

4S Society for Social Studies of Science

Winter 1980

Volume 5 Number 1

IN THIS ISSUE

4S: Progress and Prospects

MEMBERSHIP RENEWAL FOR CALENDAR 1980 3

FIFTH ANNUAL MEETING 5

Thought and Opinion

Scientific Journals: Selection Criteria for Information Services
S. Maricic 6

Science and Religion: Is There Room for the Complementarity
Principle?
V.V. Nalimov 9

In the Literature

Journal Contents 14

Announcement of Recent Books 22

Recent and Forthcoming Publications 27

Announcements

Reports of Meetings - Trevor Pinch 31

Forthcoming Meeting - Trevor Pinch 33

Call for Papers 36

Position Vacancy 36

Award - Gerald Holton 36

Learning Resources in International Studies 37

International Network for Social Network Analysis 38

4S Society for Social Studies of Science

President: Bernard Barber

Secretary-Treasurer: Lowell Hargens

Council: Daryl Chubin, Jerry Gaston, Ian Mitroff, Brigitte Schroeder-Gudenus, Henry Small, Albert Teich, Arnold Thackray, Dorothy Nelkin, *ex officio*

Editor: Henry Small

Associate Editors: Jerry Gaston, Steve Woolgar

Foreign Correspondent: Trevor Pinch

Editorial Advisors: Bernard Barber, Joseph Ben-David, Ruth Schwartz Cowan, Diana Crane, Michael Gibbons, Gerald Holton, Camille Limoges, Peter Mathias, Ian Mitroff, Harold Orlans, Nelson Polsby, Nathan Rosenberg, Harvey Sapolsky, Steven Shapin, Merritt Roe Smith, John Ziman, Dorothy Zinberg, Harriet Zuckerman

ERRATA (4S Newsletter, 5:1)

I. The announcement on page 5, listing the three plenary sessions at the FIFTH ANNUAL MEETING, should read as follows:

Science, Technology and Human Values

(Marcel La Follette, Chair, with the support of the
USA National Endowment for the Humanities)

Patterns in the Social Relations of Mathematics

(Sal Restivo, Chair)

Public Presentations of Science

(Richard Jarrell, Chair)

II. The headings on page 36 include "CALL FOR PAPERS" and "POSITION VACANCY." The appropriate heading for the announcement about Professor Gerald Eklon should read "AWARD" as it does on the top page under "IN THIS ISSUE, "----"Announcements."

MEMBERSHIP RENEWAL FOR CALENDAR 1980

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

COUNTRY _____

MEMBERSHIP DUES

Three Categories of Membership:

Please check
which is appropriate

- | | | |
|--|---------|-------|
| 1. Professional (e.g. Faculty or Postdoctoral) | \$15.00 | _____ |
| 2. Student | \$ 5.00 | _____ |
| 3. Institutional (including libraries) | \$25.00 | _____ |

Send a check or money order (in U.S. dollars) to:

Lowell Hargens
4S
Department of Sociology
Indiana University
Bloomington, IN 47401 (USA)

NOTE: PLEASE SEND IMMEDIATELY TO SAVE SCARCE RESOURCES REQUIRED
TO SEND "REMINDER" NOTICES.

Cut & Mail

FIFTH ANNUAL MEETING

OCTOBER 17-19, 1980 JOINT MEETING OF SOCIETY FOR THE SOCIAL STUDIES OF SCIENCE; HISTORY & SOCIOLOGY OF SCIENCE, SOCIETY FOR THE HISTORY OF TECHNOLOGY AND PHILOSOPHY OF SCIENCE SOCIETY

Call for Papers and Proposals for Sessions

The local arrangements committee in Toronto, in cooperation with the program committees of the participating societies, have decided on a few super-plenary sessions which it is hoped will represent the interests of all societies, though possibly subject to minor modifications three of these are:

Science Technology and Human Values, chr. Marcel La Follette,
with the support of the (US) National Endowment for the
Humanities Patterns in the Social Relations of Mathematics;
chr. Sal Restivo Public Presentations of Sciences chr. Richard
Jarrell

The 4-S program committee is arranging for four other sessions, specifically intended for its membership but also hoping to appeal to the interests of members of the other societies. Some suggestions still in hand as a result of the Washington meeting will be reconsidered for these sessions. In addition we solicit new proposals, both for individual papers and for sessions from the 4-S membership.

Abstracts of papers and proposals for sessions, including titles of individual papers, their authors, and a rationale for their general importance, should be sent either to Patricia Woolf, Department of Sociology, Princeton University, Princeton, New Jersey 08544, or Dan Sullivan, Dean of Academic Development and Planning, Carleton College, Northfield, Minnesota 55057.

THOUGHT AND OPINION

Scientific Journals: Selection Criteria for Information Services

Dr. S. Maricic, Editor

Croatica Chemica Acta

The National and University Library

41000 Zagreb, P. O. B. 550, Yugoslavia

In this era of scientific information flooding, many a scientist has made use of the publications issued by the Institute for Scientific Information (ISI) from Philadelphia, USA. "Current Contents," for instance, has become a regular means of browsing through scientific periodicals and Science Citation Index editions are widely used for personal literature retrievals. However, my intention is not that of contributing towards ISI publicity, but rather that of examining briefly a social aspect of the ISI activity. Namely, in addition to the above mentioned direct role in helping individual scientists, ISI had done an immense service to the quantification of science production studies for various disciplines, or institutes, or countries. Moreover, it appears to have opened up quite novel avenues of research into the intricate fabric of science as a whole.¹ It is this side that I deem to bring to the attention of your readers. Hopefully, a discussion of this question may eventually lead to some proper action.

The social implication of ISI publications which I have in mind is their role in promoting top quality science in small (and less developed) countries. The scientific journals in these countries should in the first place have the same task, and it could be fulfilled only through an international refereeing system. This, in turn, requires perseverance and patience on the editorial board's side while two forces counteract such attempts:

(i) The smaller the scientific community within a country the greater the influence of factors other than purely scientific merit of personal achievements. Exposed to the watchful local eye of their colleagues some scientists develop an unfortunate evasive attitude towards international standards of quality in science. This is often masked (wrongly) by national pride as if there were something like "a national science," and (rightly?)² by pointing to prejudiced closed refereeing circles. The social behaviour of scientists leads in consequence to both a quality and subject polarization.

At one extreme there are those, I guess a smaller part of the local scientific community preponderately in fundamental natural sciences, who take the cynical stand of utmost efficiency, i.e. of publishing only abroad. At the other end of the spectrum is the major section of varied quality, predominately in social sciences and humanities, who publish at home in journals with rarely a proper refereeing procedure.

(ii) Well, what does all this have to do with Current Contents (CC), Science Citation Indexes (SCI) and Journal Citation Reports (JCR) published by ISI? It does have a lot because these tertiary and quaternary publications are becoming more and more a kind of magic looking-glass for the face of science. Out of some 55000³ or 30000⁴ "live" scientific and technical journals in the world, CC selects about 6000, a figure shrunk further by SCI and JCR to no more than about 3000 journal titles. The point I am making is that CC in the first place, but SCI too (and recently JCR), are shaping the reading and publishing habits of scientists to a considerable degree through this unavoidable evaluative selection procedure, although there is no clear statement of the policy behind it.

True enough, most of the pertinent papers of the world's scientific output are covered by the ISI publications. To put it in the information science jargon, Bradford's law was obviously observed by ISI. In other words, ISI editors have chosen the small number of those journals which publish most of the total scientific production, the so-called "inner core journals." The trouble as I see it, however, is that ISI has incorporated also journals outside the "Bradford core." I submit that there are a number of less respectable journals left out by ISI although these could score better than a series of journals which have already nested within the 3000-odd respectable ones.

We have recently conducted a study of nine Yugoslav and one Czechoslovakian journal to see if a consistent ISI selection policy could be delineated for the "outer-shell" journals.⁵

The only two Yugoslav journals from natural sciences and the one from social sciences which were included in the 1976 and 1977 issues of JCR were used as "standards" together with one Czechoslovakian mathematical journal as there was no corresponding Yugoslav journal in JCR. Two chemical, one biomedical, one mathematical and two social-sciences Yugoslav journals which were not included in the ISI publications were compared with the corresponding "standards" as to their "JCR-value."

Altogether 1278 articles published in the 1972, 1973 and 1974 year-volumes of these ten journals were scanned for citation frequency through SCI's of 1972-1977. Most of these journals published in foreign languages with English predominating and in all cases had abstracts in foreign languages. This aspect, therefore, is of no influence in the analysis from which two conclusions relevant to ISI publications have emerged.

Firstly, those journals which are not covered by ISI attain their maximum citation frequency two to three years later than those included in CC, SCI and JCR. The sample examined may not have been large enough to draw a general conclusion, but in all likelihood a journal which has found its way into the ISI family has a greater chance of bringing its content to the reader's attention more quickly.

Secondly, judged by the impact factor,⁺ there are three Yugoslav journals out of the six examined which, if put within the impact factor ranking scale of JCR would leave behind quite a number of journals from other countries. At the negative extreme of this argument, it is highly questionable why even the only Yugoslav journal from social sciences was covered by ISI.

This analysis calls, at least, for an extension of this approach to journals from several countries to gain a more complete insight before drawing final conclusions. However, it appears to me that there is already enough ground to suggest a revision of the ISI journal coverage.

It may well be that there are more of the "outer-shell" journals still deserving the ISI data base input. A greater number of these journals may be prohibitive for tackling them within one data base like that of ISI. In such a case I suggest that ISI would serve the worldwide science information task much better with regard

⁺The impact factor is simply the ratio of the number of citations received by papers from a journal within a certain period of time, divided by the number of the published papers. It thus compensates for the sheer size of a given journal.

to the smaller scientific communities if the journal lists for various disciplines had a cut-off closer to the inner-core journals than presently.

At any rate it would be desirable to have an objectively determined list of journals of comparable citation status, for different disciplines and from various countries. If such a list turns out to be too large for ISI, perhaps one should consider a joint venture into building up another citation data base for the "outer-shell" journals. A selection of these journals could possibly be done only within an international scientific association (International Council of Scientific Unions, ICSU?), which would thus extend the positive influence of citation data bases upon "small" scientific communities in their striving for better quality research, especially if such a journal selection would be kept on permanent revision. At the same time this could prevent the trouble of facing the ever growing information problem of "garbage in--garbage out."

When this comment was drafted a paper by Tefko Saracevic was brought to my attention. Let me end with a quotation from this paper:⁶ ". . . in an evolutionary way the new information systems aimed at controlling the literature are changing the shape of literature itself." The question is--how, and to whose benefit?

References

1. Cawkell, A. E.: Science perceived through the Science Citation Index. Endeavour 1 (n.s.) (1977) 57-62.
2. Meadows, J.: The problem of refereeing. Scientia 112 (1977) 787-794.
3. Wooton, C. B.: The growth of the literature and its implications for library storage. 2. serials. British Lending Library (BLL) Review 4 (1976) 41-43.
4. ICSU AB announcement of International Serials Catalogue in Int. Forum Inf. Doc. 3 (1978) 28.
5. Spaventi, J., Silovic, N., Maricic, S., Labus, M.: A Bibliometric analysis of scientific periodicals from Yugoslavia. Submitted for publication to Informatologia (Zagreb).
6. Saracevic, T.: An essay on the past and future(?) of information science education - 1. Information Processing & Management 15 (1979) 1-15.

Note: Eugene Garfield has replied to Dr. Maricic in an essay entitled "How do we Select Journals for Current Contents?" Current Contents (45):5-7, 5 November 1979.

Science and Religion: Is There Room for the Complementarity Principle?

V.V. Nalimov
Moscow State University

1. The complementarity principle changes our scientific vision of the world: by and by it becomes more and more polymorphous. We are ready to perceive one and the same phenomenon at different angles describing it by non-rival models. Even mathematical statistics, traditionally directed at selecting the best, and therefore only true model, is now ready to acknowledge the right for existence of a multitude of models. However, so far the entire manifold of possible models remained within one paradigm and was always expressed by the same language, that of contemporary science. Here it seems relevant to pose a question: can the complementarity principle be broadened to the extent of preparing our culture to perceive the world by a manifold of models generated by essentially different paradigms? And if this actually is so, will this lead to the fuzziness and inter-section of mutually opposed paradigms?
2. The divergence between science and religion seems to have started as long ago as the epoch of Galileo. Both systems aimed at the utmost mutual separation which was, perhaps, the consequence of the inherent European cultural urge for a dichotomous vision of the world. This had found its symbolic expression in the myth of original sin, which lay at the source of our epoch. There was a time when science and religion seemed to be mutually orthogonal.
3. However from time to time there were attempts to glance at the world in its inseparable integrity. Of interest in this respect are two books which are fairly close in content and foundation. The latter contains the notion of "nosphere" central for both books, which brings together scientific and religious concepts. One of the books is written by Teilhard de Chardin (1965), a paleoanthropologist and a Jesuit monk, the other by Vernadsky (1977), an outstanding geochemist who occupied a fairly high position in the Soviet scientific hierarchy. It is noteworthy that both books could be published only posthumously. However, such protuberance-like flashes, though they aroused interest, did not affect the contemporary culture in a serious way.
4. Recently papers have appeared which trace the parallels between the ideas of modern science and Oriental religious concepts. We would like to mention the book by Capra (1975), though it was criticized by Restivo (1978) who emphasized the traps lying in wait for studies of this kind. In our paper (Nalimov, & Barinova, 1974), which unfortunately was published only in a shortened version, we have attempted to trace the ideas of cybernetics back to Ancient Indian philosophy. We have proceeded from the idea that a priori we ascribe to the notion of cybernetics meanings quite different from those ascribed to it in Ancient India. But, ascribing to words the broad meaning of our culture, we constantly reduce it as compared with the meaning of the ancient texts.¹ This is what makes hermeneutics simultaneously so difficult and attractive. However, reading philosophical works of the XIXth century, we come across the same difficulty: the prior meaning of philosophical terms has changed considerably since that time. Moreover, in science we also face the difficulty of understanding texts. Lysenko was still a Darwinist, though an absurd one, and it was senseless to argue with him since he proceeded from different prior meanings of words. Be it as it may, the possibility of discovering

¹We considered in detail the mechanism of perceiving verbal semantics in our book (Nalimov, 1979). We proceeded from the assumption that semantic fuzziness can be probabilistic.

contemporary ideas in ancient texts is fascinating. It may as well be an illusion, but comprehension of any contemporary text is no less an illusion.

But no matter how fascinating the parallels between modern science and ancient religions are, they are not enough to bring together the two visions of the world.

5. The true contiguity of the two forms of world perception will become possible only after each of them feels the acute need for a new approach to the evaluation of reality. This is to say that both paradigms must be extended and softened so as to make possible the emergence of a new, unified paradigm. Only by this way will our culture be able to absorb both forms as complementary. C o m p l e - m e n t a r i t y is possible only u n d e r t h e c o v e r o f o n e p a r a d i g m. But so far this question has not been discussed in the literature. Why?

6. Today both sides seem to feel the insufficiency of their paradigms.

7. Western science has come to feel that the paradigm fostered by it has closed the possibility of studying man. And the problem of man has unexpectedly come to the fore in our culture.

Quite recently, when cybernetics was just budding, the majority of scientists believed the problem of c o n t r o l to be linked, on the one hand, with the progress of computers, and, on the other hand, with the development of applied mathematics. Now it is clear that the solution of the problem is hampered by our ignorance of man.

It is becoming evident that salvation from the ecological crisis, can only be achieved by creating a new culture (Nalimov, 1979a), but, again, this problem is connected with the knowledge of man, and we still cannot estimate his hidden desires and faculties.

8. We shall proceed from the assumption that the human spectrum of consciousness is broader than we can imagine. Each culture is a filter which lets out to the surface of life only a narrow part of the spectrum. The rest of the filter affects people of this culture in a hidden and incomplete manner.

Assume that there exists personal time with the rate $v_c = ds/dt$, where s is a scale of actions.¹ Change in the metric of the scale, its extension or narrowing, naturally changes the rate of the personal, psychological time. Each culture has its own metric for the scale s and, therefore, its own psychological time opening up a part of the spectrum of our consciousness. Modern culture on the one hand compresses the scale s and, consequently, narrows down the filter regulating to what extent the consciousness is open. This might account for the peculiar narrow-mindedness and degeneration of our culture. On the other hand, some extreme manifestations of our culture related to the progress of technology tend to broaden the scale. In what way does staying in an atomic submarine differ from severe religious Hermetism? The only difference seems to lie in the Weltanschauung preparedness for this state.

¹This problem is thoroughly considered in my paper "Time: A Dialogue with the Metaobserver" to be published in the Proceedings of the International Society for the Study of Time edited by J.T. Fraser.

This example brings forth the psychological aspects of the ecological problem: consciousness is changed under the influence of changes in the medium. We feel these aspects will soon draw attention of researchers.

Culture may change by the changes of psychological time through the changes of the scale of actions. Esoteric religious systems used to master such techniques.

9. If modern science is willing to cope with the problem of man, it will have to revise at least the following three basic paradigmatic requirements.

A. The requirement of reproducibility. In studies of man it is not so much the recurrence of his states and behavior that is important, as their rare and unique manifestations which reveal the hidden part of the spectrum of consciousness.

B. The requirement of dividing the subject and the object of research. It is impossible to take a detached view of the parts of the spectrum of consciousness concealed from direct observation. They must be entered, experienced consciously, and discovered within oneself. The brilliant descriptions of pupillage by Carlos Castaneda (1968, 1972 & 1974) may serve as an illustration no matter whether these books are actual sketches of an anthropologist or merely a literary device.

C. The requirement to acknowledge as ontological reality only what can be perceived by means of technical devices. The requirement may be opposed by stating that man, too, is a special receptor who is able, under specific conditions and after special training, to discover a reality concealed from physical instruments.

The last requirement is especially hard to fulfill. The essence of science is aimed at the mastery of the world (Nalimov, 1977) and it agrees to accept as scientific only what can be made by human hands and mind; man cannot be regarded as a scientific device since he is created by the genitals.

10. It seems impossible to discover a single demarcation line between science and religion. The conception of falsification by Karl Popper (1963 & 1965) has not provided such a division either.

Undoubtedly, however, one such division includes the attitude towards q u e s t i o n s. Any question contains a hidden assertion making the answer possible. Science has been developing as answers to questions, which in a compact form formulated the entire knowledge accumulated up to that moment. Any scientific theory is primarily a question posed to nature. A theory disappears when it stops being a question calling forth answers. The early forms of mastering nature, e.g. alchemy, knew no questions. Western religion, at least in its traditional form, did not know them either. As to Eastern religions, they permitted questions to some extent (certainly, not to the extent science does), and this may explain the interest in them in the contemporary West.

Religion of today, at least to our mind, has faced the necessity to acknowledge the right to question: many-sided modern questions whose assertive component contains all the novel knowledge of the world. This is the only way for religion to acquire the dynamism it needs.

11. It is now also necessary for religion to acknowledge the right of

experimentation.¹ Strictly speaking, religion has never been alien to experimentation. Its experiments were personal experience, meditation, or prayer. But what we now must keep in mind is a directed experiment carried out as the answer to a question.

12. Contemporary religion and science have a point of contiguity. It is the search for a new-culture as the answer to the question posed by the ecological crisis. We believe the answer cannot be found without acknowledging a different ontological reality for us to enter.

¹Our paper (Nalimov a.o., 1979) is an example of a scientific experiment bordering religious experience.

References

- Capra, F., The Tao of Physics, San Francisco, Berkeley, Shambhala Publications, 1975.
- Castaneda, C., The Teachings of Don Juan: A Yakui Way of Knowledge, New York, Simon & Schuster, 1968.
- Castaneda, C., Journey to Ixtland, New York, Simon & Schuster, 1972.
- Castaneda, C., A Separate Reality: Further Conversations with Don Juan, New York, Simon & Schuster, 1974.
- Castaneda, C., Tales of Power, New York, Simon & Schuster, 1974.
- Nalimov, V.V., "The Receptivity of Hypotheses" (a short version of Ch. I from the book "Faces of Science"), Diogene 100 (1977) 179-197.
- Nalimov, V.V., Probabilistic Model of Language (in Russian), 2d ed, Moscow, Nauka, 1979 (the English translation of the book is to be published in the USA by ISI Press in 1979-1980).
- Nalimov, V.V., "Is the Scientific Approach to Eschatological Problems Possible? A Logical Analysis of the Problem of Large Ecology," Ch. VII from the book Faces of Science (Faces of Science is to be published by the ISI Press in 1980-1981. As an article this Chapter is in press in Diogene, end of 1979a).
- Nalimov, V.V. and Barinova, Z.B. "Sketches on the History of Cybernetics. Predecessors of Cybernetics in Ancient India," Darshana International (India), April 1974.
- Nalimov, V.V., Kuznetsov, O.A. and Drogalina, J.A., Visualization of Semantic Fields of a Verbal Text in Group Meditation (in Russian), The Unconscious, Tbilisi, Metsniereba, v. III, 703-710. 1979.
- Popper, K.R., Conjectures and Refutations. The Growth of Scientific Knowledge, New York-London, Basic Books Publishers, 1963.
- Popper, K.R., The Logic of Scientific Discovery, London, Hutchinson, 1965.
- Restivo, S.P., "Parallels and Paradoxes in Modern Physics and Eastern Mysticism, Part I - A Critical Reconnaissance," Social Studies of Science, 8(2), 1978. See also: "Physics, Mysticism, and Society; A Sociological Perspective on Distinguishing and Relating Alternate Reality," 4S, 4(1), 1979.

Teilhard de Chardin, P., The Phenomenon of Man, N.Y., Harper & Row, 1965.

Vernadsky, V.I., Notes of a Naturalist, v. II: Scientific Thought as a Planetary Phenomenon (in Russian), Moscow, Nauka, 1977.

IN THE LITERATURE

JOURNAL CONTENTS

These journal contents pages have been reprinted from Current Contents: Social and Behavioral Sciences with the kind permission of Eugene Garfield of the Institute for Scientific Information.

GR734 Social Studies of Science

Articles in English

VOL. 9 NO. 1 FEBRUARY 1979

1 Contradictions of Professionalism - Scientists, Trade Unionism and the 1st World War. *R. Macleod, K. Macleod*

33 Verfahrenstechnik (Chemical Engineering) - its Development, Present State and Structure. *K. Buchholz*

63 Knowledge and Utility - Implications for the Sociology of Knowledge. *M. Mulvey*

NOTES AND LETTERS

81 Citation Analysis of a Scientific Career - Case Study. *I. Ruff*

COUNTRY REPORT

91 Social Studies of Science in Bulgaria. *S. Kachanov, K. Simeonova*

101 Contemporary Soviet Theories of Scientific, Technological and Social Change. *E.P. Hoffmann*

115 Finalization Debate in Germany - some Comments and Explanations. *F.R. Pfetsch*

CONFERENCE REPORTS

125 Social Assessment of Science (Bielefeld, 26-28 May 1978). *E. Mendelsohn, D. Nelkin, P. Weingart, A. Rip*

135 Science, Society and Education (Amsterdam, 14-17 August 1978). *A. Rip*

HS397 Social Studies of Science

Articles in English

This is the latest issue of this journal.

The cover date does not correspond to the actual date of publication.

VOL. 9 NO. 3 AUGUST 1979

265 Carcinogenic Risk Assessment in the United-States and Great Britain - Case of Aldrin-Dieldrin. *B. Gillespie, D. Eva, R. Johnston*

303 Interdependence of Theory and Experiment in Revolutionary Science - Case of Parity Violation. *D.H. White, D. Sullivan, E.J. Berboni*

329 Normal Explanations of the Paranormal - Demarcation Problem and Fraud in Parapsychology. *T.J. Pinch*

REVIEW PAPER

349 Psychology of the Scientist - Evaluative Review. *M.J. Mahoney*

NOTES AND LETTERS

377 Authorship Recognition of Subordinates in Collaborative Research. *A.G. Heffner*

385 Deductive Explanation of the Matthew Effect in Science. *J.A. Goldstone*

393 Scientific Societies and Their Journals - Biomedical Scientists Assess the Brainstorm. *K.B. Lewin*

HY503

Social Studies of Science

Articles in English

VOL. 9 NO. 4 NOVEMBER 1979

403 Origins of the American Scientific Debate over Fallout Hazards. *C. Kopp*

423 Reification of Mandel. *A. Brannigan*

DISCUSSION PAPER

455 Quantitative Foundations for the Sociology of Science - Linking Blockmodeling with Co-Citation Analysis. *T. Lenoir*

NOTES AND LETTERS

481 International Research Collaboration. *J.D. Frame, M.P. Carpenter*

499 Citation Visibility of African Science. *Y.M. Rabkin, T.O. Eisenmon, J.J. Lalitcheoussal, E.M. Rathgeber*

507 Could the 1978 Nobel Prizewinner in Chemistry Have Been Predicted. *C. Oppenheim*

RESPONSES AND REPLIES

509 Notion of Independent Simultaneous Invention or Discovery. *R. Westrum*

509 " " " " " " *D.K. Simonton*

510 " " " " " " *E. Constant*

ESSAY REVIEW

511 From Advocacy to Job - Changing Nature of Scientific Practice. *R. Moseley*

HQ333

Minerva

VOL. 16 NO. 4 WINTER 1978

Academic Autonomy and Governmental Demands - Case of Malawi. *I. Michael*

Policy for the Advancement of Science - Rockefeller-Foundation, 1924-29. *R.E. Kohler*

Diverse and Changing Fortunes of the University-Of-Heidelberg under National Socialism. *A. Carmon*

Struggling to be Born - Scientific Community in Brazil. *S. Schwartzman*

Use of the Breeder Reactor. *A.M. Weinberg*

Humanism. *P.O. Kristeller*

REPORTS AND DOCUMENTS

BOOK REVIEWS

Revelations and Progress in Economic Knowledge - T.W. Hutchison. *G.J. Stigler*

Visible College - Collective Biography of British Scientists and Socialists of the 1930s - G. Wersky. *R.A. Hodgkin*

UNCSTD ISSUE:

United Nations Conference on Science and Technology for Development
August 1979

Rodney W. Nichols	87	For Want of a Nail? An Assessment of Prospects for the United Nations Conference on Science and Technology for Development
Thomas F. Malone	107	Science and Technology: Resources for Human and Economic Development
Guy B. Gresford	115	Toward Vienna 1979: Preparations for the United Nations Conference on Science and Technology for Development
Richard S. Eckaus	123	Criteria and Orientations for Science and Technology for Development
Jermen M. Gvishiani	137	Management and Technological Change
Philippe de Seynes	147	Science and Technology in Global Perspective
Jean Wilkowski	153	The US and UNCSTD
Amoakon-Edjampian Thiemele	159	Science and Technology in the Service of Development
Ona B. Forrest	165	Some Historic Notes Regarding the Predecessors of UNCSTD: A Comparison

Technology In Society

VOL. 1 NO. 3 AUTUMN 1979

Frank P. Davidson	171	Macro-Engineering: Its Social Implications
Mel Horwich	179	Designing and Managing Large-Scale Public-Private Technological Enterprises: A State of the Art Review
Hans R. Huessey	193	Dealing with the Negative Social Consequences of Technology
Jean-Jacques Salomon	205	The Social Function of Science Today
Jay W. Forrester	219	Energy Policy
Allan Mazur	229	Separating Factual Disputes from Value Disputes in Controversies Over Technology
Andrew A. Marino		
Robert O. Becker	239	The IQ of the Undeveloped Countries and the Jones Intelligence Doctrine
Stevan Dedijer		
Arnoldo K. Ventura	255	Commentary on "The IQ of the Undeveloped Countries and the Jones Intelligence Doctrine"
Lewis M. Branscomb	261	A Letter to Stevan Dedijer

GF978

SOCIOLOGICAL
INQUIRY

Abstracts in English

VOL. 48 NO. 3-4 1978

The Sociology of Science: Problems, Approaches and Research

Part 1: The Norm of Universalism 1

Sex Differentiation and the Social Organization of Science 6

Barbara F. Reskin

Race and Universalism in the Scientific Community 38

Willie Pearson, Jr.

Research Funding for Sociology in the National Science Foundation 54

Donald R. Ploch

Part 2: Problem Choice 63

Theory Choice and Problem Choice in Science 65

Harriet Zuckerman

Problem Retention and Problem Change in Science 96

Thomas F. Gieryn

Part 3: Different Approaches 117

Theory and Method in the Sociology of Science 121

Lowell Hargens

Possible Relationships Between the History and Sociology of Science 140

Donald deB. Beaver

Ups and Downs in the Pulse of Science and Technology 162

Derek de Solla Price

The Ethos of Science Revisited: Social and Cognitive Norms 172

Nico Stehr

Emergence of National Traditions in the Sociology of Science: 197

Joseph Ben-David

HD095

research policy

Abstracts in English

VOL. 8 NO. 3 JULY 1979

European policies on space science and technology 1960-1978

M. Schwarz

Influence of technology on science: A comment on some experiences at IBM research

D. C. Gazis

Setting research priorities

H. H. Ross, W. S. Lyon and W. D. Shults

Innovation management for an industrial product

J. W. Horsmans

An analysis of the role of users in the total R&D portfolios of scientific instrument firms

F. C. Spital

204

244

260

274

284

HT570

research policy

Abstracts in English

VOL. 8 NO. 4 OCTOBER 1979

A quantitative analysis of the Science Research Council's policy of 'selectivity and concentration'

C. Farina and M. Gibbons

The local government market as a stimulus to industrial innovation

J. D. Roessner

R&D strategy in the U.S. pharmaceutical industry

J. E. Schnee

Centres of decision in French science policy: The contrasting influences of scientific experts and administrators

P. Papon

306

340

364

384

JA155

research policy

Abstracts in English

VOL. 9 NO. 1 JANUARY 1980

Dimensions of R&D location in the United States

E. J. Matecki

Developing countries as exporters of industrial technology

S. Lall

The economic effects of innovation: Some calculations for The Netherlands

J. H. Spaaij

The origin and direction of industrial R&D in India

A. V. Desai

2

24

54

74

HP711

impact of science on society

Abstracts in English

VOL. 29 NO. 3 JUL.-SEP. 1979

Human Needs, Societal Goals and Research Priorities.....	189
Human Needs, Social Goals and Research Priorities - Comment. S.A. Petrovsky, R.I. Khairon	191
Are Science and Technology Leading to a New Pattern of Development. A. Dousin	201
Scientific-Technical Progress and the Social Goals of Science. D.M. Gristiani	211
Evaluating the Impact of Scientific Technology.....	217
Knowledge Transfer and the Universities - Policy Dilemma. U. Dambrosio	223
Influencing the Direction of University Research - some Problems. G. Benarro	231
Scientific and Technical Revolution in the Socialist Republic of Viet-Nam. N.K. Vien	241
Research and Immediate Education. Y. Friedman	247
Designing Self-Sufficient Housing for Temperate Climate. G. Armstrong	253
Biological Network to Safeguard Nature's Unseen Assets. E.J. Davila	261
Energy Research - Long-Range Perspectives. J.A. Snow	265
Science in the Face of Intellectual Needs. J. Malecki	273
Creativity, Hard Work and Long Life. A. Goleysova	281

LETTER

How Should Research be Organized in a Compartmentalized Ocean. M. Raito	283
---	-----

HW821

The Courier

Abstracts in English

NO. 10 NOVEMBER 1979

SCIENCE AND TECHNOLOGY: THE DEVELOPMENT DILEMMA

4 SCIENCE AND TECHNOLOGY: THE DEVELOPMENT DILEMMA

by Ibrahim Helmi Abdel Rahman

10 TWELVE 'MUSTS' FOR DEVELOPMENT

by Joao Frank da Costa

12 TANZANIA'S 'UJAMAA' WAY TO SELF-RELIANCE

Photo report

13 A WIDENING CHASM BETWEEN RICH AND POOR

900 million still live in absolute poverty

by N. A. Cox-George

16 THE CANDLE OF LEARNING

The tragedy of neglected scientific talent in the developing world

by Abdus Salam

18 WATERWEEDS AT WORK

Photo report

21 DIMINISHING RETURNS

by Ono Gianni

25 THE SEARCH FOR A GLOBAL STRATEGY

by Dzhermen Gvishiani

26 THE BOUNTY OF THE EARTH

CONSERVATION FOR DEVELOPMENT

MEIJI JAPAN:

A CASE STUDY IN INDUSTRIALIZATION

by Keichi Oshima and Keichi Furuya

34 THE DECISION-MAKERS

by Francisco Papa Blanco

ETHICS FOR SCIENCE POLICY

Nobel Symp on Ethics for Science Policy. Sodergarn, Sweden, August 20-25, 1978. Sponsors: Nobel Fdn / Bank Sweden Tercentenary Fdn / Svenska Handelsbanken Fdn Social Sci Res / Sven & Dagmar Salen Fdn

EDITED BY T. SEGERSTEDT

Pergamon Press Ltd. (Oxford), 1979, 253 Pages, \$25.00 Hardbound /

\$10.00 Softbound, ISBN: 0-08-024464-5

AS THE PUBLISHER REQUIRES PRE-PAYMENT, PLEASE ENCLOSE WITH YOUR ORDER A CHECK PAYABLE TO Pergamon Press Ltd.

Ethics for Science Policy - Opening Remarks.	J.E. Wikstrom	xiii
Rationality and the Personal Element in Science Policy.	S. Hallden	1
Science as a Source of Political Conflict.	D. Nelkin	9
Ethical Responsibility of Social Scientists - Historical Survey and Comment.	J.B. David	31
	J.R. Revetz	49
Critical Awareness of Science.	P. Saltman	57
Critique of Pure Science.	P. Aigrain	69
Priorities and Control in the Organization of Research.	H. Curien	75
Priorities and Control in the Organization of Research from the Scientists Point of View.		
Scientists View of Priorities and Control in the Organization of Research.	D.S. Fredrickson	81
	D.K. Price	91
Ethical Principles of Scientific Institutions.	T. Segerstedt	105
Priorities and Control in the Organization of Research from the Scientific Institutions Point of View.	F. Barnaby	117
	K. Lohs	125
Ethical Dilemmas in Weapen Development.	J. Feldman	133
Ethical Dilemma of Arms Development.	B. Vitale	145
People, Knowledge and Science.	H. Alfven	153
What Becomes of a Scientist.	L.E. Obeng	165
Science, Progress and Destruction.	J.B. Neillands	177
Information and Communication in the Developing World.	M. Malice	187
Transdisciplinary Communication - Priority in Scientific Information.	B.D. Davis	203
Limits in the Regulation of Scientific Research.	V. Aubert	215
Ethics and Priorities in Social Science.	D.A. Hamburg	225
Perspective on some Ethical Dilemmas in Health Sciences Policy.	S.S. Brown, E.O. Nightingale	245
Editors View - Research and Ethics.	T. Segerstedt	245

GJ845

IDS BULLETIN

Institute of Development Studies
Each Abstract in English, French and Spanish

VOL. 10 NO. 2 JANUARY 1979

PERSPECTIVES AND ISSUES

Indigenous Technical Knowledge: Analysis, Implications and Issues
Michael Howes and Robert Chambers 5

The Uses of Indigenous Technical Knowledge in Development
Michael Howes 12

TECHNICAL KNOWLEDGE: LEARNING FROM RURAL PEOPLE

Taking Indigenous Technology seriously: The Case of Inter-cropping Techniques in East Africa
Deryke Belshaw 24

Community Environmental Knowledge in African Rural Development
Paul Richards 28

Appropriate Methodology: An Example using a Traditional African Board Game to measure Farmers' Attitudes and Environmental Images
David Barker 37

KNOWLEDGE AND POWER

Notes on Traditional Knowledge, Modern Knowledge and Rural Development
Jeremy Swift 41

The Exploitation of Indigenous Knowledge, or the Indigenous Exploitation of Knowledge: Whose Use of What for What?
Martin Bell 44

A Select Annotated Bibliography: Indigenous Technical Knowledge in Development
Liz O'Keefe and Michael Howes 51

BOOK REVIEW

The Challenge of Poverty. The Developing Countries in the New International Order by Nandini Joshi
H. W. Singer 59

HC280

SCIENTOMETRICS

Articles and Abstracts in English

VOL. 1 NO. 5-6 AUGUST 1979

- G. M. Dobrov, R. H. Randolph, W. D. Rauch (Austria): New Options for Team Research via International Computer Networks 387
- H. Inhaber, M. S. Lipsett (Canada): Gaps in "Gaps in Technology" and Other Innovation Inventories 405
- T. K. Krauze, R. McGinnis (USA): A Matrix Analysis of Scientific Specialties and Careers in Science 419
- H. G. Small, D. Crane (USA): Specialties and Disciplines in Science and Social Science: An Examination of their Structure Using Citation Indexes 445
- E. Shearer, M. J. Morawcik (USA): Citation Patterns in Little Science and Big Science 463

HY506

SCIENTOMETRICS

Articles and Abstracts in English

VOL. 2 NO. 1 JANUARY 1980

- Fundamental Regularities of the Distribution of Scientific Productivity. Publication Rate as a Function of Laboratory Size in a Biomedical Research Institution. A.I. Yablonsky 3
- Subject Composition of the World's Scientific Journals. M.P. Carpenter, F. Narin 35
- Scientometric Investigations in the USSR. J.E. Cohen 53
- LETTERS TO THE EDITOR S.D. Hailun 65
- Is Citation Analysis a Legitimate Evaluation Tool. D. Chubin 91
- Is Citation Analysis a Legitimate Evaluation Tool - Reply. E. Garfield 92

B 042Z RESEARCH IN SOCIOLOGY OF KNOWLEDGE, SCIENCES AND ART, Vol. 2

A Research Annual

RESEARCH IN SOCIOLOGY OF KNOWLEDGE, SCIENCES AND ART. VOL. 2

EDITED BY R.A. JONES, H. KUKLICK

Jai Press (Greenwich), 1979, 247 Pages, Figures, \$29.50, ISBN: 0-89232-123-7

- Science and the Ethic of Protestant Asceticism-A Reply to Professor Robert K. Merton L.S. Feuer 1
- Needham, Joseph and the Comparative Sociology of Chinese and Modern Science. S.P. Reiche 28
- Phenomenological Marxism and Critical Theory. B. Smart 53
- Sociology, Past and Future - Prescriptive Implications of Historical Self-Consciousness in the School of Social Sciences. H. Kulkick 73
- Social Basis of Conceptual Diversity - Case Study of the Concept of Race in Physiological Anthropology. J.A. Stark, L.T. Reynolds, L. Lieberman 87
- Early French Contributions to the Sociology of Knowledge. W.P. Vogt 101
- Durkheim, Emile Today. T.N. Clark 123
- Social Evolution of the Artistic Enterprise. V. Kavolis 185
- Sociology of Werner, Elias. W. Stark 189
- Functions of Intellectual Rubble. J. Agassi 209
- Factor of Hermeneutics in Habermas Critical Theory. D.E. Sutherland 229

B 026D

SCIENCE & GOVERNMENT REPORT INTERNATIONAL ALMANAC 1978-1979

EDITED BY D.S. GREENBERG

Science and Government Report (Washington), 1979, 368 Pages, Figures, \$75.00

AVAILABLE ON THE COUPON BELOW OR FROM: Science and Government Report International Almanac, Post Office Box 6226, Washington, D.C. 20015.

SCIENCE POLICY: NATIONAL AND INTERNATIONAL REVIEWS

INTERNATIONAL DISTRIBUTION OF R&D RESOURCES - OVERVIEW, C. Norman 3

The Major Powers

UNITED STATES, D. Dickson 13

SOVIET-UNION, J. C. Phlips, B. Woodbury 26

SOVIET-UNION, J. C. Phlips, B. Woodbury 43

Europe

BRITAIN, D. Davies 52

EUROPEAN ECONOMIC COMMUNITY, L. Micoeur 64

FEDERAL-REPUBLIC-OF-GERMANY, K. Dillhor 70

FRANCE, F. Seguer 79

ITALY, G. Pace 90

NETHERLANDS AND BELGIUM, C. Schuering 98

SCANDINAVIA, J. Aarneshaug, A. Jernsten 105

SPAIN, P. Puigdemont 115

SWITZERLAND, L.F. Truab 124

The Scientifically Advanced Smaller Nations

AUSTRALIA, L. Pires 130

CANADA, D. Surgeon 148

ISRAEL, K. Pines 161

JAPAN, J.H. Douglas 176

SOUTH-AMERICA, G. Baker 185

The Developing Nations

BRAZIL, R.C. Descombrantes 194

PEOPLES-REPUBLIC-OF-CHINA, P.M. Perrella 201

INDIA, M. Anandakrishnan 214

MEXICO, F. Duhra, S. Mabo 228

INDONESIA, Z. Sander 239

MAJOR DOCUMENTS OF SCIENCE POLICY

CARTER ADMINISTRATION PROCLAIMS A SCIENCE POLICY, J. Carter 257

CHINA - TOWARD THE MAINSTREAM OF SCIENCE, H.P. Tong 283

RAISE THE SCIENTIFIC AND CULTURAL LEVEL OF THE ENTIRE CHINESE NATION, K.F. Hu 297

FISCAL DILEMMA OF BIOMEDICAL RESEARCH, J.A. Collins 305

FEDERAL-REPUBLIC-OF-GERMANY - R&D IN THE SERVICE OF HEALTH 311

GOVERNMENT SUPPORT OF R&D IN THE EUROPEAN COMMUNITY 326

OECD - TRENDS IN SCIENCE POLICY 343

B 9821

RECEPTION OF UNCONVENTIONAL SCIENCE

AAAS SELECTED SYMPOSIA SERIES, VOL. 25

Symp on the Reception of Unconventional Science Held at the Annual Meeting of the American Assoc for the Advancement of Science, Washington, DC, February 12-17, 1978. Sponsor: Amer Assoc Advancement Sci

EDITED BY S.H. MAUSKOPF

Westview Press (Boulder), 1979, 137 Pages, \$13.25, LCW 78-19735.

ISBN: 0-89158-027-5

AS THE PUBLISHER REQUIRES PRE-PAYMENT, PLEASE ENCLOSE WITH YOUR ORDER A CHECK PAYABLE TO Westview Press.

Introduction, S.H. Mauskopf 1

The Reception of an Actual Quantum Mechanics in Germany and Britain—P. Forman 11

The Reception and Acceptance of Continental Drift Theory as a Rational Episode in the History of Science, H. Frankel 51

Reception of Acupuncture by the Scientific Community: From Scorn to a Degree of Interest, J.Z. Bowers 91

The Controversy over Statistics in Parapsychology 1934-1938, S.H. Mauskopf, 105

B 060C

SCIENCE, TECHNOLOGY AND DEVELOPMENT

Essays in Honour of A. Rahman

EDITED BY K.D. SHARMA, M.A. QURESHI
Sterling Publishers (New Delhi), 1978. 478 Pages, \$15.00/R 120.00
AS THE PUBLISHER REQUIRES PRE-PAYMENT, PLEASE ENCLOSE
WITH YOUR ORDER A CHECK PAYABLE TO Sterling Publishers.

Science, Technology and Development - Introduction.....	v
SCIENCE POLICY AND DEVELOPMENT	
Science Policy and Social Objectives. J.J. Solomon	3
Science Policy in the Field of Influence of Social Development. G. Krober	22
Science and Policy-Making. L. Peres	34
Integrated Versus Sectorial Policies for Science and Technology. Y. Dehemptinne	59
Private Science and Public Policy. V. Siddhartha	68
SCIENCE AND SOCIETY	
Governability of Complexity. E.B. Skolnikoff	91
Culture, Science and the Economy. J. Bogner	108
Humanising Engineers Activity. B. Walentynowicz	114
Intelligence as an Applied Science. A.L. Mackay	124
Role of Science in Environmental Management. A. Khosla	138
TECHNOLOGY ASSESSMENT	
Technology Assessment and the Unanticipated Consequences of Technology. H. Rothman	150
Framework for Alternative Technology. K.D. Sharma, M.A. Qureshi	197
TECHNOLOGY AND UNDERDEVELOPED COUNTRIES	
Strategy for Rural Development. C. Subramaniam	217
Transfer, Transformation and Generation of Technology for Rural Development. A.K.N. Reddy	237
Application of Technology in Rural Sector Towards Employment Generation. C.R. Mitra	276
Some Current Field Research on Appropriate Technologies for the Less Developed Countries. A.H. Rubenstein, T.W. Schile, A.D. Jedlicka	283
RESEARCH MANAGEMENT	
Research and Development Management and Corporate Planning. A.W. Pearson	305
Personnel Management in Industrial Research Organizations. P.C. Mehta	311
SCIENCE IN INDIA	
India as a Small, Highly Developed Scientific Nation. D. Desai/price	329
Regional Development Aspect of Technology Policy. K.K. Subramanian	336
Scuttling the Coal Gasification Project at Hyderabad - Perils of Public Patronage in Bridging the Development Gap - Preliminary Analysis in Real Time of a Technological Decision. W. Morehouse	347
SCIENCE IN OTHER COUNTRIES	
Transfer of Technology to the Rural and Collective Sectors in China. J. Sigurdson	381
Chinese Views on Scientific Development. G. Dean	401
Public Science in the Modernisation of Japan. S. Nakayama	418
Science and Technology Policy and Planning in Arab-Republic-Of-Egypt. A.A. Seber	435
STUDY OF SCIENCE	
Present State and Problems of the History of Natural Sciences. S.R. Mikulinsky	449

Zetetic scholar

CONTENTS

ARTICLES

THOMAS A SEBEOK: Close Encounters with Canid Communications of the Third Kind.....	3
A DIALOGUE ON THE THEORIES OF I. VELIKOVSKY.....	27
JOSEPH MAY: The Heresy of a New Synthesis.....	28
Critical Comments by:	
DAVID MORRISON.....	48
LEROY ELLENBERGER.....	50
MICHAEL JONES.....	54
MALCOLM LOWERY.....	60
R.G.A. DOLBY.....	64
ROBERT MCAULAY.....	64
PETER J. HUBER.....	67
DONALD GOLDSMITH.....	67
Epilogue by M. TRUZZI.....	68
RICHARD DE MILLE: Explicating Anomalistic Anthropology with Help from Castaneda.....	69

FEATURES

EDITORIAL.....	2
ASTROLOGY: A REVIEW SYMPOSIUM.....	71
Prologue by M. TRUZZI.....	71
Reviews by:	
G.O. ABELL.....	74
DANE RUDHYAR.....	83
H.J. EYSENCK.....	85
MICHEL GAUQUELIN.....	87
MALCOLM DEAN.....	89
The Authors (GEOFFREY DEAN & ARTHUR MATHER) Respond	
To G.O. Abell.....	93
To Dane Rudhyar.....	96
To H.J. Eysenck.....	98
To Michel Gauquelin.....	99
To Malcolm Dean.....	100
Review-Article by JOSEPH AGASSI: Towards a Rational Theory of Superstition.....	107
The Authors respond to Joseph Agassi.....	120
QUOTEWORTHY.....	25
BOOK REVIEWS	
Lawrence E. Jerome's <i>Astrology Disproved</i> (Anthony Standen).....	127
A.R. Lieber's <i>The Lunar Effect: Biological Tides and Human Emotions</i> (Ivan W. Kelly).....	128
BOOKS BRIEFLY NOTED.....	128
BIBLIOGRAPHIES	
Lycanthropy: A Basic Bibliography on Werewolves and Their Kin.....	21
Random Bibliography on the Occult and the Paranormal.....	122
Supplements to Past ZS Bibliographies.....	126
ABOUT THE CONTRIBUTORS.....	136

Zetetic scholar



CONTENTS

NUMBER 5 - 1979

ARTICLES

MAHLON W. WAGNER & MARY MONNET Attitudes of College Professors Toward Extra-Sensory Perception.....	7
A DIALOGUE ON "STATISTICAL PROBLEMS IN PSI RESEARCH"	
Prologue: M. TRUZZI.....	17
Reply to Persi Diaconis: EDWARD F. KELLY.....	20
Rejoinder to Edward F. Kelly: PERSI DIACONIS.....	29
PIERRE GUÉRIN Thirty Years After Kenneth Arnold: The Situation Regarding UFOs.....	35
J. RICHARD GREENWELL A Review of UFO Witnesses' Reliability.....	54
RON WESTRUM A Visit to the Centre de Cryptozoologie.....	64
ROBIN RIDINGTON Literalism and Symbolism in Anthropological Understanding: The Sasquatch Image.....	66
JOSEPH MAY "The Heresy of a New Synthesis": The Author Responds	78

ZS DIALOGUES CONTINUED

JOSEPH AGASSI: Rejoinder. / G. DEAN & A. MATHER: Reply	85
C. LEROY ELLENBERGER: Comments on the Dialogue on Velikovsky.....	89

FEATURES

LETTERS AND COMMUNICATIONS: JAMES W. DAVIS, THOMAS A. SEBEOK, MARVIN A. LUCKERMAN and RANDALL COLLINS.....	2
EDITORIAL.....	5
QUOTE WORTHY.....	32
IVAN W. KELLY: BIBLIOGRAPHY ON SCIENTIFIC STUDIES OF THE "LUNAR EFFECT" AND HUMAN BEHAVIOR.....	50
RANDOM BIBLIOGRAPHY ON THE OCCULT & THE PARANORMAL.....	73
BOOK REVIEWS:	98
Francis Hitching's <i>Dowsing: The Psi Connection</i> (R. Hyman); Allan Hendry's <i>The UFO Handbook</i> (R. Westrum and Reply by Hendry); Seymour H. Mauskopf's <i>The Reception of Unconventional Science</i> , Bernard Heuvelman's <i>Les Derniers Dragons d'Afrique</i> , & Vincente- Juan Ballester Olmos's <i>OVNIS: El Fenomeno Aterrizable</i> (R. Westrum)	
BOOKS BRIEFLY NOTED.....	114
ABOUT THE CONTRIBUTORS.....	123

ANNOUNCEMENT OF RECENT BOOKS

These announcements are made for the immediate interest of our readers. We hope to publish reviews at the earliest possible time.

Citation Indexing—Its Theory and Application in Science, Technology, and Humanities

Eugene Garfield
Institute for Scientific Information

Contents

Chapter 1	1
A Conceptual View of Citation Indexing	
Chapter 2	6
A Historical View of Citation Indexing	
Chapter 3	19
The Design and Production of a Citation Index	
Chapter 4	37
The Application of Citation Indexing to the Patent Literature	
Chapter 5	41
The Citation Index as a Search Tool	
Chapter 6	62
A Science-Management Tool	
Chapter 7	81
Citation Analysis as a Method of Historical Research into Science	
Chapter 8	98
Mapping the Structure of Science	
Chapter 9	148
Citation Analysis of Scientific Journals	
Chapter 10	240
Perspective on Citation Analysis of Scientists	
Epilogue: The Future of Citation Indexing	253
Cited Author Index	257
Subject Index	259

A WILEY-INTERSCIENCE PUBLICATION
JOHN WILEY & SONS
NEW YORK • CHICHESTER • BRISBANE • TORONTO

THE IMPACT OF THE NUCLEAR CONTROVERSY ON DECISION- MAKING STRUCTURES

G. Küppers, H. Nowotny, eds.

Bielefeld 1979

Table of Contents

	Page
I. Foreword G. Küppers & H. Nowotny	I - II
II. Assessing the Impact of the Nuclear Controversy: Introduction and Conclusions H. Nowotny	1 - 20
III. The Emergence, Development and Effectiveness of the Nuclear Protest Movement E. Thom	21 - 82
IV. Energy Model in Today's Energy Policy H. Hirsch	83 - 113
V. Effects of the Nuclear Energy Debate on Energy-Research - the Development of Energy Research in the Federal Republic of Germany G. Küppers	119 - 163
VI. The Influence of the Nuclear Contro- versy on the Political Administrative System W. Zehetner	164 - 223
VII. List of Contributors	224 - 227

Limits of Scientific Inquiry

Edited by GERALD HOLTON and ROBERT S. MORISON



W · W · NORTON & COMPANY · INC · New York

Contents

<i>Preface</i>	vii
ROBERT S. MORISON • Introduction	ix
LOREN R. GRAHAM • Concerns about Science and Attempts to Regulate Inquiry	1
ROBERT L. SINSHEIMER • The Presumptions of Science	23
DAVID BALTIMORE • Limiting Science: A Biologist's Perspective	37
LYNN WHITE, JR. • Science and the Sense of Self: The Medieval Background of a Modern Confrontation	47
LEO MARX • Reflections on the Neo-Romantic Critique of Science	61
DON K. PRICE • Endless Frontier or Bureaucratic Morass?	75
WALTER P. METZGER • Academic Freedom and Scientific Freedom	93
SISSALA BOK • Freedom and Risk	115
JUDITH P. SWAZEY • Protecting the "Animal of Necessity": Limits to Inquiry In Clinical Investigation	129
BARBARA J. CULLITON • Science's Restive Public	147
PETER BARTON HUTT • Public Criticism of Health Science Policy	157
HARVEY BROOKS • The Problem of Research Priorities	171
DOROTHY NELKIN • Threats and Promises: Negotiating the Control of Research	191
ROBERT S. MORISON • Misgivings about Life-Extending Technologies	211
GERALD HOLTON • From the Endless Frontier to the Ideology of Limits	227
<i>Notes on Contributors</i>	243
<i>Index</i>	245

Science, Technology and Public Policy

An International Perspective



PERGAMON PRESS

EDITED BY SOL ENCEL AND JARLATH RONAYNE

Contents

Introduction	1
Jarlath Ronayne and Sol Encel	
PART I: THE INTERNATIONAL SETTING	
1. Government Funding of Research: An Assessment	15
Georges Ferné	
2. Science Policy Procedures in Canada: An Evaluation	24
Andrew H. Wilson	
3. Technical Change and Unemployment	53
Christopher Freeman	
4. The Control and Development of Technology:	77
Orienting Research to the Needs of Industry	
Michael Gibbons	
PART II: THE AUSTRALIAN SCENE	
5. Planning for Science and Technology in Australia	97
Geoffrey Badger	
6. Perceptions of Science and Technology in Industry,	108
Government and Universities: Some Comparisons	
J.A. Allen	
7. The Role of Government in Science and Technology	117
A.J. Birch	
8. The Role and Optimum Structure of a National	123
Scientific Research Organisation	
E.G. Hallsworth	
9. Australian University Research and National Objectives	139
N.H. Fletcher	
10. The Criteria for Social Scientific Choice	148
Stuart Harris	

Recent and Forthcoming Publications

Scientometrics

Vol. 2, No. 1, 1980

Contents

- A.I. Yablonsky (USSR): On Fundamental Regularities of the Distribution of Scientific Productivity
- J.E. Cohen (USA): Publication Rate as a Function of Laboratory Size in a Biomedical Research Institution
- M.P. Carpenter, F. Narin (USA): The Subject Composition of the World's Scientific Journals
- S.D. Haitun (USSR): Scientometric Investigations in the USSR (Review)

News

(Abstracts to above papers)

"On Fundamental Regularities of the Distribution of Scientific Productivity"
A.I. Yablonsky, Institute for Systems Studies, 29 Ryleyev Street,
Moscow, 119034 (USSR)

The paper presents a methodological and mathematical study of the main regularities related to the distribution of scientific productivity. An analysis of these regularities is given from the point of view of two approaches, the frequency and the rank one, to the problem of scientific productivity. The connection between these approaches is studied and a number of mathematical formulas that are both of theoretical significance for the understanding of information data bases formation mechanisms and a practical one, in particular, for the estimate of Bradford's law parameters, are deduced. The relation between the scientific productivity distributions under consideration and stable non-Gaussian distributions is analyzed. The formation of the corresponding regularities of scientific productivity is regarded as a consequence of the probability process being combined with the deterministic one.

"Publication Rate as a Function of Laboratory Size in a Biomedical Research Institution"

J.E. Cohen, The Rockefeller University, 1230 York Avenue, New York,
New York 10021 (USA)

At the Rockefeller University in 1977-78, the number of all publications of a research group in a year was approximately proportional to the number of individuals in that group during the year. The number of primary research publications of a group in a year was also approximately proportional to the number of individuals in that group during the year.

The observed frequency distribution of laboratory size was statistically indistinguishable from a 0-truncated negative binomial distribution, which is the equilibrium frequency distribution of size predicted by stochastic models for the dynamics of freely-forming primate social groups.

"The Subject Composition of the World's Scientific Journals"

M.P. Carpenter and F. Narin, Computer Horizons, Inc., 1050 Kings
Highway North, Cherry Hill, New Jersey 08034 (USA)

A country by subject count of the serial periodical collection at the British Library Lending Division (BLLD) in 1973 is reported and compared to previous counts. Approximately 25,000 periodicals have titles indicating that they are scientific journals in nine fields of the physical and biological sciences, engineering, and mathematics. The overall subject distribution of the journals appears to be remarkably stable when compared to a similar count by Hulme 60 years ago, although the number of journals appears to have doubled in the last 60 years. A major shift was found in the national origin of the journals, when compared with Hulme's counts, with a notable rise in the number and percent of U.S. journals, and a sharp decline in the percentage of French and German journals.

"Scientometric Investigations in the USSR (Review)"

S.D. Haitun, Institute of the History of Science and Technology of the
Academy of Sciences of the USSR, Staropansky per., 1/5, Moscow (USSR)

The following is a review of scientometric investigations in the USSR. Scientometrics has been taken in the strict sense of the term, defined as a science of science approach responsible for measuring reproducible science. The state of scientometric research in the Soviet Union is compared to that of other countries.

Scientometrics

Vol. 2, No. 2, 1980

Contents

K.D. Knorr, R. Mittermeir (USA): Publication Productivity and Professional
Position: Cross-National Evidence on the Role of Organizations

V.A. Pokrovsky (USSR): Some Problems of Measuring the Impact of R&D Upon the
Efficiency of Social Production

J.D. Frame (USA): Measuring Scientific Activity in Lesser Developed Countries

J.C. Sheldon (Australia): A Cybernetic Theory of Physical Science Professions:
The Causes of Periodic Normal and Revolutionary Science Between 1000
and 1870AD

News

(Abstracts to above papers)

"Publication Productivity and Professional Position: Cross-National Evidence on
the Role of Organizations"

K.D. Knorr, Department of Sociology, University of Pennsylvania (USA)
R. Mittermeir, Department of Computer Sciences, University of Texas,
Austin (USA)

Studies of stratification in science have increasingly accepted the idea that science is a highly stratified and elitist system with skewed distributions of productivity

and rewards. Attempts to explain the higher productivity of higher status scientists by pointing to their greater ease of publication as far as acceptance of their work by journals and publishers is concerned were not supported by the data in some recent studies. If status in general does not confer greater ease of publication the present paper argues that position within a research organization does confer greater ease of author--or coauthorship--and this is the major explanatory variable accounting for productivity differences within research laboratories as far as quantity of articles (and books) is concerned. Upward moves in a laboratory's formal or informal position hierarchy are associated with a change of a scientist's research involvement from goal executing to goal setting functions as well as with an increasing access to scientific manpower and project money. Goal setting tasks provide for a significant reduction of time-expenditures in research necessary to assure that the scientist is identified with the research results; consequently, they allow for an involvement in more research tasks than originally. Equivalently, resources in scientific manpower and project money act as a multiplying element as far as quantity of output is concerned. When group productivity is considered, individual publication productivity and especially supervisory productivity retain a major significance. Additionally, size of the research unit seemingly plays a key role: in the present data set, size tends to be negatively related to per capita group productivity, with most pronounced relationships occurring in academic natural science units.

"Measuring Scientific Activity in Lesser Developed Countries"

J.D. Frame, Computer Horizons, Inc., Washington Office, 7101 Wisconsin Avenue, Washington, D.C. 20014 (USA)

(No abstract)

"Some Problems of Measuring the Impact of R&D Upon the Efficiency of Social Production"

V.A. Pokrovsky, State Committee for Science and Technology, Moscow (USSR)

A critical analysis of works by Soviet authors, devoted to the problem of assessing the contribution of science to the efficiency of social production, is carried out. The computational results of two different versions of production function and a factor analysis technique are also presented, based on the same statistical data of the 8th and the 9th Five-Year-Plan periods. The numerical value of economic efficiency of investment in R&D, which was determined by relating the benefits from R&D to the associated expenditures, has been found to be 2.1-11 times higher than the profitability of plant investment. The classification and analysis of the major factors, contributing to the growth of public production efficiency, using a multiple correlation technique, show, that a 1% increase in R&D expenditures is associated with a 0.43% rise in labor productivity which also confirms the higher productivity of R&D investments.

"A Cybernetic Theory of Physical Science Professions: The Causes of Periodic Normal and Revolutionary Science Between 1000 and 1870AD"

J.C. Sheldon, Department of Physical and Inorganic Chemistry, University of Adelaide, Adelaide, G.P.O. Box 498 (South Australia, 5001)

The changing levels of activities in a physical science profession are modelled as a network of relations between different career stages. This cybernetic theory

predicts that the dominance of elites undergoes 300 year cycles of sharp alternations whereas the challenge of embryonic elites fluctuates in 100 year cycles. These results seem confirmed by a survey of chemical histories: the birthrate of outstanding chemists oscillates in 300 year cycles and of lesser chemists in 100 year cycles, both with the waveprofile specified by the model. These fluctuations seem to correspond to Kuhn's periods of revolutionary and normal science.

REPORTS OF MEETINGS
Trevor Pinch

SOCIAL PROCESSES OF SCIENTIFIC INVESTIGATION, Bielefeld, 17th-19th June, 1979

This conference was organised by the Yearbook of the Sociology of the Sciences in association with PAREX. Most of the papers presented had been precirculated, thus giving ample time for discussion sessions. The papers were:

- R. Krohn, "Science as the Pursuit of Cultural Change: a Step Beyond the old Dichotomies"
- M. de Mey, "Perception, Conception and the Interaction between Theory and Data in Science"
- J. Barmark and G. Wallen, "An Interdisciplinary Approach to Interdisciplinary Research"
- T. Pinch, "Theoreticians and the Production of Experimental Anomaly: the Case of Solar-Neutrino Physics"
- C. Salomom-Bayet, "Histoire et Sociologie des Sciences: Entre la Commemoration et la Description"
- W. Harvey, "The Effects of Social Context on the Process of Scientific Investigation: Experimental Tests of Quantum Mechanics"
- A. Pickering, "Cognitive Interests and Consensus: Model Choice in High Energy Physics"
- K. Knorr, "The Research Process: Method Reconsidered"
- G. Travis, "Constructing Creativity: the Memory Transfer Phenomenon"
- S. Woolgar, "Logic and Sequence in a Scientific Text"
- G. Küppers, "Cognitive and Institutional Factors in the Research Process--a Case Study in the Field of Theoretical Plasmaphysics"
- B. Latour, "Sociology of a Peptide"
- N. Gilbert, "Science and Laboratory Practice"

The discussants were drawn from members of the Editorial Board of the Yearbook.

The conference was conceived as a forum for sociologists working on the nuts and bolts of scientific activity to present and discuss their findings. Although when the conference was set-up it was intended that participants should be guided by a nexus of problems and theoretical issues set-out in an introductory paper by Roger Krohn, in practice no single unified perspective emerged. This was not surprising and simply reflects the diversity of theoretical approaches and aims now current in the sociology of science. The difference between this meeting and previous ones is that at last a rich pool of empirical material is starting to emerge on which the theoretical debates can focus. Indeed the hallmark of the meeting was the detailed working through of several case studies of scientific investigation.

The papers presented are to be revised in the light of the discussion at the conference and eventually published as Volume 5 of the Yearbook under the editorship

of K. Knorr, R. Krohn and R. Whitley. A similar conference is planned to be held in Montreal in order that N. Americans may contribute. The format of a conference preceding a revised published collection is an excellent idea and it is my understanding that the Yearbook intends to follow this procedure for Volume 6. The feedback between discussants and presenters at Bielefeld would have proved even more fruitful if a greater proportion of the discussants had themselves been engaged in the kinds of empirical studies presented. Perhaps in the future, discussants could be chosen from a wider pool which included more of the presenters.

THE SOCIOLOGY OF MODERN PHYSICS, B.S.A. Science Study Group Meeting, Wolfson College, Oxford, July 7th, 1979

Papers presented were:

Harry Collins, "Son of the Seven Sexes: The Social Destruction of Gravitational Radiation"

Bill Harvey, "Plausibility: A Useful Concept in the Sociology of Science"

Trevor Pinch, "The Social Component of Solar-Neutrino Predictions"

Andy Pickering, "Networks, Arguments and Interests"

This meeting served to expose the weakness of the "special case argument" against the sociology of scientific knowledge. It is claimed that areas where the sociology of knowledge proves fruitful are simply "special cases" and that it has nothing to say about the bulk of science and in particular "hard" sciences such as physics. Few would surely question the pedigree of the science discussed in these papers. Gravitational radiation, quantum mechanics, solar neutrinos and high energy physics are all fields in which Nobel prizes are won and lost.

All the papers were rich in empirical content and reflected the working knowledge of the technical details of the science acquired by the presenters. Indeed an unsuspecting observer at the meeting who happened to walk in when John Ziman was expounding some technical point of physics, might be forgiven for thinking a physics seminar was taking place--such are the close links between the science and the sociology evident in these case studies.

There was general agreement that the appropriate epistemological stance for this kind of work is the explanation of scientific developments without giving any explanatory power to the Natural World. Differences in emphasis did, however, emerge. Perhaps this was most notable in the approaches of Pickering and Collins. Pickering offered a model which attempted to account for developments in HEP in terms of cognitive interests. Collins, on the other hand, was more concerned to demonstrate how a relativist epistemology could be fruitfully applied to areas in which there is substantial scientific consensus.

The Study Group meeting was arranged to coincide with the end of the conference "Practical Reasoning and Discourse Processes" held at St. Hugh's College, Oxford, the preceding week. This was a good idea in principle, but unfortunately most of the participants at the Discourse conference were too exhausted to stay on for the Study Group. Notable exceptions were Harold Garfinkle and Michael Lynch who both gave informal and informative talks about their conception of an ethnomethodology of science.

The feeling shared by many participants at the meeting was that it had provided an excellent forum for sociologists of science to sit down together and talk about the detailed problems of the emerging empirical studies.

FORTHCOMING MEETING

NEW PERSPECTIVES IN THE HISTORY AND SOCIOLOGY OF SCIENTIFIC KNOWLEDGE. Jointly organised by the British Society for the History of Science and the BSA Sociology of Science Study Group. To be held at the University of Bath, 27-29 March 1980. For further information contact H.M. Collins, School of Humanities and Social Sciences, University of Bath, Claverton Down, Bath, BA2 7AY (The conference is now over subscribed.).

The program for this meeting is as follows:

27 March 1980

THE BODY

"The Concept of Inhibition: History and Interpretation in Neurophysiology"
Roger Smith

"Changing Images of the Body in Eighteenth Century Britain"
Maureen McNeil

"Bureaucracy, Liberalism and the Body in Post-Revolutionary France: Pt. 1
Bichat's Physiology and the Paris School of Medicine"
John Pickstone

Discussants: R. Willis
Roy Porter

28 March 1980

NATURALISM AND MATERIALISM

"Natural Laws and Divine Judgement: Some Reflections on Scottish Natural Theology"
Paul Baxter

"Darwinism and Social Darwinism: Can the Scientific and the Ideological be
Disentangled?"
Ted Benton

"Somatic Theories of Mind and Social Interests in Britain, 1850-80"
Stephen Jacyna

"Matter and Spirit as 'Natural Symbols' in Eighteenth Century British Natural
Philosophy"
Christine Wilde

"The Triumph of the Will: The Newton Leibniz Disputes and Political Ideology"
Steven Shapin

Discussants: David Miller
Ed Yoxen

CLASSIFICATION (A)

"Some Conventional Aspects of Biological Taxonomies"
John Dean

"On Classifying a Continuum: Reflections on the Historical Construction of the
Relative Time-Scale in Geology"
Martin Budwick

"The Social Maintenance of Two Divergent Classifications: A Case Study From the History of Ecology"

Malcolm Nicolson

Discussants: Mary Hesse

William Outhwaite

CLASSIFICATION (B)

"Taxonomy and Practice: Medical Classification in the Eighteenth Century"
Christopher Lawrence and M. Neve

"Herschel in Bedlam: Natural Classification and Social Coherence in Stellar Astronomy"

Simon Schaffer

"A Durkheimian Analysis of Scientific Knowledge: J.A. Udden's Particle Size Analysis"

John Law

Discussants: Peter Wright

Barry Barnes

SOCIAL CONSTRUCTION OF MODERN SCIENCE (A)

"Social Accounting in Research Papers"

Nigel Gilbert

"Replicating Replication? The Case of Memory Transfer"

David Travis

"The Sun Set: Certainties and Uncertainties in Scientists' Responses to the Solar-Neutrino Problem"

Trevor Pinch

Discussants: Bruno Latour

Alex Dolby

29 March 1980

SOCIAL CONSTRUCTION OF MODERN SCIENCE (B)

"Son of Seven Sexes: The Social Destruction of Gravitational Radiation"

Harry Collins

"The Hunting of the Quark: The Experimental Method in Science"

Andrew Pickering

"Why Does the World Seem Non-Negotiable? An Attempt to Reconcile Two Views of the Production of Scientific Knowledge"

William Harvey

Discussants: Bill Brock

Rom Harre

MATHEMATICS

"Did Hamilton's Metaphysics Influence his Algebra?"

David Bloor

"Understanding or Experience: Euclidean and Non-Euclidean Geometries"

Christopher Knee

"Wittgenstein's 1939 Lectures and the Value of Rhetoric"

Vittoria de Vecchi

"Charles Babage, John Herschel and Analytics: 'Professionalism' and
Mathematics in Early Nineteenth Century England"

Philip Enros

Discussants: - To Be Decided

CALL FOR PAPERS

TEMPLE UNIVERSITY PRESS is sponsoring a new series, TECHNOLOGY AND URBAN GROWTH. Manuscripts addressing all phases of the historic urban and technological scenes are invited. The editors are Blaine Brownell, The University of Alabama-Birmingham; Mark Foster, The University of Colorado-Denver; Zane Miller, The University of Cincinnati; Mark Rose, The Franklin Institute; and Howard Sumka, Office of Policy Development and Research, U.S. HUD. Manuscripts should be sent to Kenneth Arnold, Editor, Temple University Press, Temple University, Philadelphia, PA 19122.

POSITION VACANCY

UNIVERSITY OF PENNSYLVANIA. The Department of History and Sociology of Science seeks to hire an historian of the social sciences for a three year assistant professorship beginning in September 1981. A secondary competence in the sociology of knowledge is desirable. The deadline for application is 15 July 1980. Write Dr. Robert E. Kohler, Search Committee, Department of History & Sociology of Science, University of Pennsylvania, E.F. Smith Hall /D6, Philadelphia, PA 19104. An equal opportunity/affirmative action employer.

GERALD HOLTON, Mallinckrodt Professor of Physics and Professor of the History of Science at Harvard University received the Oersted Medal at the January 1980 annual joint meeting of the American Physical Society and American Association of Physics Teachers.

LEARNING RESOURCES IN INTERNATIONAL STUDIES
SCIENCE AND SOCIETY IN A GLOBAL CONTEXT
WORLD CONFLICT AND COOPERATION IN SCIENCE AND TECHNOLOGY
INTERNATIONAL SCIENCE AND TECHNOLOGY POLICY
DISARMAMENT, ENVIRONMENT, HEALTH AND BIOMEDICAL SCIENCES
NEW DIRECTIONS FOR THE U N SYSTEM IN THE 1980s
SOCIAL VALUES OF SCIENCE AND TECHNOLOGY IN A CHANGING WORLD
Special Offer for Entire Seven Volume Series

These are among the many topics covered in two important sets of publications on the last major international conference of the decade:

United Nations Conference on Science and Technology for Development (UNCSTED),
Vienna, August 1979

Useful source material for students, scholars, and working scientists concerned with the social impact of science and technology, the changing role of science and technology in the international economic and political system, science and public policy, and international scientific cooperation.

Science and Technology for Development: International Conflict and Cooperation.
A Bibliography of Studies and Documents Related to UNCSTED:

Preliminary Version (January 1977) and No. 1 (April 1977) - revised and reissued February 1978	\$ 6.00
No. 2 (April 1978)	\$ 5.00
No. 3 Subject Index to Nos. 1 and 2 (June 1978)	\$ 6.00
No. 4 (September 1978)	\$ 8.00
No. 5 (April 1979) National and Regional Papers for UNCSTED	\$10.00
No. 6 (October 1979)	\$10.00
Combined price of all six publications (including handling and postage)	\$30.00

Over 550 pages, 2364 entries, with extensive subject index.

Special Offer for Entire Series: Those ordering Nos. 1-6 at this time will receive the 7th and final volume in the series automatically and without additional charge.

A Joint Bibliographical Project of the Research Policy Institute, University of Lund, Sweden, and the Program of International Science and Technology Affairs, Council on International and Public Affairs, New York.

To Be Published: No. 7 (which will complete the series), Spring, 1980. No. 7 will cover the official documentation issued at the Conference, the final report of the Conference, including the Vienna Programme of Action, and post-mortem accounts of Vienna and assessments of UNCSTED within the context of setting the stage for the Third Development Decade of the 1980s.

THE UNSCTED INFORMATION PACKET

The UNCTED Information Packet provides an authoritative picture of what went on in Vienna as well as an assessment of the accomplishments and shortcomings of the Conference. The Packet includes 10 issues of Retort, the Conference daily newspaper, which were issued during the Conference itself. Also included is the special post-mortem issue prepared by the same team of experienced science journalists from North and South who covered all the important aspects of the official Conference and the NGO Forum.

In addition, the Information Packet includes the official Vienna Programme of Action adopted by UNCTED.

The entire Packet is available for \$18.00, including handling and postage.

Address all inquiries to: Ward Morehouse, President, Council on International and Public Affairs, Suite 1026, 60 East 42nd Street, New York, New York 10017.

INTERNATIONAL NETWORK FOR SOCIAL NETWORK ANALYSIS

International Network for Social Network Analysis was founded in 1977 to link together network analysts and disseminate current information. It now has over 400 members from all continents and all social science disciplines, mathematics, philosophy, statistics and theology.

INSNA publishes three issues of a Bulletin, CONNECTIONS, annually. (It is somewhat like 4S.) Recent issues have each been over 60pp. long. It contains brief research reports and position papers; research round-ups; abstracts and summaries of papers (unpublished and published), new books and dissertations; computer programs; meetings information; grant announcements and news items. A Directory of all members appears in the current issue (Volume 2, Number 3), giving addresses, telephone numbers and research interests.

INSNA has also served as the framework for a number of conferences--in Toronto, Uppsala and Bremen. Members may also subscribe to the new journal SOCIAL NETWORKS at a special price of \$20. Dues for INSNA itself are \$8, which includes a subscription to CONNECTIONS. For subscription and editorial information, please contact:

Barry Wellman
INSNA Coordinator
Structural Analysis Programme
Department of Sociology
University of Toronto
Toronto Canada M5S 1A1

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 (\$15 for professionals, \$5 for students) and institutional subscriptions (\$25) should be sent to: The Secretary/Treasurer, 4S, Department of Sociology, Indiana University, Bloomington, Indiana 47401.

Editorial Assistant: Beverly Morber

4S

Department of Sociology
Southern Illinois University at Carbondale
Carbondale, Illinois 62901

Non-Profit Org.
U.S. Postage
PAID
Permit No. 15
Carbondale, IL
