

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Science serves its readers as a forum for the presentation and discussion of important issues related to the advancement of science, including the presentation of minority or conflicting points of view, rather than by publishing only material on which a consensus has been reached. Accordingly, all articles published in *Science*—including editorials, news and comment, and book reviews—are signed and reflect the individual views of the authors and not official points of view adopted by the AAAS or the institutions with which the authors are affiliated.

Editorial Board

1972

ALFRED BROWN	FRANK PRESS
JAMES F. CROW	FRANK W. PUTNAM
THOMAS KUHN	WALTER O. ROBERTS
ELLIOTT W. MONTROLL	

1973

H. S. GUTOWSKY	GARDNER LINDZEY
ARTHUR D. HASLER	RAYMOND H. THOMPSON
RUDOLF KOMPFFNER	EDWARD O. WILSON
DANIEL E. KOSHLAND, JR.	

Editorial Staff

Editor

PHILIP H. ABELSON

Publisher	Business Manager
WILLIAM BEVAN	HANS NUSSBAUM

Managing Editor: ROBERT V. ORMES

Assistant Editors: ELLEN E. MURPHY, JOHN E. RINGLE

Assistant to the Editor: NANCY TEIMOURIAN

News and Comment: JOHN WALSH, DEBORAH SHAPLEY, ROBERT GILLETTE, NICHOLAS WADE, CONSTANCE HOLDEN, BARBARA J. CULLITON, SCHERRAINE MACK

Research News: ALLEN L. HAMMOND, WILLIAM D. METZ, THOMAS H. MAUGH II

Book Reviews: SYLVIA EBERHART, KATHERINE LIVINGSTON, KATHRYN MOUTON

Cover Editor: GRAYCE FINGER

Editorial Assistants: MARGARET ALLEN, ISABELLA BOULDIN, BLAIR BURNS, ELEANORE BUTZ, ANNETTE DIAMANTE, MARY DORFMAN, JUDITH GIVELBER, MARLENE GLASER, CORRINE HARRIS, OLIVER HEATWOLE, CHRISTINE KARLIK, MARSHALL KATHAN, MARGARET LLOYD, DANIEL RABOVSKY, JEAN ROCKWOOD, PATRICIA ROWE, LEAH RYAN, JOHN SCHAUER, LOIS SCHMITT, YA LI SWIGART, ALICE THEILE

Guide to Scientific Instruments: RICHARD SOMMER

Membership Recruitment: LEONARD WRAY; **Subscriptions:** BETTIE SEEMUND; **Addressing:** THOMAS BAZAN

Advertising Staff

Director	Production Manager
EARL J. SCHERAGO	BONNIE SEMEL

Advertising Sales Manager: RICHARD L. CHARLES

Sales: NEW YORK, N.Y. 10036: Herbert L. Burklund, 11 W. 42 St. (212-PE-6-1858); SCOTCH PLAINS, N.J. 07076: C. Richard Callis, 12 Unami Lane (201-889-4873); CHICAGO, ILL. 60611: John P. Cahill, Room 2107, 919 N. Michigan Ave. (312-DE-7-4973); BEVERLY HILLS, CALIF. 90211: Winn Nance, 111 N. La Cienega Blvd. (213-657-2772)

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phones: (Area code 202) Central office: 467-4350; Book Reviews: 467-4367; Business Office: 467-4411; Circulation: 467-4417; Guide to Scientific Instruments: 467-4480; News and Comment: 467-4430; Reprints and Permissions: 467-4483; Research News: 467-4321, Reviewing: 467-4440. Cable: Advancesci, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. See also page xv, *Science*, 30 June 1972. **ADVERTISING CORRESPONDENCE:** Room 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE-6-1858.

Research and Planning

We are all familiar with Bertrand Russell's famous nonquestion, "Who shaves the barber?" The barber's quandary, it will be recalled, stemmed from the fact that in his community he shaved every man who did not shave himself and he shaved no man who shaved himself. I have referred to this as a nonquestion because, although at first blush it looks like a question and parses as a question, the attached definition of the barber's domain precludes a proper answer. In our family we have an in-joke that ends, "Ask a silly question and you get a silly answer." I should like now to suggest that, if you ask a nonquestion, you get a nonanswer.

Nonquestions may be more common than is generally supposed. We in science and science administration are frequently asked, "How do you plan research?" Albert Szent-Györgyi,* drawing on his long and fruitful career, has written: "... research means going out into the unknown with the hope of finding something new to bring home. If you know in advance what you are going to do, or even to find there, then it is not research at all: then it is only a kind of honorable occupation."

And again: "... when I go home in the late afternoon from my laboratory I usually do not know what I am going to do the next day. That depends on what I found today, and I need time to digest it, which I mostly do overnight."

Research is the invasion of the unknown. One may traverse previously mapped territory, planning one's course in some detail until one reaches the border of terra incognita. At this boundary, there must be an abrupt change in strategy. The jungle is dense, perception is limited. One cannot know where one will be a day hence, one cannot be certain of either distance to be covered or direction to be taken. In short, one cannot plan.

The best one can do is prepare for contingencies. Supplies and navigational tools may be acquired and survival skills may be learned—but these may never be needed, while others, soon to be needed, may be overlooked. As one trudges through the jungle, foresight is generally limited except when an occasional clearing is encountered. Once the trail has been blazed, to pave it into a road can be a planned operation; but, as Szent-Györgyi points out, this is no longer research.

If research is equated with a form of intellectual endeavor that cannot be planned, then the question, "How do you plan research?" translates into, "How do you plan that which cannot be planned?" This is clearly a nonquestion. If a resolution is needed it may be sought in the realm of trans-science,† where unanswerable but superficially scientific questions find operational solutions in the legal and legislative techniques of adversary confrontation, advocacy, and the polling place. Preparations for the conduct of research (for example, funding and training) may be planned, but the research proper remains an unplanned exercise. —DEWITT STETTEN, JR., *Director, National Institute of General Medical Sciences, Bethesda, Maryland 20014*

* A. Szent-Györgyi, *Perspect. Biol. Med.* 15, 1 (1971). † A. M. Weinberg, *Minerva* 10, 209 (1972).