

"Proposed Stages of Application of Cybernetics to the
United States Political and Economic System."

by

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I. Introduction.

This is a draft outline of a proposal for the stages of application of cybernetics to the US political and economic system. The object of this proposal is to lay the base for techniques to enable the US system to use cybernetics and information theory in a way to coordinate a mixed system, namely a free enterprise system with respect for individual rights, with a limited amount of coordination by governmental agencies to help coordinate the interaction between different segments of the economy. In this proposal, the principle emphasis is on utilizing and cultivating the naturally occurring feedback loops within our social system that develop as a consequence of our tradition of civil liberties, religious freedom, and the historical religious base to our Western civilization.

This proposal is the result of a long series of studies done principally as a hobby while devoting my regular working hours to electrical engineering projects. The more recent stages in the series are as follows:

SEP No. 65-D(9/24/61-10/29/62) A Research Proposal for a Book on
"Communication Theory in the Cause of Man."

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An inquiry into the feasibility of using certain analogies from mathematics and the physical sciences and in particular from cybernetics and information theory to bridge the gaps between the different fields of specialization in science and between the humanities and the sciences. Although this process is proceeding step by step in the growth of science, a fresh organization of the material from an engineering viewpoint is proposed which has potential for both speeding up the application of these concepts and for providing awareness of the potential misapplication of such concepts.

SEPR No. 66 (11/20/61-4/24/64) "Creativity, Ethics and Specialization in Engineering."

First draft issued as "The Pseudo-Spiral of Creative Thought." An inquiry into the process by which the thoughts about the application of concepts of cybernetics and information theory were developed and their relationship to the technical engineering problems.

SEPR No. 67 (2/4/62-11/27/64) "Peace and Freedom."

Near the end of 1961 Mr. Blackman of CORE who was completing an internship with Acts for Peace prepared a draft memorandum on "Freedom and Peace," dealing with the relevance of the Communist question to the American peace movement. I commended Mr. Blackman for urging that we work for "Freedom and Peace," not just Peace. However, I questioned whether his analysis went deep enough from a sociological viewpoint to really grapple with the fundamental problems involved. He was approaching a problem where people's "channel capacity" was already exceeded. He made no mention of the philosophical problems of cybernetics which are at the root of recent significant developments in the Soviet Union. There is a principle of "quantization of truth" involved here, in which the society which discovers and uses the appropriate level of truth for our stage of development of civilization will become preeminent on planet earth.

This manuscript in the series (SEPR No. 68-A) was drafted while I was attending the American Association for the Advancement of Science and Society for General Systems Research national meetings in Philadelphia, December 26-30, 1962. The material is organized into the following sections:

- (I) Introduction
- (II) Need for a common philosophy
- (III) Need for a handbook

- (IV) A series of magazine articles
- (V) The re-examination of the way our system used to increase negative entropy
- (VI) The postulation of a model of what has happened to our system to cause this aging effect or slowing down of the increase of negative entropy that used to occur.
- (VII) Consider a strategy for rejuvenating the US system
- (VIII) Develop Laswell's social planetarium concept as an important tool in a democratic society.

II. Need for a Common Philosophy.

For the US and other countries of the West to compete with the Soviet Union in developing our respective systems, we need some philosophical base which could be used by UNESCO or some other agency of the United Nations as a measure of which direction the different countries were going, what progress they were making, to achieve their goals. I suggest that the concept of increasing negative entropy as an analogy from information theory offers great potential.* It enables all the diverse religious groups of the world in different political and economic systems to recognize the right of each other to co-exist. At the same time, it puts a test in the direction of greater recognition of individual rights and greater economic benefits to the people of the world as an overall criterion

* Note added 3/13/65: I have encountered considerable skepticism regarding the usefulness of the concept of "maximizing negentropy." Recently I have found that this approach is philosophically the same as the "thermodynamic imperative" of R. B. Lindsay, "Entropy Consumption and Values in Physical Science," American Scientist, 47, 376 (1959), with the added feature that my engineering approach gives promise of developing some concrete examples. See also R. B. Lindsay, The Role of Science in Civilization, N. Y.: Harper & Row (1963).

in this relationship. I feel that the steps outlined in my proposal, Social Engineering Problems, No. 65-C, and 65-D, offer a good approach to developing such a philosophy.

If we already had this common philosophy formalized we might be better able to give recognition to the significance of particular things the Soviet Union has done in the last few years, for example, the Soviet Union has been under criticism for a number of years for restricting the publication rights of the Jewish people in the Soviet Union, particularly for some time no Yiddish newspapers or magazines were being printed. Sometime in 1961 the Soviet Union re-established the Yiddish magazine, Sovetish Haimland, which is a step toward increasing the negative entropy as considered in the different religious and racial groups. Also some changes in their legal procedure may possibly be steps toward increasing the negative entropy of their system. If we have this common philosophy well organized and established we could then examine such legal changes and recognize which direction these changes were moving.

III. Need for a Handbook.

In order to develop a common philosophy, we need some kind of a handbook of the basic concepts of information theory and cybernetics together with criterion for what is a proper way to apply them to the social phenomena. I feel that to develop such a handbook is a very important step in this program. It is also very important that the procedures of science be carefully examined so that there is some example like the discussion of Einstein's special theory of relativity so that the layman studying this will get a better idea

of how many of our important scientific theories are developed and how they are tested so that they will be in a position to look for equivalent types of tests in the development of this common philosophy.

I have encountered some difficulty in discussing these ideas with religious leaders. The principle difficulty is that ministers of religion usually feel that they cannot take the time to learn new concepts and new definitions. If we had a handbook in good form, I think that the religious leader would find reading this handbook over in one evening would give him a big step toward understanding these ideas so that we would be able to break through the communications barrier.*

IV. A Series of Magazine Articles.[#]

The development of the handbook proposed above would take considerable time and could be subject to many editorial delays and many controversies. If the fundamental assumptions were discussed in a series of magazine articles distributed over a wide range of magazines this might help get some of the arguments going and resolved while the book is in the process of preparation. An

* Note: Since preparing this draft a number of things have developed which reduce the need for my particular form of handbook. The Twentieth Century Encyclopedia of Catholicism has published a volume by Neville Moray on "Cybernetics," N. Y.: Hawthorn Books (1963). R. B. Lindsay's recent book includes a section on the "thermodynamic imperative". Georgetown University recently held a symposium on "Cybernetics and Society." There are also problems, namely some people have been advocating solutions to the problems of automation, before they have utilized the available facilities for simulating the effect of such proposals upon the economy.

No really important magazine articles for the layman along these lines have been published. However, a lot of valuable experience has been gained in discussions with magazine editors, publishers, and officials of organizations.

important thing to consider is what magazines would be more useful in the initial stages. It might be more desirable to have these initial articles appear in magazines and news bulletins of various protest groups such as peace organizations, CORE, NAACP, civil liberties groups, then move on to religious magazines, philosophical journals, and then later come into some of the technical journals and more popular magazines. This sequence may appear to be a radical direction but it may be more useful in carrying a sustained discussion of the concepts and to develop more public interest and understanding in the long run.

V. Re-examination of the Way Our System Used to Increase Negative Entropy.

My limited understanding of history indicates that in the US we used to have more articulate protest groups like the Socialist Party. In the earlier stages the Labor unions performed an important function in that these protest groups formed a kind of negative feedback loop which disturbed the system enough so that they would point out what problems needed to be solved but in general the Socialists proposed something which, eventually, the Democrats or Republicans would put into practice. We needed and used the interaction of these protest groups as a kind of mixed positive-negative feedback system to enable our social system to grow to more fully realize our democratic ideals and our ideals with respect to individual rights and individual liberty. I have pointed out some aspects of this in references to Steinmetz in Social Engineering Problems, No. 1 and some of the later versions. One can particularly note

how Steinmetz, politically a Socialist, both worked for the General Electric Company, and was the Socialist mayor of Schenectady. During his Socialist administration a good number of reforms were experimented with that have now become accepted practice in the US. At the same time, Steinmetz recognized that certain developments requiring a large amount of capital could practically be done only by large corporations in our social structure so that he favored the consolidation of local power companies into large electric power systems even though these were contradictory to our concept of anti-trust laws. Sociologists, political scientists, and economists could probably contribute significantly to this re-examination. However, I wish to point out one note of warning. In 1947 I discovered that some of our competent sociologists or social scientists were not tackling the important problems we were facing, because for some reason they seemed to be afraid that if they spoke the truth as they saw it they would be less likely to get promoted. So these social scientists looked for less significant problems to study that would still generate pages of interesting scientific papers to give them recognition. I feel that the country has suffered from the failure of the social scientists to honestly tackle the important problems, although we cannot be too critical because they wanted to protect their jobs and chances to be promoted.

VI. Postulation of Models of What Has Happened to Us.*

* Note: Since writing this section an important book in political science has been published: Karl W. Deutsch, Nerves of Government - Models of Political Communication and Control, Free Press of Glencoe (1963).

Possibly we can conceive of our social system with a free enterprise system as a great many loosely connected systems with feedback loops with long time delays such that the economic system can go into oscillation due to the poor timing of the transfer of information among these independent companies. But then we can see that with a few controls like the Federal Reserve Boards controlling of the amount of securities, currency systems, and interest rates, that the Federal government has been able to effect partial stabilizing effect to help give these separate units a chance to recover or to regain stability. Perhaps a more significant part to examine is what kind of feedback loops exist in our political system due to individuals protesting when things went wrong, church groups protesting, and minority political groups protesting. It may be that the generalization of our loyalty and security system at the end of World War II has seriously disabled some of the naturally occurring control loops in our political system. With the loyalty system for all federal employees and in some states for all state employees, less people feel moved to conscientiously object when they see injustices that the system fails to handle. This appears to some as the equivalent of a breakdown of conscience in our system. Although we do not have a precise model of this process, it is important to investigate so we can know what is happening to our own system. One possible feature that may have greatly reduced the naturally occurring feedback loops is the McCarran Act with the regulations of the Subversive Activities Control Board requiring alleged Communists to register. There may be a carry-over of this scare into

church groups and non-Communist Socialists from being very active so that they in turn have disabled more thoroughly the natural feedback loops in our system.

VII. Consider a Strategy for Rejuvenating the US System.*

We need to attempt to cultivate individuals and groups who naturally develop the role of a conscience in our society. When some individuals or peace groups or religious groups, or members of minority groups like CORE or NAACP put on some protest we should have the appropriate government agency against whose policy they are protesting give them some kind of hearing -- polite but not too much time -- to present their ideas to whatever board or policy planning group -- AEC, Dept. of Defense, or whatever department is concerned -- so that they will have a chance to get some feedback. Suppose they appear before some committee on defense. The experts on defense might give back to them some questions that they might not be able to answer initially, but would send them back for study to determine whether they still felt they were correct, or whether they had overlooked something.

We should examine what administrative and legal procedures inhibit the natural functioning of the groups that form these feedback loops in our society. For example, it might be necessary to amend the McCarran Act or repeal it, or possibly the courts might find sufficient portions of it unconstitutional. Further, some

* Another bad feature of the early post World War II loyalty system was the inhibition of interdisciplinary studies due to loyalty oath crises at University of California. This was partially overcome by the developing space program which by its project orientation forced the crossing of boundaries of formal disciplines.

changes in the security procedures could help protect our society. One feature that causes a serious inhibition of religious groups concerned with peace and freedom is the common practice of some of our industrial companies in their screening of applicants for engineering jobs is to have the investigating concern make a check on the applicant in which one of the printed questions is: Does the applicant belong to any so-called "Peace groups"?

Another item that has interfered with the natural functioning of people's consciences is the existence of detention camps on a standby basis in peace time for political prisoners in the event of war. All these camps were eliminated a few years prior to 1962. Since it is not generally known to people that the camps were disbanded, people still assumed it was the policy of the US government to maintain these detention camps. It was just this year (1962), I think, that it became generally known that the camps had been disbanded several years prior to 1962. This and other features of the U.S. security program were particularly disturbing to people who were aware of the history of the Nazi Party in Germany. It was also disturbing to some people who had become interested in the cause of world government partly through the reading of Cord Meyer, Jr.'s book Peace or Anarchy. In his chapter on "What Price Preparedness?" he said, "History does not encourage one to believe that the rights and freedoms of a democratic government can long survive a dominant military influence."#

Cord Meyer, Jr. Peace or Anarchy. Boston: Little, Brown and Co. (1947), p. 57.

VIII. Develop Laswell's Social Planetarium Concept and the Necessary Computer and Communications Hardware to Put it Into Practice.

The first part might be to set up a National Institute of Engineering Sociology or we might call it some other name which would coordinate such developments. This institute might also assist the United Nations to set up a corresponding institute. The idea is a social planetarium that would enable different groups to simulate different proposals on how to change factors in the economic or political system. It would be necessary to encourage opposing political and economic groups to learn computer programming so that they could put their own computer programs on the system. It might also be necessary to develop the necessary programming techniques and hardware for economical remote programming of computers so that if a University professor from some small college does not have a computing installation he could have a low cost telephone device at his university/^{so}that he could dial a nearby service bureau or an institute in Washington, D.C., to send in his program, run it, make changes, and get the results. These components might be developed in the natural course of events by the computer industry or it might be necessary for a government agency to ask for bids to develop the type of equipment/^{that}this national institute might find was necessary.

IX. Conclusions.

The overall objective of these items in this proposal is to lay the base for a system that would allow the West and the particular subdivisions of the West, like the U.S., to keep track of what is happening in our political and economic system in a way that still

gives a chance for the individual companies, individual countries, to make their own decisions. But it provides the individual companies and their governments and the United Nations understanding what the consequences are of many different individual decisions of smaller groups. This is a somewhat more complicated problem than the problem the Russians are dealing with to simulate their essentially controlled economic system on the computing system would be well worth it in protecting human freedom to develop a system that can coordinate without severely controlling the freedom of the individual parts. There are other advantages, particularly to be derived from this common philosophy. It should be possible for scientists to generate more enthusiasm for the general advance of science if they can more readily relate the work in their field to the work in other fields, and see how the concepts of cybernetics and information theory help tie together a coherent view of the whole structure of science, the great progress made in each separate field.

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