

## TRENDS AND SOCIAL IMPLICATIONS OF RESEARCH<sup>1</sup>

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Acceptance of an invitation to deliver a lecture in such an eminent and established institution as the Josiah Willard Gibbs Lectureship places on one a responsibility to conform, as well as one's background and talents permit, to the aims and traditions of the series. Fortunately the aims as stated permit a broad range of possible subjects; to wit, the lectures are "to be for a general scientific public on topics in mathematics or in fields closely allied to mathematics." Of course, once an invitation has been extended there is probably no way to control what the invitee says or whether he conforms to the stated aims. And elastic as the aims of the Gibbs Lectureship are, I find on looking over the titles of past lectures, as well as reading the published versions of some, that these aims have been stretched at times to rather extreme limits. Thus the topics have ranged over a broad spectrum from the biographical through biological evolution, astronomy, social sciences, experimental and theoretical physics, mechanics, engineering, sensory prosthesis, genetics, operations research and information theory to pure mathematics. Some of these topics involved extensive applications of mathematics, while others had little or no relation to mathematics. The talks in mathematics have ranged from foundations and philosophy through topology and number theory; only one seems to have been devoted to mathematics as a field, viz., Marshall Stone's lecture 12 years ago on *Mathematics and the future of science* [1].

My own selection has of course been influenced by my personal interests and limitations, but more strongly by the increasing concern throughout the scientific community with the problems centering about such topics as research and development, basic research versus technology, research versus teaching and the like, not only as affected by public and private support of research, but as represented by congressional investigations and numerous critical articles in both the popular and scientific press. Much of the latter has been characterized by misrepresentation, and in considerable part by misunderstanding. Misrepresentation, especially when deliberate or politically motivated,

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<sup>1</sup> Except for the addition of section headings and a short bibliography, this is a verbatim copy of the 42nd Josiah Willard Gibbs Lecture delivered before the Annual Meeting of the Society in New Orleans on January 23, 1969; received by the editors April 22, 1969.