SOCIO-ENGINEERING PROBLEMS REPORT NO. 33-B

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.

"APPLICATION OF THEORY OF FUNCTIONS
OF REAL VARIABLES".

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"Application Theory of Functions of Real Variables".

Abstract

The enclosed one page note was written in 1947
while taking a course in The Theory of Functions of Real
Variables. The way I assimilated the "abstract" concepts
of mathematics was to go for a walk in the hills above
the Berkeley Campus after class. I would contemplate
what types of phenomena might be represented by the
concepts of the mathematics I was studying.

Plans for extending these embryonic ideas are given
in Socio-Engineering Problems No. 65-C*, "Proposed Research
Plan of Communication Theory in the Cause of Man", Oct.10,1962,
Section II. A. Covering Theorem and II B, Partial Derivative
and Series Expansions.

Frederick B. Wood

*Also in SEP No. 65-D,pars. 1.B. (3) a-b.

An Abstract of an Unwritten Paper on the Application of the Theory of Functions of a Real Variable to Electrical Engineering.

The analysis of the coupling of resonant circuits such as microwave resonant cavities utilizes the Stieltjes integral. When electrical engineering is redefined as the application of our knowledge of electromagnetic phenomena to the meeting of human needs, other possible applications of the theory of functions are foreseen.

These other possible applications lie in the field of a possible theory of social integration which might take ten or twenty years of intermittent research to establish. Although no evidence has yet come to my attention that any parts of the theory of Riemann integration can be directly applied to social theory, it seems possible that certain theorems of mathematics, when generalized in the form of logic, may prove useful in the field of sociology. It is possible that when these (unwritten) ideas are examined by experts in the fields involved that this may turn out to be naive imagination without much basis for logical analysis.

Table of Contents (Proposed)

1. A Discussion of the scope of electrical engineering.

2. An example of the use of the Stieltjes integral in computing the mutual inductance of a loop in a resonant cavity.

3. A discussion of a proposed investigation of a theory of social integration.

   a. Is there a social analogue to the existence theorem for the solution of a differential equation?

   b. Can the solution of differential equations by methods of successive approximations be of assistance in setting up procedures for varying social hypotheses?

   c. What is the covering theorem of applied sociology (i.e. engineering application of social psychology and social theory) corresponding to the Heine-Borel-Lebesque covering theorem?

   d. What form might a theory of social integration take?

   e. Of what assistance might the analysis of convergent series contribute to a sequence of coverging social hypotheses?

F.B.W.   12/15/47