

4S Society for Social Studies of Science

Spring 1979

Volume 4 Number 2

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4S Society for Social Studies of Science

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4S: PROGRESS AND PROSPECTS

Editors' Note

Readers of the Newsletter may have noted in our previous issue (Volume 4, Number 1) a change in the Editorial staff. Leaving the staff is Dr. Henrika Kuklick who served as an Associate Editor during the difficult period of transition between Editorial teams. Her efforts are greatly appreciated. At the same time we welcome Dr. Steve Woolgar as a new Associate Editor. Steve will add an important European perspective to the Newsletter. Good luck to all!

BE SURE TO SEE THE FOLLOWING SECTIONS ON:

1. FOURTH ANNUAL MEETING
2. ELECTION OF OFFICERS - 1979

FOURTH ANNUAL MEETING: PROGRAM NOTES

TIME: 8 PM Friday, 2 November to 3:30 PM Sunday, 4 November 1979

PLACE: L'Enfant Plaza Hotel, 480 L'Enfant Plaza East, S.W., Washington, D.C. 20024

The fourth annual meeting of the 4S will be held at the L'Enfant Plaza Hotel in Washington, D.C., on November 2-4, 1979. The program will begin on Friday evening at 8:00 p.m. and will end on Sunday afternoon at 3:30 p.m.

Conference organizers are planning a special luncheon and a dinner banquet for the 4S on Saturday. The speaker at the luncheon will be Derek de Solla Price. (The cost of the luncheon is included in the pre-registration fee of \$25.) The Saturday banquet dinner will cost \$20. Dorothy Nelkin will make her Presidential Address at the banquet. Those planning to attend the conference are strongly urged to pre-register and to pay for the dinner in advance; eating facilities near the hotel are virtually non-existent on the weekends.

Please send your payments for pre-registration and the banquet by September 30, 1979 to the 4S, c/o Professor Lowell Hargens (4S Secretariat), Department of Sociology, Indiana University, Bloomington, Indiana 47401. (Registration at the conference will cost \$30.)

The L'Enfant Plaza Hotel is reserving a block of rooms at a special rate for those attending the 4S Conference. Single rooms will cost \$45 per day; double rooms will cost \$50 per day. In order to be assured of getting this rate, you should return the hotel reservation form by September 30, 1979.

Although most of the program will be arranged by the time this Newsletter appears, anyone interested in presenting papers or serving as discussants should contact the arrangers directly. For other questions about the program, write or call:

Albert H. Teich
Graduate Program in Science, Technology,
and Public Policy
The George Washington University
Washington, D.C. 20052
(202) 676-7292

PRELIMINARY PROGRAM

I. Historical, Philosophical and Literary Perspectives on Science

A. Historical and Philosophical Science Studies: Implications
for Science Policy

Arranged by: Prof. Sal Restivo
Department of Anthropology and Sociology
Rensselaer Polytechnic Institute
Troy, NY 12181

B. Contemporary Relations Between Science and Literature

Arranged by: Professor John Woodcock
Department of English
Indiana University
Bloomington, IN 47401

C. Alternative Perspectives on Science and Technology

Arranged by: Professor Henry Etzkowitz
Department of Sociology
SUNY College at Purchase
Purchase, NY 10577

II. Sociology and Social Psychology of Science

A. Social Processes of Scientific Investigation

Arranged by: Professor Roger Krohn
Department of Sociology
McGill University
855 Sherbrooke Street West
Montreal, PQ, Canada H3A 2T7

and Professor John M. Wilkes
Department of Social Science and Policy Studies
Worcester Polytechnic Institute
Worcester, Mass. 01609

B. Sociology of Science in Developing Countries: The Case of Latin America

Arranged by: Professor Diana Crane
13 rue Cassette
75006 Paris
France

C. The Sociology of Applied Research

Arranged by: Professor Daryl Chubin
Department of Social Sciences
Georgia Institute of Technology
Atlanta, GA 30332

contd/....

and Professor Albert H. Teich
Graduate Program in Science, Technology
and Public Policy
George Washington University
Washington, D.C. 20052

III. Science Policy

A. Comparative Perspectives on the Formulation and Implementation of Science Policies

Arranged by: Professor Linda L. Lubrano
School of International Service
The American University
Massachusetts and Nebraska Avenues, N.W.
Washington, D.C. 20016

B. Science Indicators for Research and Policy

Arranged by: Dr. Roberta Miller
Social Science Research Council
1755 Massachusetts Avenue
Washington, D.C. 20036

C. Dollars and Scholars: The Future of Academic Science

Arranged by: Dr. James E. Katz
Center for Science and International Affairs
John F. Kennedy School of Government
Harvard University
79 Boylston Street
Cambridge, Mass. 02138

D. Political Controversies Involving Science

Arranged by: Professor Robert F. Rich
Woodrow Wilson School of Public and International
Affairs
Princeton University
Princeton, N.J. 08540

PRE-REGISTRATION AND HOTEL RESERVATION FORMS

PRE-REGISTRATION

NAME: _____

ADDRESS: _____

ACADEMIC OR PROFESSIONAL AFFILIATION: _____

PRE-REGISTRATION FEE \$25 _____
(Registration at Meeting will be \$30)

BANQUET-DINNER, 3 November 1979: \$20 Yes, I plan to attend \$20 _____
_____ I do not plan to attend

I enclose a check (payable to 4-S) for: \$ _____

CLIP THIS FORM AND MAIL WITH CHECK BY 30 SEPTEMBER 1979 TO:

Professor Lowell Hargens
4S Secretariat
Department of Sociology
Indiana University
Bloomington, Indiana 47401

HOTEL RESERVATION FORM

FOR ROOM RESERVATION, CLIP AND MAIL BY 30 SEPTEMBER 1979 TO:

Reservations Manager
L'Enfant Plaza Hotel
480 L'Enfant Plaza East, S.W.
Washington, D.C. 20024

4TH ANNUAL MEETING OF THE
SOCIETY FOR SOCIAL STUDIES OF SCIENCE

November 2-4, 1979

Singles @ \$45.00 daily Doubles @ \$50.00 daily

RESERVATIONS RECEIVED AFTER OCTOBER 12, 1979 WILL BE
ON SPACE AVAILABILITY AT PREVAILING ROOM RATES.

Please make reservations for _____ Sgl Rms _____ Dbl Rms

Name _____

Address _____

City _____ State _____ Zip Code _____

Company _____

Arrival: Date _____ at ☐ 6 p.m. Departure Date: _____

☐ Deposit Enc.

8% Sales Tax + \$.80 City Occupancy Tax NOT INCLUDED

All reservations are held until 6:00 p.m. on the day of arrival, unless guaranteed by your company or one night's deposit is sent with your reservations. Check-out time is 1:00 p.m.

PLEASE PRINT OR TYPE ALL INFORMATION

ELECTION OF OFFICERS - 1979

CANDIDATE PROFILES FOR SOCIETY ELECTION

Presidential Nominees

BERNARD BARBER is Professor of Sociology and a member of the Barnard College and Graduate Faculties of Columbia University. His Science and the Social Order was published first in 1952 and has been issued in different printings since, including one in 1978. He edited, with Walter Hirsch, The Sociology of Science (1962), has written Drugs and Society (1967), and Research on Human Subjects: Problems of Social Control in Medical Experimentation (with John J. Lally, Julia Loughlin Makarushka, and Daniel Sullivan). He is the editor of Medical Ethics and Social Change (ANNALS, 1978) and of Informed Consent In Medical Therapy and Research (forthcoming, 1980). He has been an Advisory Editor of Technology and Culture. He has published many articles on the sociology of science and on the ethics of research. He has received fellowships and research grants by the Guggenheim, Ford, Rockefeller, and Russell Sage Foundations and has been a member of the Drug Research Committee (NAS/NRC) and of the Health Advisory Board, Office of Technology Assessment, U.S. Congress. He has served as a consultant to the Ford Foundation, the National Science Foundation, and other organizations.

MICHAEL J. MORAVCSIK is Professor of Physics in the Department of Physics and Institute of Theoretical Science, at the University of Oregon. His research interests include: Theoretical Physics (elementary particle physics; intermediate energy physics), Science of Science (citations as measures of scientific output; productivity distributions in science; progress indicators for scientific disciplines), and Science Policy (science and technology in developing countries; communication methods in the scientific community). Excluding technical papers in physics, his publications include "Citation Patterns in Scientific Revolutions" (with P. Murugesan) Scientometrics 1, 161 (1979); "The Dynamics of Scientific Manpower and Output" (with S.G. Gibson) Research Policy 8, 26 (1979); and "Developing Countries and the Fruits of Science" Leonardo 11, 214 (1978). He has testified at hearings before the Committee on Foreign Relations, United States Senate (March 15, 1979), on the bill establishing the Institute for Scientific and Technological Cooperation.

Council Nominees

DARYL E. CHUBIN is Assistant Professor in the Department of Social Sciences at Georgia Institute of Technology. His interests include science policy, intellectual and social processes of scientific specialization, theory-method relations in science studies; and ethical and value dimensions of multidisciplinary team research. His publications include "The Politics of Cancer," (with K.E. Studer) Theory and Society 6 (July 1978); "Knowledge and Structures of Scientific Growth: Measurement of a Cancer Problem Domain," (with K.E. Studer) Scientometrics 1 (January 1979); "Chance and Eminence in Science: Ecclesiastes II," (with S.J. Turner) Social Science Information 18 (forthcoming 1979); and "Peer Review at NSF: A Dialectical Policy Analysis," (with I.I. Mitroff) Social Studies of Science 9 (forthcoming 1979).

MARCEL LA FOLLETTE is co-editor of Science, Technology, & Human Values at Harvard University. Her research interests are effects of public images of science on public policy and ethical conflicts in communicating science to the public. Her recent publications include The Citizen and Science Almanac (Bloomington, Indiana: The Pointer Center, Indiana University, 1977), and "Science on Public Television" Science, Technology, & Human Values, 4, #27 (Spring 1979).

ALEXANDER J. MORIN is Director of the Office of Science and Society of the National Science Foundation. His research interests include sociology of scientific knowledge and science and society. His recent publications include "Science, Technology and the U.S. Public: Three Experimental Programs" (with William A. Blanpied), paper prepared for UNESCO (January 1978), and "Revelation and Heresy in Sociobiology: A Review Essay" Science, Technology, & Human Values, 4, #27 (Spring 1979).

BRIGITTE SCHROEDER-GUDEHUS is Professor and Chair of Institut d'histoire et de Sociopolitique des Sciences, University of Montreal. Her research interests include international scientific cooperation and political history of science. Her recent publications are Les Scientifiques et la Paix (Montreal, Canada: Les Presses de l'Universite de Montreal, 1978) and "The Argument for the Self-Government and Public Support of Science in Weimer, Germany" Minerva, Volume X, 4 (October 1972), pp. 537-570.

HARRISON SHULL is Research Professor of Chemistry at Indiana University. His research interests are theoretical chemistry, human resource problems, career patterns of scientists, and science policy. His recent publications include Ph.D. Employment Cycle: Damping the Swing (National Research Council 1978 Annual Report); "The Regulation of Ph.D. Production" presented at the Association of Graduate Schools (Fall 1978); and "Science and Public Policy" paper presented at third annual meeting (4S) 1978.

HENRY SMALL is Director of Grant and Contract Research at the Institute for Scientific Information. His research interests are: history and sociology of scientific disciplines and citation analysis. His recent publications include "A Co-citation Model of a Scientific Specialty: A Longitudinal Study of Collagen Research" Social Studies of Science 7 (1977) pp. 139-166, and "Cited Documents as Concept Symbols" Social Studies of Science 8 (1978) pp. 327-340.

ALBERT H. TEICH is Associate Professor of Public Affairs and Deputy Director of Graduate Program in Science Technology and Public Policy at George Washington University, Washington, D.C. His professional interests include science and technology policy; energy and environmental policy; and management of government R&D programs. He edited Technology and Man's Future (St. Martin's Press, second edition, 1977), was editor of and contributor to Scientists and Public Affairs (MIT Press, 1974), and with W.H. Lambright published both "Scientists and Government: A Case of Professional Ambivalence" Public Administration Review (April 1978) and "The Redirection of a Large National Laboratory" Minerva (Winter 1976-77).

4S ELECTION: BALLOT

President (vote for one):

BERNARD BARBER _____

MICHAEL J. MORAVCSIK _____

Council (vote for no more than four of the following):

DARYL E. CHUBIN _____

MARCEL LA FOLLETTE _____

ALEXANDER J. MORIN _____

BRIGITTE SCHROEDER-GUDEHUS _____

HARRISON SHULL _____

HENRY SMALL _____

ALBERT TEICH _____

Cut along this line (or copy)

Please put your name and return address on the envelope containing this ballot. Ballots arriving without this information will not be counted. Mail to:

Professor Lowell Hargens
4S Election
Department of Sociology
Indiana University
Bloomington, Indiana 47401
USA

THE DEADLINE FOR RECEIPT OF BALLOTS IS 31 AUGUST 1979.

SEND BALLOT TO:

Professor Lowell Hargens
4S Election
Department of Sociology
Indiana University
Bloomington, Indiana 47401
USA

BE SURE TO IDENTIFY YOURSELF ON THE ENVELOPE;

NOT ON THIS BALLOT

THOUGHT AND OPINION

Professional Ethics and Self-Regulation: A Speculative
Essay and Research Agenda

Mark Frankel
Wayne State University

Most informed observers would agree, I suspect, that we are experiencing a period of profound public and professional concern over the ethical implications of the conduct and use of scientific research. It is not equally clear, however, where this current ambiance will lead. Several possibilities, not necessarily mutually exclusive, have already been the subject of considerable speculation in the press, in professional journals and in government hearings and reports; others will be discussed in future issues of this newsletter. I would like to take this opportunity to reflect on one aspect of the present clamor over the ethics of scientific research--professional self-regulation.

If my sense of the current mood is correct, debate over the relative merits of the professions and/or the government in the regulation of scientific research is likely to reach a feverish pitch during the next few years. If the scientific societies hope to retain some meaningful measure of their professional autonomy, they will need to demonstrate a capability for bringing effective force to bear to assure that ethical principles are observed.

The adoption of ethical principles by a professional society can be viewed as a critical indicator of the profession's willingness to accept some responsibility for sensitizing its members to proper professional conduct and for regulating their behavior. But the presence of a set of ethical principles is only part, albeit an important one, of the machinery needed to effect self-regulation. Without appropriate support activities to encourage proper professional conduct, or the means for detecting and investigating possible violations and imposing sanctions on violators, the impact of the profession's ethical principles on its members' behavior may be negligible. Admittedly, provisions for implementing and enforcing a profession's ethical principles will not guarantee effective self-regulation; but their presence does make it possible.

At present, the mechanisms and strategies of professional self-regulation remain relatively unexplored terrain. Very little is known about the types of structures and activities employed by the scientific societies, the range of resources committed to their operation, or their effectiveness. Yet prescriptive injunctions are likely to be misguided as well as ignored without adequate knowledge of what is and what practically can be. Such knowledge is essential for evaluating current efforts at self-regulation and for identifying the most appropriate (and potentially most effective) activities that the societies should adopt in support of professional ethics. What, then, constitutes the critical mass of data?

Initially, procedures for monitoring professional behavior need to be described. Without a routine pattern of review, incompetent or unethical behavior may go undetected. The strategies employed by the societies to inform members and the public about procedures for raising a complaint relating to professional

behavior must also be identified. Do the society's ethical principles or its procedural requirements explain in precise terms what responsibilities a member has in those cases where he/she suspects improper behavior by a colleague? While it is undoubtedly true that some incompetency and unethical behavior originates at the individual level, the professional regulatory system can contribute to rather than diminish the occurrence of error in skill or in judgment. This is likely to be the case if the system fails to make clear the importance of adhering to certain rules or the consequences that violations may engender. In such circumstances, the identification of individual error may not only be difficult but also inappropriate and misleading. Deficiencies in the regulatory system may be equally at fault in producing poor professional behavior.

Clearly, one cannot expect too much from monitoring processes and structures that are not buttressed by a firm commitment of professional resources. Appropriate kinds of resources and a reliable measure of professional commitment must be identified and validated by testing over a wide range of professional associations. Differences among the professions in their membership, goals and relationship to the law may well produce pronounced, but understandable, variances in the type and level of resources committed to professional self-regulation.

Effective professional self-regulation is also likely to be influenced by the nature of the support activities and sanctions employed. Support activities may take at least two forms: (1) programs designed to reinforce proper professional behavior, e.g., counseling, education, positive incentives (rewards to members for compliance); and (2) support to members whose rights as scientists are threatened, e.g., arbitration, financial and legal assistance. Despite the apparent importance of such activities, there is a scarcity of data on the range of supports used by professional societies, let alone on their impact on members' behavior. Further study is also needed of the punitive sanctions applied by the professions or, in some cases, applied to the professions or its members from the outside. Why some sanctions are more effective than others in deterring unacceptable behavior and the relative importance of individual and systemic characteristics in determining their effectiveness merit serious scholarly investigation.

Finally, there is need for a critical assessment of professional self-regulation. Under what circumstances are self-regulatory systems likely to produce improved ethical behavior? What are the benefits and costs--and for which parties at interest--associated with self-regulation? Both professional and external controls are affected by the costs of time, personnel and financial commitment required for their effective implementation and enforcement. While effective self-regulation can reduce the costs to society of enforcing formal laws, it can also generate costs to the professions in the form of the time and effort committed to monitoring colleagues, disseminating information and registering disapproval. It is by no means certain that the scientific societies are able and willing to absorb those costs by themselves. Nor is it self-evident that they should be expected to do so. Perhaps, paradoxically effective self-regulation can only be achieved in the presence of external incentives or controls.

BOOK REVIEW

Joseph Ben-David and Terry Nichols Clark (eds.), Culture and Its Creators: Essays in Honor of Edward Shils. Chicago: The University of Chicago Press, 1977, x + 325 pages. \$15.00

The range of these twelve papers in honor of the American sociologist Edward Shils presents the reviewer, at least this reviewer, with an extremely difficult task. Within its covers this publication includes essays by Raymond Aron and Seymour Martin Lipset on the "end of ideology" debate; S.N. Eisenstadt on the origins, development, and institutionalization of the sociological enterprise; Morris Janowitz on the objective gatekeeper and the politically involved advocate conceptions of the role of journalist; Harry C. Johnson on the radical challenge to economics; Reinhard Bendix on the provincial and metropolitan culture of eighteenth century Germany; Clifford Geertz on charisma and the sacredness of central authority in society; Priscilla and Terry Clark on the writer in French society; Saul Bellow on the condition of the writer in American society; and Talcott Parsons, Joseph Ben-David and Jack Goody on various aspects of science, education, and knowledge.

Those familiar with the work and career of Shils will recognize numerous ideological, theoretical, and professional points of interaction between Shils and the various authors represented.

The rationale for this spectrum of topics and papers is, according to the editors, that (1) societies have a tradition that defines relationships among individuals, subgroups, and society as a whole, and gives to all this some unity and meaning, (2) conditions in modern society require continual efforts of reinterpretation, (3) such reinterpretations are represented in ideology and literature, (4) interpretations require authority, and (5) while in the past authority was derived from religion, "Today this authority has been transferred to science, the only source of universally accepted beliefs about men's place in the universe . . ." (p. vii). While to posit that science is the "only source of universally accepted beliefs" is unconvincing, there is little doubt that science and its associated institution of education are among the most important forces in modern society.

These introductory comments concerning the historical and contemporary role of science are particularly welcome at a time when much of the work in the sociology of science is concerned with communication and stratification patterns within educational and scientific communities.

I shall deal with the task of reviewing these essays by focusing on the three that are concerned with the science-education-knowledge complex.

Talcott Parsons, an erstwhile collaborator of Shils, has always been associated with the abstract grand theory level of sociological analysis. In a number of his most recent writings he has, however, been concerned with the importance of the "educational revolution" for Western society. This revolution has, according to Parsons, an order of significance of at least as great as the older democratic and industrial revolutions. It is in this context that Parsons has found a convergence with the post-industrial society thesis of Daniel Bell, or at least that part of the thesis that singles out the university as the most important single category of structural collectivity in modern society. The university's significance emanates from its ability to mobilize theoretic knowledge upon which the post-industrial society is dependent. In the present paper,

"Some considerations on the growth of the American system of higher education and research," Parsons rejects the "materialistic" interpretation of the development of American institutions of higher learning and substitutes a "multiple-factor" explanation. Single factor and materialistic interpretations can be read as Marxist. Parsons has always maintained that single factor theories belong to a "Kindergarten" stage in the development of sociology and that Marxism has always belonged in the wings rather than at the core of that development. Parsons' Weberian heritage suggests that he search for factors other than the "obvious economic interests." In addition to these, Parsons proposes that the growth of higher education in the United States was influenced by Puritanism or the Protestant-ethic tradition and by the high prestige of European intellectual culture during the period of growth. European culture was particularly important for the "prestige-hungry groups in the upper reaches of American society" for "they had become acutely conscious of the sense in which America's cultural status had come to be defined as inferior to that of the principal European nations, and they were, shall we say, desperately anxious at least to catch up, if not to excel" (p. 277). If it is true, as Ben-David and Clark argue in their introduction, that science provides a source of authority, then I suggest that those who were interested in the development of higher education and science in the United States were not only "prestige hungry" but also "authority-hungry." That is, they were searching for a source for the legitimation of their power.

Parsons goes on to argue that the system of research and education that developed in the United States was an autonomous decentralized one and that even the massive growth in financial support of science has not "resulted in what is in any simple sense a government-sponsored or controlled system" (p. 276). It is my impression that contrary to the views of Professor Parsons, it is not only "left-oriented interpreters" who "see government control around every corner of the winding way of academic development . . ." (p. 276). Lewis Coser's comments on a recent paper of Parsons' apply equally well to Parsons' present contribution. These comments are, "One need not hold the vulgar notion that he who pays the piper always calls the tune to remain skeptical of the idea that the knowledge 'estates' are gaining ascendancy because we all depend on them as resources."¹

Joseph Ben-David has in his writings also stressed the importance of the decentralized nature of the American educational and research system even in the face of increasing government support. In the present paper, "Organization, social control, and cognitive change in science," Ben-David stresses the continuity of the normative structure of the scientific institution from its emergence in the 17th century to the present. Thus, while organizational and theoretical revolutions have occurred in science, "the establishment of science as a distinct intellectual activity, to be controlled only by its own norms--was accomplished in the seventeenth century. After that, fundamentally significant ('revolutionary') discoveries could be made with no further institutional revolution" (p. 262). Ben-David is reacting against those who have recently attacked the actual significance of norms such as "universalism," "skepticism," and "disinterestedness," in the scientific role. What he does is to argue that these norms are a mechanism for social control in the process of the recognition and evaluation of research, while in the process of research itself one cannot expect to find "disinterestedness,"

or "skepticism." Thus, in reference to the activity of the scientist, Ben-David states, "Because he will eventually be judged by fairly strict and impartial norms, he can be allowed practically as much individual freedom as he wishes" (p. 265).

- Ben-David stresses the normative content of the scientific role and the view that in addition to being physicists, chemists, or economists, scientists are also members of a moral community. This may be true, but I for one would suggest that what is of significance about scientists is the cognitive contributions they make to physics, chemistry, or economics. Finally, I would argue that what particular research is funded and in what research areas is increasingly dependent upon political decisions that have little, if anything, to do with the norms of science. Ben-David, himself, has elsewhere² stated:

If science now comes to be regarded as serving some interests and not others, if it comes to be associated with military destruction, and if scientists are to be regarded as a privileged "clerical" group lavishly supported by government, then the faith in its values may be eroded by envy and doubt.

The problem is to find those groups in industrial societies that are willing and able to support a science that does not in turn reinforce the power, position, and authority of established structures and groups.

Finally, in the paper with the broadest historical and cultural scope, "Literacy, criticism, and the growth of knowledge," Jack Goody suggests that "It is now possible to see why science, in the sense we actually think of this activity, occurred only when writing made its appearance and why it made its most striking advances when literacy became widespread" (pp. 237-238). While Goody stresses the significance of writing, the alphabet, and printing in the development of modern society and science in particular he, like Parsons, maintains that he is not proposing a single-factor theory. It is not, according to Goody, norms of rationality and skepticism that are unique to modern scientific institutions but rather the cumulative development of skeptical and rational thought. This development could not exist in the absence of ideas that are written down and communicated across time and space.

While the papers discussed above as well as a number of the other contributions are informative and often stimulating (Bellow's paper in particular), the very nature of the collection contributes to its basic limitation. That is, these papers do honor Edward Shils implicitly in their basic orientations if not explicitly in their citations. In his writings Shils has discussed "central" and "counter" traditions in intellectual developments. The papers in this collection fall within the "central" traditions of liberal sociological and social thought. Those readers who are interested in the important issues examined here, but would rather approach these issues from one of the "counter-traditions" (Marxist, neo-Marxist, critical, reflexive etc.) will have to look elsewhere.

References

¹Lewis Coser, "Structure and Conflict," in Approaches to the Study of Social Structure. Edited by Peter M. Blau. (New York: The Free Press, 1975) p. 218.

²Joseph Ben-David, The Scientist's Role in Society (Englewood Cliffs: Prentice-Hall, 1971) p. 180.

IN THE LITERATURE

Bibliography

This Bibliography covers articles published from about July 1978 to January 1979. It does not include articles which have been covered in the "Journal Contents" section of the Newsletter. For the first time we have attempted to classify the items using the categorized specialty list which appeared in the Spring 1977 issue of the Newsletter in connection with the 4S membership survey. The Editors welcome comments on this new format. Members are also urged to send notification of their own publications and those of others to the Editors for inclusion in the Bibliography.

SCIENCE IN SOCIETY

11 - IMPACT OF SOCIETY ON SCIENCE AND TECHNOLOGY

McAulay, Robert, "Velikovsky and the Infrastructure of Science: The Metaphysics of a Close Encounter," Theory and Society 6 (1978) 313-342.

12 - SOCIAL IMPACT OF SCIENCE AND TECHNOLOGY

Busch, Lawrence, "On Understanding Understanding: Two Views of Communication," Rural Sociology 43 (1978) 450-473.

Garfield, Eugene, "High Impact Science and the Case of Arthur Jensen," Current Contents #41 (October 9, 1978) 5-15.

13 - PUBLIC UNDERSTANDING AND EVALUATION OF SCIENCE

Duncan, Otis Dudley, "Sociologists Should Reconsider Nuclear Energy," Social Forces 57 (September 1978) 1-22.

Nelkin, Dorothy and Susan Fallows, "The Evolution of the Nuclear Debate: The Role of Public Participation," Ann. Rev. Energy 3 (1978) 275-312.

15 - SCIENCE POLICY

Atkinson, Richard C., "Rights and Responsibilities in Scientific Research," The Bulletin 13 (December 1978) 10-14.

Delgado, Richard and David R. Millen, "God, Galileo, & Government: Toward Constitutional Protection for Scientific Inquiry," Washington Law Review 53 (1978) 349-405.

Healey, Frank H., "Industry's Needs for Basic Research," Research Management (November 1978) 12-16.

Sabatier, Paul, "The Acquisition and Utilization of Technical Information by Administrative Agencies," Administrative Science Quarterly 23 (September 1978) 396-417.

16 - SCIENCE, TECHNOLOGY AND PUBLIC POLICY

Dobrov, Gennady M., "Systems Assessment of New Technology for Decision-Making in Government and Industry Part II - Case Studies," Technological Forecasting and Social Change 12 (1978) 95-109.

La Porte, Todd R., "Nuclear Waste: Increasing Scale and Sociopolitical Impacts," Science 201 (July 1978) 22-28.

17 - TECHNOLOGY ASSESSMENT

Thwaites, A. T., "Technological Change, Mobile Plants and Regional Development," Regional Studies 12 (1978) 445-461.

18 - SCIENCE IN DEVELOPING COUNTRIES

Cole, Sam and Graciela Chichilnisky, "Modelling With Scenarios: Technology in North-South Development," Futures 10 (August 1978) 303-321.

Macioti, Manfredo, "Technology and Development: The Historical Experience," Impact of Science on Society 28 (1978) 313-319.

Rahman, A., "End of Colonialism and the Development of Science Policies for New Nations," J. Scient. Ind. Res. 37 (February 1978) 65-72.

SCIENCE IN HISTORY

21 - SCIENCE AS A CULTURAL MODE

Inkster, Ian, "Robert Goodacre's Astronomy Lectures (1823-1825), and the Structure of Scientific Culture in Philadelphia," Annals of Science 35 (1978) 353-363.

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CONTROVERSY

POLITICS OF TECHNICAL DECISIONS

Edited by
DOROTHY NELKIN

A SageMark Edition



SAGE PUBLICATIONS Beverly Hills London

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(Abstracts to above papers)

G.M. Dobrov, R.H. Randolph, W.D. Rauch (Austria): New Options for Team Research via International Computer Networks

In this paper, international team research (ITR) is discussed as an object for measurement, systems analysis, and management. The paper is intended as a contribution to the development of a "problem" orientation in scientometrics. In the authors' view, scientometric studies can help solve the problem of efficient ITR in several ways--for instance, by identifying needed improvements in (a) international scientific communication in general, (b) scientific interactions within and among research teams as part of the creative process, and (c) the overall international usage of existing scientific knowledge. The paper discusses the machinery of ITR, models of scientific communication, and some original experience in using computers and telecommunications as tools for scientific interaction. All of these are potential objects for scientometric investigation. The paper itself performs some first steps in obtaining economic parameters for the different forms of international team research.

H. Inhaber, M.S. Lipset (Canada): Gaps in "Gaps in Technology" and Other Innovation Inventories

A 1970 report of the Organization for Economic Corporation and Development indicated that Canada ranked last on a list of about 10 industrialized countries in terms of innovations. This ranking has been used to support the frequently held contention that Canada is technologically uninnovative. However, the OECD list had no criteria for the inclusion or exclusion of a particular innovation. The OECD data does not correlate well with other independent measures of innovation. A comparison is made to a related study by Gellman Associates. This latter study shows that the Canadian position is not as poor as indicated by the OECD list.

T.K. Krauze, R. McGinnis (USA): A Matrix Analysis of Scientific Specialties and Careers in Science

[No abstract]

H.G. Small, D. Crane (USA): Specialties and Disciplines in Science and Social Science: An Examination of Their Structure Using Citation Indexes

The technique of co-citation cluster analysis is applied to a special three-year 1972-1974 file of the Social Sciences Citation Index. An algorithm is devised for identifying clusters which belong to a discipline based on the percentage of source documents which appear in a disciplinary journal set. Clusters in three disciplines economics, sociology and psychology are identified using this algorithm. Clusters in a specialty of natural science particle physics obtained from the 1973 Science Citation Index are compared and contrasted with the three groups of social sciences clusters. Certain common structural characteristics of the social science and natural science groups suggest that knowledge is developing in parts of the social science disciplines in a manner similar to the natural sciences.

E. Shearer, J. Moravcsik (USA): Citation Patterns in Little Science and Big Science

The classification of citations by their context, previously formulated and used for other studies, is employed here to see if the citation patterns of big and little science are different or not. Theoretical physics articles in 1935 and 1955 are thus compared. No significant differences were found except in the number of references per article which increased significantly from 1935 to 1955, and again to 1968. It is found, however, that the German journal Zeitschrift für Physik has considerably higher percentages of conceptual, organic, and evolutionary citations, both in 1935 and in 1955, than The Physical Review. The interpretation of this difference remains unclear.

COUNTER-MOVEMENTS IN THE SCIENCES--The Sociology of the Alternatives to Big Science, Edited by Helga Nowotny and Hilary Rose

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ANNOUNCEMENTS

Recent Meetings

WORKSHOP ON SCIENTOMETRICS, UNIVERSITY OF MONTREAL, MONTREAL CANADA, FEBRUARY 11, 1979. The Workshop, the first to be held in Canada on this topic, was organized by Yakov M. RABKIN and his colleagues at the Institut d'histoire et de socio-politique des sciences at the Université de Montréal. Canadian interest in scientometrics has been growing over the past few years, and a workshop of this type was a useful opportunity for those in the field to exchange ideas. Over 40 people attended the meeting, representing the university and government sectors.

Four papers were presented, in addition to a keynote address by Prof. Derek de Solla Price, of Yale University in the United States. The first paper was by Alex Michalos of the University of Guelph, Guelph, Ontario. Michalos is an active participant in the field of social indicators, designed to measure "quality of life" in a non-economic way, and he discussed the relationship of science indicators to this field. In particular, the subjects of research and development manpower, "brain drain," innovation and patents were discussed. He noted that, in terms of expenditures, most of the research and development falls into the latter category. The implication of this fact for scientometrics was analysed.

Since Canada's science is, in many ways, related to that in the United States, a number of comparisons between the two countries were made. At present, U.S. science expenditures as a fraction of gross national product are declining; those of Canada are remaining almost constant.

One of the main justifications for spending on science is the expectation that it will produce economic benefits. Michalos discussed how true this was, and sub-divided science, for this analysis, into five phases: invention, innovation, product differentiation, development and diffusion.

The relationship of patents to scientometrics was also discussed. The number of patents per scientist or engineer in the United States is much higher than in Canada. While patent analysis is a potentially useful tool in studying science and technology, it has been used only in a limited way up to now.

The results of this work will be presented in full in a forthcoming book by Michalos.

The second paper was by Y. RABKIN et al. He studied the citation and reference patterns of two black African universities (Nairobi and Ibadan) in four subjects: botany, geology, mathematics and physics. A control group of other Commonwealth universities was used.

In general, the citations to these African universities from Britain and Asian countries were higher than expected on the basis of the latter group's share of world science. This is because African scientists in the two universities either are trained in Britain or have emigrated from Asia. RABKIN also found that African scientists were within the mainstream of scientific communication insofar as their citation patterns were concerned.

J. MACAULAY of the Science Council of Canada gave a more theoretical paper. He discussed the relationship of communications science and scientometrics. The theory of knowledge should play a more important role in our field. We must first understand the relevance of knowledge, then organize this knowledge, and then select the data.

The flow of data is an important topic in scientometrics. Historically, it can be shown that the flow is reversed when going from the early studies of KESSLER.

to the recent ones of SMALL. MACAULAY also showed a graph of a "knowledge surface" in three dimensions. This indicated the concentrations of scientific work in Canada in an unusual and interesting way.

The last speaker was G. BINDON of Concordia University in Montreal. He had studied the Pulp and Paper Research Institute of Canada, an industrial research group attached to McGill University, also in Montreal. BINDON analysed the history of the institute as reflected in the funds available, and the number of researchers and students. As expected, more of the graduates of this institute went into industrial research than other graduates of McGill. Industrial research has been studied only in a limited way in Canada, and an analysis of this type can be useful in bringing this subject to the attention of scientometrics.

DE SOLLA PRICE, the keynote speaker, ranged over a wide variety of recent topics in the science of science. He discussed in detail his theory of the cumulative advantage of papers and citations. This theory may be the key to understanding much of scientific citations. His address evoked enthusiastic response in the audience, so that the address and the question period which followed after a break for lunch lasted for almost three hours. DE SOLLA PRICE was often the center of attention during the rest of the day, and his comments and criticism contributed significantly to the Workshop's success.

The Workshop turned out to be a useful first try in getting Canadian scholars and science administrators to talk to each other about how to measure science. This experience is certain worth repeating.

H. Inhaber

SCIENCE INDICATORS CONFERENCE HELD. A seminar entitled "Research Needs and Applications for Indicators Based on the Scientific and Technical Literature" was held on April 9-10, 1979 in Philadelphia. The meeting was sponsored by the National Science Foundation and organized by the Institute for Scientific Information. Papers presented are listed below. For further information contact H. Roberts Coward, ISI, 325 Chestnut Street, Philadelphia, Pennsylvania 19106.

Program

"Issues, Indicators, and the Concerns of American Science"

William D. Carey, Executive Officer, American Association for the Advancement of Science

"Science Indicator Needs for Science Policy Making"

John D. Holmfeld, Science Policy Consultant, U.S. House of Representatives Committee on Science and Technology

"Constructing Indicators: Reflections Upon Our Points of Departure"

Alex C. Michalos, Director, Social Indicators Research Programme, University of Guelph, Ontario

"Science Indicator Applications of Data on the Scientific and Technical Information Transfer Process"

Donald W. King, King Research, Inc., Rockville, Maryland

"Some Exploratory Methods for Developing Indicators from Data on the Scientific Literature"

James L. Dolby, Dolby Associates and San Jose State University, California

"Conceptual and Methodological Concerns in the Development of International Science Indicators"

Yvan Fabian, OECD Science & Technology Indicators Unit

"Potential Applications of the SCI^R Database in the Development of Science Indicators"

Henry Small, Institute for Scientific Information

Call For Papers

SEVENTH BIENNIAL MEETING OF THE PHILOSOPHY OF SCIENCE ASSOCIATION, October 16-19, 1980 (tentative dates), Toronto, Canada. The Philosophy of Science Association will hold its Seventh Biennial Meeting in Toronto, Canada. The meeting is tentatively scheduled for the third weekend in October. The program will include sessions of contributed papers as well as symposia and other special sessions. Contributed papers will be preprinted as Volume 1 of PSA 1980. The symposia and other papers will be published later as Volume 2.

Contributed papers may be on any topic in the philosophy of science and written from any philosophical standpoint. Maximum length is 3500 words. Two copies, each including a 100 word abstract, should be prepared in double spaced type-script. Since blind refereeing will be used, the author's name and institution should appear on a separate cover page. These materials should be sent to the Chairperson of the Program Committee:

Professor Ronald N. Giere
Department of History & Philosophy of Science
130 Goodbody Hall
Indiana University
Bloomington, Indiana 47401
U.S.A.

The closing date for submission is January 15, 1980.

PSA is primarily interested in papers that are ready for publication. However, papers involving work in progress which the author wishes to present at the meeting but not necessarily to publish in the proceedings will be considered. When submitting such a paper, the author should indicate that it is being submitted for presentation only.

Authors of accepted papers which are to be published will be responsible for preparing a camera-ready typescript. Instructions, which pertain to both style and format, will be mailed with the letter of acceptance. Since it would speed preparation of the final copy, potential contributors are encouraged to prepare their original manuscripts in accordance with these instructions. Copies may be obtained from the Program Chairperson or from the PSA Business Office, 18 Morrill Hall, Michigan State University, East Lansing, Michigan 48824 U.S.A. The deadline for camera-ready copy will be May 1, 1980. Authors of papers accepted for presentation only will be asked to submit a 500 word abstract by that date.

Knowledge

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CREATION | DIFFUSION | UTILIZATION

CALL FOR PAPERS

KNOWLEDGE: Creation, Diffusion, Utilization

A NEW QUARTERLY JOURNAL

Through the publication of research findings, reports of successful and unsuccessful R & D Management practices, and "think pieces", this international and interdisciplinary journal is committed to highlighting the linkages between the processes by which knowledge is created, diffused, and utilized. We are firmly committed to highlighting the process by which knowledge is developed; knowledge development includes the processes of creation, diffusion, and utilization. Each of these sub-processes influences the others.

Individuals have tended to think of themselves as working, or at least concentrating on knowledge creation or knowledge diffusion or knowledge utilization; as a result, these fields have developed independently of each other. This journal will provide a forum for communication among these individuals as well as a context in which to develop research, methodology, and practices that establish much needed linkages.

The relationship(s) between knowledge creation, diffusion, and utilization may be thought of in terms of internal and external linkages. The internal linkages refer to the interactions between the production, dissemination, and application of knowledge. This includes the issue of how theory is translated into action; it also covers issues related to how scientists communicate with each other and with potential users. We are equally concerned with external linkages: the context/environment in which knowledge is developed. This "context" includes: legislative mandates (e.g., the creation of new information agencies), changes in the market place, changes in leadership or management, reorganization, and executive orders, etc. Our understanding is incomplete without recognizing both internal and external linkages as well as the relationship between the two.

We encourage people working on knowledge creation, knowledge diffusion, and/or knowledge utilization to submit articles to this new journal. In putting together each issue, we will attempt to highlight the relationship between these three sub-processes. Thus, articles enlarging our understanding of the linkages between the processes will be especially welcome.

The journal, to be published quarterly, will be divided into four sections:

- A. Articles -- reports of research findings, methodological articles, and "think pieces." In some cases, appropriate practitioners will be invited to comment on these reports.
- B. Reports of successful and unsuccessful R & D Management practices -- reports of officials in the public and private sectors responsible for programs involving knowledge creation, diffusion, and utilization.
- C. Research abstracts -- short reports of on-going research in the U.S.

D. Book reviews -- on occasion, we will also publish review essays.

Sections one and two will be refereed; two referee reports will be solicited for each articles. These reports will be made available to each prospective contributor, without identification of the referees.

Specifically, we are soliciting articles in the following areas:

- | | | |
|---|--|--|
| 1. Diffusion of information/innovations | 7. The role of consultants | 14. Paperwork value/burden |
| 2. The subjective side of knowledge transfer | 8. New information agencies and divisions -- their genesis and development | 15. Information science, processing |
| 3. Creation of knowledge -- types, methods | 9. Sociology of knowledge; Sociology of Science | 16. Networking |
| 4. Information policy | 10. Philosophy of science as it relates to creation, diffusion, and utilization of knowledge | 17. Controlling the quality of creation, diffusion, and use of knowledge |
| 5. Utilization/impact of knowledge | 11. History of science and technology | 18. Science Policy |
| 6. Knowledge procurement practices -- public and private sector | 12. The value of knowledge | |
| | 13. The relationship between creation/use and productivity of knowledge | |

KNOWLEDGE will accept articles based on empirical research as well as "think pieces." Good, clear, concise writing is also to be encouraged. Academics and practitioners should be equally at home in reading the journal. Our main goal is to encourage a dialogue between and among individuals who identify themselves as working in the creation, diffusion, or utilization of knowledge.

Manuscripts submitted for publication in KNOWLEDGE should be sent in triplicate (one original and two clear copies) to the Editor, Robert F. Rich, KNOWLEDGE, Woodrow Wilson School, Princeton University, Princeton, New Jersey 08540. All copy, including indented matter, notes, and references, should be typed double-spaced and on standard white paper. Each manuscript should include all tables and figures (on separate pages) and an abstract of no more than 100 words. Footnotes and an alphabetical list of references should be appended to each manuscript copy. Referees will evaluate manuscripts anonymously. Therefore, potential contributors should attach a cover sheet to each manuscript copy giving title, author, affiliation, and full mailing address; the body of the manuscript should bear only the title of the paper as a means of identification. A detailed style sheet is available upon request from the Editor or the publisher of KNOWLEDGE.

THE NATIONAL HUMANITIES INSTITUTE

Founded in July, 1975, under a grant from the National Endowment for the Humanities, the National Humanities Institute at The University of Chicago is designed to enhance the teaching of the humanities in American colleges and universities. Emphasizing inter-disciplinary approaches, this Institute takes as a general theme, Technology and the Humanities. Each year for three years, beginning in the academic year 1976-1977, nineteen resident Fellows spend the academic year at the Institute, developing new courses and undertaking research to broaden their teaching. Fellows read, participate in seminars and university activities, lecture, and some experiment in the classroom with new ideas and methods.

The need for more imaginative teaching is not new, but this moment is both urgent and exciting for the humanities. The last several decades have witnessed major and provocative changes in a series of humanistic fields. Humanists currently speak to larger audiences, and many have involved themselves directly with the changes brought about by the upheavals of contemporary life: the transformations of technology and science, universal education, professionalization, secularization, and a series of rising expectations and rising fears about the shape of modernity, both in this country and throughout the world. While the economic and political fruits of a developed technology have become more obvious, only now are we learning of some of the hidden humanistic costs of such change. The environmental perspective, which has achieved prominence recently, has accelerated modifications of humanist positions. The totality of man and society is at issue: our health and sickness, our work, and leisure, our human relationships, our sense of the good and the beautiful, are now seen as intricately related to each other.

The Institute seeks to formulate these problems for humanistic study. It attempts to confront serious challenges to humanistic values, build upon the growing interest in artifacts, mass culture, biological and genetic research, and seek a meeting point with the relevant methodological changes in the natural and social sciences. The Institute offers scholars a chance to pursue the study of cultures at different stages of their technological development, and permits humanists to study some of the systematic effects of (and constraints upon) technological change.

Technology, literally, is the science of the practical or industrial arts. The humanities are concerned with study of human culture, past and present, "as a help to knowing ourselves and the world." In many ways, then, the study of technology is itself a part of the humanities. But it has not normally been treated as such. For too long, we have segregated the purity of our highest ideals from our efforts to increase economic efficiency. It is urgent that our traditionally departmentalized arts and sciences accelerate the re-integration of technology and the humanities. This challenge the Institute wishes its Fellows to accept.

During its first year, the Institute took as its specific theme for study, "Culture and Technology." Last year's program considered "Society and Technology." The final year of the Institute's work brings the entire program to focus on the consequences and significance of technology for individual human beings. From the point of view of the humanities, such abstractions as "culture" and "society" have their greatest importance as they affect personal lives and values. The central concern of this final year, accordingly, will be the interaction of technological changes with the expectations, experiences, patterns of life, and self-perceptions of those who live in "technological" societies.

This concern will be explored through several different channels. Without cutting ourselves off from the cultural, historical, and sociological perspectives that received primary attention in the first two years, we shall pay more attention to other sources of insight. Those areas of writing and scholarship (literature, biography, and journalism) which document and chronicle the impact of modern technological/urban life on our experiences, attitudes, and purposes will receive particular attention. We intend also to face directly the effects of modernity on moral, religious, and aesthetic experiences and conceptions.

Thus, the third year of the Institute brings together humanistic scholars who are interested in developing courses and curricula that address the issues of "technology and the individual." They will encounter professionals from the fields of medicine, law, and religion, along with sociologists, anthropologists, and psychologists. Such encounters may stimulate fresh approaches to these problems and new ways of incorporating them in undergraduate education.

For further information contact:

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Chicago, Illinois 60637

STUDY OF CONSUMER ELECTRONICS INDUSTRY UNDERWAY. The Northwestern University Center for the Interdisciplinary Study of Science & Technology (CISST) has been commissioned by the U.S. Department of Commerce to undertake a study of policy and strategy alternatives for the U.S. consumer electronics industry. The purpose of the study is to identify and evaluate basic policy and strategy action alternatives which could strengthen the current and long-term competitive position of the industry. Areas to be studied include (a) technology development, application of technology to product development, and technology transfer; (b) marketing in the consumer electronics market, responding to foreign competition, and developing export markets; (c) production technologies, labor costs, distribution and capacity extension; and (d) development of economic and governmental environments.

The research team includes an interdisciplinary group of Northwestern faculty and graduate students, institutions sub-contracting specific portions of the study, and an advisory group of industry leaders.

The study is one of a number of similar projects currently underway with Department of Commerce support, each involving the study of an impacted industry, i.e., one that has been impacted by foreign competition. It will be undertaken in three steps: (1) Phase I: Two preliminary studies, one a Marketing, Production, Economic and Industry Structure Strategy Analysis, and the other a Technological Opportunities Analysis; (2) An industry workshop to present the findings of Phase I and to reach a consensus on goals and strategies for the second phase; (3) Phase II: Develop and carry out a program for issues identified in Phase I and specified at the workshop.

PUBLICATION OF DIFFUSION OF INNOVATIONS STUDY PLANNED. Negotiations are underway to publish The Diffusion of Innovations: An Assessment, edited by Michael Radnor, Irwin Feller and Everett Rogers. This collection of papers by researchers in the field of innovation is the output of a workshop funded by the National Science Foundation in which they participated. A limited number of copies of the unpublished report are available from the NSF Office of Policy Research and Analysis.

THE SCIENCE, TECHNOLOGY AND SOCIETY ASSOCIATION

The Association provides a forum for all those interested in the social, industrial, economic, environmental and political relations of science and technology. Membership is drawn from all sectors of education, from industrial management and trade unions, from politics, and from among the growing body of individuals who share these concerns.

THE AIMS of the Association are expressed as:-

"The advancement and propagation of education in, and understanding of, the social dimensions of science and technology."

To further these aims the Association:-

- a) publishes a quarterly newsletter and occasional papers,
- b) arranges conferences, debates and regional meetings.

Membership is open to all who agree with the aims of the Association.

Subscriptions are as follows:-

Individual UK Membership	£5.00
Student Membership	£1.50
Individual Overseas Membership	£3.00 or \$7.00
Institutional Membership	£20.00

Members receive the newsletter of the Association, and Institutional members receive three copies per issue.

There is no life membership.

Subscriptions are due on the 1st January in any year.

I wish to apply for membership of the STSA in the following category (please tick):

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The completed form should be sent to:-

STSA Membership Secretary,
Department of Liberal Studies in Science,
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MANCHESTER M13 9GB

4S Society for Social Studies of Science

The 4S Newsletter is published four times each year at the Department of Sociology, Southern Illinois University, Carbondale, Illinois 62901, and sent to all members of the Society for Social Studies of Science. Membership is on a calendar year basis. Membership dues (\$10 for professionals, \$5 for students) and institutional subscriptions (\$20) should be sent to: The Secretary/Treasurer, 4S, Department of Sociology, Indiana University, Bloomington, Indiana 47401.

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4S

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