

SOCIO-ENGINEERING PROBLEMS REPORT NO. 43

A series of manuscripts on the social relations of engineering and related philosophical questions dealing with the interaction of science and society. Distribution is limited to reviewers and discussion groups for criticism prior to consideration for possible publication.

"A PLAN FOR INVESTIGATION OF THE RELATIONSHIP BETWEEN PHYSICS,
ELECTRICAL ENGINEERING AND THE SOCIAL SCIENCES."

Note

This is a reprint of a manuscript of October 3, 1946, in which the first part of SEPR No. 41, "Proposed Social Engineering Research," is extended. The results of pursuing this plan are reported in the following reports:

SEP Nos. 9A & 10A, "Partial Derivatives of History" (11/25/46-3/3/62)
SEP No. 11A, "The History of Electromagnetic Theory" (Abstract)
(5/26/47-4/6/62)
SEP No. 12A, "Historical Perspective" (1/10/47-5/7/62)
SEP No. 13A, "The Dilemma of Specialization" (1/10/47-5/8/62).

The classification of the sciences in SEPR No. 41 was extended to the form of a "checking chart" in:

SEP No. 14A, "Example of the Use of Checking Chart, Part I:
Checking Chart, Historical Perspective and World Power
Production." (5/21/47-5/10/62) The "checking chart"
was first used in a YMCA discussion group. (4/28/46)

The concept of the "checking chart" is further developed in
SEP Nos. 1, 20A, 20B, 27A, 27B, 27C.

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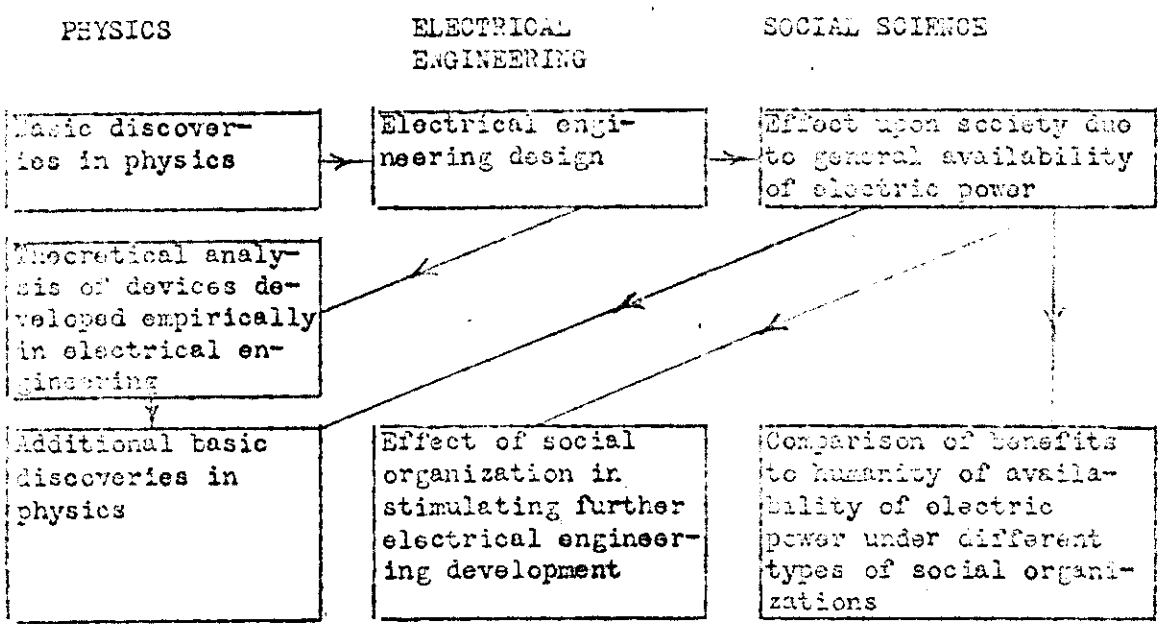
A PLAN FOR INVESTIGATION OF THE RELATIONSHIP BETWEEN PHYSICS,
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If one were to ask "What is the most important problem facing our civilization today?" one would receive many answers. However, I would venture to guess that a majority of the answers would be some kind of a statement of the tremendous problem of securing cooperation among the various social groups that inhabit the earth. If one calls upon the experts in social science, philosophy, social welfare, religion, politics, industry, etc., one receives many different suggestions. These suggestions as to how to secure cooperation among the various social groups in our society frequently include verbal affirmation of the principle of "the brotherhood of man," but in many cases the specific plans of action appear to contradict the high principles to which adherence is claimed.

This situation leads one to guess that the scientific method has not been extensively applied to the problem of cooperation between social groups. An obvious attack upon the problem is to greatly increase the amount of social research by granting of fellowships and other types of financial assistance to social scientists. In addition there may be some less obvious methods of attack. There is a noticeable separation between the "natural sciences" and "social sciences" as far as our existing knowledge is concerned. Perhaps an

investigation of the relationship between the "natural sciences" and the "social sciences" might reveal certain relationships which would help contribute to the establishment of the "social sciences" on a more sound basis.

I propose to investigate the relationship between the "natural sciences" and the "social sciences." Since this can be a very broad field, it is necessary to establish some limiting conditions for the preliminary investigation. These limiting conditions might be established by making a study of some specific invention such as the electric motor* or transformer* in regard to aspects suggested by the following outline:



* Selected for this proposed study because a sufficient length of time has elapsed since the invention for sociological effects to be observed.

On further consideration it appears that the development of radio communication would be just as good a subject. Although not as much time has elapsed since the invention of radio as has elapsed since the invention of the electric motor or the transformer, there appears to be more material available regarding the social problems relating to the use of radio communication.

After brief examination of the field of radio communication, I find that with the study centered around electrical engineering design that there are so many subdivisions of radio engineering that it is difficult to make an initial study without involving an enormous amount of research. To overcome this difficulty I have considered different plans for the initial subject of investigation. If I shift the center of study to the social sciences, I would be using the direct attack and reducing the possibility of uncovering significant data on the relationship between physics, electrical engineering, and the social sciences. This leads me to consider two approaches simultaneously: one general study centered in physics dealing with the history of electromagnetic theory; and one more specific study centered in electrical engineering on the application of electromagnetic theory to microwave waveguide transmissions. This still leaves many difficulties in the plan; but the material to be studied will be of value from the traditional viewpoint of electrical engineering even if it fails to yield significant data on the relationship between the "natural sciences" and the "social sciences."