

"A Hypothesis On the Negative Entropy Of
Sociological Systems As A Measure Of The
Respect for Human Freedom."*

by

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As a computer engineer I would like to take exception to some of the statements of Mr. Ben B. Seligman. Since the time is short, I shall comment only on what Mr. Seligman calls the most serious social costs:

"Perhaps the most serious social cost stems from distortions of our value systems imposed by cybernation, for the philosophic preconceptions in computer technology are thoroughly mechanistic." [p. 7, par. 2]

"What is so disturbing about these efforts to cybernate existence is the creation of conditions which facilitate the manipulation of people. ----- Such activities can be rooted only in a callousness and sense of expediency that readily sustains a mass society in which individual uniqueness cannot survive." [p. 9, par. 1]

The above issues are more philosophical than computer engineering, therefore I shall switch hats to my alternate ego of "philosopher." I agree with Mr. Seligman as to his concern for human values. However, I feel he only sees a part of the total picture. I grant that, if we look at the designer's circuit diagrams, an operating computer, the input cards or tapes, and the

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output, we see a mechanistic system.

If we take another look at the mathematics used in designing computer systems we can see how the computer system can be looked at as a set of communication channels with memory and switching circuits generically related to telephone exchanges and networks. This means we could study some aspects of the efficiency of the computer using concepts from Information Theory for calculating the average negative entropy of sets of messages.

Next, if we use the viewpoint of General Systems Theory to put the above material in perspective relative to other human activities, we can estimate whether the equation for average negative entropy on the physical plane has significance on either of the other levels of phenomena such as chemical biological, psychological or sociological.

Now I shall state a hypothesis which I can neither prove nor disprove at this stage. I shall use this working hypothesis, even though unproved, because to date it gives results which are consistent with known facts and accepted political theory. To further define the field of application of the concepts with respect to all human activities it is convenient to define a three-dimensional space in which the x-location defines the process: understanding nature; engineering or applied science; learning or teaching; or decision-making. The y-direction would define the method: empirical science; abstract, philosophical; or intuitive-poetic. The z-position would be the level of phenomena from physical to sociological.

HYPOTHESIS: The equations for the average negative entropy of a set of instructions in a computer or a set of messages on a telegraph line have isomorphic applications on other z-levels in the column y = applied science.

COROLLARY: If we replace the probabilities of a set of messages or instructions being transmitted by the probabilities that people have a set of freedoms in a sociological system, then the calculated average negative entropy is a measure of the protection of individual human values or a measure of the democracy in the system.

A start has been made in the investigation of this hypothesis and corollary. Some assumed sets of human freedom probabilities have been put into the equation for average negative entropy with the following result:

<u>Set of freedoms corresponding to:</u>	<u>Negative*</u> <u>Entropy</u>	<u>Relative</u> <u>PerCent</u>
Ideal Democracy	16.61	100%
Approximate Democracy with 10% of population underprivileged, but status determined by individual performance.	16.52	99.5%
Democracy with special pri- vilidges for upper class of 10% on the basis of ancestry or color.	13.90	88.6%

* More complete details are given in Socio-Engineering Problems Report No. 88-B, P. O. Box 85, Campbell, California.

The preceding table indicates that a part of the mathematics used in computer design has potential value in measuring the respect for individual human values or a measure of democracy in a sociological system when viewed from the perspective of General Systems theory. Thus there is the possibility that the use of computer technology may yield as a by-product some isomorphic sociological laws which can at least help us measure the respect for individual human freedom, and may lead to further research on the structure of society so that individual uniqueness can more easily survive.

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