SEPR No. 101-B
July 27, 1969

"The Evolution of Non-Violence from a Universe Characterized by Violence" *
(Part I: Evolution of Our Universe)

by

See SEPR No. 102-B for Part III.

Frederick B. Wood

It is my thesis that to develop plans for non-violent or peaceful cooperation of the races of mankind that we must first understand the sociological, biological and physico-chemical roots of social evolution. The evolution of our universe, our planet, the plants, the animals, and mankind sets restrictions on what choices we have available for future evolving of mankind. If through ignorance of these processes we make naive choices inconsistent with nature our civilization will collapse like ancient Greece and Rome.

For a starting point let us refer to Milton K. Munitz, Theories of the Universe - I from Babylonian Myth to Modern Science (Glencoe, Ill.: The Free Press & The Falcon's Wing Press, 1957). To use as a hypothesis, let us examine the chapter by George Gamow on "Modern Cosmology," * where the theory of the universe evolving from an originally highly compressed gas through five stages.

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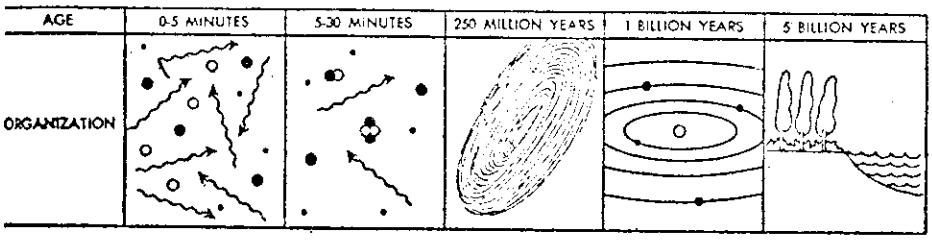
* Requires some parts of SEPR No. 179-C "How Can We Correlate Significant Changes in Our Civilization?" 7/25/69 (Part II)

* from Scientific American, March 1954, Vol. 190, No. 3, pp. 55-63.



Evolution of the Universe is symbolized at five stages. During the first five minutes of its expansion photons (*wavy lines*) outweighed solitary particles of matter such as protons (*black circles*), neutrons (*larger white circles*) and electrons (*smaller white circles*). Between five and 30 minutes matter had gained the upper hand and the fundamental particles had begun to coalesce into more complex nuclei such as those of deuterium (*proton and neutron*) and helium (*two protons and two neutrons*). After 250 million years the primordial gas began to break up into huge protogalaxies. After a billion years the matter in the protogalaxies had condensed into stars and planets. The present epoch is characterized here by the presence of life on at least one planet.

Fig 1. Illustration of the five stages of evolution of our universe from Scientific American.

During the first five minutes of the universe when radiation predominates over mass the physical behavior of the radiation is determined by Maxwell's equations.

$$\text{curl } H = \frac{1}{c}\left(4\pi i + \frac{\partial D}{\partial t}\right)$$

$$\text{curl } E = -\frac{1}{c}\frac{\partial B}{\partial t}$$

$$B = \nu H$$

$$i = \sigma\left\{E + \left[\frac{v}{c}B\right]\right\}$$

Fig 2. Maxwell Equation for Radiation

When the percentage of mass (particles) becomes significant compared to the radiation, we have to add another equation *

* H. Alfvén, Cosmical Electrodynamics (Oxford U. Press, 1950) pp 78, 86.

$$\frac{dv}{dt} = G + \frac{1}{e}\left\{\left[\frac{1}{c}B\right] - \text{grad } p\right\}$$

Fig 3. The hydrodynamic Equation.

For this analysis of violence and non-violence it is not necessary to study the full significance of these equations. The point here is that in the process of the evolution of the universe conditions reach a state where an additional equation is needed in addition to the original set to properly make a physical analysis of the universe.

In the period five to 30 minute in Fig 1. as more complex chemical elements were formed, additional equations governing chemical elements entered the scene. Instead of writing down these additional equations, let us make a geometrical table of the stable conditions allowed by the chemical equations.

The diagram in Fig 4 shows the chemical elements on a modified spiral graph. This graph is from S.I. Tomkieff, "A New Periodic Table of the Elements;(London; Chapman & Hall, Ltd, 1954)

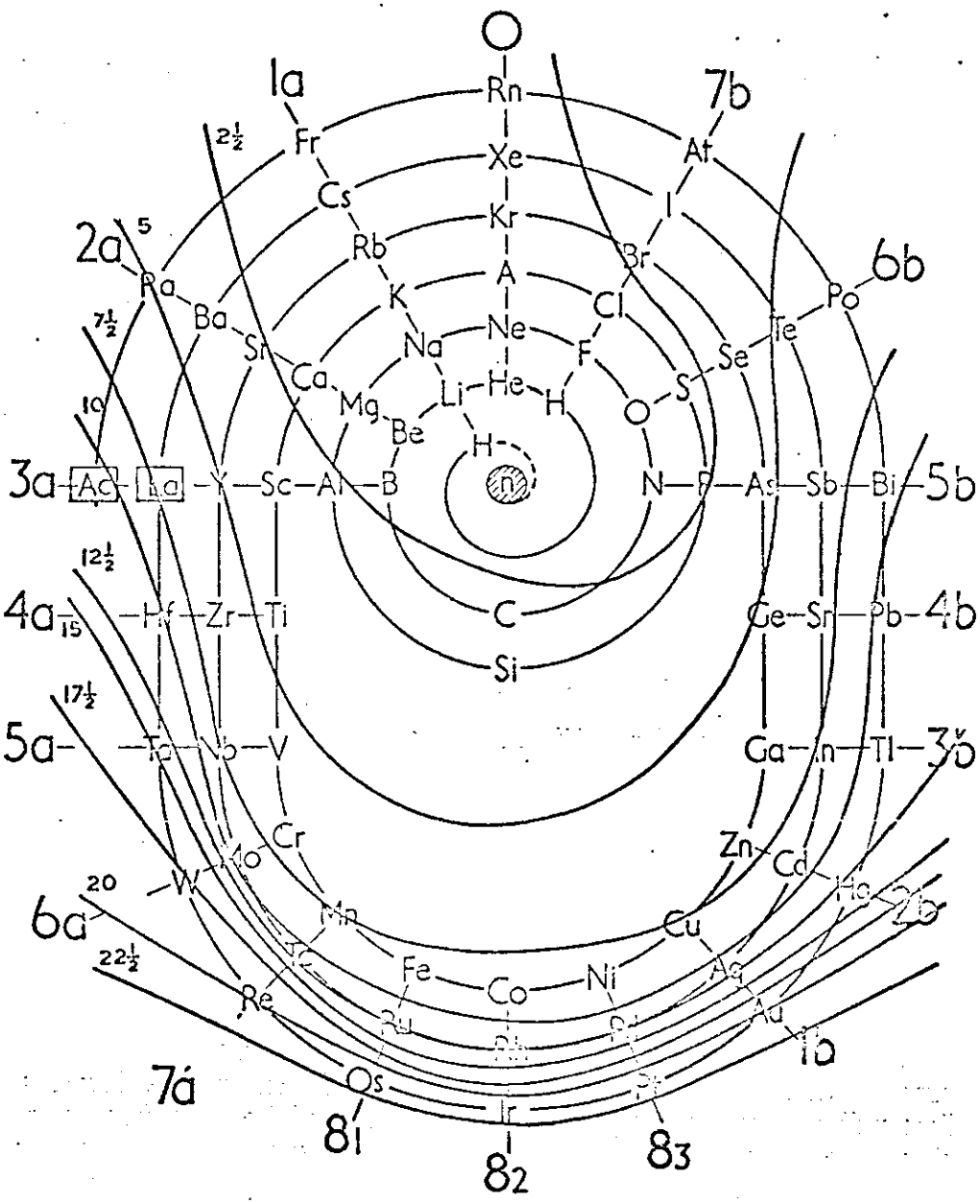


FIG. 5—Map representing the distribution of the specific gravity among the elements in their solid state. Specific gravity is expressed in the usual grams per cubic centimetre units and the contour interval is 2½ units.

La Lanthanum and Lanthanides Series — La Ce Pr Nd Pm Sm Eu Gd Tb Dy Ho Er Tm Yb Lu

Ac Actinium and Actinides Series — Ac Th Pa U Np Pu Am Cm Bk Cf

Fig 4 - Modified Spiral Table of the Periodic Elements.

If we consider the "rare earth" elements as special cases which can be omitted from the table, the remainder of the elements can be plotted on a spiral chart like Fig 5.

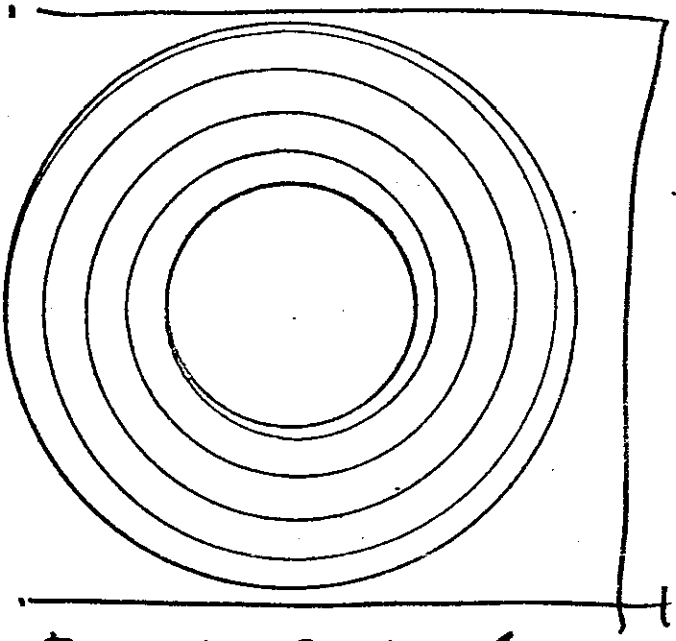


Fig 5A - Spiral form from Tomkieff

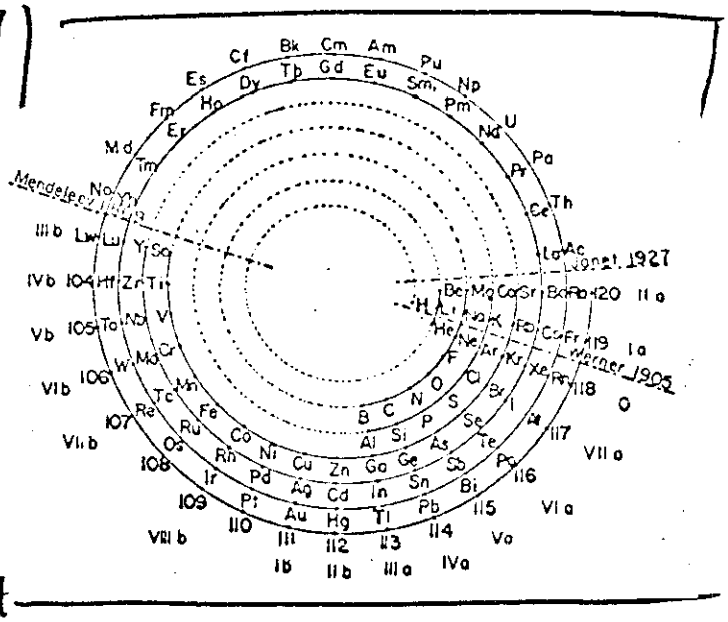
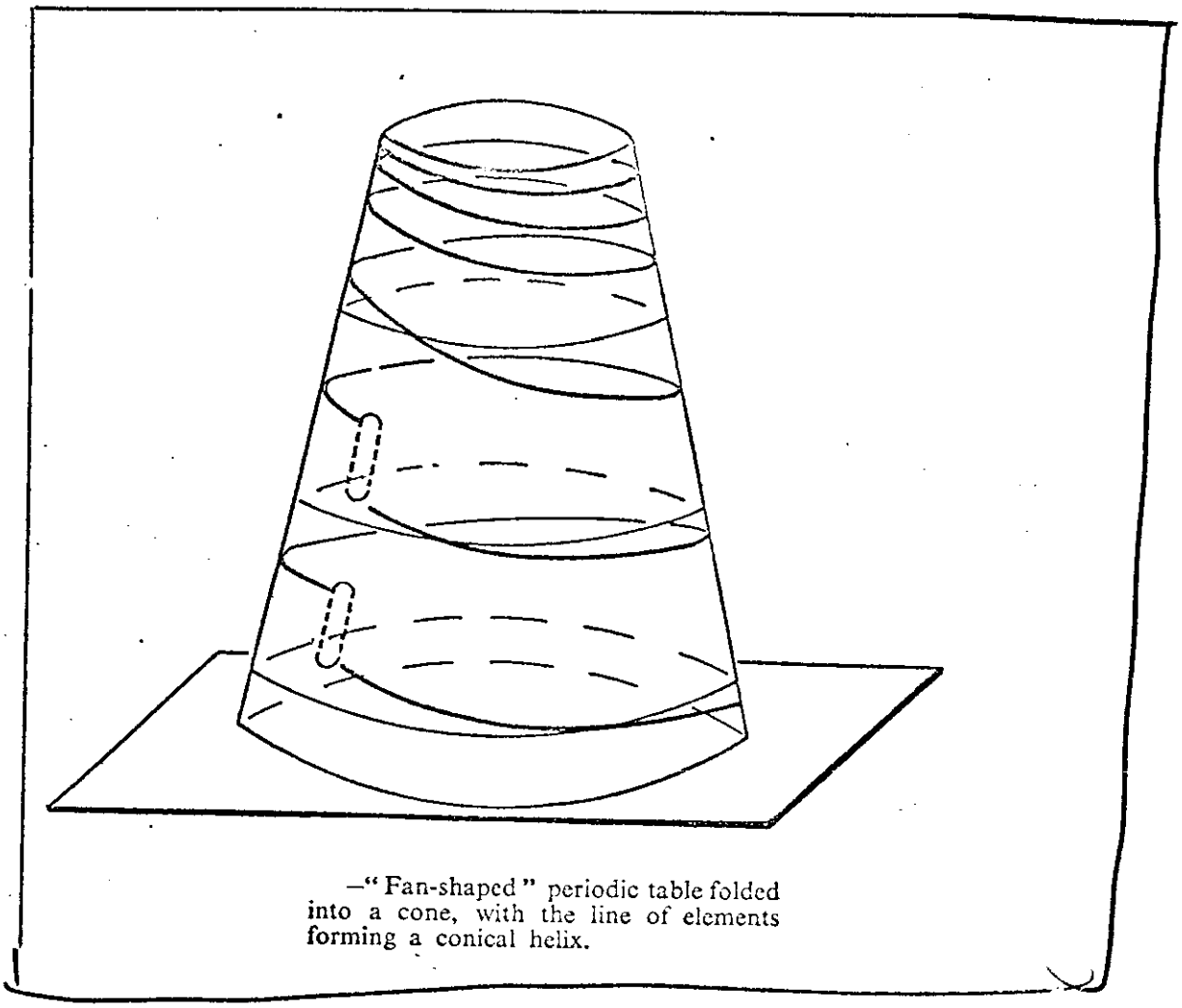


Fig 5B - Spiral form from Janet. *

These spiral charts of the chemical elements can be replotted on the surface of a cone of the form shown in Fig 6. The distance down from the top of the cone is a measure of the atomic weight, and the position on the circumference is a measure of the number of electrons in the outer rings of the atom.

* Edward G. Mazurs, "Ups & Downs of the Periodic Table," Chemistry, July 1966 pp 6-11, Vol 39, No. 7 esp. Fig 8.

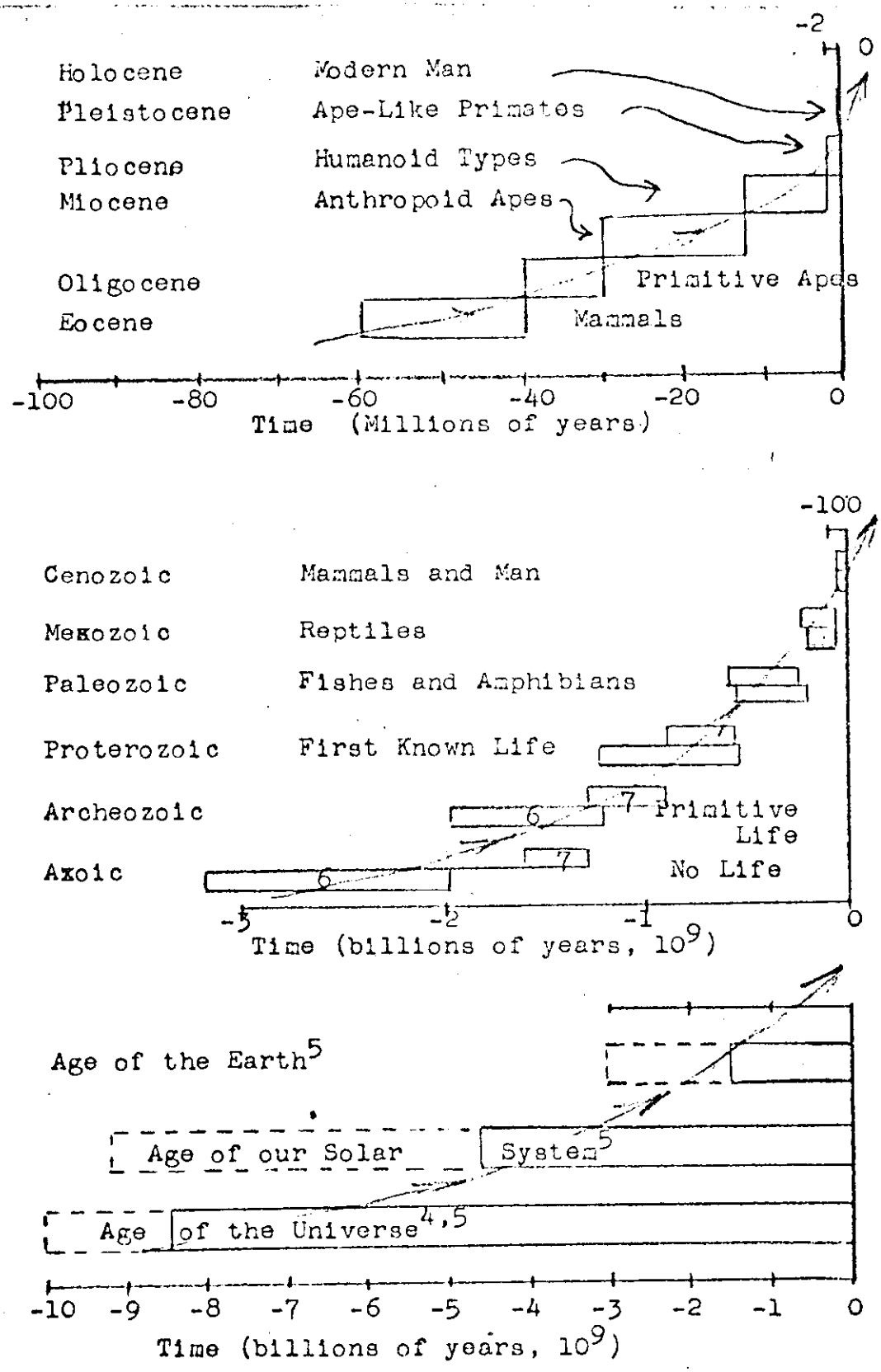


—"Fan-shaped" periodic table folded into a cone, with the line of elements forming a conical helix.

Fig 6 - Periodic Table Folded into a Cone

A chemist wishing to make chemical compounds has to understand the properties of the individual elements as displayed by these periodic tables.

The next thing to look at is the time scale of biological evolution. To get at this, we examine Fig 7 [from SEP No. 12 Fig 2 or SEPR No. 175-B Fig 3]



~~Fig 6~~ Fig 7. Historical Perspective (Part One)

Using the 7th Order Partial derivatives of History (center section of Fig 7) we obtain a time scale for the ~~the~~ evolution of elementary life forms. Now we would like to be able to look at biological-social evolution in a way similar to that of the chemist. Can we find some properties of biological systems that would enable us to construct a spiral chart on the surface of a cone similar to the periodic table of the chemical elements?

Brian Bergson at a meeting of the Society for General Systems Research in San Jose, Calif, January 5, 1968, on the topic "Equipotentiality in a General System" described a spiral periodic chart of biological systems defined as "Bonner Colonies." He described the process of biological evolution in terms of a cycling between two states "equipotentiality" and "mosaic structure".

In a biological system characterized by "equipotentiality" each member can do all the necessary functions for survival. In a "mosaic structure" there is specialization such that each individual performs specialized functions and is dependent for survival on other specialists performing tasks for him in exchange for his special services.

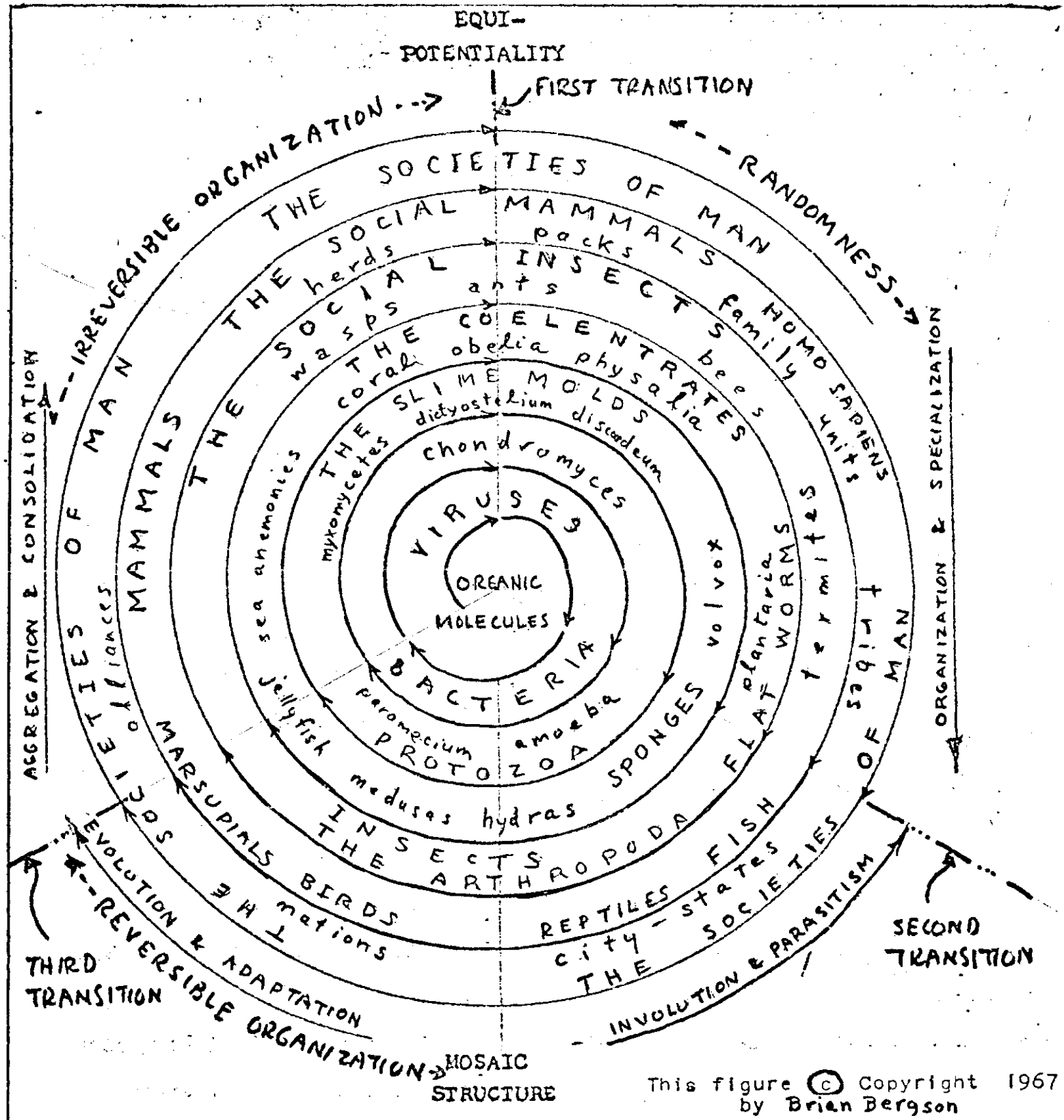


Fig. 8. PERIODIC CHART OF THE BONNER* COLONIES

* The term "colony" is used in the sense defined in James Tyler Bonner, The Ideas of Biology, N.Y.: Harper (1962).

The recent "civil rights" movement, draft resistance, hippies, etc, are signs that our civilization is nearing the normal end of the "moraine structure" at the "Third transition" in Fig 8.

Now to go back to the biological part and connect Figs 7 and Fig 8, look at page 11 of SEPR No. 179-C. Here we have superimposed the spiral of Fig 8 onto the time scale of Fig 7 giving a cone-like spiral. Looking at the end view, I place the position of the USA USSR and CHINA at different points in the cycle.

For the development of sociological data see pp 1-9 of SEPR No. 179-C, based primarily on the work of Pitirim Sorokin.

It is suggested that you next study
Part II: SEPR No. 179-C
and then
Part III: SEPR No. 102-B.

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SEPR No. 179-C

"How Can We Correlate Significant Changes in Our Civilization?"

The last few years have witnessed many confusing phenomena in human civilization. The splintering of the negro civil rights movement from its Washington, D.C., 1963, March of Solidarity to the present fragmented groups -- the series of student demonstrations from the 1964 Univ. of Cal. FSM demonstrations to the students in Paris taking over -- the Watts Riot of 1965 -- the hippie colonies in many of our cities - the illogical war in Vietnam -- and many other social phenomena indicate something is slipping out of gear in our civilization.

Now I haven't been able to find any way to affix any relative values to these phenomena. I would like to be able to find parameters that we could plot to show trends of these developments.

Perhaps the analyses of the late Professor Pitirim A Sorokin might be of help to me.

At least up to the present times, historians have been able to, after the facts, point out there were signs decades and even centuries prior to major social change that intelligent beings ought to be able use to help understand social change. Perhaps in the work of the late Prof. Sorokin, we can find some clue to understand these changes that are going on in our civilization.

In checking with the library, I find that P.A. Sorokin's major work is Social and Cultural Dynamics (1). I found there was too much

1. Pitirim A. Sorokin, Social and Cultural Dynamics. New York, 1937-1941, 4 vols.

information for me to digest easily in the four volume work. However, I found that a lot of the significant material has been summarized in a one volume book (2).

2. Pitirim A. Sorokin, Society, Culture and Personality: Their Structure and Dynamics. N.Y.: Harper & Bros (1947).

I have copied a few sample empirical curves from Sorokin (ref 2)

Now as I study the curves in Sorokin's book, I notice they fall into two classes. The curves of types of philosophy, ethics, truth systems, and other characteristics of human culture appear to be cyclical, i.e., approximate to sine wave. On the other hand his curves of discoveries, inventions, etc., rise exponentially with time.

Some of the sine wave type curves are reproduced below:

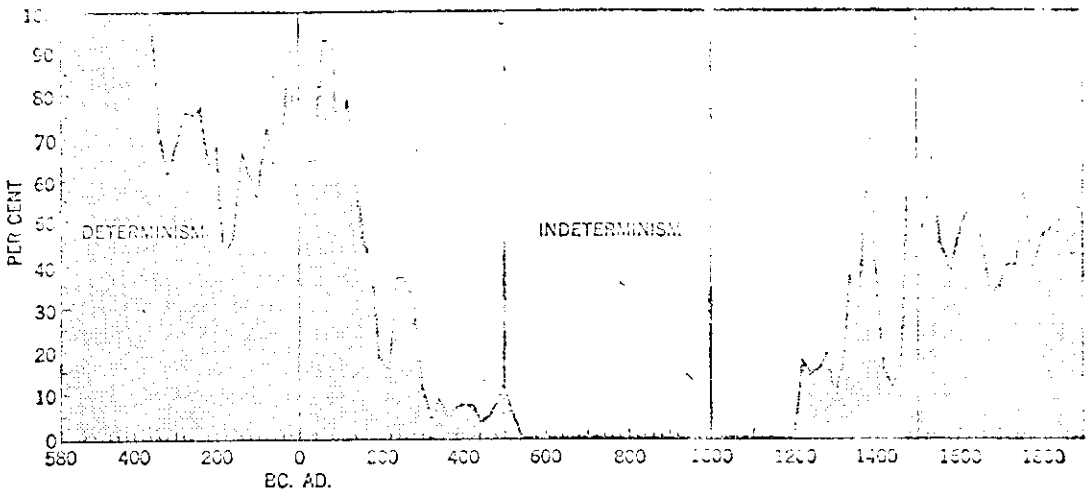


Figure 16. Movement of Deterministic and Indeterministic Philosophies, 580 B.C. to 1900 A.D.

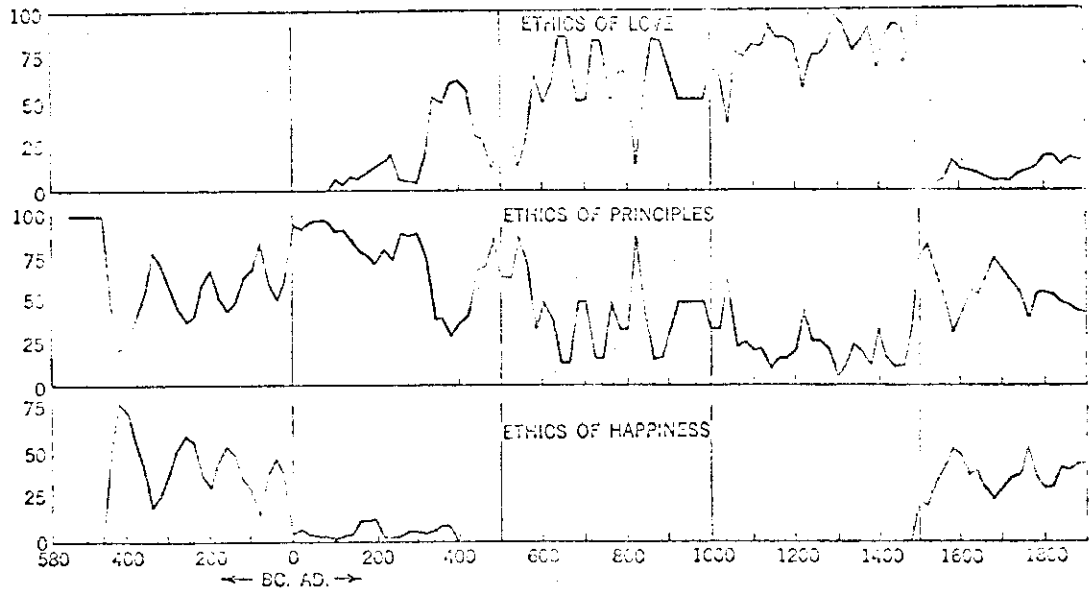


Figure 13. Ethics of Love, Principles, Happiness.

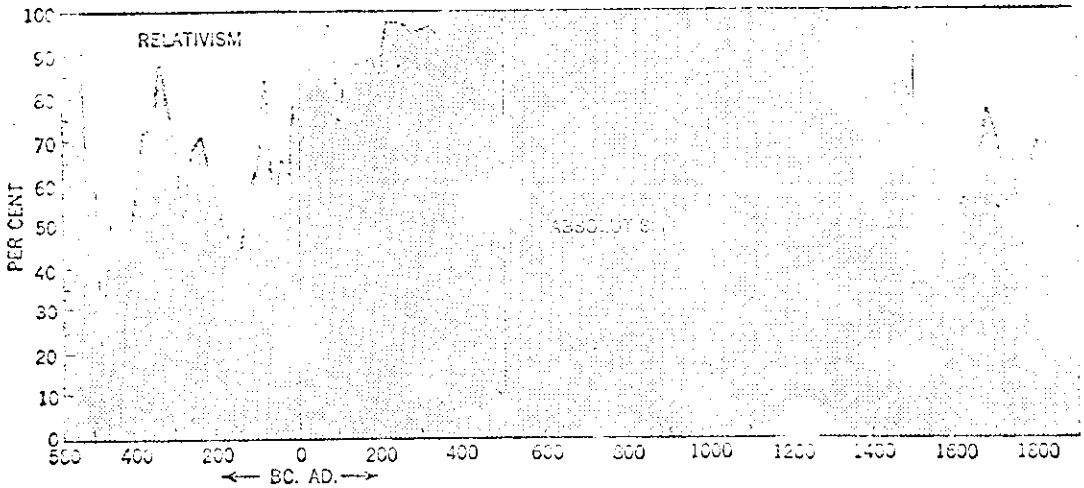


Figure 14. Relativism vs. Absolutism in Ethics and Philosophy.

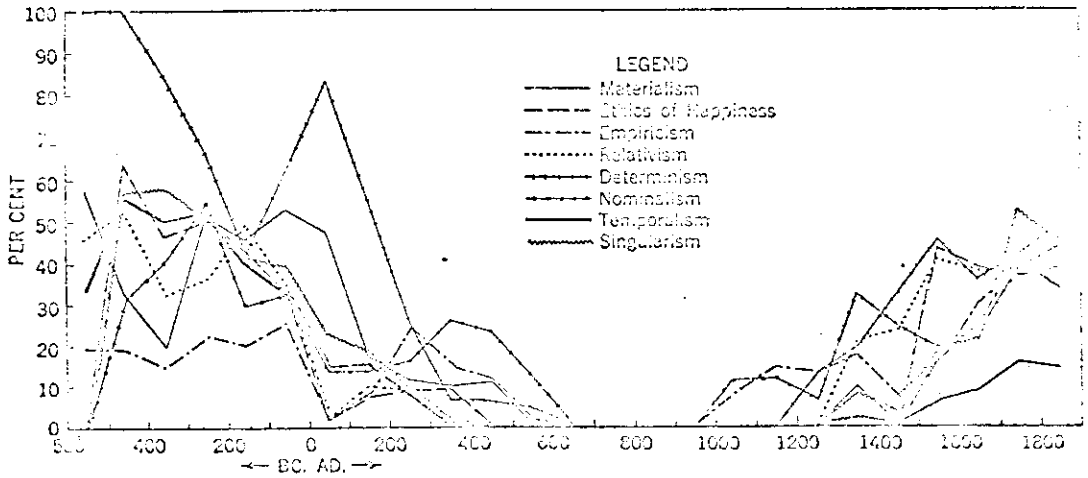


Figure 15. Subsystems of Sensate System of Truth.

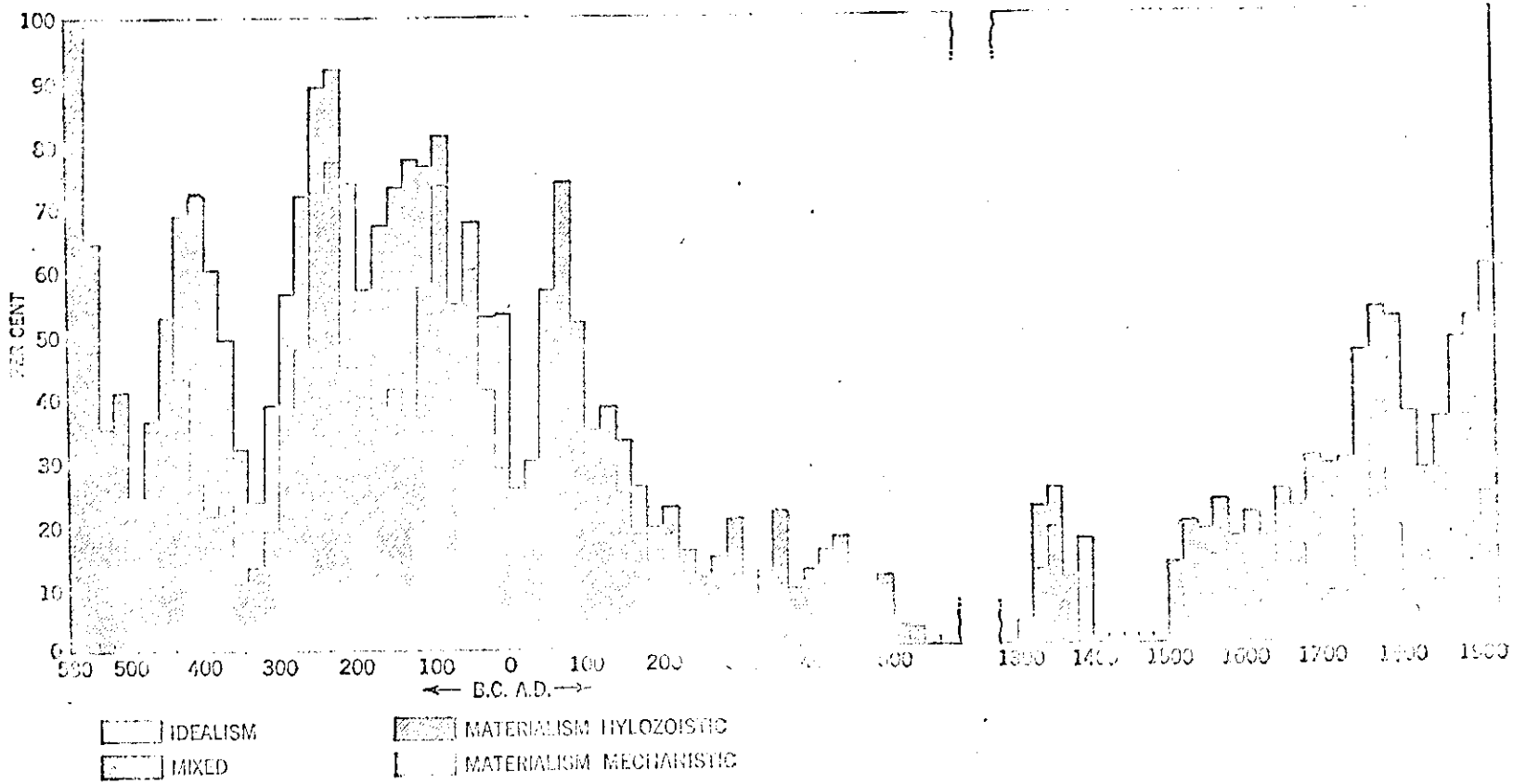


Figure 12. Movement of Idealism and Materialism, 580 B.C. to 1900 A.D.

Some of the experimental curves are shown as follows:

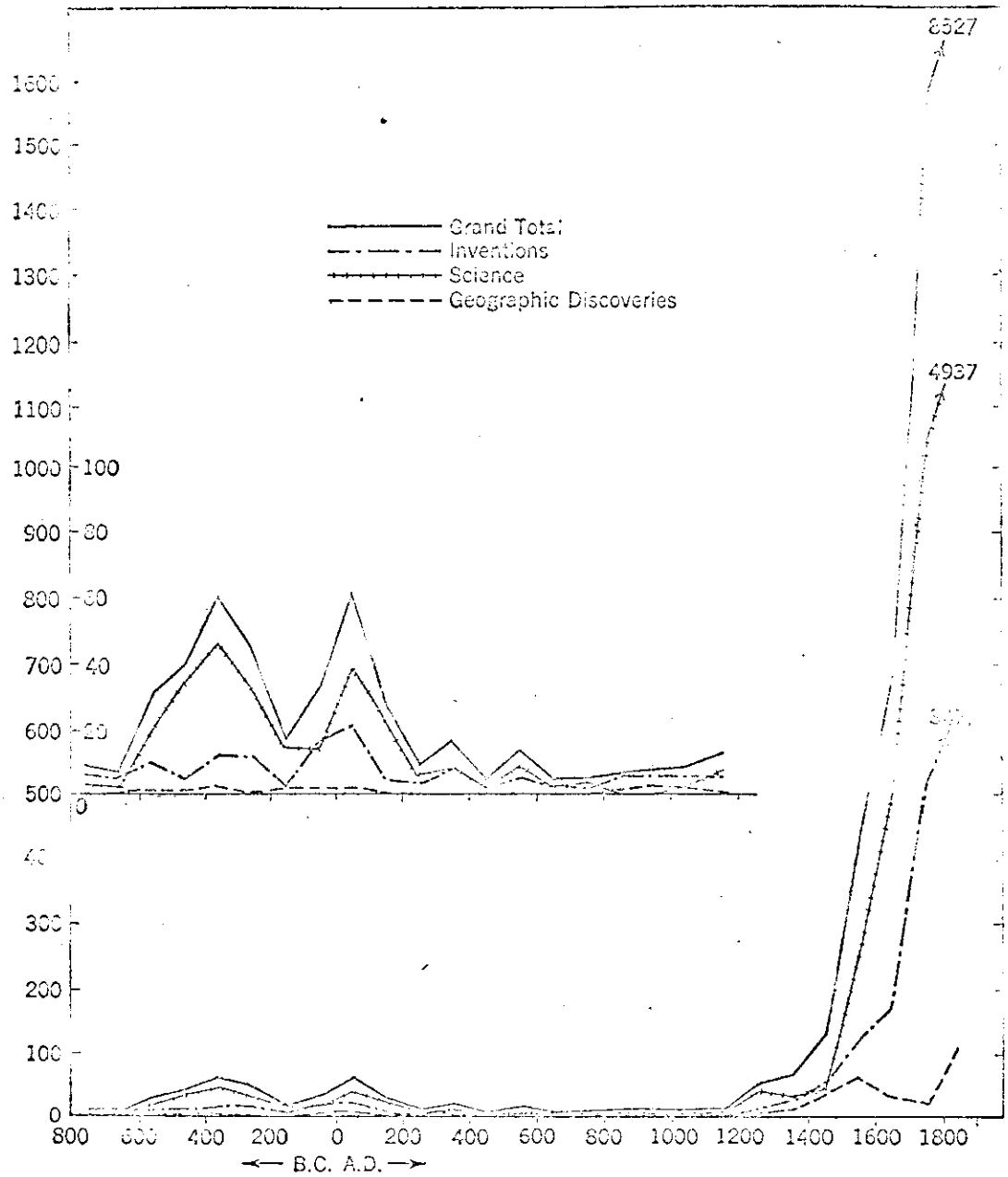


Figure 9. Number of Scientific Discoveries and Inventions, 800 B.C. to 1900 A.D., by Centuries.

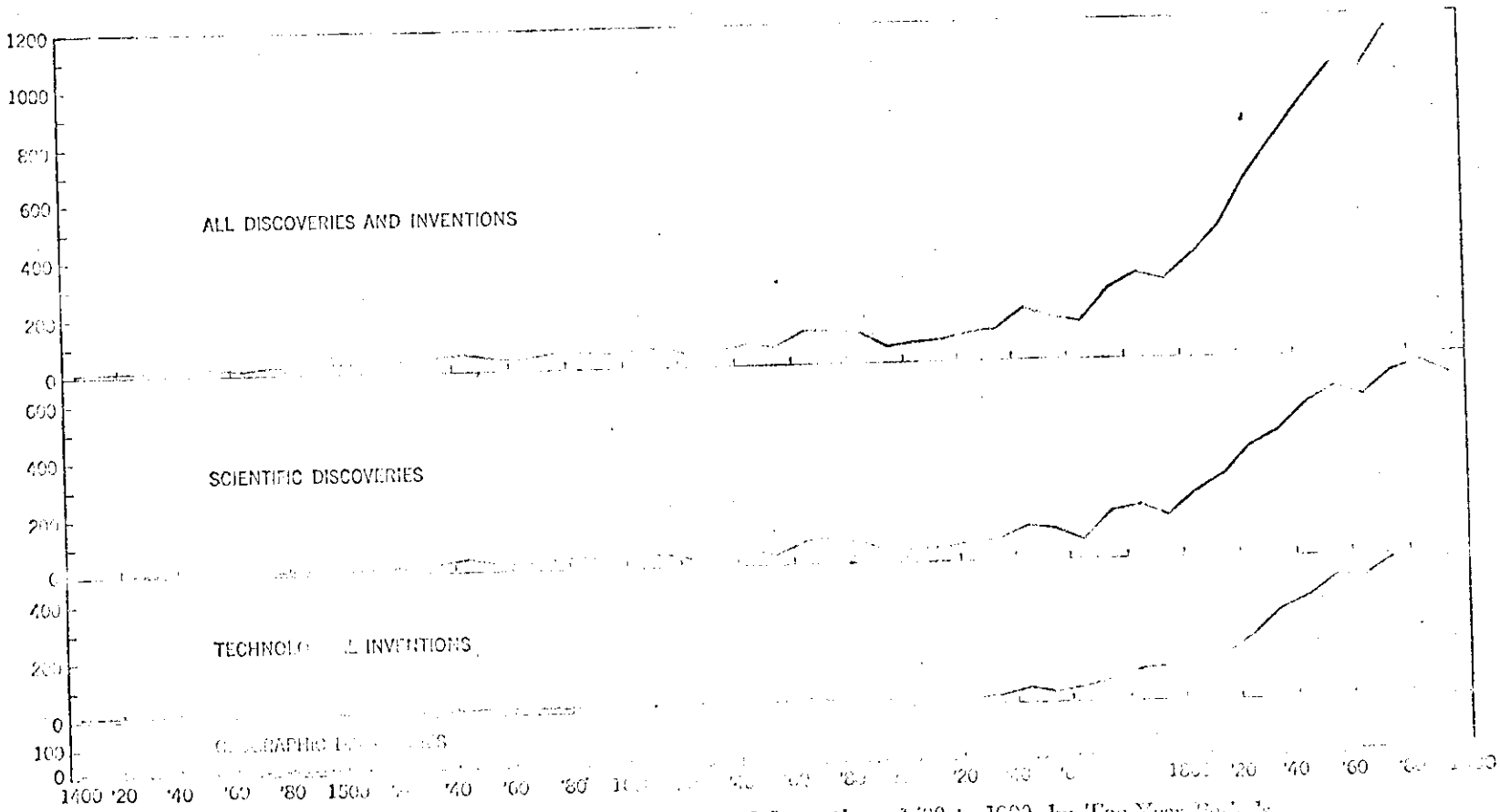
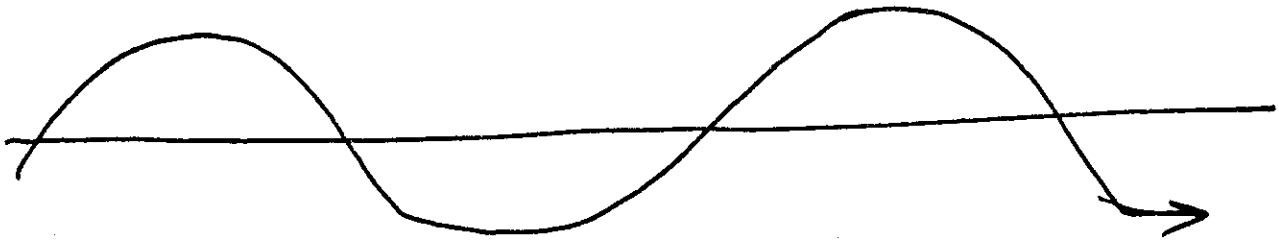
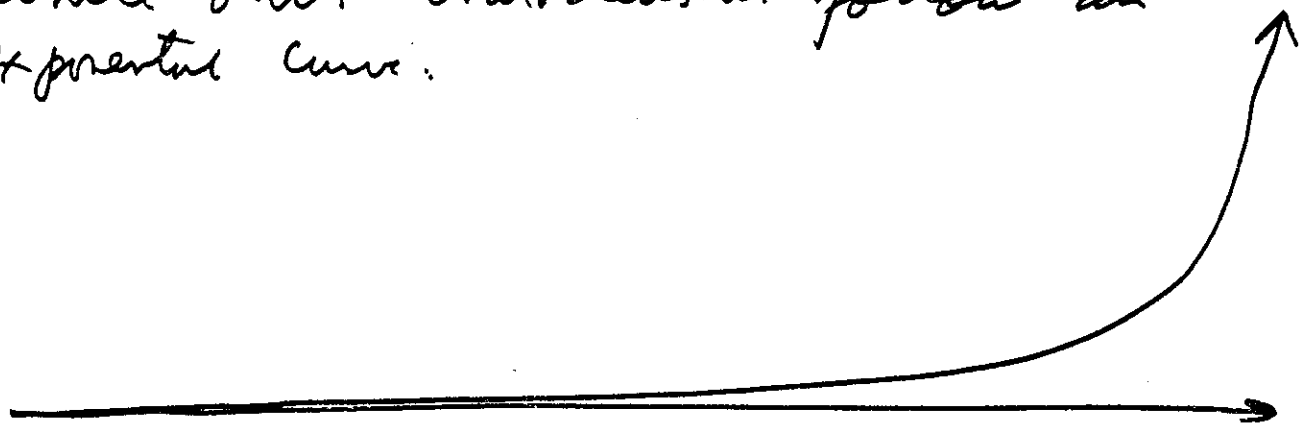


Figure 10. Number of Scientific Discov and Inventions, 1400 to 1900, by Ten-Year Per ds.

Now we see that some characteristic of human civilization appear to follow a sine wave variation with time.



While other characteristics follow an exponential curve.



Could it be that these two types of curves are two views of some more complex function of human change?

There is yet another view of parameters of social change. A physicist in San Jose has been saying "have we found the right coordinate system in which to plot social phenomena?" In his search, he has investigated polar coordinates

in which he plots certain characteristics as a spiral. Mr. Bergson's spiral chart is shown on the next page (p. 10).

The next thing that occurs to one studying these curves is that Mr Bergson's spiral is the projection of three dimensional spiral generated by some kind of a product of a sine wave and an exponential wave.

On page 11 an example of such a three-dim. spiral is shown. It is postulated that it is difficult to observe a time spiral in real life, because different countries may be at different points on the spiral, thus creating a mixed international system.

To explain Mr Bergson's spiral I refer you to his unpublished manuscript (3)

3. Brian Bergson, "The Gods We No Longer Worshipped - The Theory of Socio-Meiovolic Transition"; manuscript of lectures by Brian Bergson, 15000 Jeanette Lane, San Jose, Calif. 95127. Chapters 1-5; pp. 1-131

Now these curves don't fit together very well yet. The exponential rise of the inventions and discoveries seems to be on a different scale that that of the biological evolution.

Another important feature from the : manuscript is a concept of biological evolution which gives a periodic (spiral) table of biological systems. The placement of different stages of evolution on the diagram correspond to an oscillation between equipotential and mosaic type organization. This periodic table is reproduced below.

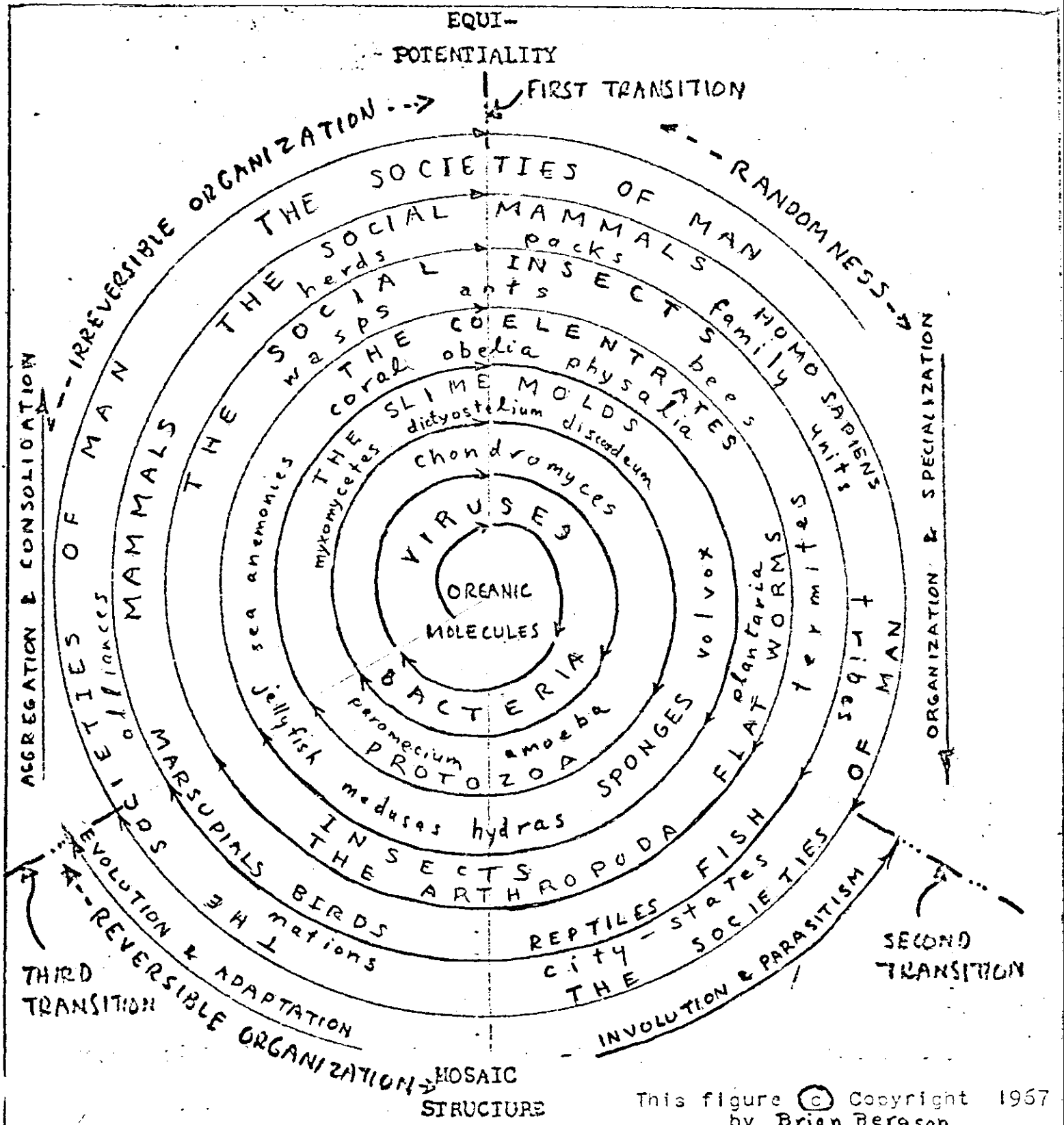
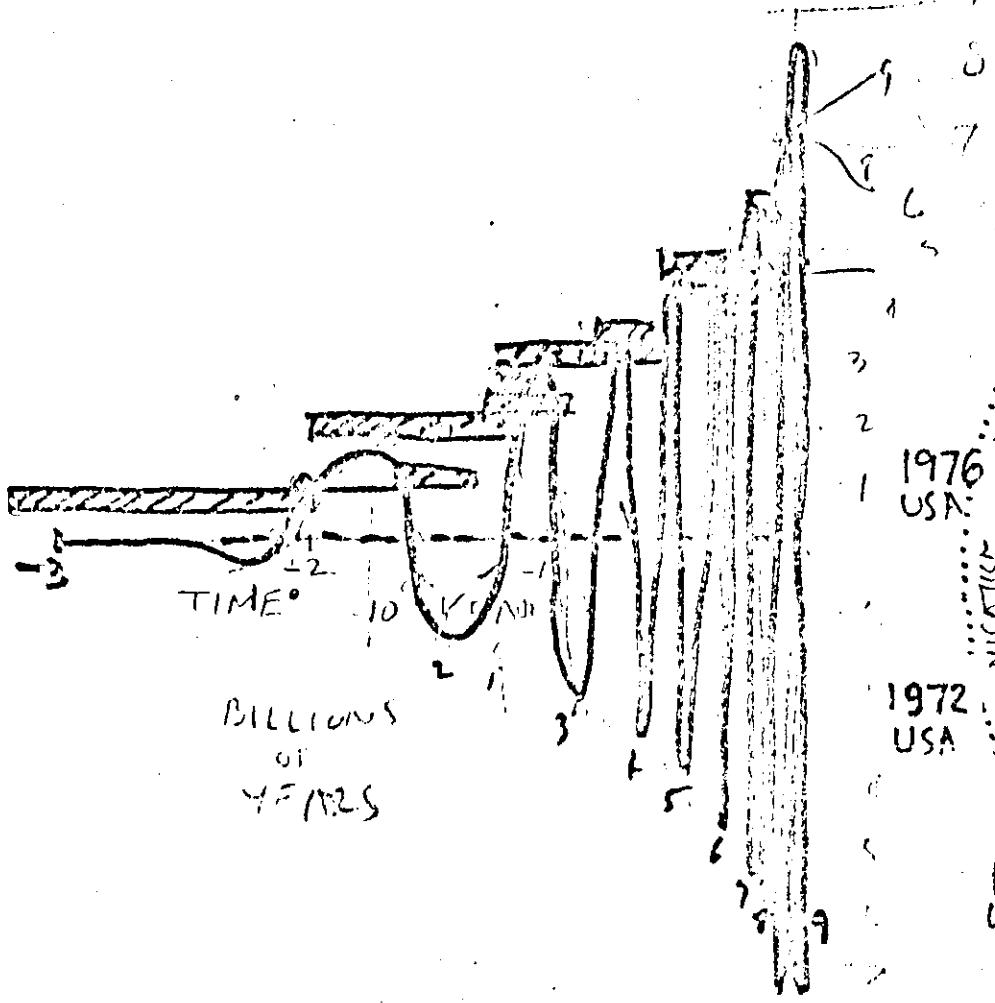


Fig. PERIODIC CHART OF THE BONNER* COLONIES

* The term "colony" is used in the sense defined in James Tyler Bonner, The Ideas of Biology, N.Y.: Harper(1962).

○ Dates for Red China.
◇ Dates for USSR.
◘ Dates are U.S.A. Stages of Development.



Time Spiral

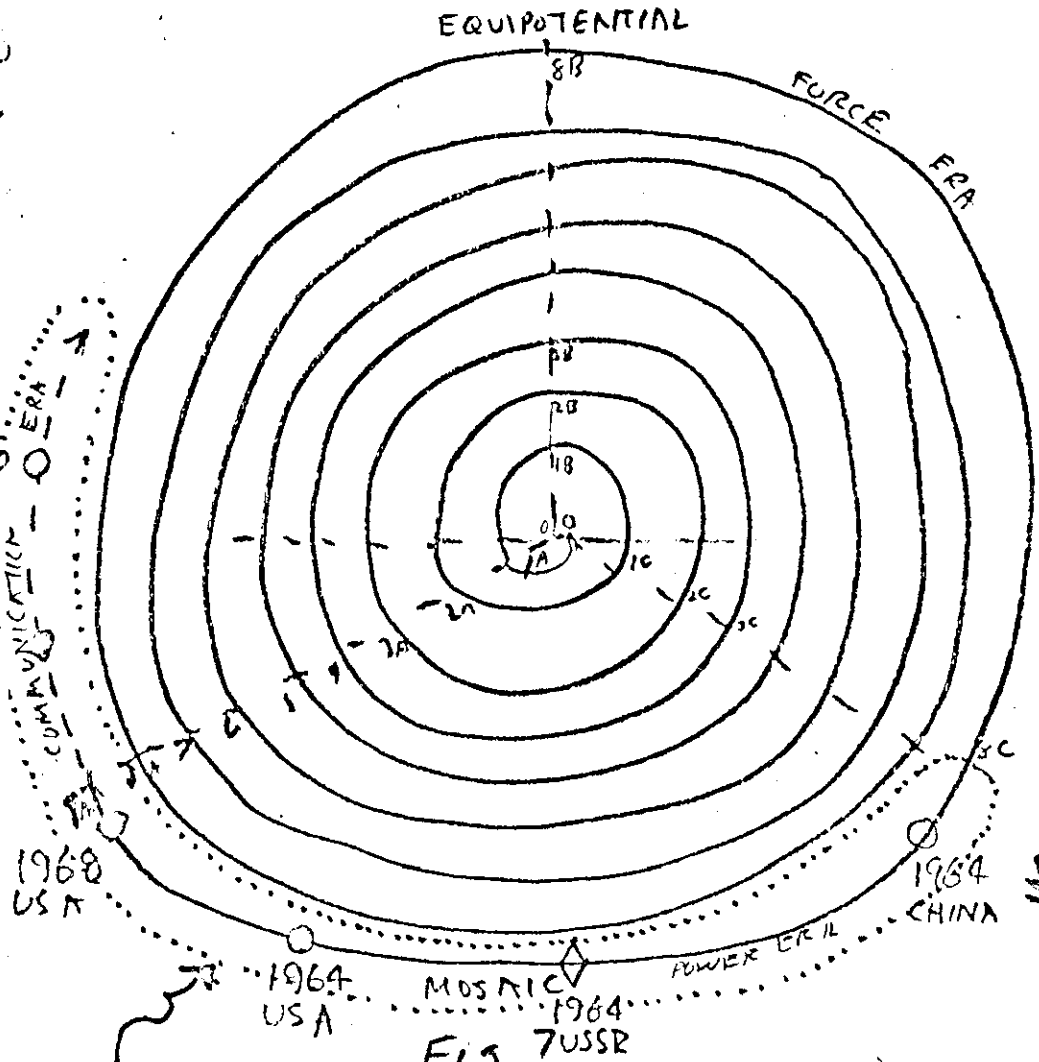
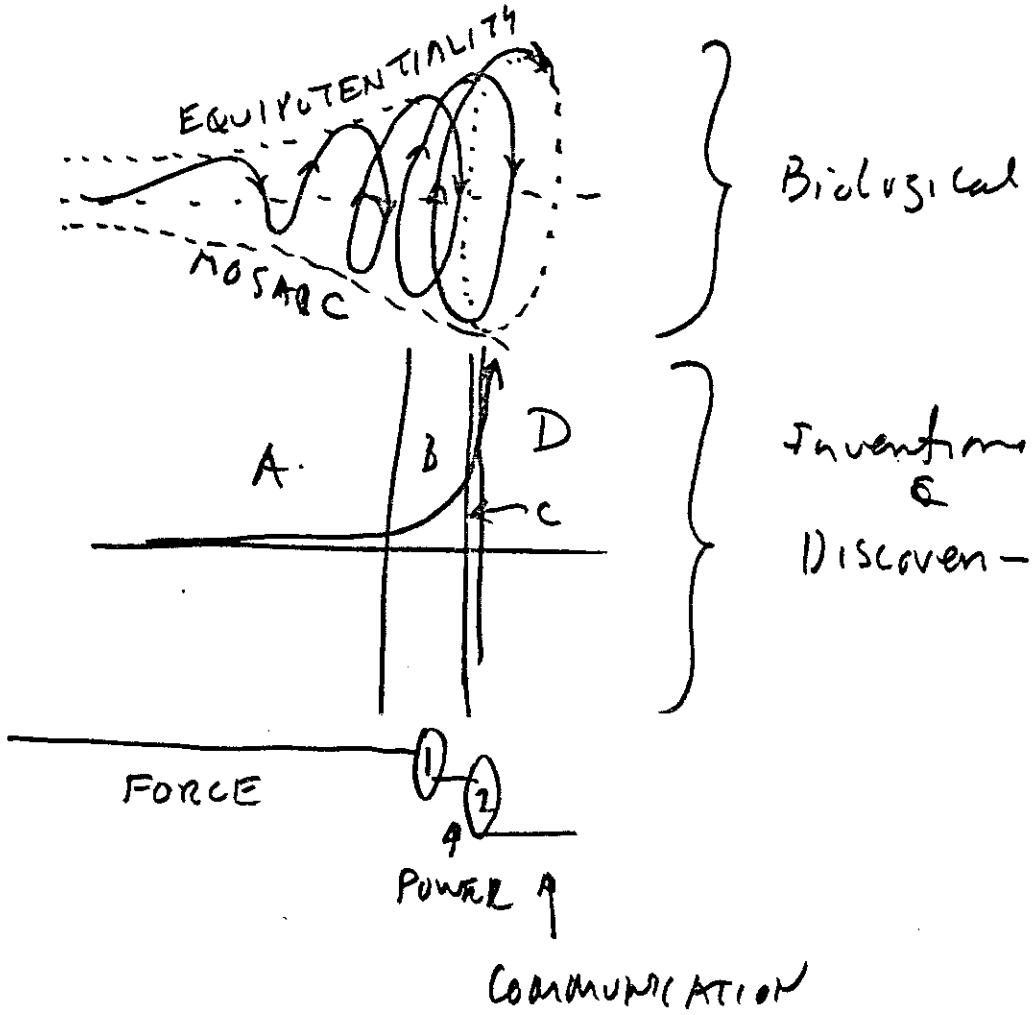


Fig 7

Region of Usefulness of "Thermodynamic Imperative" with "Continuous Channel Model"

Perhaps these currencies are more complex.



① = 1st industrial revolution

② = 2nd industrial revolution

Era | Transition

Force

1st Industrial Revolution

Power[1]

2nd Industrial Revolution[2] [3] [4]

Communication[1]

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1. Power era called "science" era by S. Ramo & L. DuBridge on KQED NET program 3/14/67 They called communication era → "social" era.
2. 2nd indust. rev also called "electronic revolution" by some and "Computer revolution" by others.
3. 2nd indust. rev. called "cybercultural revolution" by Alice Mary Hilton.
4. See also Karl W. Deutsch, The Nerves of Government Free Press of Glencoe (1963)

Conclusion

This brief study gives a fresh insight as to possible ways of looking at the social turmoil that is going on. The curves illustrated in this note are probably oversimplified. However with these curves as a rough approximation, we can more easily see

how the transition in social system and in technology develop at this time causing a more profound upheaval in human society. Also with these types of models we see that these evolutions have a historical development, and hence we can learn their logical development, so we can perceive where conscious decisions can push the changes toward a more humanistic society.

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July 25, 1968

Continuation from
SEPR No. 101-B,
SEPR No. 179-C'.

SEPR No. 102-B
July 27, 1968

"The Evolution of Non-Violence from a Universe Characterised by Violence"
Part III: Directions for Non-Violence.

by

Frederick B. Wood

The human race has a great opportunity for developing a "non-violent" mode of life.

Astronomers describe the condition when the earth, moon, and sun line up in a straight line as a "SYZYGY." At such times we have an unusually high or low tide as the case may be.

We now are in a condition of a "SOCIOLOGICAL SYZYGY" where we are going through three transition points at almost the same time, namely:

(1) A transition in technological state from "power era" to "communication era"

(2) A transition in bio-social evolution from MOSAIC STRUCTURE toward EQUIPOTENTIALITY upon the third transition point; and

(3) A transition in Scientific-Philosophic-Ethical evolution using the "Teleodynamic imperative" implemented with cybernetic models.

Under #1 we can say that the military action in Viet Nam was logical for the "Power Era" but then we were departing from the power era well before the 1965 escalation of war in Viet Nam. Also the communication era gives the advantage to the people who concentrate on communicating their ideas and having true dialogs with people instead of throwing force and power around.

Under #2, we can appreciate the rose level sensitivity of the hippies in wanting out from the Mosaic Structure. Their projects are oriented toward the previous equipotential structure instead of the next. To prepare for the next equipotential structure in human civilization we have to overhaul our educational system to develop a general system based education such that students can learn general principles which apply to most special fields.

Under #3, we can develop a "technological ethic" from the thermodynamic imperative with a communistic theory implementing model. This would give us a more universal ethic for promoting cooperation between all nations so we could put more reliance on "non-violence".

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