the Systems Sciences, Edinburgh, Scotland, July 2-7, 1989,Vol. IV, pp. 276-282.

[2] Ian I. Mitroff and C. West Churchman, 1992, "A Manifesto for the Systems Sciences: Outrage Over the State of Science." General Systems Bulletin Vo. XXII, No. 1, Autumn, 1992, 7-10.

[3] Peter M. Senge, 1990, The Fifth Discipline. New York: Doubleday/Currency.

[4] Kenneth Watt, 1992, Taming the Future - A Revolutionary Breakthrough in Scientific Forecasting. Davis, Calfornia: The Contextured Web Press, pp. 101-107.

Table II-A
Outline of Features of Fifth Discipline *
Systems Thinking, Pesonal Mastery, & Mental Models

SYSTEMS THINKING
- Essences
  - HOLISM
  - INTER-CONNECTEDNESS
- Principles
  - STRUCTURE INFLUENCES BEHAVIOR
  - POLICY RESISTANCE
  - LEVERAGE
- Practices
  - SYSTEM ARCHETYPES
  - SIMULATION

PERSONAL MASTERY
- Essences
  - BEING
  - GENERATIVENESS
  - CONNECTEDNESS
- Principles
  - VISION
  - CREATIVE TENSION VS. EMOTIONAL TENSION
  - SUBCONSCIOUS
- Practices
  - CLARIFYING PERSONAL VISION
  - "HOLDING" CREATIVE TENSION
    - ..FOCUSING ON THE RESULT
    - ..SEEING CURRENT REALITY
  - MAKING CHOICES

MENTAL MODELS
- Essences
  - LOVE OF TRUTH
  - OPENNESS
- Principles
  - ESPOUSED THEORY VS. THEORY-IN-USE
  - LADDER OF INFLUENCE
  - BALANCE INQUIRY AND ADVOCACY
- Practices
  - DISTINGUISHING "DATA" FROM ABSTRACTIONS BASED ON DATA
  - TESTING ASSUMPTIONS
  - "LEFT-HAND" COLUMN

Table II-B
Outline of Features of Fifth Discipline*
Building Shared Vision & Team Learning

BUILDING SHARED VISION
- Essences
  - COMMONALITY OF PURPOSE
  - PARTNERSHIP
- Principles
  - SHARED VISION AS "HOLOGRAM"
  - COMMITMENT VS. COMPLIANCE
- Practices
  - VISIONING PROCESS
    - --SHARING PERSONAL VISIONS
    - --LISTENING TO OTHERS
    - --ALLOWING FREEDOM OF CHOICE
  - ACKNOWLEDGING CURRENT REALITY

TEAM LEARNING
- Essences
  - COLLECTIVE INTELLIGENCE
  - ALIGNMENT
- Principles
  - DIA-LOGOS
  - INTEGRATE DIALOGUE AND DISCUSSION
  - DEFENSIVE ROUTINES
- Practices
  - SUSPENDING ASSUMPTIONS
  - ACTING AS COLLEAGUES
  - SURFACING OWN DEFENSIVENESS
  - "PRACTICING"

*Peter M. Senge, The Fifth Discipline - The Arts & Practice of The Learning Organization. New York: Doubleday/Currency (1990), 424 pages.

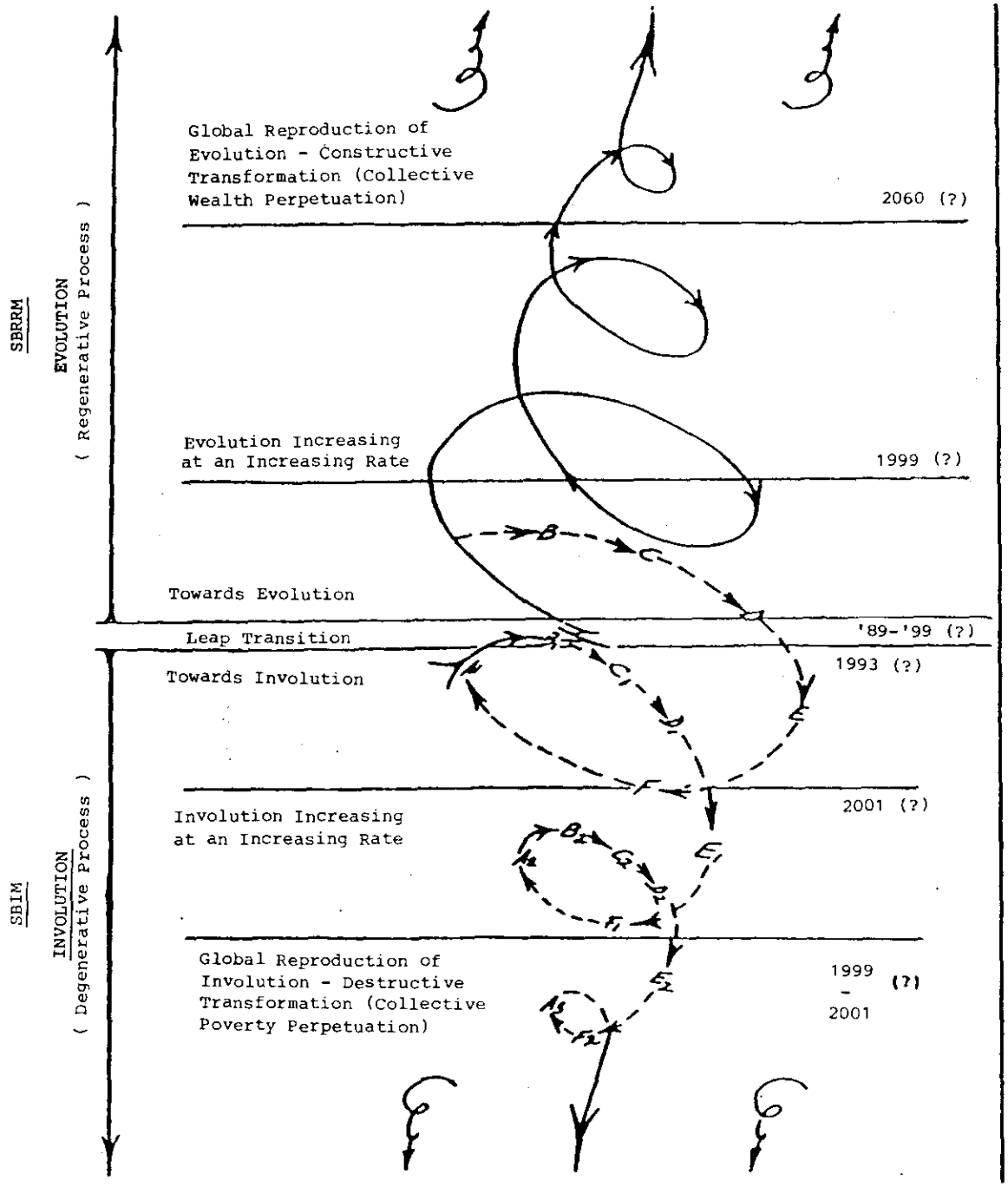


Fig. 2A. SBRRM and SBIM
(Depict main trends on qualitative basis only)

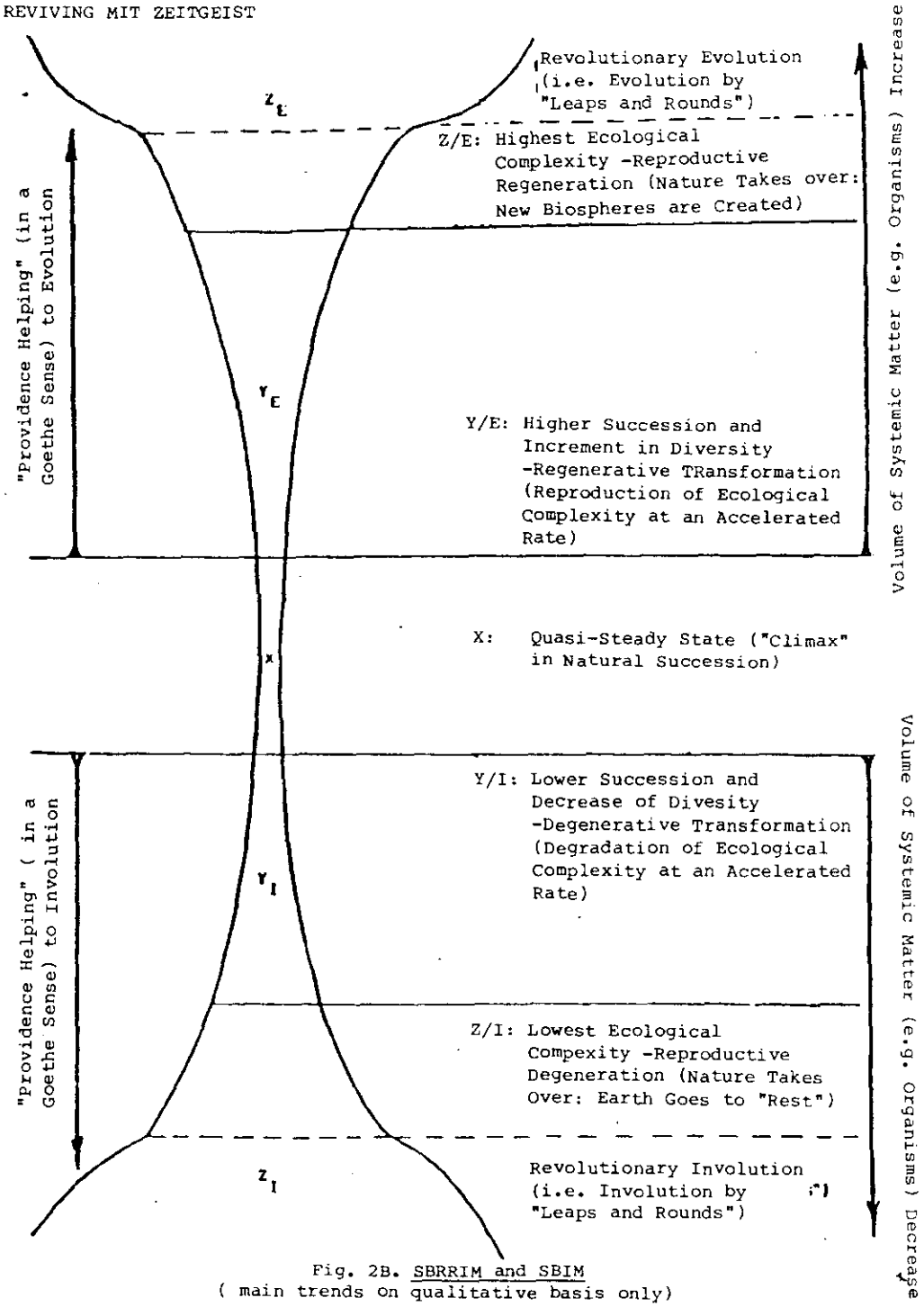
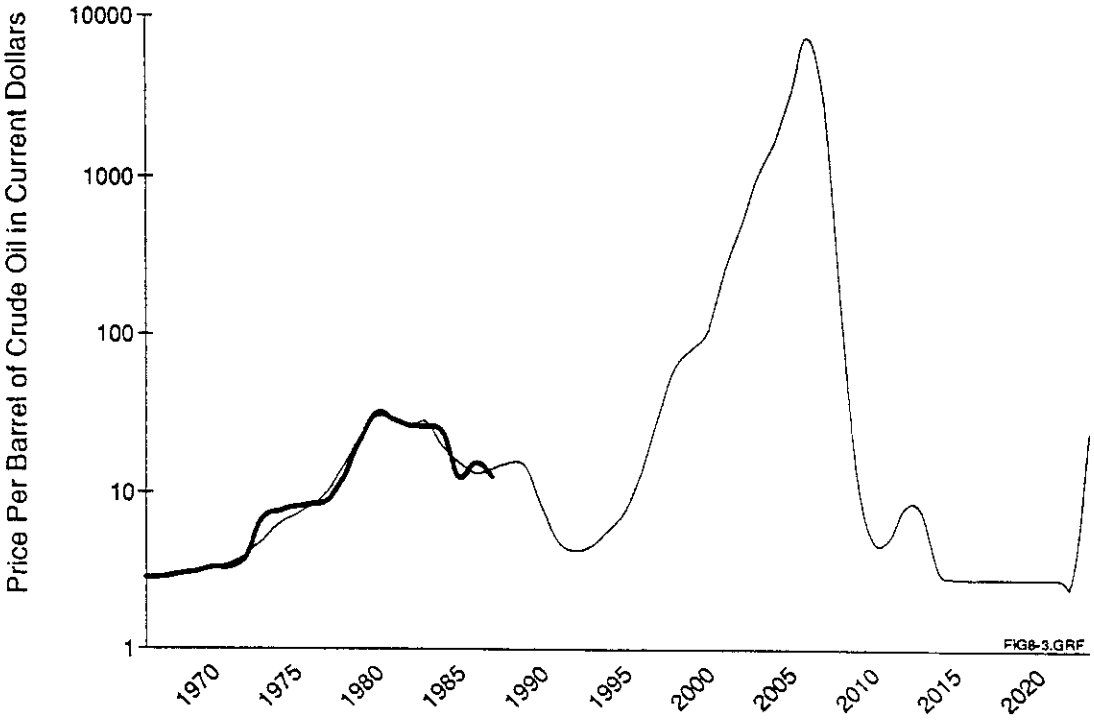


Fig. 2B. SBRRIM and SBIM
(main trends on qualitative basis only)



Past and projected future world oil prices, in current dollars. Data to 1978 from Energy Information Administration Annual Report to Congress, 1978, Volume 2, Table 26; thereafter SA1987, Table 1166. Prices after 1988 generated from program listed in Chapter 13.

Fig. 3. Projection of world oil prices from K. Watt [4]