

4S Society for Social Studies of Science

Fall 1977

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4S Society for Social Studies of Science

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4S: PROGRESS AND PROSPECTS

PRESIDENT'S MESSAGE

Scientific and scholarly thought often progresses most rapidly at the margins of disciplines, in part because ideas and research techniques developed in one discipline prove fruitful in others. As a consequence, when there is enough institutional flexibility, interdisciplinary efforts are common: research projects, research organizations, teaching programs, and societies such as our own. Accompanying the intellectual excitement often found in such efforts are distinctive kinds of social processes. The borrower of new intellectual tools is likely to be aware that he may misuse them. He may seek recognition from those in other disciplines, for there he can obtain, in Norman Storer's words, a "competent response" to his own creative work,--this despite the real possibility that such recognition may not lead to other kinds of organizational rewards. He may seek direct assistance from those in other disciplines. Such exchanges may be symmetrical; if not, the asymmetry of exchange may contribute to differentials in disciplinary prestige.

The competitive coexistence of disciplines in universities and other settings allows prestige differentials to be manifested in quite different ways. In intellectual exchange, prestige differentials accompany contributions known to be valuable from direct experience. In other settings, disciplinary prestige is important precisely because of ignorance of the fields involved. I have encountered this manifestation most clearly through service on interdisciplinary research grant review committees, in which members were asked to assess proposals from those in disciplines more or less remote from their own. In such settings, proposals from those in disciplines of lower prestige were subjected to harsher scrutiny and were more apt to be ridiculed than proposals from those in disciplines of higher prestige. Sensing the importance of prestige in such settings and elsewhere in the larger intellectual community, those in disciplines of relatively low prestige may be tempted to emulate those above them by borrowing ideas and techniques that are inappropriate means for achieving their own distinctive goals, which may be lost sight of in the process. (These speculations may deserve systematic study. I know of no good descriptive studies of the relative prestige of disciplines. This is somewhat surprising, given numerous studies of the prestige of occupations and of universities and given the perennial interest by the "learned class" in "gradations of rank and ritual," to borrow Thorstein Veblen's words.)

I do not believe that disciplinary prestige, the making of invidious distinctions, and emulation are at all important in 4S: we know one another's contributions, and know who can give competent responses to our own work. Others might disagree. Roger Hahn (*Physis* 1975), in discussing 4S and related matters, noted that "Danger lies principally in the absorption of one group by the other, or in the dominance of one set of views above the other." The intense intellectual exchanges at our meetings and in the journals and newsletters serving the social studies of science lead me to believe the danger is remote. We are likely to continue to have what Hahn, and I presume the rest of us, desire: "A variety of perspectives [that] protects one from having to rely on the exclusive and often arrogant views of academics who know they are right."

Warren Hagstrom

SECOND ANNUAL MEETING: PROGRAM (Abstracts Follow Program)

14-16 October 1977

SESSION I. SCIENCE POLICY AND SCIENTIFIC INTERACTIONS

Chairperson: Warren O. Hagstrom (University of Wisconsin)

Discussants: Robert Wright (National Science Board)
Michael Useem (Boston University)

"Policy-Oriented Science Indicators"

Christopher Wright (Office of Technology Assessment, U.S. Congress)

"Changing Patterns of the Science-Government Relationship: The Evolution of Science Policy Advisory Councils in France, the Netherlands and the United States"

Ronald Brickman and Arie Rip (Cornell University)

"Circulation of the Elite: Value Elements in European-United States Scientific Interactions"

Dorothy Zinberg (Harvard University)

SESSION II. LIMITS AND BOUNDARIES OF SCIENTIFIC THOUGHT AND SCIENTIFIC INSTITUTIONS

Chairperson: Peter Weingart (University of Bielefeld)

Discussants: Dorothy Nelkin (Cornell University)
Joseph Agassi (Boston University)

"Limits of Inquiry in Science"

Gerald Holton (Harvard University)

"At the Borders of Science"

Everett Mendelsohn (Harvard University)

SESSION III. INTERNATIONAL ASPECTS OF SCIENCE

Chairperson: Michael Moravcsik (University of Oregon)

Discussant: Jerry Gaston (Southern Illinois University-Carbondale)

"Science in Developing Countries: An Unexplored and Fruitful Area for Research in Science Studies"

Michael Moravcsik (University of Oregon)

"Trans-Societal Linkages of Southeast Asian Academic Scientists: A Comparative Study of the Philippines and Malaysia"

John Useem (Michigan State University), Ruth Hill Useem (Michigan State University), Abu Hassan Othman (Universiti Kebangsaan Malaysia), and Florence E. McCarthy (University of Connecticut)

- "International Aspects of a Specialty in Elementary Particle Physics:
National Participation and Barriers to the Diffusion of Knowledge"
Daniel Sullivan (Carleton College), Edward J. Barboni (Grinnell
College), and D. Hywel White (Cornell University)

SESSION IV A: COGNITIVE AND RHETORICAL STRUCTURES IN SCIENCE

Chairperson: Patricia Woolf (University of Pennsylvania)

- "Peer Review: A Dialectical Policy Analysis"
Ian Mitroff (University of Pennsylvania) and Daryl E. Chubin
(Georgia Institute of Technology)
"Cognitive and Research Styles in Paradigm and Pre-Paradigm Fields"
John M. Wilkes (Cornell University)
"The Sociology of Local Hidden Variable Experiments"
William Harvey (University of Edinburgh)
"Scientific Advice and Risk Assessment: A Sociological Analysis"
Ron Johnston (PREST, University of Manchester)

SESSION IV B: SPECIALTIES AND RELATIONS AMONG SPECIALTIES: I

Chairperson: Belver C. Griffith (Drexel University)

- "Cross-Institute Integration of Research Supported by National Institutes
of Health"
Francis Narin, Rosalie Shapiro, and Gabriel Pinski (Computer Horizons)
"Bibliometric Relations among Coauthorship Sets in Friend Virus"
Edward J. Hackett, Kenneth Studer, and Carl B. Backman (Cornell
University)
"Interspecialty Utilization of Knowledge and Indicators of Cognitive and
Social Structure"
Tadeusz Krauze (Cornell University)

SESSION V A: SOCIAL STRATIFICATION AND MOBILITY IN SCIENCE

Chairperson: Michael Useem (Boston University)

- "The Impact of Academic Sponsorship on the Career Outcomes of Doctoral
Scientists"
Barbara Reskin (Indiana University)
"Research Careers of Astronomers: Patterns of Problem Selection over the
Life Cycle"
Thomas F. Gieryn (Columbia University)
"The Uncertain Careers of Professionals in Training: The Case of Experi-
mental Physics"
Richard W. Wilsnack (Indiana University)

"Five Factors That Contribute to the Utilization of Biochemists' Research:
I. Three Direct Effects"

Robert McGinnis, J. Scott Long, and Paul Allison (Cornell University)

SESSION V B: PHILISOPHICAL AND HISTORICAL ISSUES AND OPPORTUNITIES

Chairperson: Sal P. Restivo (Rensselaer Polytechnic Institute)

"Edgar Zilsel and the Sociological Interpretation of the Origins of
Modern Science"

Wolfgang Krohn (Max Planck Institut Starnberg)

"A Theory of the Professions, Professional Jealousies, and the Sciences--
England around 1815"

Susan Cannon (Smithsonian Institution)

"The Cognitive Paradigm in Science Studies"

Marc De Mey (Tilburg University)

"The Positivistic Inheritance and Cognitive Styles in Contemporary Physics:
How Positivism Inhibits the Mutual Animation of Physics, Philosophy, and
Social Studies of Science"

Michael J. Zenzen (Rensselaer Polytechnic Institute)

SESSION VI A: SPECIALTIES AND RELATIONS AMONG SPECIALTIES: II.

Chairperson: Yoram Neumann (Boston University)

"Research Areas and Stratification Processes in Science"

Lowell L. Hargens, Pamela K. Hecht, and Nicholas C. Mullins
(Indiana University)

"Mannheim's Unfinished Agenda: American Grassland Ecology As a Case
Study in the Ideology of Scientists, 1895-1935"

Ronald Tobey (University of California at Riverside)

"A Comparative Study of Ten Scientific Specialties"

Henry Small (Institute for Scientific Information)
Janet Stanley

SESSION VI B: PROBLEMS IN SCIENCE POLICY AND NATIONAL SCIENTIFIC PROGRAMS

Chairperson: Harold Orlans (National Academy of Public Administration)

"Images of Knowledge and Science Policies of Status Groups in the German
Big Science Establishment"

Ingrid Deich (University of Missouri at Rolla)

"Scientific Advice and Risk Assessment: A Sociological Analysis"

G. de Zeeuw, P.A. Koefoed, and W.A. Verloren van Themaat (Institute
for General Systems Research and Netherlands Universities' Joint
Social Research Centre)

"Social Conditions of Scientific Progress"

Maurice Richter (State University of New York at Albany)

Other Program Events:

- (1) Banquet at Harvard Faculty Club with brief speeches by Paul Doty, Warren Hagstrom, and Robert K. Merton.
- (2) Meeting on "Research Opportunities for Social Scientists in Social and Economic Aspects of Marine Science Research," coordinated by Lorry King (National Science Foundation).
- (3) Organizational meeting of those interested in the Psychology of Science, coordinated by Ian Mitroff (University of Pennsylvania).

Abstracts of Presented Papers.

Brickman, Ronald and Arie Rip (Program on Science, Technology and Society, Cornell University, Ithaca, NY 14853)

Changing Patterns in the Science-Government Relationship:
The Evolution of Science Policy Advisory Councils in
France, the Netherlands and the United States

The evolution of high-level science advisory councils in France, the Netherlands and the United States is reviewed in the light of common trends in the relationship of science and government over the past twenty years and the influence of particularistic features of each council's political and cultural setting. The creation of the councils responded to similar needs of the governments in the domestic policy and international spheres. Subsequently, the councils underwent a period of decline to which such parallel developments as the institutionalization of science policy, a more goal-oriented approach in governments' sponsorship and changing public attitudes towards science were contributing factors. Signs of revitalization in the mid-1970s were similarly inspired by emerging needs and institutional developments affecting the three governments at the time. Despite such general similarities, each council throughout its history has demonstrated unique features in role, approach, composition, institutional position and impact. These distinguishing characteristics derive from underlying differences in political organization and culture which, for analytical purposes, are subsumed under three factors of cross-national variation: the governmental conception and implementation of science policy; the role of the scientist in public affairs; and the organization of scientific and technological interests and their incorporation in political decision making.

Zinberg, Dorothy (Harvard University, Cambridge, MA 02138)

Circulation of the Elite: Value Elements In
European-United States Scientific Interactions

This paper presents the findings of a study which sought to establish the current state of long-term research visits to Great Britain and Western Europe by American natural scientists. Social science research has identified a scientific elite through studies of citation indices, publications, social networks, as well as Nobel Prize awardees. Less frequently mentioned as a measure of elitism is foreign travel--its frequency, duration, location and sponsorship. In part, this is due to the assumption that basic science is an international activity which except for periods of war or on issues related to national security is carried on as a natural feature of scientific research. It is also assumed by many scientists that exchange activity is necessary for the vitality of scientific creativity. A two-part study was undertaken to examine the international research-related travel of elite scientists. The first was a series of interviews with more than fifty American and European scientists. Well over ninety percent agreed that there was a need to maintain international exchanges; a slightly smaller percentage believed there was a substantial diminution of research visits abroad which posed a serious threat to basic science research. The overall impression was that to a large extent, senior scientists were traveling as much as ever (disputed by some thirty percent of the sample) but that the young elite of science--postdoctoral awardees--were not. The second part of the study explored the reality of the impression regarding young elites through an analysis of the foreign residency undertaken by first-year postdoctorals between the years 1966-1975. Using data from the National Research Council's Survey of Earned Doctorates it was shown that between 1970 and 1975 there was a forty percent decrease of American postdoctorals abroad. Interviews with senior and young scientists revealed several reasons behind the sharp decline: a cutback in funding, fear of missing job opportunities at home, inflation and a belief that the best science is being done in the United States. Subsequent interviews with European scientists provided reciprocal information: fewer young European scientists were traveling to the U.S. for the same economic reasons their American counterparts were not going abroad. In addition, the development of new, well-equipped laboratories and an increase in intra-European research visits had diminished the post-World War II European need to work in the United States. If, on the one hand, internationalism is critical for the maintenance of creativity in basic science and if, on the other hand, fewer young scientists in the process of being socialized as professionals are not being exposed to the thinking and techniques of foreign laboratories, serious questions can be raised about the vigor of American science in the coming decades. It remains for social scientists to establish the relative importance and interaction of these variables.

Moravcsik, Michael (University of Oregon, Eugene, Oregon 97403)

Science in Developing Countries: An Unexplored and Fruitful
Area for Research in Science Studies

This paper deals with the rationale for science studies in developing countries, what considerations an agenda for research must include, how such research might be conducted, and numerous proposed topics for research. The topics may be categorized under (1) motivation and justification of science, (2) science education, (3) manpower, (4) communication among scientists, (5) nature of scientific research, (6) organization of science, and (7) aspects of international agencies and science in developing countries.

Useem, John, Ruth Hill Useem, Abu Hassan Othman, and Florence E. McCarthy
(Michigan State University, East Lansing, Michigan 48824)

Trans-Societal Linkages of Southeast Asian Academic Scientists:
A Comparative Study of the Philippines and Malaysia

This study of 240 academic scientists in the Philippines and Malaysia was designed to investigate the shared experiences, behavior, roles, self identities and values of academic scientists in the context of the social structure of their own societies and in the third cultural networks with other scientists around the world. The data show these Southeastern Asian scientific communities are neither autonomous within their own societies nor separate from the world systems of science. The variables point to commonalities but also to significant differences. Our delimited findings raise questions about the extent to which there is a unified third world of science.

Sullivan, Daniel, Edward J. Barboni, and D. Hywel White (Carleton College,
Northfield, Minnesota 55057)

International Aspects of a Specialty in Elementary Particle Physics:
National Participation and Barriers to the Diffusion of Knowledge

Citation data from journal articles are used to study international communication in weak interactions, a subfield of elementary particle physics. Levels of national participation, national differences in intellectual focus, and barriers to the international diffusion of knowledge are analyzed and discussed. Because of their different social dynamics and publication patterns, theory and experiment are analyzed separately.

The data from 1950-1972 from 49 countries and 1 international institute (CERN) show that national participation is highly concentrated, and that the major producers of weak interactions articles (U.S.A., U.S.S.R., United Kingdom, Italy, Japan, France, West Germany, and India) differ greatly in their relative contributions to theory and experiment.

National differences in broad intellectual focus of experimentalists are found to be a consequence of differential national access to particular accelerator beams. Where access is equal, however, experimentalists are similarly distributed over current problem foci regardless of national affiliation. Theorists are not constrained by technology, but problem foci are nevertheless dependent on national affiliation because of greater communication within national communities than between them. Co-citation analyses from a selected three year period show no international theoretical research program common to theorists of the major producing countries.

Referencing patterns within a major area of theory (unitary symmetry) for the same three year period show that theory articles from each country are not cited at a level consistent with the level of theory productivity in each country. It is argued that communication between theorists is therefore not maximally open between nations. Similar analyses of referencing patterns within an area of experimental research show the expected level of citation assuming an open communication system among experimentalists (excepting Russian work which was entirely uncited).

Mitroff, Ian and Daryl E. Chubin (University of Pittsburgh, Pittsburgh, Pennsylvania 15260)

Peer Review: A Dialectical Policy Analysis

The continuing controversy over peer review is viewed as a dialectic. The arguments espoused by advocates and critics of the system wherein research proposals are evaluated by advisors to funding agencies are reviewed. Then the findings of two recent studies of peer review in the National Science Foundation are summarized and critiqued. These findings seem to establish merit as the primary factor in the recommendations of peer reviewers to fund proposals. Yet a lack of cognitive data on the reviewers themselves raises questions as to psychological and intellectual factors which may intervene in the review process to restrict the bounds of acceptable innovation in proposed research. An expanded design is suggested for future peer review studies, one which features the collection of data on a more diverse array of variables, taps the experiences and perceptions of different categories of scientist and nonscientist alike, renders the adversaries' views of the system more testable, and perhaps, will reveal the dialectic to be a potent tool for policy analysis.

Wilkes, John M. (Cornell University, Ithaca, NY 14853)

Scientific Styles and Disciplinary Emphases

This paper reports a comparative study of four fields, Chemistry, Physics, Economics and Sociology, based on a sample of 276 academic scientists in the most prestigious departments of these fields located in the northeastern U.S. The findings indicate that there is a systematic relationship between the state of a field described in terms of its "paradigm" development and the cognitive orientations predominant amongst the researchers active in a field.

Cognitive style was determined by scoring researchers on two cognitive skills; Differentiation, a quality related to the ability to formulate problems and "Remote Association" a problem solving ability.

Pre-paradigm fields tended to be disproportionately populated with High Differentiators while Paradigm fields were populated disproportionately by Remote Associators. Analogous variation by cognitive style was found between specialties within fields as well as between fields.

This pattern seems to be due to a combination of self-selection and selective advancement. Researchers of middle class origins seem particularly likely to enter fields attuned to their cognitive skills and the occupants of the senior positions in the most prestigious academic departments of each field reflect the cognitive emphasis of each field more than the rest of the sample.

The cognitive differences between fields demonstrated in this study also have implications for important behavioral variables. These include the breadth of information gathering researchers engaged in and the (career) timing of their research publications.

Harvey, William (University of Edinburgh)

The Sociology of Local Hidden Variable Experiments

This paper examines a series of experiments which were designed to choose between two theories in atomic physics. These theories, Quantum Mechanics and Local Hidden Variable Theory, gave conflicting predictions for the correlation behaviour of photons emitted in atomic cascades.

The paper examines three stages in the development of the experiments: (1) construction of theoretical criteria relevant to a realistic experimental set-up; (2) resolution of experimental anomalies; (3) interpretation of experimental results. In each of these stages, physicists were faced with a gap between, on the one hand, the statements they could make with complete certainty, e.g., that experiment A gives result X, and on the other hand, more general statements which did not follow directly from what was known, e.g., that experiment A completely rules out theory Y.

In each of the three stages, physicists resorted to a variety of devices (explicit and implicit assumptions, methodological rules, intuition, legitimization by appeals to 'reasonableness,' etc.) to close this gap. While the "real world," in the form of experimental data, evidently played a part in forming conclusions, many other factors, sociological and psychological in nature, had a significant role in the process of achieving consensus.

Narin, Francis, Rosalie Shapiro, and Gabriel Pinski

Cross-Institute Integration of Research Supported by
National Institutes of Health

An analysis of the integration of the research publications being supported by the different institutes at NIH is reported, based on the cross citing patterns between papers written by their grantees. Specifically, a data base and methodology has been developed to analyze the citations between 50,000 U.S. and U.S. supported source papers published in 264 biomedical journals in 1973, and the papers published in the same journals in 1970 which are cited by the source papers. It was found that basic research papers are cited twice as frequently as clinical papers, as was expected. It was also found that the basic research papers published by the grantees of each institute are all cited with about the same frequency.

The distribution of citations to the papers of the different NIH institutes varies considerably, with papers supported by basic institutes such as General Medical Sciences cited far more widely than papers supported by more specialized institutes. It was also found that almost all of the individual NIH institutes are strongly dependent upon work being supported outside of their institute: approximately 25% of the referencing from a typical large institute is to its own papers, 25% to other NIH supported papers, and 50% to papers supported outside of NIH.

Hackett, Edward J., Kenneth E. Studer, and Carl B. Backman (Cornell University, Ithaca, NY 14853)

Bibliometric Relations Among Coauthorship
Sets in Friend Virus: A Preliminary Report

A strategy is suggested for understanding the structure and development of research in a scientific specialty. The specialty considered, Friend virus, was defined through keywords in Index Medicus and Biological Abstracts. Authors were divided into disjoint subsets on the basis of coauthorship ties revealed in this set of papers. Perusal of these sets suggested further subdivision into subsets for three time periods. To learn more about the relationships among these sets, cocitation analysis was adapted to treat sets as units. Configurations of coauthorship subsets were examined in the light of coauthorship and citation ties, and location. A plan for extending this analysis by including relationships based in different data sets is presented and its value for specialty studies discussed.

Reskin, Barbara F. (Indiana University, Bloomington, IN 47401)

The Impact of Academic Sponsorship on the Professional Outcomes of Chemists

Scientists' academic sponsors should influence their students' professional outcomes both through the quality of training they provide and their ability to transmit to their students a professional status and other ascriptive advantages. This study explores the effects of several characteristics of doctoral sponsors on their students' scientific productivity and institutional placements over their first postdoctoral decade. Data are for a probability sample of chemistry Ph.D. recipients. Measures of sponsors' characteristics include their doctoral original; their academic standing, professional age, previous nonacademic employment experience, eminence, visibility and productivity (both in research articles and doctoral students) at the time the sample members completed their Ph.D.'s; the extent sponsors collaborated with sample members during training; and sponsors' professional visibility through the subsequent decade, including participation on national science advisory committees, number of scientific awards and honorary degrees, and collegial citations to their work.

Holding constant other relevant variables (including the prestige of sample members' Ph.D. department, predoctoral publication, length of doctoral study, etc.), I explored the effects of sponsors' characteristics on sample members' productivity and institutional location both immediately after the Ph.D. and at the end of their first post-Ph.D. decade. Contrary to previous findings, the impact of Ph.D.-department prestige was not significant for any of the productivity measures and showed no independent effect on any of the positional outcomes examined. But some of their mentors' characteristics did directly affect either the chemists' subsequent productivity or their institutional placement. For example, their sponsors' productivity while they were still in graduate school (excluding papers they coauthored with their students) and student-sponsor collaboration through the chemists' Ph.D. year both affected the chemists' early postdoctoral productivity. Measures of sponsors' eminence showed direct effects on their students' institutional locations throughout their first postdoctoral decade, independent of the effects of measures of the chemists' intervening performance. These results are consistent with the claim that ascriptive aspects of sponsorship influence scientists' positional outcomes independently of sponsors' impacts on their students' professional achievements. The nature of such effects presumably vary across disciplines and over time as market structures vary, and ascriptive features of allocation processes may become even more important in tight markets.

Gieryn, Thomas F. (Columbia University, New York, New York 10027)

Research Careers of Scientists:
Patterns of Problem Choice Over the Life Cycle

The concept of "research career"--the sequence of research interests of a scientist over the life cycle--is developed, and empirical analysis of several questions suggested by a life-cycle orientation to problem choice in science are provided. Using continuous histories of research interests of 2308 American

astronomers between 1951 and 1975, two findings are reported: first, when considering problem choices of a scientist from one triennium to the next, the likelihood of an accretion of research interests is about twice that of a discrete switch (migration strictly defined) from one problem area to another; second, the probability of participation in a problem area increases with the number of preceding consecutive years a scientist has had that research interest, up to the fifteenth year of participation, after which the probability of continued participation declines.

Wilsnack, Richard W. (Indiana University, Bloomington, IN 47401)

The Uncertain Careers of Scientists in Training:
The Case of Experimental Physics

Career prospects in physics are uncertain and unpromising. Nevertheless, a 1973-1974 study of graduate-student and postdoctoral experimental physicists discovered few signs of distress or intentions to abandon physics. The young physicists remained hopeful possibly because of social support in their research groups, flexibility about their career options, and present-oriented or future-oriented career strategies. Present-oriented respondents were planning to stay in physics temporarily. Future-oriented respondents were working to stay in physics for a long time, hoping for traditional academic research careers. However, future-orientation was used mainly at career turning-points (beginning and completing training), and only in research groups confident about their work. Thus while present and future orientations together may keep an unexpectedly large proportion of young physicists active in physics, only those who are sponsored by confident research groups seem to have strong ambitions for traditional research careers.

McGinnis, Robert, J. Scott Long, and Paul Allison (Cornell University, Ithaca, New York 14853)

Factors that Influence the Postdoctoral Deployment of Biochemists

The early research productivity of two cohorts of biochemists (Ph.D. recipients from U.S. universities in 1957-1958 and 1962-1963) is seen to be profoundly influenced by their initial postdoctoral (or postfellowship) deployment in the labor force. Thus, we investigate those characteristics of the cohorts that may influence their occupational deployment. Since the acceptance of a postdoctoral fellowship significantly influences deployment, we also investigate this decision as a dependent variable. Contrary to expectation, both loglinear and regression analyses show that individual research achievement, as measured either by number of pre-Ph.D. publications produced or of citations to them, has virtually no bearing on winning a postdoctoral fellowship; nor has the rated quality level of the Ph.D. department (although regression and loglinear analyses are somewhat contradictory here). Instead of personal achievement of one's Ph.D. department or the position in the academic prestige hierarchy, an apparently horizontal differentiation variable, the college

location of one's Ph.D. department, has the most profound influence on acceptance of a fellowship among those we measured. A Ph.D. biochemist in our cohorts from an arts or medical college was 2.8 times more likely to take a postdoctoral fellowship than was one from an agricultural college. Two personal characteristics, neither clearly related to ability, also influenced receipt of a fellowship: age and marital status at receipt of the Ph.D. degree both had significant effects, the older and the married evidently being less willing to invest further time in their scientific training.

Characteristics that significantly affected the labor force deployment (in particular, of deployment into industry) included college of Ph.D (even after controlling for fellowship), receipt of a fellowship, age at Ph.D. and level of publications upon receipt of the Ph.D. The ideal candidate for an industrial position was an older non-fellow product of an agricultural college whose publications were below the cohort medians.

Cannon, Susan (Smithsonian Institution, Washington, D.C. 20560)

Postulates for Treating the Professions, Professional
Jealousies, and the Sciences in England from about 1800

England in 1800 was a well-professionalized society but became less so under the impact of numbers, new wealth, and the new "amateur" ideal. Two rival feelings about professionalism were present: the gentlemenlike one, with security of income and good social status as the goal; and the hard-driving work-and-respectability one. The latter focused on "certification" in field after field of society. Science was pursued mostly along the first lines, with university teaching emerging as the major occupation for scientists.

Science itself in its internal intellectualist structure is not "professionalized." This internal structure is the backbone of the subject and cannot as yet be explained in any detail on socio-psychological terms. When activity in a science is dominated by persons whose scientific activity is their major claim to social status among their near-peers, then the science is professionalized. Incomes earned are of no significance. This has happened at different times and by different routes in different sciences in different countries.

A science is not a subject matter but a set of principles or method of treatment. A scientist is not therefore anyone of the appropriate "ists" but only those who "pursue" the principles or methods.

De Mey, Marc (Tilburg University)

The Cognitive Paradigm in Science Studies

The cognitive orientation which is currently adopted in several disciplines happens to be the most recent stage in a series of stages which characterize theories on perception and communication. These stages which apply to the development of our understanding of cognitive processes in daily life turn out to be also most suitable for a better insight into several schools and conceptual frameworks elaborated for the analysis of scientific knowledge and scientific development. These stages are:

- a monadic stage handling information-units as single self-contained entities separate and independent of each other;
- a structural stage in which information is seen as a more complex entity consisting of several information units arranged in specific ways;
- a contextual stage which in addition to structural organisation emphasizes the necessity for contextual information to disambiguate;
- a cognitive stage in which information is seen as supplementary or complementary to a conceptual system that represents the information-processing-system's knowledge of his world.

The stages are exemplified in terms of developments in artificial intelligence and cognitive psychology and are then applied to approaches in the study of scientific knowledge according to the following scheme:

knowledge & information	AI pattern recognition perception	AI language processing communication	Science Studies
monadic	template-matching	word-to-word translation	positivism
structural	feature-analysis	syntactical analysis	logical positivism
contextual	context-analysis	indexical expressions	sciences of science
cognitive	analysis by synthesis	world-models	paradigm- theory

Zenzen, Michael J. (Rensselaer Polytechnic Institute, Troy, NY 12181)

•The Positivist Inheritance and Cognitive Styles in Contemporary Physics:
How Positivism Inhibits the Mutual Animation of Physics, Philosophy, and
Social Studies of Science

Positivism is not dead but has fragmented and taken on many forms. It is not simply a cognitive style but entails an image of man and a general world-picture. There is a "positivistic inheritance" in the sense that philosophy, natural science, and social science carry on internal struggle with various strains of positivism.

Communication implies something to be communicated, that there is not perfect clarity, that self-understanding and self-reflection are necessary. The image of man which informs positivism is one which makes self-reflection either impossible or unnecessary. Positivism has inhibited the self-reflection and self-understanding of philosophy and the sciences, consequently, communication among them has been impeded.

Philosophy of natural science supplanted epistemology, ignored the relation of knowing in favor of the structure of the known, and reconstructed natural science according to models borrowed from logic and meta-mathematics. This serves to give an illusion of permanence to the foundations of natural science and deflect reflexive inquiry.

Philosophy of social science, at least in its Anglo-American form, was influenced by the positivist reconstruction of natural science and uncritically assumed the underlying continuity of natural and social science. This led to the construction of models of explanation which mirrored the deductive models constructed in positivistically-inspired philosophy of natural science.

The Kuhnian revolution, by injecting sociological and historical perspectives into philosophy of science, seems to transcend positivism but I contend that subtle strains of positivism persist in Kuhn. The paper addresses a set of questions intended to resurrect the critical-normative aspect of social theory: Are the social sciences progressing? What is the relevant concept of progress here? Should the social sciences try to be like natural science? What are the implications of adopting Kuhn's view of progress and his description/prescription of how to achieve the transition to maturity? Where are we getting our model of natural science? Are the social sciences trying to be like a positivistic reconstruction of natural science? Is natural science carrying on an inner struggle with its own form of positivism? Are the foundations of physics much less solid than we believe? Is physics undergoing a transition to maturity marked by an unprecedented degree of reflexive inquiry?

Hargens, Lowell L., Pamela K. Hecht, and Nicholas C. Mullins (Indiana University, Bloomington, IN 47401)

Research Areas and Stratification Processes in Science

In this paper we examine data for two research areas as a first step in the study of relations between research area structure and social stratification processes in science. We examine three main issues. First, we contrast the social status of the members of the two areas with the general status levels shown by members of the disciplines which encompass the two areas. This contrast is relevant to previous speculation about the social characteristics of the central figures in research areas. Second, we examine the effect of a scientist's participation in the development of a research area on subsequent scientific performance and status. This topic is relevant to claims that being a central participant in a research area gives a scientist an advantageous position in relevant communication networks, which in turn leads to higher levels of subsequent scientific productivity and eminence than would occur without the position. Third, we examine the organizational linkages of the members of the two areas, and those for two research areas in the social sciences, in order to test arguments about the importance of organizational bases for research area development. In contrast to the first two topics, this third question is relevant to the stratification of research areas rather than individual scientists.

Tobey, Ronald C. (University of California at Riverside, Riverside, CA 92502)

Mannheim's Unfinished Agenda: American Grassland Ecology
as a Case Study in Ideological Influences
on Scientists, 1895-1955

Wolfgang Stegmüller's theory of "holding a theory" is applied to American grassland ecology from 1895 to 1955 with the objective of extending Karl Mannheim's program for the sociology of knowledge to a scientific specialty. Grassland ecology came under ideological influences twice: first in the 1890s when the specialty originated at the University of Nebraska and University of Chicago within a framework of the founders' ideologies of scientific research, and second in the 1930s when the Nebraska grassland scientists endeavored to obtain a management role in mitigating the effects of the drought of that decade. Both the theoretical core and the intended paradigm examples, as described by Stegmüller, were affected ideologically. Archival evidence, as well as analysis of publications, and evidence from collective biography and citational analysis are brought to the argument.

Small, Henry and Janet Stanley (Institute for Scientific Information,
325 Chestnut Street, Philadelphia, Pennsylvania 19106)

A Comparative Study of Ten Scientific Specialties

The method of co-citation analysis is applied to a sample of ten specialties over a four year period (1970-1973). Questionnaire and interview information were collected to test the bibliometric data. The co-citation clusters are analyzed in terms of their cognitive and social structures, and a method is suggested for determining the degree of coupling between the two. It is found that rapid change in structure is associated with a high level of cognitive/social coupling, and that changes in structure are often associated with important events in the narrative history of the specialties.

Deich, Ingrid (University of Missouri, Rolla, MO 65401)

Images of Knowledge and Science Policies of Status Groups in German Big Science Establishments

The perspective of technological determinism in organization theory is insufficient for the account of the social processes through which the structure of German big science establishments were adapted to new tasks around 1970. The influence/bargaining model of organizations seems more appropriate. According to this model beliefs and relative power of organizational participants intervene between organizational task and structure.

The new structures which were created in the early 1970s were a reflection of the assessment of the new organizational task by different status groups in terms of the concepts of science which they held, and at the same time a reflection of the power which they were able to bring to bear on one another in the attempt to structure social relationships according to their beliefs. The status groups which struggled over the course and the structure of big science establishments were the government officials of the federal research ministry, the institute directors, the Akademiker (scientific and engineering employees) and the lower level employees. During the early years of big science establishments the government officials, institute directors and Akademiker shared a charismatic concept of science; only the lower level employees held a work concept of science with respect to big science. Under the influence of new tasks, new work experience and the general socio-political developments in Germany in the late 1960s, the government officials and the majority of unionized Akademiker adopted the work concept of science for big science. As a result of this new constellation "scientific codetermination" was instituted in big science establishments in the early 1970s.

Richter, Maurice N. Jr., (State University of New York at Albany, 1400
Washington Avenue, Albany, NY 12222)

Social Conditions of Scientific Progress

One tradition emphasizes the importance to science of individual freedom, an autonomous scientific community, and spontaneous coordination of scientific activity, and views these features as more secure in "liberal" than in "authoritarian" societies. On the other hand, various observers have suggested that science can adapt to major limitations on freedom, or that it is actually benefited by some such limitations, or that it is generally less free or less autonomous than is commonly assumed. Marxists generally assume that socialism and communism are more favorable than capitalism to scientific progress.

This paper seeks to clarify the issues thus raised, by presenting some concepts concerning "needs" of science and ways in which these needs can be met, and by comparing ways in which these needs have actually been met in societies of widely divergent types. Particular attention is given to societies which have sought to develop science while rejecting the "liberal" model of scientific organization: e.g., the USSR (especially during Stalin's time) and China (especially during Mao's Cultural Revolution). The conclusion is reached that science is compatible with a wide variety of societal arrangements, but that this may perhaps be true only within a comparatively narrow range of global conditions.

THIRD ANNUAL 4S MEETING

THE THIRD ANNUAL MEETING OF 4S IS SCHEDULED TO BE HELD NOVEMBER 3-5, 1978,
AT INDIANA UNIVERSITY IN BLOOMINGTON. SUGGESTIONS FOR PROGRAM CONTENT
AND FORMAT SHOULD BE ADDRESSED TO PRESIDENT HAGSTROM (DEPARTMENT OF
SOCIOLOGY, UNIVERSITY OF WISCONSIN, MADISON, WI 53706).

Minutes of Council Meeting, Boston, October 10, 1977

Present: J. Gaston, W. Hagstrom (President), R. McGinnis (Secretary-Treasurer), R.K. Merton (Past President), M. Moravcsik, D. Nelkin, P. Woolf, and D. Zinberg. Absent: N. Mullins and E. Skolnikoff.

The meeting was called to order at 10:00 AM by President Hagstrom.

1. The Society has been invited by the ISA Research Section on the History of Sociology to affiliate with that group.

Motion: That Council explore the prospects of some form of affiliation with the ISA Research Section on Sociology of Science, the natural line of affiliation within ISA, but not with the History of Sociology Section as this would overemphasize the sociological aspects of our multidisciplinary society. Passed.

2. A possible dues increase was discussed together with publication costs of the Newsletter, the society's major single expense. It is clear that 4S cannot continue to support publication costs at the current level without a substantial increase in annual dues. Publications Chairman J. Gaston proposed a publication plan involving substantially reduced printing and mailing costs, by which total issue expenses could be reduced to no more than \$800.00 per issue.

Motion: Adopt Gaston's plan, transfer publication site to Southern Illinois University and hold dues to the current annual rate for at least one year. Passed.

3. Future meeting sites were discussed.

Motion: Hold the third annual 4S meeting in Bloomington, Indiana, a Local Arrangements Committee to be selected by the Program Committee. Passed.

Motion: Authorize the Program Committee to agree on Washington, DC as site of 1979 meeting, recognizing, however, that the Council and its Committees cannot commit a future President of the Society regarding membership on the Program Committee, but Council does recommend to the then-president that at least one of the Washington group be included on that Committee. Passed.

4. It was announced that Ian Mitroff will serve as 4S representative to Section X of AAAS.

5. Membership on the Nominating Committee was discussed.

Motion: It is recommended that the Nominating Committee endeavor to include in its slate 4S members from overseas. Passed.

6. Alternate dates for next Council meeting were selected: January 27 or February 11 in New York City.

Council adjourned at 12:35 PM.

FINANCIAL REPORT

From 1 January - 31 October 1977

Funds Available for Period

Funds on Hand at Beginning of Period \$ 4,523.31

Income:

(1) Membership Dues \$ 1,782.83

(2) Annual Meeting

(a) Registration \$ 2,120.44

(b) Bus Fares \$ 107.00

(c) Banquet Tickets \$ 1,110.00

Total Annual Meeting \$ 3,337.44

(3) Other: NSF Conference Income - 1st Annual Meeting \$ 1,375.70

TOTAL FUNDS AVAILABLE \$11,019.28

Funds Expended During Period

Expenses:

(1) Newsletter (Vol 2: 1, 2, 3, 1977) \$ 3,744.70

(2) Annual Meeting

(a) Registration, packets and materials \$ 345.54

(b) Local arrangements (secretarial, office supplies) \$ 2,264.82

(c) Bus charter \$ 129.90

(d) Banquet Meals \$ 1,012.50

(e) Other: (1) Miscellaneous \$ 476.73

(2) Unpaid bills at Harvard \$ 300.00

Total Annual Meeting \$ 4,529.49

(3) Other:

Hagstrom to AAAS \$ 192.00

Secretary-Treasurer's Office Expenses \$ 1,237.77

Total Other \$ 1,429.77

TOTAL FUNDS EXPENDED \$ 9,703.96

BALANCE AVAILABLE

31 OCTOBER 1977

\$ 1,315.32

SOME RESULTS FROM THE 4S MEMBERSHIP SURVEY

At press time, 136 questionnaires had been received from our membership of over 400. These have the following characteristics and interests.

Field of Highest Earned Degree by Region and Position

Field of highest earned degree	Region				Total
	U.S.A. and Canada			Overseas	
	University Faculty	Other Professional Positions	Students		
Sociology and Social Psychology	33	3	9	6	51
History and History of Science	16	4	2	4	26
Physical and Biological Sciences	12	1	0	5	18
Political Science and Public Administration	9	1	1	0	11
Philosophy	7	2	0	2	11
Economics	0	0	0	2	2
Industrial Administration and Business	2	0	0	0	2
Other	5	3	2	5	15
Totals	84	14	14	24	136

NOMINATIONS: THE NOMINATING COMMITTEE HOPES TO PREPARE A SLATE OF CANDIDATES FOR THE OFFICES OF PRESIDENT, SECRETARY-TREASURER, AND COUNCIL BY EARLY FEBRUARY. SUGGESTIONS FROM THE MEMBERSHIP ARE WELCOMED AND SHOULD BE ADDRESSED TO PRESIDENT HAGSTROM (DEPARTMENT OF SOCIOLOGY, UNIVERSITY OF WISCONSIN, MADISON, WI 53706).

Specialty Areas

Each respondent could select three specialty areas from the pre-coded list.
The distribution of all choices for the 122 non-student respondents follows.

	Number selecting
SCIENCE IN SOCIETY	
Impact of society on science and technology	18
Social impact of science and technology	22
Public understanding and evaluation of science	7
Science education	6
Science policy	17
Science, technology and public policy	27
Technology assessment	2
Science in developing countries	6
Other "Science in Society:	7
SCIENCE IN HISTORY	
Science as a cultural mode	16
Development of technology	5
Science-technology relationships	6
Scientific and technical societies	5
Development of disciplines	13
Development of professions	6
University science	4
National groupings	2
Other "Science in History"	7
ORGANIZATION OF SCIENCE	
Social backgrounds, mobility and manpower	5
Stratification and reward systems	12
Communication processes	10
Bibliometrics	9
Economics of research and development	5
Sociology of specialties and disciplines	23
Sociology of science, general	24
Sociology of technology	2
Other "Organization of Science"	7
SOCIAL STUDIES OF SCIENCE, N.E.D.	
Personality of scientists	3
Creativity studies	3
Psychology of science, general	4
Ethnoscience	0
Philosophy of science	15
Ethics of scientific research	8
Social studies of science, general	11
Science indicators	8
Other and not ascertained	10

[Further analysis of this survey will appear in the next issue]

THOUGHT AND OPINION

Review Symposium

David O. Edge and Michael J. Mulkey, Astronomy Transformed: The Emergence of Radio Astronomy in Britain. New York: Wiley-Interscience, 1976.

Due to the intrinsic importance of its subject and the quality of the work, this book should influence the way we regard science for many years to come. Astronomy Transformed offers the first detailed study of the social and intellectual properties of a scientific specialty involving high technology.

The book focuses on the emergence of radio astronomy in Britain after World War II and its development during the 1950s. The analysis of the 1960s is mostly limited to the quasar and pulsar discoveries. The scope of the book is further narrowed by concentrating mainly on the development of research concerning the nature of discrete radio sources at Cambridge and Manchester (Jodrell Bank) Universities. There is some analysis of the Australian work (CSIRO Radio Physics Division, Sydney, and later, the University of Sydney) that was in competition with the radio source survey program at Cambridge. Edge and Mulkey estimate that research into the nature of discrete sources "accounts for 48% of the Cambridge output in the period under review, 27% of the Jodrell Bank output, and 23% of the Sydney output." The first six chapters are given over to an intellectual and social history of the field, while later chapters are concerned with discovery, competition and cooperation (chapter 7), the relationship between radio and optical astronomy (chapter 8), the social structure of the Cambridge and Jodrell Bank research groups (chapter 9), and a sociological comparison between the case of radio astronomy and the several other studies of scientific specialties that have been completed.

The authors found that radio astronomy, like other scientific specialties that have been analyzed, had its beginning in the work of two researchers who were marginal to existing academic research networks (Jansky and Reber). The work of these marginals (both American) was picked up by a group of British academic physicists who had pioneered in the development of radar and radio technology during World War II and who, upon return to their universities after the war, looked for ways to exploit their wartime experience in the field of basic science. With respect to traditional optical astronomy, they too were marginals. Edge and Mulkey argue that, given the technical commitments optical astronomers had made and the need to exploit the avenues of research made available by that technology, together with the lack of technical expertise in radar and radio among optical astronomers, radio astronomy had to be started by people marginal to traditional astronomy. Their analysis of the role of this kind of marginality, both in radio astronomy and in many other specialties, is one of the high points in the book.

The different experiences they had had with radio and radar technology during the war led two groups, Ryle's at Cambridge, and Lovell and Hey's at Manchester, to build research instruments which lent themselves to exploitation of two very different sorts. The succession of arrays developed at Cambridge was flexible in form and was basically designed for extensive surveys of the distribution of discrete sources of radio emission, while the series of parabolic dish aerials built at Manchester's Jodrell Bank site, which could accurately track a single

Review Symposium (Continued).

source across the sky, were especially suited to detailed studies of a few sources. Once commitments to these two very different research technologies were made, many other features of the system were constrained.

First, of course, the research strategies became different. Once elaborate instruments are built, it is essential that they be used to do what they can do, even though, on abstract grounds, it might be that another type of measurement should be given precedence at some point.

Second, the nature of competition and cooperation in the field was also constrained. Since Cambridge and Manchester were largely doing different things, there was little competition between them. Sydney, on the other hand, had instruments and a research program that were quite similar to those adopted at Cambridge, and the competition between the two centers was intense and occasionally bitter. The detailed treatment of competition in radio astronomy and the more general analysis of competition are additional high points in the book.

Third, the group structure, and hence the social experience of the researchers in radio astronomy, was affected by the technological choices made at the two main British research centers. The Cambridge research program, with extensive source surveys, was less differentiated than the Manchester program, with detailed studies of particular discrete sources, and the authors conclude that the Cambridge research group was also less differentiated. The Manchester group at Jodrell Bank pursued a larger number of more narrowly specified problems and organized itself in problem-oriented teams. In short, the influence of big technology on the social structure and functioning of the community of radio astronomers was large, with discussion in this review limited to just a few effects. Edge and Mulkay's analysis of this aspect of radio astronomy is compelling.

Another feature of radio astronomy is that both the Cambridge and Manchester discrete source research programs were highly exploratory. The idea was to build instruments to look at what seemed like a promising phenomenon and to expect that something of interest would be found. Discovery therefore seems serendipitous, and theoretical work was of the "post-hoc" variety. The only major exception is the case of the search for the 21 cm line in hydrogen, where there was a concerted search for a phenomenon that had been predicted by theory. The specialty was therefore not very much like the description of science given to us by Kuhn and others, although it is clearly "progressive," and the authors discuss this very effectively in the last chapter.

It should be clear by now that we are impressed by the book. We have just two complaints, and both have to do with the way in which evidence is presented. There are, first of all, far too many quotations throughout the text. The many interviews give the authors a rich data base, which they analyze with great skill. Too much raw data have found their way into the writing, however. Secondly, the many tables and other presentations of a quantitative sort are also undigested. Not enough analysis is done to make clear the regularities in the data, and the reader is hard pressed to see how the statistics are relevant. Edge and Mulkay must feel caught between a rock and a hard place on this issue: having used such data at all they risk the criticism of those who feel such counting is irrelevant to an understanding of the real nature of science, and by not analyzing their quantitative

Review Symposium (Continued).

data sufficiently they are vulnerable to the criticisms of the quantifiers as well.

In conclusion, we would express a thought which was stimulated by the comparative analysis of specialty growth and development given in the last chapter of this fine book. Perhaps we should look to a perspective like cultural ecology, currently a thriving enterprise in anthropology, rather than to developmental models, for an analogue to the process by which scientific specialties grow and change. Within the perspective of cultural ecology societies are seen as open systems adapting to a physical and social environment. The nature of the economic technology that is adopted (hunting and gathering versus various forms of agriculture versus industry) is seen as strongly affecting the social structural and cultural features of the system which, in turn, feed back as constraints on the technology. The history of a particular group is seen as the outcome of a complex interactive process between prior commitments and current opportunities. Though there may be similarities in outcome when starting points are similar and experiences are somewhat alike (which they often have been), there is also divergence and singularity, and this, too, is expected. What we seem to be finding, as we better understand the cases we have and analyze more cases of scientific specialty growth and development, are a few commonalities (e.g., the role of marginals in specialty formation) but many divergencies. This result precludes an optimistic view that the problems faced by the sociology of science are simple, but, on the other hand, efforts like this one of Edge and Mulkey reassure us that we can make progress.

Daniel Sullivan
Carleton College
and
D. Hywel White
Cornell University

David Edge and Michael Mulkey have written what is probably the most detailed and thorough study of a scientific specialty by sociologists of science that has yet appeared. The richness of detail which they present to the reader is both an asset and a liability. On the one hand, this mass of information gives the reader the sense of truly participating in the development of a specialty, of watching it grow at first hand. On the other hand, their unwillingness to apply any theoretical framework to their historical account of the field, which takes up more than half the volume, makes their book difficult to read and less useful than it might have been had they dared to be more speculative.

The difficulty is compounded by the fact that they attempt to give the reader a fairly broad picture of events in the field. They have in effect written a sociologically-oriented history of the field but I suspect that a similar study by a historian of science would have focused upon a particular person, group, event, or problem area.

Using a variety of materials, including interviews, publications in the field, historical and biographical writings by members of the field, and, as they put it, "objective data" such as citation analyses and rates of membership in scientific societies, they piece together an account of the specialty from its beginnings in the

Review Symposium (Continued).

1930's to the end of the 1960's. Chapter 1 describes the emergence of the field. Chapter 2 documents the origins of the research teams which studied the field over several decades. Three chapters describe "the evolution of problems, ideas and techniques" in each of three decades. A sixth chapter provides some technical background.

In Part II, the authors present sociological analyses of some aspects of the development of the specialty but even here, as they themselves state, their discussion is "at a low level of generality and remains close to the empirical data generated in the case study." In this section, three chapters take up, respectively, the extent and causes of competition among researchers in radio astronomy, the relationship between radio astronomy and its nearest neighbor, optical astronomy, and a comparison of the social structures of the two largest research groups in radio astronomy in Britain. A final chapter discusses the relationship between their findings and those of previous studies in the sociology of science.

For example, they show how the structures of the two leading research groups were affected by the nature of the techniques they were using as well as by the kind of leadership they had. This discussion would have been more useful if it had focused less upon the effects of these structures for members of the groups and more upon their consequences for the overall cognitive development of the field. They also assess the impact of dramatic findings in radio astronomy upon optical astronomy and show that they were "peacefully assimilated" by optical astronomy, probably because they supplemented rather than replaced approaches and findings in the latter specialty.

For most sociologists of science, the most interesting chapter in the volume will be Chapter 10 in which they compare their findings with other studies in the field and attempt some very tentative generalizations. Specifically, they examine the social origins of innovation, the stages and processes of development of specialties, the development of deviant specialties, and Kuhn's model of normal and revolutionary science. They compare the development of radio astronomy with Ben-David and Collins' study of the emergence of experimental psychology, with Mullins' study of the Phage group in molecular biology, and with Dolby's study of the development of physical chemistry. In each case, they find that the differences outweigh the similarities in development. In the case of the Phage group, the differences they find are probably due to the fact that they are comparing a research area within a specialty to a specialty. In the cases of psychology and physical chemistry, they are comparing the establishment of disciplines with specialties. The establishment of a new discipline is likely to encounter more resistance than the establishment of a new specialty within a discipline. The latter is relatively easy, particularly in periods when universities are expanding as was the case during much of the period when radio astronomy was being introduced in Britain.

The authors lament that previous researchers have paid "scant attention . . . to cultural factors" so that comparative studies of cultural development are not possible. However, their own study of cultural change in radio astronomy does not lend itself to comparative studies either. In order to make such comparisons, we need to be able to characterize the differences between research ideas, specialties, and disciplines much more precisely. We also need to know

Review Symposium (Continued).

more about how types of theory and experimental work vary in different disciplines and specialties. For example, the authors conclude that the development of radio astronomy does not fit the Kuhnian model of scientific revolutions. However, this may in part be due to the heavily descriptive emphasis in the early stages of the development of this field. The Kuhnian model may be more applicable to fields where the theoretical component is stronger. Similarly, Edge and Mulkay stress "the role of the particular form and scale of radio astronomical techniques in moulding the social and intellectual development" of radio astronomers. This also suggests the necessity for developing typologies of scientific fields that would presumably have different patterns of intellectual and social development. Edge and Mulkay stress that radio astronomy went through a long period of exploratory investigation before theories emerged. It would be helpful to know whether radio astronomy is typical, in this respect, of specialties in astronomy or of other specialties in the physical sciences.

Finally, the larger social context in which the field developed is ignored, for the most part. A specialty which relied on such expensive instrumentation must have had complex interrelationships with science policy-making committees. How decisions at the governmental level affected the development of the field is only touched upon briefly.

Nevertheless, this book sets a high standard for studies in our field. Hopefully, the wealth of information it provides will be mined for hypotheses by future researchers. While the authors were conservative about applying theoretical interpretations to their data and speculating about the implications of their study, perhaps others will be less so.

Diana Crane
University of Pennsylvania

What is the Social Psychology of Science?

I'm not sure, but one of the interesting things about it is that even those who met at an informal luncheon gathering to discuss it during the annual 4S meeting were not fully agreed that this label accurately represented their interests. There was agreement that important problems centering on the place of the individual in the institutional structures of science need greater attention. There was also agreement that an interest in the roots of creativity cross cut the interests of a large proportion of the sociologists, historians, educators, clinical psychologists and anthropologists present. Curiosity about the intriguing question of why the study of science had never become institutionalized in psychology as it has in sociology also seemed to bind the group together.

Oh well, what's in a name if people's intellectual juices are awakened by one another and they can agree that they want to meet again, stay in touch with one another and contribute enough papers next year to warrant a session in whatever it is. It may even be a good thing that there was resistance to the idea of being considered psychologists if it means that this group won't be limited by that perspective or create a schism in the 4S society. The important thing is that the group provides encouragement to those interested in following up the leads developing out of historical, sociological, and philosophical studies of science that extend into psychology; and helps to combine them with the work of pioneering psychologists, such as Ann Roe, which has not been picked up by other psychologists. We have long known that the study of science must be a multidisciplinary endeavor.

Thus far, the group has prepared a list of addresses to facilitate the exchange of papers, discussed the possibility of people close to one another meeting again before next year and drafted me to be secretary for the coming year. As I see it my duties include the circulating and updating of the list of interested people, preparing a column like this for the 4S newsletter when it comes out, and collecting such information as people send me which might be of interest to those interested in the subjective side of science. I will then decide what events and new materials deserve a special mailing and which can be mentioned in the 4S newsletter column. People with papers they wish to circulate would certainly be assured of a mention in the column so that those interested can contact them directly.

Finally, I should point out that this group of . . . 'social-psychologists of science'? . . . has no intention of being exclusive or talking only to itself. The intent is to bring greater balance to the study of science and the contributions of anyone with findings or questions involving the differences between researchers as well as the condition of the enterprise as a whole would be quite welcome. I hope that questions we might raise about the organization, history or philosophy of science will be accepted in a similar spirit.

John M. Wilkes

Interim Secretary, Social-Psychological
Study Group

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c/o Center for Applied
Social Science
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Boston, Massachusetts 02215

PROGRAMS AND MEETINGS

Report on Recent Meetings.

East-West Center Technology and Development Institute. The Institute sponsored an international conference on "Technology Assessing: The Quest for Coherence" on May 31-June 10, 1977 at the East-West Center in Honolulu. The conference was organized by Bruce Koppel, Director of the Technology Assessing project at the Center. The keynote address, "Assessment as a General Problem" was presented by Kenneth Boulding. The 55 participants included scientists, technologists, social scientists and policy-makers from 8 nations (West Germany, France, United States, Japan, Republic of China, Philippines, India, and Iran).

The widening international interest in technology assessment is an interest in the question: how can a perspective firmly derived from social goals be incorporated into science and technology policy formulation and analysis? The question is not culturally specific, although undoubtedly the answers are. Whatever the answers, they will reflect the abilities of societies to cope with uncertainty, to bring the future with all its unknowns into the present and convert both the present and future into constructive social experiments.

The conference was organized around four broad generic issues:

- (1) What are the problems and prospects of international technology assessing?
- (2) What are alternative strategies for institutionalizing technology assessing?
- (3) What are the appropriate criteria for evaluating the broader social, political and cultural effects of research-innovation systems?
- (4) What are the roles of the social sciences and of social scientists in the technology assessing process?

After exploring these complex issues, the conference examined their application to four areas: national planning, industrialization, agriculture, and energy. Finally, working groups were formed to identify and rank research and action needs and, to the degree feasible, propose in broad outline the strategies that might be employed to address higher priority needs.

Several themes which received repeated attention are of special interest to 4S members:

- (1) The role of context was given recognition as being considerably more significant than the refinement of TA methodologies. Ledivinia Carino, Ted Lowi and David Sills emphasized this point most strongly. A number of paradoxes involving dual and potentially conflicting advocate-critic roles for scientific communities and the possibilities that types of professionalization best suited for one role were damaging for the other were discussed by Lowi, Narendra Singhi and Richard Suttmeier.
- (2) TA as normative rather than purely positive science was the subject of lively debate with Boulding, Herbert Paschen and Charles Wolf arguing for the former and Aquiel Ahmad and Pat Johnson leaning towards the latter.

East-West Center Technology and Development Institute (Continued).

- (3) There was little consensus as to what TA was in any precise sense. However, perhaps more significantly, there were major differences between developed and developing country participants in assumptions underlying the numerous views of the TA process. The issues of problem bounding, participation and the relationship of TA to the policy process were issues which which tended to split on an Asia-U.S./Europe gradient.

Participants expressed two views as to the ways in which the conference was unique. One view was that it was probably the first true international meeting on TA (Bijan Aalami, Bertrand Chatel). Another view was that the conference had explored TA from a social science perspective to a much greater extent than has perhaps taken place to date (Alan Porter).

A selection of conference presentations and discussions will be published. For additional information please contact: Bruce Koppel, Technology Assessing Project Director, The East-West Center, Honolulu, Hawaii 96848.

15th International Congress of the History of Science. The 15th International Congress was held in Edinburgh, Scotland from August 10-19. More than seventy sessions involving over 450 papers were organized for the seven sometimes hectic meeting days. Clearly no one observer could report first-hand the affairs of such a conference and the author of this report is no more omnipresent or less inclined to have strayed from time to time from the meeting halls, than the average attendee. What follows, therefore, is a personal perspective on the meetings based on papers which I heard.

Measures of the success of such international gatherings are difficult to devise but the Congress was clearly attractive to national funding sources which were, presumably, willing and able to fund most of the more than 650 participants who registered in time to have their names recorded in the program. One may safely guess that well over 800 were present for at least some of the meeting. Although attendees came from forty-one countries the gathering was nearly half composed of U.S. (220+) and U.K. (140+) delegates. Of the other countries, only Germany (FRG) with 48, Japan (46), France (44) and the U.S.S.R. (34) sent more than 25 scholars to the Congress. Overall, the participants were more often scientists with historical interests than they were professional historians, philosophers or sociologists of science.

The Congress provided an appropriate opportunity to reflect upon the function of such meetings. With more than 450 papers (including over 130 by Americans) to be heard, these sessions provided as great an opportunity for communication (or bibliographic credits) as sessions of many of the national societies did for their respective delegations. The use of English by five out of six presenters despite the four official languages of the Congress suggests that for many from non-English speaking countries the sessions also provided an opportunity to alert English language scholars to their work.

Participants were nearly all housed at the University Residence Halls and thus saw each other on buses provided to go to and fro, at breakfast and at the numerous social functions and receptions organized by the hosts. Here the usual gossiping, job hunting and social visiting which established contacts, formed networks and exchanged personnel was amply provided for. These private transactions, which probably are the *raison d'être* of such conferences, will not be reported on here but they may, perhaps, bring closer together the communities of discourse whose linguistic isolation and separate concerns remained evident throughout the formal papers.

Of the ten symposia, I attended parts of only four: those devoted to the internal/external dispute, to medicine and industrialization, to international cooperation and the diffusion of science, and to problems of source materials in the history of science. The promising looking session on the "Internal and External Causation of Scientific Ideas", with papers by Pauli Rossi (read by Mary Hesse in his absence), Joseph Ben-David and Arnold Thackray, unfortunately produced no new insights on papers previously heard in similar forms elsewhere. This suggests, as most of the speakers and discussants argued, that the internal/external issue no longer serves a vitalizing function in history of science discourse. The history of science is the social study of science insofar as it is pursued with sophistication.

Such sophistication, drawing upon disciplinary traditions beyond the history of science, was displayed in the session on industrialization and medicine by E.A. Wrigley (Cambridge) and C. Webster (Oxford) who discussed the reconstruction of retrospective time series from poor mortality data and the relationship between such statistics and our understanding of the role of the dispensary in 19th century England. In the afternoon session a posthumously read paper by George Rosen

15th International Congress (Continued).

emphasized the fine line between the history of medicine or science and social history by relating the conditions in the New York garment trade to social legislation to control tuberculosis. The discussants, particularly Barbara Rosenkrantz (Harvard) pointed out the connection between the utilization of scientific knowledge and the structure and values of mediating institutions.

Some mediating institutions were the focus of the symposium on international cooperation and diffusion in science organized by Maurice Crosland whose lead paper argued from the experience of the Metric conferences that technical needs for standardization of terminology and methodology led to increasing numbers of international conferences in all fields in the mid-19th century. Entrepreneurial explanations were preferred by J.A. Cawood and by other discussants but perhaps the most intriguing suggestion for the spread of the international conference and other international organizations was contained in the paper by Brigitte Schroeder-Gudehus (Montreal). She claimed that it was the efforts of segments of national scientific communities which sought control of science in their own countries and used international bodies to support their claims to legitimacy which explained the formation of the International Association of Academies (1899-1914), the International Research Council (1916-1931) and the International Council of Scientific Unions. From this premise she went a long way towards explaining the peculiar political histories of these groups.

The scientific sessions continue to be organized around particular scientific disciplines in two periods - antiquity to 1600 and post-1600. The section devoted to "Science and Society since 1600" contained numerous papers of interest to 4-S members, particularly in the two sessions organized by the new International Council for Science Policy Studies (ICSPPS). In the first of these sessions, in which speakers were unfortunately limited to 20 minutes with little opportunity for discussion, Barbara Rosenkrantz again raised the issue of the relationship between scientific knowledge and public health policy by examining the manner in which American values and social institutions constrained the application of scientific knowledge in one national context. Jean-Claude Guedon (Montreal) followed with an argument concerning the role of the French revolution in transforming an explicit but inconsistent relationship between science and government into an implicit science policy which transformed the shape of entire disciplines (notably chemistry) in creating a science which served the interests of the bourgeoisie. In the second session papers by E. Hickel (FRG) and Lewis Pyenson (Montreal) argued that the specific socialization experiences of scientists had shaped the content of German chemistry in the mid-19th century (Hickel) and German physics in the early 20th century (Pyenson). Their efforts to identify the important elements in forming national disciplinary styles may be contrasted with the focus upon institutional determinants of scientific research programs articulated in the papers of Jan Janko and Sona Strabonova of the Institute of Contemporary History in Prague.

Very few purely sociological reports on science were heard at the Congress. Patricia Woolf discussed implications of her study of the differential rewards (as measured by citations) for two simultaneous discoverers of an assay for cyclic AMP. She illustrated the undoubted advantage secured by communication through the Gordon Conference and the Proceedings of the NAS over against presentation of a discovery outside the major research network and it favored communications avenue but argued her evidence against Merton's Mathew hypothesis. In other sessions issues of contemporary science policy were discussed by Jean-Jacques Salomon, Jerome Ravetz and Dorothy Nelkin.

Within the time at Edinburgh several specialized groups found opportunities to meet and hear papers. A Commission on Geographical Thought, a Committee on Historical

15th International Congress (Continued).

and the International Committee on the History of Technology all held sessions outside the main program. These sessions, together with those sponsored by the International Council for Science Policy Studies, expanded the boundaries of the traditional concerns of the International Congress. The message that the current format does not provide sufficient opportunity for those interested in applied sciences and technology, science policy or social studies of science in its broadest sense, will hopefully be heard and heeded in the organization of future meetings.

CONTRIBUTED BY: David Bearman, University of Pennsylvania

INTERNATIONAL SOCIOLOGICAL ASSOCIATION
CONFERENCE OF THE RESEARCH
COMMITTEE ON THE SOCIOLOGY OF SCIENCES

Budapest, September 7-9, 1977

"On the Differential Importance of Human-Relations-Aspects for Research Activities: A Comparison Between Academic and Industrial Research Units"

Georg Aichholzer, Roland Mittermeir and Georg Waller (Institute for Advanced Studies and Scientific Research, Vienna, Austria)

"Interdisciplinarity in the Light of the Development of Science and the Actual Research Work"

Marja Alestalo (University of Helsinki, Department of Sociology, Helsinki, Finland)

"The Impact of Science Policies Upon the Process of Allocation of Funds for Universities in the Province of Quebec Canada"

Geneviève Benezra (Institut d'Histoire et de Socio-Politique des Sciences, Université de Montreal, Montreal, Canada)

"A Strategy for Organized Technology"

G.M. Dobrov (International Institute for Applied Systems Analysis, Laxenburg, Austria)

"Concerning the Characterization of Socio-Economic Types of Scientific Activity"

Georg Domin (Academy of Sciences of the GDR, Berlin, GDR)

"Professional Communication in University Departments: A Study of Engineering Professors in Two Quebec Universities"

Thomas Eisemon (Department of Social Foundations of Education, McGill University)

"The Role of Science in the Consolidation of the Chinese Revolution"

Robert W. Friedrichs (Williams College, Williamstown, MA)

"Science Within the System of Culture"

P.P. Gaidenko (Institute of the History of Science and Technology
of Academy of Science USSR, Moscow)

"On Planning Activity of Research Units"

Ágnes Haraszthy and Lajos Szántó (Institute for Science Organization,
Hungarian Academy of Sciences, Budapest, Hungary)

"Connections Between Some Characteristic Composite Measures Related to the
Supply and Performance of Research Units"

P. Hunyam, Á. Halász and Cs. Fajsz (Jozsef Attila University,
Szeged, Hungary)

"Goal Direction of Scientific Research"

Dr. Ron Johnston and Mr. T. Jagtenberg (Department of Liberal
Studies in Science, The University, Manchester, UK).

"Science as a Form of Intellectual Production"

V. Zh. Kelle (Institute of the History of Science and Technology
of Academy of Science USSR, Moscow)

"Zum Verhältnis von Technik und Wissenschaft--Erkenntnisziele und
Theoriendynamik am Beispiel der Feuerungstechnik und der Thermo-
BZW. Hydrodynamik"

Günter Küppers (Universitätsschwerpunkt, Wissenschaftsforschung
Universität Bielefeld, Bielefeld, Germany)

"Scientists and Science Policy"

Zhivko Nedev (Sofia, Bulgaria)

"The Ecology of the Research Process"

Pál Tamás (Hungarian Academy of Sciences of Sociology, Budapest,
Hungary)

"Some Questions Concerning the Sociocultural Function of Science"

Pawel Rybicki (Jagiellonian University, Cracow, Poland)

"External Resources, Their Subjective Perceptions and Effectiveness of
Research Units"

Veronica Stolte-Heiskanen (Institute of Sociology, University of
Helsinki, Helsinki, Finland)

"Action Research in a Research and Development Organization"

Karoly Varga (Institute of Sociology, Hungarian Academy of Sciences, Budapest, Hungary)

"The Role and Position of the Technical Staff in Research Organization"

Katriina Virtanen (University of Helsinki, Helsinki, Finland)

"Gnostic and Social Aspects of Division of Labour and Cooperation in Research"

Dietrich Wahl (Institute for Theory, History and Organization of Science, Academy of Science of the GDR, Berlin, GDR)

"Towards Ethnomethodology?--A Chronicle of Research Development in the Sociology of Science"

Steve Woolgar (Department of Sociology, Brunel University, Uxbridge, England)

"The Professionalization of Scientists"

Assen Yossifov (Bulgarian Academy of Sciences, Institute of Sociology, Sofia, Bulgaria)

ISA RESEARCH COMMITTEE ON THE SOCIOLOGY OF SCIENCE
UPPSALA, SWEDEN
AUGUST 14-19, 1978

Session 1: Studies in the historical sociology of science.

Session 2: Science and ethics.

Session 3: Sociological analysis of scientific knowledge.

Session 4: Science and politics.

Session 5: Miscellaneous items of particular interest.

Contact: Dr. Michael Mulkay
Department of Sociology
University of York
Heslington, York, YO1 5DD, England
GREAT BRITAIN

NSF: Announcement. New cut-off dates for all proposals considered by the programs of the Division of Social Sciences are:

For proposals starting in:

June-July
September-October
January-February

Proposals should arrive by:

November 15
February 15
August 15

NSF: Open Meeting-Advisory Panel for History and Philosophy of Science. An open meeting of the NSF Advisory Panel for History & Philosophy of Science was held at the Institute for Advanced Study, Princeton, NJ on June 3, 1977. The purpose of the meeting was to seek advice for the History and Philosophy of Science and Technology Committees on their current research interests and funding priorities. The historians of technology and philosophers of science present at the meeting declined to suggest any priorities or special needs, since both disciplines are holding conferences to address these specific issues. Nevertheless, the following special resource needs were suggested:

- 1) Handbooks of method in history of science
- 2) Guides to unpublished sources
- 3) Analytical bibliographies of older primary sources
- 4) Translations of important works into English
- 5) Archival projects
- 6) Editorial projects
- 7) Oral history projects, especially in areas other than physics
- 8) Completion of Science Citation Index back to about 1890

No priorities were set in this list though several of those attending supported the need for archival projects and the extension of the Science Citation Index.

The question was also raised whether there were any basic research topics within the history and philosophy of science with potential for useful applications. The only area specifically suggested as "applicable" was retrospective assessment of impacts of alternatives of science and technology. Several historians objected to this kind of question. Others argued that the real need is for post-doctoral research support.

On the matter of interdisciplinary research projects, three specific areas were cited: (1) socio-economic studies of science and technology, (2) historical anthropological studies of science and technology and (3) historical and sociological studies of history and technology. There was some debate about the fruitfulness of sociology of science. However, no consensus was reached. There was also expressed a concern by some that none of the areas should be emphasized. If a good project comes in, it should be supported, but no special efforts should be made to solicit proposals in these areas. Finally, it was noted that the Program itself is interdisciplinary and promotes interdisciplinary research in history and philosophy of science.

Also discussed were research areas in need of "special emphasis". Listed as "underdeveloped" areas of interest were: (1) history of mathematics, (2) comparative studies, (3) popular science and (4) art and science. Several historians, however, expressed the view that no special area should be emphasized.

The Panel adjourned on Saturday afternoon, June 4, 1977, after the Panel had reviewed and evaluated twenty-six individual research proposals.

NATIONAL ENDOWMENT FOR THE HUMANITIES
1978 SUMMER SEMINARS FOR COLLEGE TEACHERS

The National Endowment for the Humanities has announced that 122 seminars in all disciplines of the humanities and the humanistic social sciences will be held during the summer of 1978 under the aegis of its program of Summer Seminars for College Teachers. Twelve college teachers will be selected to participate in each seminar, and participants will receive a stipend of \$2,500 to assist in covering living expenses, the purchase of books and other research expenses, and the cost of travel to and from the seminar location.

The purpose of the program is to provide opportunities for faculty members of two-year, four-year, and five-year colleges to work under the direction of a distinguished scholar and to have access to the collections of a major research library. Participants will examine a body of common readings with their colleagues in the seminar, prepare a written report, and, outside the seminar, will pursue an individual project of their own choosing and design. It is hoped that through research, reflection, and frequent discussions with the seminar director and with other teachers from across the country, participants will expand their knowledge of the subjects they teach and improve their ability to impart an understanding of these subjects to undergraduate students.

To be eligible, applicants must be teaching either full-time or part-time at a private or public undergraduate institution or at a junior or community college. Preference will be given to those who have been teaching for at least three years and who have not recently had the opportunity to use the resources of a major library. Faculty members of departments which offer a doctorate will normally not be eligible for this program.

Listed below are those seminars scheduled for the summer of 1978 in the field of science, technology, and human values. For detailed information on particular seminars and for application instructions and forms, please write to the seminar directors at the addresses indicated. For a complete list of seminars to be offered across all disciplines, please write to the Division of Fellowships, National Endowment for the Humanities, 806 15th Street, N.W., Washington, D.C. 20506.

The application deadline is March 13, 1978.

Achinstein, Peter
Department of Philosophy
The Johns Hopkins University
Baltimore, Maryland 21218

Concepts of Scientific Explanation

June 12-August 4, 1978

This seminar will consider arguments for and against three general approaches to scientific explanation: (1) formalistic accounts proposed by Hempel, Nagel, and

Salmon; (2) contextual viewpoints held by Bromberger, Scriven, and Achinstein; and (3) historical relativism, expressed by Toulmin. Among the issues to be treated are: the relationship between explanation and prediction, whether absolute (theory-neutral) standards of scientific explanation are possible, and the ontological character of an explanation. The results of these studies will be applied to particular questions concerning micro-explanations in physics and chemistry, explanations in psychology, and functional explanations in biology and various social sciences. Open to philosophers and to natural and social scientists with some background in philosophy.

Burke, John G.
Department of History
University of California
Los Angeles, California 90024

Technology, Society, and Values in Twentieth-Century America

June 19-August 11, 1978

The purpose of this seminar is to study technological innovation in the twentieth century in the context of the political and economic institutions of the United States, the values of society, and individual and national goals. Readings will treat such subjects as the relationship of technology to society, theories of technological change, social responsibility in the development and application of technology, governmental responsibility in the process of technological choice, and technology and the future. Intended for teachers of introductory or advanced courses in history, social sciences, and humanities.

Carlisle, E. Fred
Department of English
Michigan State University
East Lansing, MI 48824

The Functions of Discourse in Science and Literature

June 19-August 11, 1978

This seminar will focus upon the modes of discourse in science and in literature and try to arrive at an informed sense of their relationships and differences. Both orthodox formulations and recent modifications of these modes of discourse will be examined, and participants will determine if it is possible, through this focus on language, to develop new perspectives and terms for understanding the relationship between literature and science. Topics for discussion will include themes and paradigms in science, models and metaphors, style and discourse in science, the language of literature, and the value of reading scientific texts as literary texts are read. Intended for an interdisciplinary audience of teachers of writing, literature, and science.

Grant, Edward
Department of the History and
Philosophy of Science
Indiana University
Bloomington, Indiana 47401

The Medieval World View

June 15-August 8, 1978

A detailed examination of the conceptual model of the physical universe that was developed during the late Middle Ages in the Latin West. Special emphasis will be given to the interaction between the demands of a pagan natural philosophy, drawn largely from the works of Aristotle, and the requirements and restrictions of a Judaeo-Christian theology; but the seminar will also examine other aspects of medieval thought--physical, spiritual, occult, and institutional--which contributed to the fully developed world view. Open to medievalists with backgrounds in history, philosophy, science, literature, theology, or art.

Hacking, Ian
Department of Philosophy
Stanford University
Stanford, California 94305

On the Importance of History to the Philosophy of Science

June 26-August 16, 1978

A study of the impact of the new historiography of science on the philosophy of science. Participants will consider the work of T.S. Kuhn, Imre Lakatos, and Paul Feyerabend, which calls into question assumptions about rationality made by logical empiricism. They will also investigate new approaches to the history of science that have consequences for the theory of knowledge, including the sociological studies of Robert Merton, Marxist sociology of knowledge, and Michael Foucault's Archaeology of Knowledge. Current interests in the philosophy of language and the theory of reference will also be discussed as they relate to the interests of the seminar. Intended for teachers in philosophy and history.

Shils, Edward
Department of Sociology and
Committee on Social Thought
University of Chicago
Chicago, Illinois 60637

Intellectuals in Culture and Society

June 26-August 18, 1978

The first part of the seminar will deal with the role of intellectuals and

and their institutions (universities, academies, publishers, libraries, learned societies, and so on) in the creation, maintenance, and transmission of intellectual works and beliefs in the humanities, sciences, and arts. The second part will treat the relationship between intellectuals and their society, focusing primarily upon the role of intellectuals within business enterprises, governments, and the political process. Attention will also be paid to the social backgrounds of intellectuals and to the processes by which intellectuals are trained, and given recognition by society. Applicants should have an interest in the topic, but may come from any disciplinary background.

Smith, David H.
Department of Religious Studies
Indiana University
Bloomington, Indiana 47401

Liberty, Equality, and Fidelity in Bioethics

June 19-August 11, 1978

After readings in philosophical and religious approaches to ethical theory, this seminar will survey a number of topics in bioethics which have received considerable recent attention both inside and outside the academic community. These will include experimentation on human subjects, the relationship between physician and patient, truth and confidentiality, eugenics, abortion, death and dying, and the distribution of medical resources. Special emphasis will be given to the difficulties involved in formulating a consistent method in normative ethics and on fiduciary relationships as loci of value. Intended for individuals with diverse backgrounds who deal with some aspect of bioethics in their teaching.

TEACHING PROGRAMS

Clark University. Science, Technology and Society (STS) is an interdepartmental program at Clark concerned with the evaluation of science and technology in a societal context. Courses are problem-oriented and multi-disciplinary, and form useful electives for students from many fields. STS may also be taken as a unique major which prepares graduates for certain assessment jobs and qualifies them for new interdisciplinary graduate areas such as energy policy, resource management, and environmental science. For more information, write to The Chairman, Program on Science, Technology and Society, Clark University, Worcester, MA 01610.

University of Delaware. The Center for the Culture of Biomedicine and Science at Delaware is a regional teaching and research endeavor. Directed by Edward Lurie, its membership consists of a core faculty of five and an associated faculty of fifteen scholars from History, Philosophy, Sociology, English, Art History and related humanistic and social scientific fields. Functions of the Center include (i) the Program for the Culture of Biomedicine, an interdisciplinary teaching program of core and advanced courses--many team-taught--in the social, cultural, and humanistic aspects of biomedicine; (ii) the Program in Science, Technology and Society, which brings lecturers to campus, sponsors conferences, and holds faculty seminars; (iii) the Philosophy and Technology Newsletter, a publication with national circulation which disseminates teaching and research information on the philosophical aspects of technology; (iv) The Philosophy and Technology Annual Compilation of Research, an annual series of volumes, the first of which will appear in early 1977, and (v) the new Guide to Science, Technology, and Medicine, which will interrelate materials from disparate fields of inquiry through "state-of-the-art" essays to be written by scholars chosen by a supervisory board. For details on any of these functions, contact the Center for the Culture of Biomedicine and Science, University of Delaware, Newark, DE 19711.

Université de Montréal. The Institut d'histoire et de sociopolitique des sciences has inaugurated a program leading to the Ph.D. degree in the history and sociopolitics of science. The course of study is two years for students who have already completed the M.Sc. or M.A. degree, or its equivalent, in a related field. A dozen students from Canada and several foreign countries are now pioneering the innovative program that integrates the history, sociology, and politics of science. Doctoral seminars are interdisciplinary and are taught collectively by experts in several fields. The program is designed to train graduates for careers in government and industry, as well as in more traditional academic settings. Teaching in the program are six permanent faculty members of the Institut. The program is enhanced by specialists who come to lecture for periods up to six weeks. A permanent program of faculty and student exchanges exists between the Institut and the History of Science Department of The Johns Hopkins University. The two-year M.Sc. program of the Institut is designed to prepare students without previous graduate training for the doctoral program. The M.Sc. program consists of courses, seminars, a comprehensive examination in six parts, and a thesis. For more information concerning studies at the Institut, write Le Directeur, Institut d'histoire et de sociopolitique des sciences, Université de Montréal, c.p. 6128, succursale A, Montreal, P.Q. H3C 3JF, Canada.

LITERATURE NOTED IN BRIEF

Lomask. A Minor Miracle: An Informal History of the National Science Foundation by Milton Lomask is now available. A readable account of the first 25 years of NSF, the book consists of episodes and developments "chosen from a large number of possibilities in an effort to convey to the general reader the flavor of a unique public institution." Copies are available from the Superintendent of Documents, US Government Printing Office, Washington, DC 20402. The price is \$2.75. Request stock number 038-000-00288-1.

NSF. Two publications are now available detailing preliminary results of the NSF Research Management Improvement (RMI) Program. The first publication, Preliminary Results, a summary of RMI projects produced by RMI grantee C. West Churchman of the University of California, Berkeley, was presented at the 10th Annual Meeting of the Society of Research Administrators in Toronto, Canada, on 19 September 1976. The second, Abstracts of Publications, is a collection produced by the RMI grantees, written as part of the American University's RMI Evaluation and Dissemination Project under the auspices of Lowell H. Hattery at the Center for Technology and Administration, American University. This document was presented at the 18th Annual Meeting of the National Council of University Research Administrators, held in Washington, DC, on 17-19 November 1976. Both publications are available from Robert S. Cutler, RMI Program Administrator, Division of Science Information, NSF (202-632-5826).

Pelz and Andrews. The Institute for Social Research at the University of Michigan has recently published a revised edition of Donald C. Pelz and Frank M. Andrews' Scientists in Organizations, a classic study of the effect of organizational contexts on the professional productivity of scientists and engineers. The new edition of this work includes both the original (1966) text based on survey responses from 1300 scientists and engineers in industrial, governmental and university laboratories, and five additional articles published by the authors between 1967 and 1975 which elaborate and extend some of the major themes. The volume is available for \$14 from the Institute for Social Research, Box 1248, Ann Arbor, MI 48106.

Price. In the September/October 1976 issue of the Journal of the American Society for Information Science, "A General Theory of Bibliometric and Other Cumulative Advantage Processes" is advanced by Derek de Solla Price. The article describes a Cumulative Advantage Distribution which models statistically the situation in which success breeds success. It differs from the negative binomial distribution in that lack of success--being a non-event--is not punished by increased chance of failure. Price shows that such a stochastic law is governed by the Beta Function, containing only one free parameter, and that this function is approximated by a skew or hyperbolic distribution of the type that is widespread in bibliometrics and diverse social science phenomena. In particular the Beta Function is shown to be an appropriate underlying probabilistic theory for the Bradford Law, the Lotka Law, the Pareto and Zipf distributions and for all the empirical results of citation frequency analysis. As a side result Price derives the obsolescence factor for literature use. The Beta Function is peculiarly elegant for these

manifold purposes because it yields both the actual and the cumulative distributions in simple form, and contains a limiting case of an inverse square law to which many empirical distributions conform.

Storer. Norman Storer has purchased the remaining copies of his book, The Social System of Science, from the publisher (Holt, Rinehart and Winston, 1966) to spare them from being "remaindered." Henceforth, copies may be obtained directly from him as long as the supply lasts for \$3.50, including postage. Write to Storer at 311 East 23rd Street, #8BB, New York, NY 10010.

OHST. Max Planck. A Bibliography of His Non-Technical Writings. Max Planck is now available from the Office for History of Science and Technology, University of California, Berkeley. It notices over 600 items in six languages, identifies the original version and occasion of each entry, and lists all known reprintings and reworkings. It shows Planck to have been a very available spokesman for science, and suggests that his roles as popular epistemologist and propagandizer deserve close study. Max Planck is the first of a series of bibliographies of the non-technical writings of modern physicists to be issued by the Office. Nothing like these bibliographies is otherwise available. They are intended to aid students of the relations of physics with other sciences, arts and politics, and anyone who needs to know the printing history of particular speeches and essays. The Planck bibliography (Berkeley Papers in History of Science, 1) can be obtained at cost (\$2.00) from the Office, 470 Stephens Hall, University of California, Berkeley, CA, 94720. Checks should be made payable to the Regents of the University of California, and should accompany orders from individuals.

The Citizen and Science Almanac and Annotated Bibliography. The Citizen and Science Project of the Poynter Center on American Institutions (Indiana University) announces publication of a guide and basic bibliography for the development of college courses or seminars on the relationship of science to the American public. It is entitled The Citizen and Science Almanac and Annotated Bibliography, compiled by M.C. LaFollette, Bloomington, IN: The Poynter Center on American Institutions, (1977, 149 pp., \$2.50). The "Almanac" section is divided into thirteen major topics (such as, "science and the mass media," "science and government," or "criticism of science"). Each of the numerous specific subtopics contains a short list of primary references; discussion of the relation of the subtopic to the larger subject; suggestions for class discussions, lecture topics, or assignments; and other useful references. The annotations in the 500-reference bibliography are also directed specifically to the teacher or student teacher. Emphasis throughout the document is on the public role of the social institution of science, its interaction with other institutions and the actions and attitudes of citizens. For further information or to order, write: The Poynter Center, 410 North Park Avenue, Bloomington, IN 47401.

NSF. In June 1975, the National Science Board established the policy that NSF would publish annually a report of all peer reviewers used by each Division of NSF. Reviewers are those individuals solicited by NSF to review proposals either by mail or in panels convened to evaluate proposals. The first report, Listing of Peer Reviewers, is now available, covering the period October 1975 through September 1976. The name, state, and institutional affiliation of some 42,000 reviewers are listed (842 pp., \$8.60, write Government Printing Office, Washington, DC 20402, request stock number 038-000-00305-4). The new Grant Policy Manual (NSF Manual No. 15), replacing the out-of-print NSF Grant Administration Manual (NSF 73-26), is now available. Grantee organizations during FY76 will receive a minimum of three copies. Others may contact the Policy Officer, Division of Grants and Contracts, NSF (phone 202/632-4148).

Other NSF. The following new publications of NSF's Science Resources Studies (SRS) Division are now available from the Superintendent of Documents, US Government Printing Office, Washington, DC 20402: Characteristics of the National Sample of Scientists and Engineers, 1974, Part 3. Geographic (\$2.00, Stock No. 038-000-00308-9); Federal Funds for Research, Development, and Other Scientific Activities, Fiscal Years 1975, 1976 and 1977, Volume XXV (\$1.45, Stock No. 038-000-00310-1); Reviews of Data on Science Resources, No. 28, "Scientists and Engineers From Abroad: Trends of the Past Decade, 1966-75" (\$0.35, Stock No. 038-000-00309-7).

DISSERTATIONS: RECENT AND FORTHCOMING

Rosen, Matthew A., "Politics and Scientific Opinion: The Sociology of Marihuana Research." Columbia University (advisor: Harriet Zuckerman).

Stern, Nancy, "The Eckert-Mauchly Computer Organization 1943-1951." State University of New York at Stony Brook (advisor: Ruth Cowan).

APPOINTMENTS AND VACANCIES

Bell Laboratories. A major industrial R&D firm in the New York metropolitan area has an opening for a writer/analyst strong in science history and/or sociology. The person hired will be expected to do original writing relating science and technology to public needs and to do liaison work with university and government groups. University or government experience would be helpful but not required. Send letter describing related education and experience. Include writing samples. Direct inquiries to G.E. Schindler, Bell Laboratories 3C-305, Murray Hill, N.J. 07974.

University of New South Wales. The School of History and Philosophy of Science intends to fill one and possibly two posts early in 1978, one of which may be at Senior Lecturer level and the other at Lecturer level. Applications are invited from candidates with teaching and research experience in the following areas: social history of science and/or technology; science studies (i.e., sociology of knowledge/science, science and public policy or economic aspects of science and technology). The School has an undergraduate enrollment of about 500 students drawn from the Faculties of Arts and Science and has prime responsibility for the Masters' program in Science and Society offered by the Faculty of Science. The appointee(s) will be expected to contribute to the teaching of existing undergraduate courses in social history of science, develop new courses at undergraduate level in the science studies area and contribute to the teaching in the Masters' program. Candidates whose academic backgrounds are in more traditional areas of H.P.S., for example, in history or philosophy of physics and cosmology, may be able to contribute to courses offered by the School in these areas. Direct inquiries to Professor J. Ronayne, Head, School of History and Philosophy of Science, The University of New South Wales, P.O. Box 1, Kensington, N.S.W., 2033, AUSTRALIA.

Massachusetts Institute of Technology. MIT is seeking candidates for three senior or junior faculty appointments in a new interdisciplinary program in science, technology and society, with possible joint appointments in relevant departments. All three positions require an interest in teaching undergraduate science and engineering majors and in collaborating with colleagues in related humanities, social science, engineering or science fields. The appointments will be in the following areas:

1. SOCIAL STUDY OF SCIENCE. Research and teaching competence in studying the interaction between scientific thought and 20th century social, political, economic and cultural issues.
2. HISTORY OF SCIENCE, with emphasis on life sciences. Research and teaching competence in the history of 19th and 20th century biological concepts, techniques and applications, and in interactions between biological thought and social issues.
3. HISTORY OF TECHNOLOGY. Research and teaching competence in one or more particular technologies and their interaction with industrial, economic, social or intellectual developments.

Send resumes to Associate Dean Donald L.M. Blackmer, School of Humanities and Social Science, 20D-210, M.I.T., Cambridge, Mass. 02139. M.I.T. is an Equal Opportunity/Affirmative Action Employer.

Cornell Program on Science, Technology and Society. Postdoctoral associateships are available for 1978-79, for persons who wish to participate in activities in one of the following areas:

1. CITIZEN PARTICIPATION IN TECHNOLOGICAL DECISION-MAKING--the underlying problems posed by the increasingly technical nature of public policy decisions; the conflict between democracy and expertise in a technological society.
2. LAW AND SOCIETY--the role of the courts in technological decision-making; the use of litigation to resolve public policy disputes.
3. SCIENCE, TECHNOLOGY AND PUBLIC POLICY--energy and environmental policy; economic analysis of research and development; the application of technology to national development of the poorer countries.
4. HUMANITIES, SCIENCE AND TECHNOLOGY--literary, historical or philosophical studies in science, technology and society; environmental and biomedical ethics; theory of choice and decision.
5. TECHNOLOGY ASSESSMENT OF TELECOMMUNICATIONS--the social impacts likely to result from the introduction of new technologies; long-range policy implications of emerging technologies.

Applications are invited from young scholars with disciplinary backgrounds in the physical, biological and social sciences; the humanities; engineering; business and public administration; and law. The number of positions available for 1978-79 is not fixed, but it is likely that two appointments will be made. The appointments are primarily research-oriented, but in most cases there is an opportunity to participate in some classroom teaching. The appointments are for 12 months beginning either July or September 1978, with possible renewal for an additional year. The normal starting salary will be in the range of \$11,500-\$13,500, depending upon qualifications.

Applications should include:

1. An account of the proposed research project (approximately 5 pages).
2. A curriculum vitae, summary of the doctoral dissertation, and list of courses taught.
3. Three letters of reference (sent directly to the Program).

Application materials should be sent to: Lloyd Carter, Manager, STS Program, Cornell University, Ithaca, New York 14853. Deadline for applications is February 17; awards will be announced March 15.

Cornell Program on Science, Technology and Society. Cornell University announces an Assistant Professorship in Science and Technology Policy. The Program is seeking a scholar actively involved in research on the social and political bases for the development of policies for science and technology, or on the impact of science and technology on public policy. Responsibilities will include the development of new courses in these areas and participation in research, including the training of graduate students. Applicants should have a Ph.D. in political science or a related field. The appointment will be for a three-year term beginning September 1978. The starting salary will be commensurate with qualifications. Applications should include:

1. A description of teaching interests and an account of research interests, including specification of a potential research project.
2. A complete curriculum vitae including a summary of the doctoral dissertation and a list of courses taught. Manuscripts and off-prints may be included.
3. Three letters of reference (sent directly to the Program).

Application materials should be sent to: Lloyd Carter, Manager, STS Program, Cornell University, Ithaca, New York 14853. Deadline for applications is February 17.

4S Society for Social Studies of Science

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