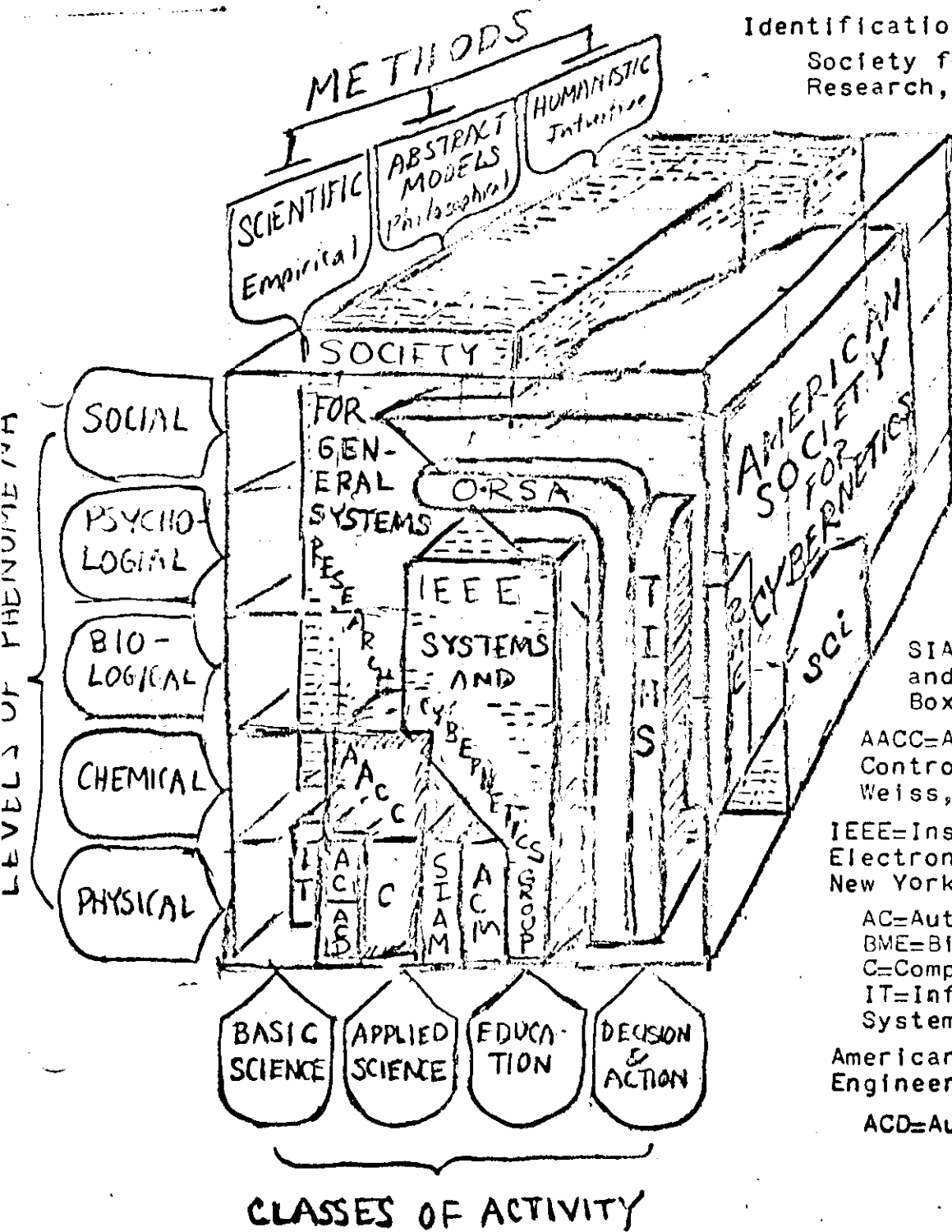


"A Perspective Of The Functions Of The Major U.S. Organizations In Systems Theory, Cybernetics And Information Theory."

The basis of this three-dimensional chart is discussed in a previous paper: Frederick B. Wood, "A General Systems Theoretic Model for the Estimation of the Negentropy of Sociological Systems Through the Application of Two Isomorphic Electrical Communication Networks," SEPR No. 92-B, London: First International Congress for Social Psychiatry, August 19, 1964.



Identification of Organizations:

- Society for General Systems Research, Box 208, Bedford, Mass
- American Society for Cybernetics, 1303 Wisconsin Ave., N.W., Washington, D.C.
- SCI=Simulation Council, Box 2228, La Jolla, Calif. 92038
- TIMS=The Institute of Management Sciences, P.O. Box 273, Pleasantville, New York
- ORSA=Operations Research Society of Amer. Mt. Royal & Guilford, Baltimore, Md. 21202
- ACM=Association for Computing Machinery, 211 E. 43, New York, NY
- SIAM=Society for Industrial and Applied Mathematics, Box 7541, Philadelphia, Pa.
- AACC=American Automatic Control Council, c/o Prof. G. Weiss, 333 Jay St., Brooklyn
- IEEE=Institute of Electrical & Electronic Engineers, 345 E. 47, New York, N.Y. 10017 --Groups:
- AC=Automatic Control,
- BME=Bio-Medical Engineering,
- C=Computer Group,
- IT=Information Theory, Systems & Cybernetics Group.
- American Society of Mechanical Engineers, 345 E. 47, New York
- ACD=Automatic Control Divis.

Most of the scientific and engineering organizations have specific areas of specialization in the physical science level in either or both methods: empirical science or abstract models. Three organizations have more specific inter-disciplinary responsibilities and objectives. The first objective of our own group -- the Society for General Systems Research is to investigate the isomorphy of concepts, laws, and models in various fields, and to help in useful transfers from one field to another. SGSR is affiliated with the American Association for the Advancement of Science (AAAS), Section L: History and Philosophy of Science. Thus our own society performs more of a pioneering role in exploring the potential significance of isomorphic relationships between different fields of science and philosophy.

The Systems and Cybernetics Group (G-35) of the Institute of Electrical and Electronic Engineers (I.E.E.E.) is oriented more closely to engineering systems for which there are techniques for testing hypotheses. Although the I.E.E.E. Systems & Cybernetics Group is based in the engineering section, physical phenomena, its plans include extensions of systems and cybernetic concepts to biological systems. It is anticipated that this group will do a thorough job of testing theories, defining concepts, and establishing methodological standards.

The American Society for Cybernetics primary aim is "to stimulate development and application of cybernetic concepts and methods for achieving higher human aspirations and for enhancing powers of intellect. ...doing so in a manner to aid the public welfare, the government and the development of business and industry--and in such a manner as to enhance the cultural growth & the material prosperity and happiness." The role of the American Society for Cybernetics may turn out to be "an interpreter of science in terms of human needs." The ASC might take on a specific project by first identifying an urgent area of human needs such as the growing complexity of scientific information management problems discussed in Vice-President Hubert Humphrey's speech of September 10, 1964 (Cong. Record - Senate, pp. 21281-5). ASC would be in an excellent position to integrate the contributions of SGSR, IEEE Groups, and others toward defining Project PASSIM to bring the talent of the scientific societies, industry, government, and labor cooperatively to bear on these problems.

The most generally accepted definition of Cybernetics is "the science of communication and control in the organism and machine. It deals with the character and function of complex systems operation, including those that are self-organizing and adaptive." Norbert Wiener in I Am A Mathematician (p. 327) includes sociology and economics within cybernetics. Segments of both the academic and industrial communities have reacted to Norbert Wiener's broad definition of cybernetics with a fear that their sphere of authority is being challenged. It is the task of the inter-disciplinary scientific societies to develop techniques of showing how increased inter-disciplinary communication can benefit both the established institutions and the overall welfare of our country.

All of the organizations listed on the chart in this note have established procedures for the review by experts of proposed papers which are developed in the course of their work to insure that hypotheses are properly labelled and that conclusions meet the requirements of the scientific method. There is one organization which I have omitted from this chart, because there is some confusion as to whether it is doing bona fide scientific research, or whether it is promoting specific economic reform measures without adequate testing of the hypotheses. I have omitted the Institute for Cybercultural Research, New York City,

pending a determination of how well it meets the customary standards of scientific research.

The objective of this note has been to illustrate how there is need for several types of inter-disciplinary organizations, namely exploratory work, on transfer of concepts from one field to another; applying the more easily tested concepts and methodologies; and coordinating the application of inter-disciplinary concepts and technologies to the urgent problems of our civilization. At present the three organizations oriented to best perform these tasks are respectively the Society for General Systems Research; the I.E.E.E. Systems and Cybernetics Group; and the American Society for Cybernetics. Each of these organizations has a unique role in filling the space in the perspective chart to insure that our country applies effort to the different phases of the urgent problems of our civilization.

* There is some controversy over the definition of the field of Cybernetics. Norbert Wiener's definition is explained and discussed in J. R. Pierce, Symbols, Signals and Noise, N.Y.: Harper & Row (1961) in the chapter on Cybernetics.

For a short bibliography on "Cybernetics and Related Topics In Communication Theory," see SEPR No. 46-C, 4/24/65, 5pp., 36 ref's.

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