

"Potential Impact of Electrical Communication Theory
on Political Ideology"

by

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Dr. Frederick B. Wood an electrical engineer who has a hobby of studying sociological phenomena from a general systems point of view in which concepts which are isomorphic between physical and social phenomena are explored will speak on: POTENTIAL IMPACT OF ELECTRICAL COMMUNICATION THEORY ON POLITICAL IDEOLOGY. An exploration of how analogies from information theory can be useful in developing an ideology suitable for helping mankind make the transition from the Power Era to the Information Era, with power politics being replaced by a theory of human development.

This talk was also given to the Santa Clara Valley Chapter of the American Humanist Association in the latter part of October 1965.

A further development of this talk is given in SEPR No. 56-B.

The development of electronic information processing techniques used in radar, sonar, and related bombsight techniques tipped the balance in World War II in favor of the democratically oriented nations. This victory in favor of democracy signalled the entry of the human race into a new era -- the Information or Communication era. Marshall McLuhan proclaims it as the electronic age.(2) If this is truly a new era, we should expect the mathematics of communication theory to show us the form of significant features of the social structure of this new era. The mathematics of Information Theory and Cybernetics should give us the insights necessary to perceive abstract models of sociological development which could help us direct our political, economic and social activities toward maintaining the proper balance between order and diversity to maximize the growth of democratic institutions.

We examine one electrical communication theory model known as the continuous channel (an abstraction of a telegraph cable) and find that, if we substitute the probability of finding people and resources related to different political views for the probability of different signal voltages occurring on a telegraph line, and then use the mathematical formula for maximizing the transmission of information over the telegraph line as an operator on the probability distribution of political views tolerated in a given country, we find that by analogy we have a measure of what we might call "dynamic-justice" -- a measure of how well the country maintains a balance between order and diversity.

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1. Marshall McLuhan, Understanding Media: The Extensions of Man.
N.Y.: McGraw-Hill Paperbacks (1965)

In contrast to the potential for growth of democratic institutions which I perceive, a number of others extrapolate the empirical observations to predict a deterioration of democratic institutions. As world energy production soars exponentially as is shown in Fig. 1, various analysts predict that the large scale organizations and the specialized control features required to produce and distribute such large amounts of energy on our planet will work against democracy. Clark Kerr in Industrialism and Industrial Man predicts an increasing conformity in human organization and Don Michael predicts the central control of government decision processes by an elite group of cyberneticians having intimate knowledge of computer technology and programming. (See Cybernation the Silent Conquest)

"End of Ideology" refers to ^{the} old generation of the 50's, before "TV Children" hit college.



IN WORLD WAR II THE ORGANISED APPLICATION OF ELECTRICAL COMMUNICATION THEORY AND TECHNOLOGY.....

.... BROUGHT FORTH A FAMILY OF

RADAR SYSTEMS

WHICH BROUGHT THE DOWNFALL OF NAZI AND FASCIST DICTATORSHIPS .

NEW APPLICATIONS OF ELECTRICAL COMMUNICATION THEORY OFFER PROMISE OF AIDING DEMOCRACY IN THE STRUGGLE FOR EXISTENCE - - - - -

- - - THIS TIME ON A PHILOSOPHICAL OR IDEOLOGICAL* LEVEL INSTEAD OF PHYSICAL WEAPONS.

* For generations of humans brought up on television, the process of living at communication levels exceeding normal channel capacity involves recording (or pattern recognition)

The method we can go about finding these new applications is the scientific method. I do not mean examining empirical trends and extrapolating them. What I mean by the "scientific method" is the development of "hypotheses" and defining ways to test the hypotheses. The method of examining empirical trends does not necessarily distinguish between natural trends due to change in quantity (size of organization) and conspiracies of power groups to maintain control of society or to prevent other groups from establishing control. It would be well to stop and review a little book by J. Browowski, Science and Human Values, to refresh our memory of the nature of science and its impact on human society.

We need to learn the difference between planned decisions to force conformity and statistical reactions of individuals to situations which favor conformity.

If we examine history on the right level, i.e., with enough derivatives in the Taylor (or MacLaurin?) series representation to lay bare the different systemic factors and decision factors. If we examine the role of the N.A.M. in 1947 in disabling democratic procedures in the U.S.A., we can find sufficient influence of specific decision factors to question the extrapolation of empirical trends.

Next we need a theoretical base for analysing the development of a country economically, including the degree of democracy in the system. Our first clue to finding analogies between different types of communication channels is to find the channel capacity curves (i.e., output information rate versus input information rate) Fig. 2A shows the channel capacity curves for a neuron, visual nerves, individual, group, and social institution. Fig. 2 B has the scale extended to include electrical communication systems.

The External Similarity of the Input - output curves of these different phenomena are indicative of potential analogies, but alone are not sufficient.

In addition we must look for some internal or structural similarity. For example are there similar **NEGATIVE FEEDBACK LOOPS** in all these systems?

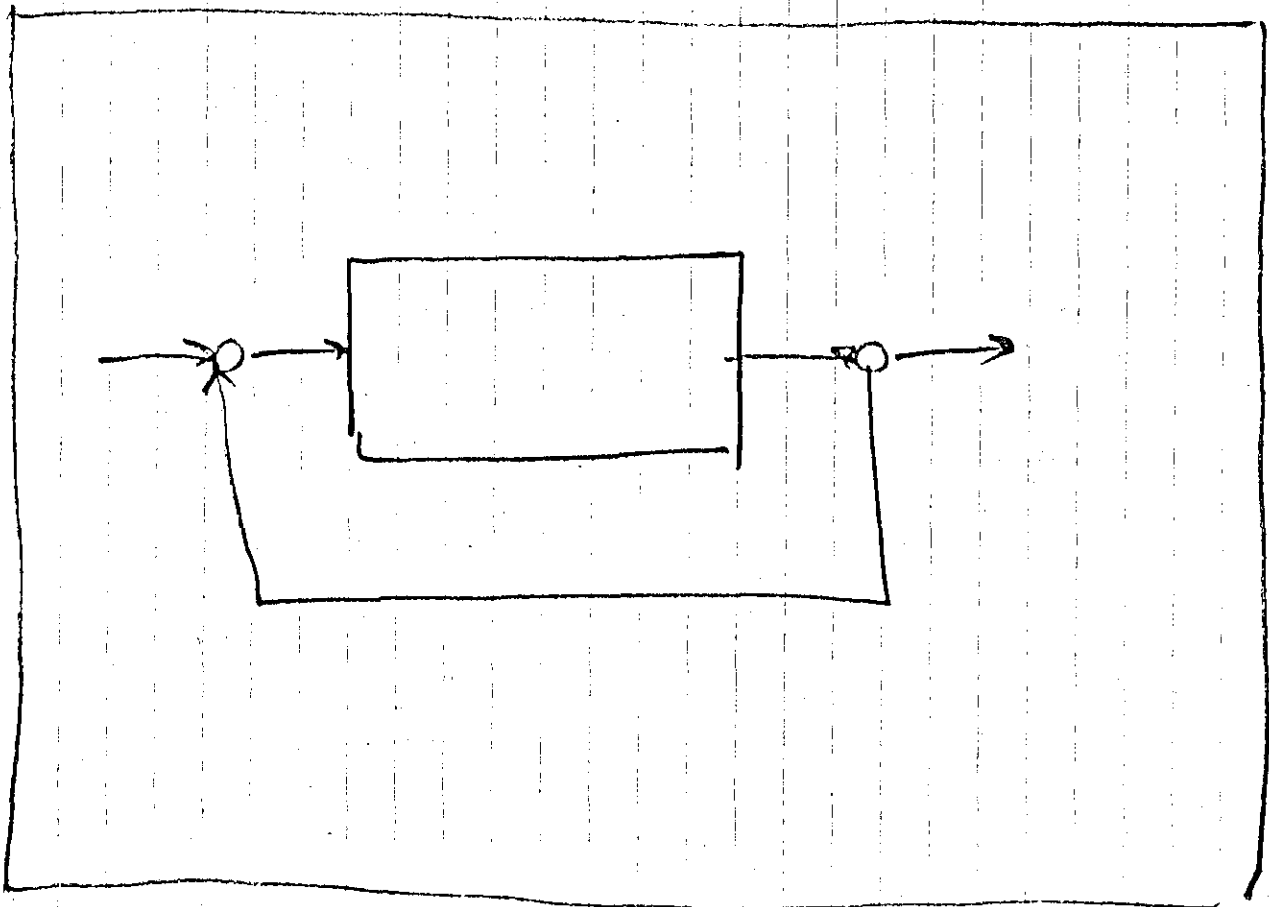


Fig 3 . Negative Feedback Amplifier

For a more up-to-date analysis see:
David Easton, A Systems Analysis of Political Life
N.Y.: Wiley (1965)

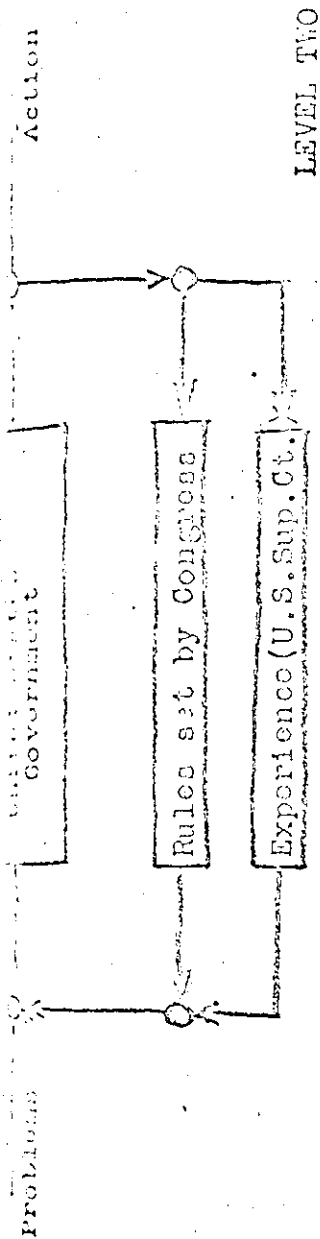


FIG. 4: Negative Feedback Circuit Representation of United States Government (Executive Department).

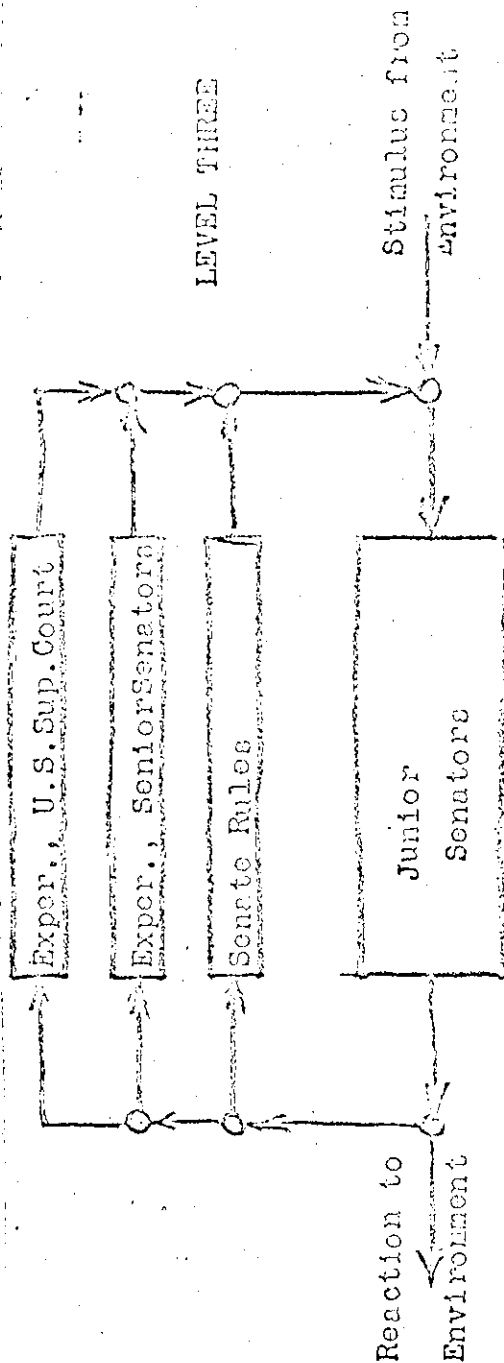

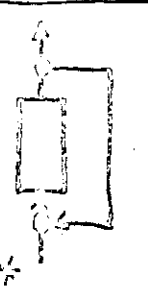



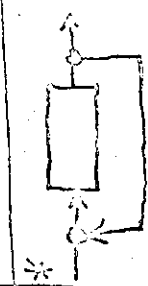

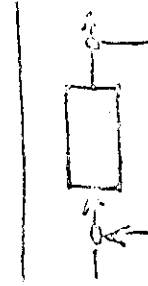

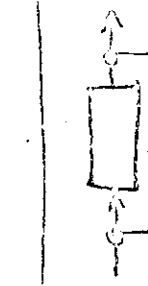
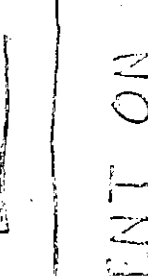
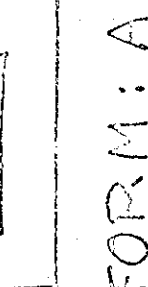


FIG. 5: Feedback Circuit of Staggered Terms in U.S. Senate.

CHANGING CAPACITY			PHILOSOPHICAL COMPRESSION CODING
			REDUNDANCY
			SEMANTIC CODING
			COMM-FREE GENETIC CODES
			TELEGRAPH AND COMPUTER CODES
			POSSIBLE COMPRESSION CODING

* D. & K. Stanley-Jones (1960) Kybernetics of Natural Systems

ACCENT ON FORM: A PATH TOWARD A UNITY.
PRINCIPLE IN SCIENCE AND LIFE.

Fig.

Consider measurement of internal degree of "democracy". See SEPR 88-B for details.

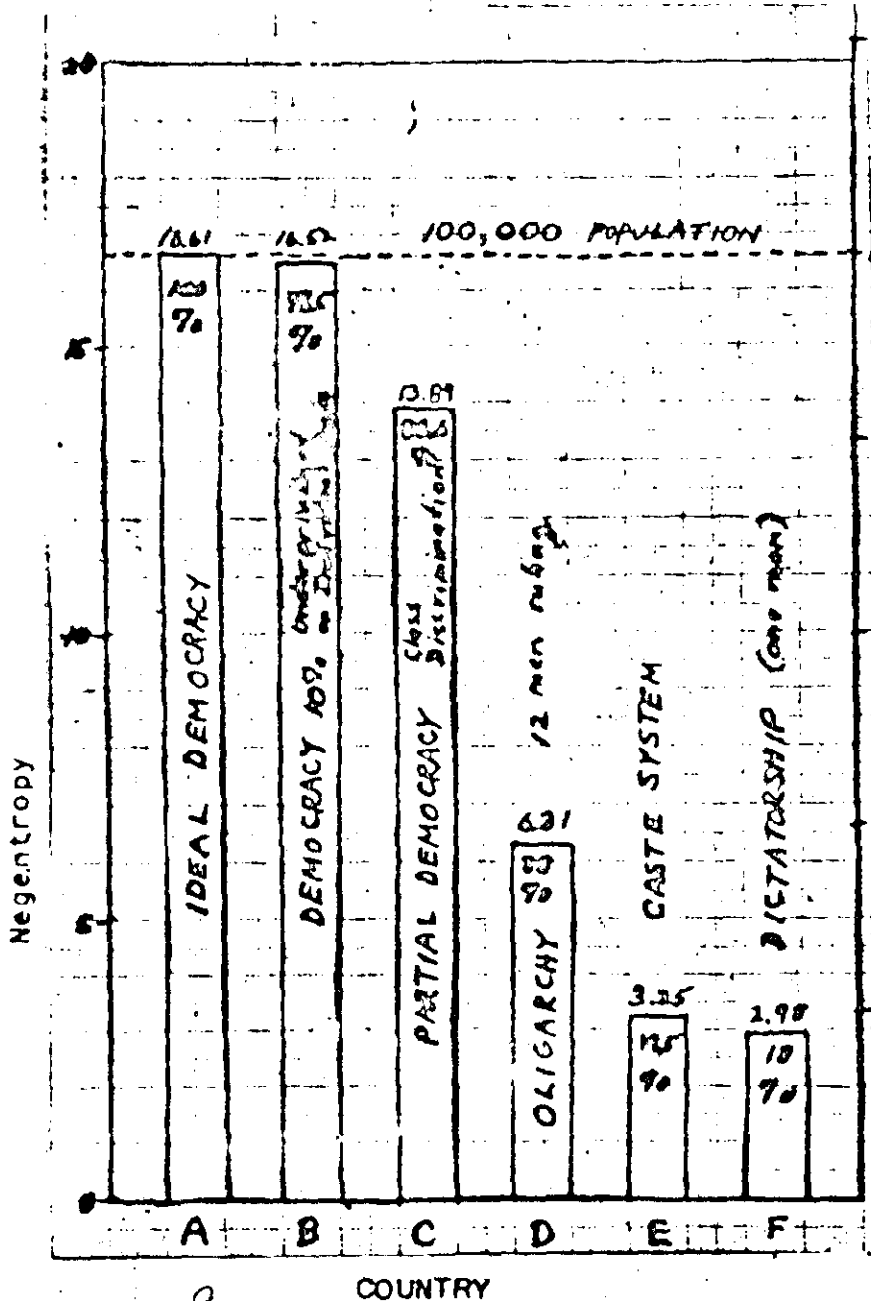
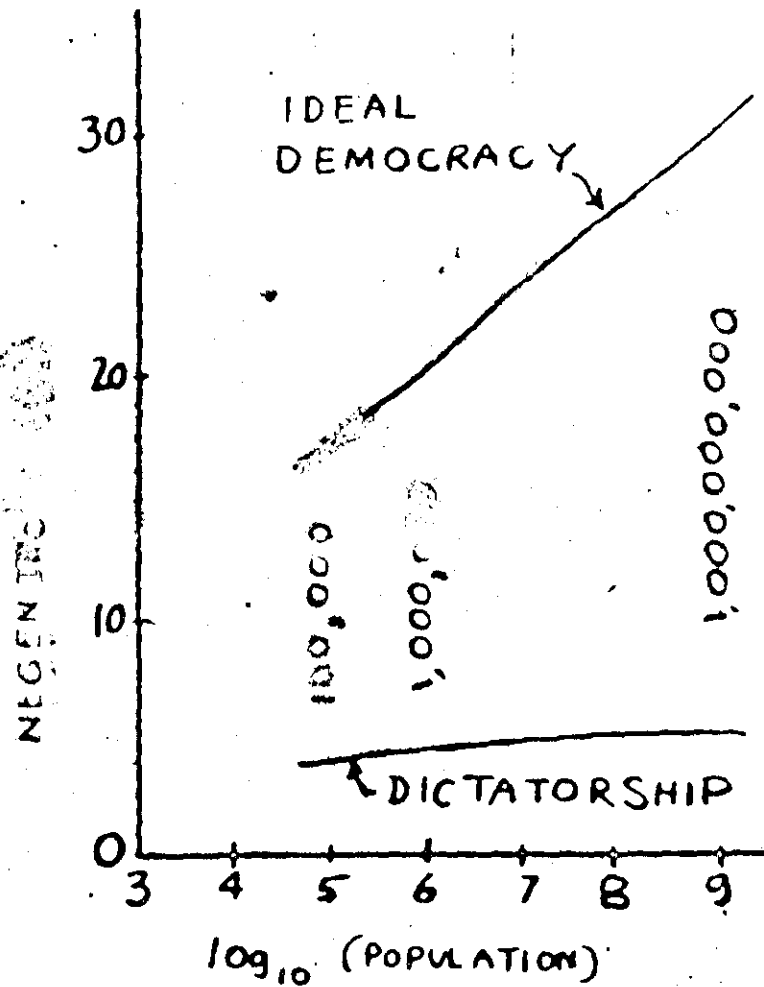


Fig. 9. Comparison of the Negentropy of Six Hypothetical Countries.



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 Fig. 12. Variation of Negentropy with Population for Ideal Democracy and for Dictatorship.

Consider dynamic-justice of a political system.

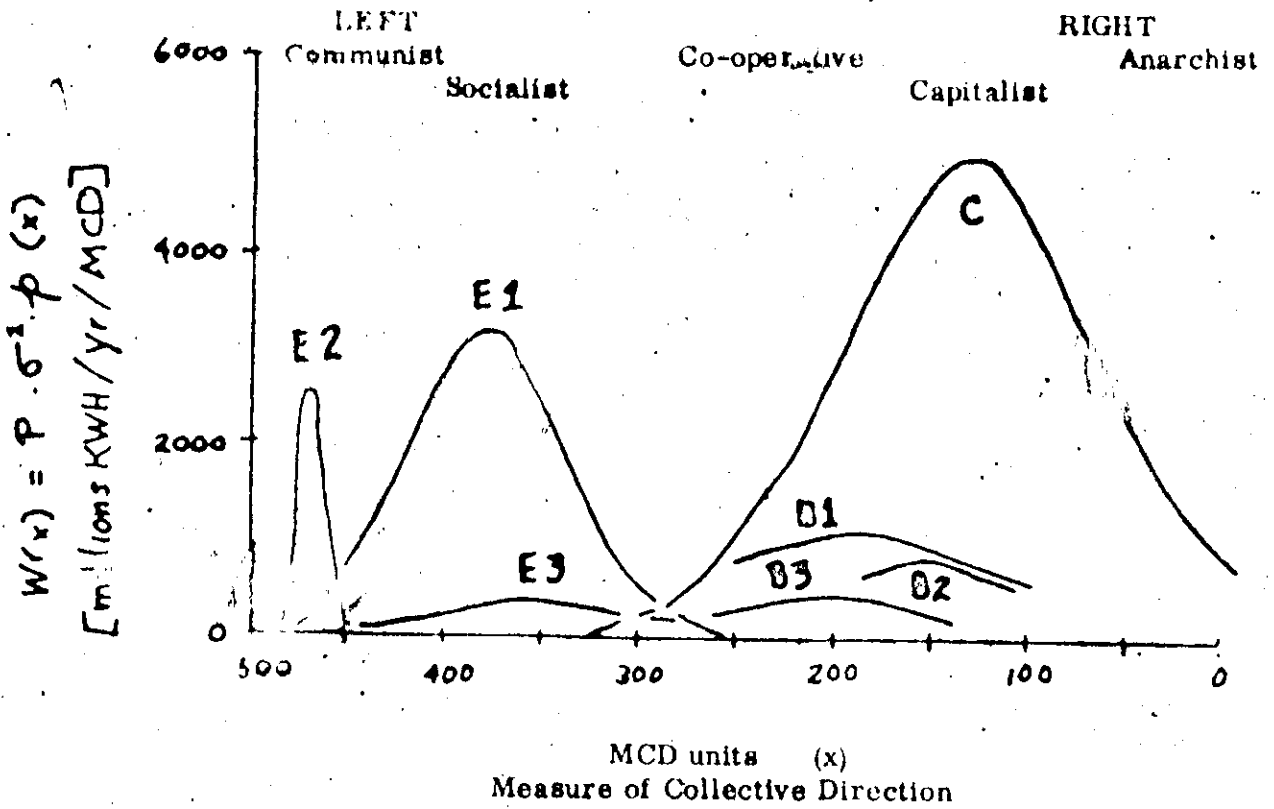


Fig. 14. Ideal Distribution Curves of Power versus Political Ideas for Some Hypothetical Countries.

Consider "preserving the tails" of probability distribution as essential to human freedom and development of creativity.

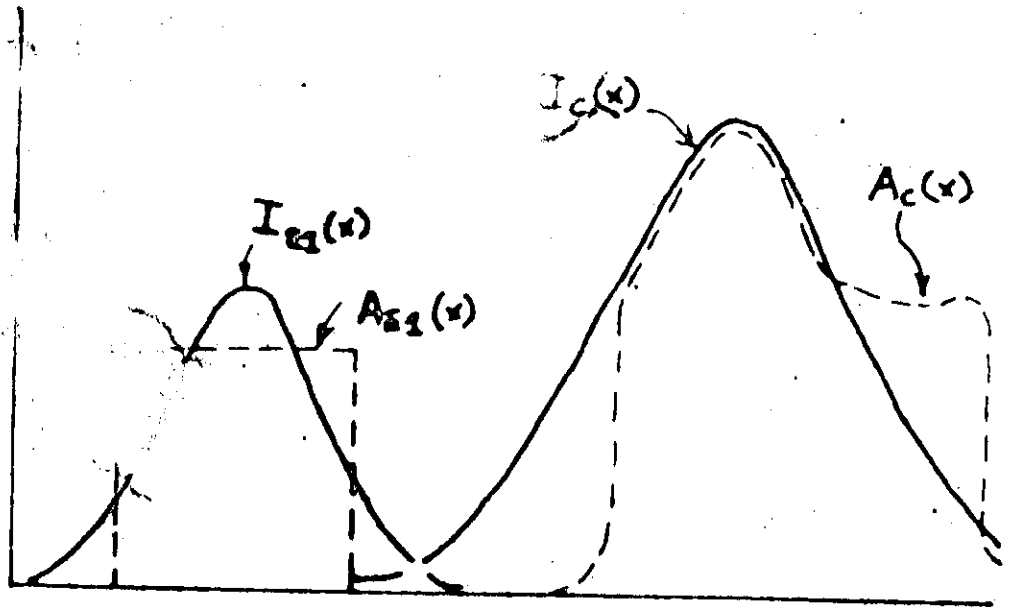


Fig. 14. Examples of Hypothetical Actual Power versus Political Ideas ($A(x)$ vs. x) Which Depart from Ideal Curves ($I(x)$ vs. x).

Testing of Hypotheses in respect to
Converging Era (Force, Power, or Communication)
A List of hypotheses (rows) and
criteria (columns).

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Notes:

- (1) Discuss method of judgement of developing countries such as
Cuba
Chinese People's Republic
- (2) Also possible check on errors in socialist development such as J. Stalin's dictatorial procedures.
- (3) Consider Rosa Luxemburg's criticism of Lenin - and its translation into negentropy.
- (4) Henry Adams concept of entropy & history.

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Date: 9/12/65 10/8/65 10/17/65 4/24/66 1/29/67

Stage:	Outline	Talk	Talk	Part to Notes
	Berkeley	San Jose	SEPR	Collected
	Unitarian	Humanist	56-B	

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