3-22-93

NEWSLETTER OF THE AMERICAN SOCIOLOGICAL ASSOCIATION SECTION ON

SCIENCE, KNOWLEDGE and TECHNOLOGY

Volume 6 Number 1 March 1993

FORTHCOMING MEETINGS

The 1993 Annual Meeting of the Society for Social Studies of Science will be held on November 19-22, 1993, at Purdue University in West Lafayette, Indiana. Proposals for papers and ideas for sessions should be sent to the chair of the Program Committee, Tom Gieryn, Dept. of Sociology, Ballantine Hall 754, Indiana University, Bloomington, IN 47405, phone (812) 855-2950 or (812) 855-4425, fax (812) 855-2818, e-mail: gieryn@iubacs or gieryn@ucs.indiana.edu. Deadline for submissions is April 1, 1993. Information about lodging and transportation may be obtained from the chair of the local arrangements committee, Lee Trachtman, Communication Dept., Heavilon Hall, Purdue University, West Lafayette, IN 47907 phone (317) 494-3429; fax (317)496-1394; e-mail xnzs@purccvn. Registration forms will be included in a forthcoming issue of TECHNOSCIENCE (the 4-S newsletter) or can be obtained from Trachtman.

SKAT SESSIONS SCHEDULED FOR THE 1993 ASA MEETING (Fontainebleau Hilton Hotel, Miami Beach, FL, August 13-17)

Title: LOOKING TOWARD SKAT'S FUTURE
Presider: Lowell Hargens, Ohio State University

Papers:

1) 1992 Hacker/Mullins Award Winner. Scientists At Work: Contexts of Discovery. Rosa Haritos, Cornell University.

2) 1993 Hacker/Mullins Award Winner. To be announced.

3) Worm, or: Forging Community in Computer World. Robert Bienvenu and Thomas F. Gieryn, Indiana University.

4) Thinking Big and Small: SKAT and Sociological Theory. Susan Cozzens, Rensselaer Polytechnic Institute.

Title: RESEARCH-FRONT STUDIES OF SCIENCE AND TECHNOLOGY
Presider: Linda Pulliam, Southern Connecticut State University

Papers:

1) Social Influences on Scientific Productivity. Thomas Phelan, SUNY Stony Brook, Stephen Cole, Institute for Advanced Study.

2) The Diffusion and Displacement of Medical Technology: The Case of Antibiotics and Tonsillectomy. Sue Chow, University of Pennsylvania.

3) Rank Advancement in the Academic Career: Sex Differences and the Effects of Productivity. J. Scott Long, Indiana University, Paul D. Allison, University of Pennsylvania, Robert McGinnis, Cornell University..

4) Flexible Databases: An Organizational Analysis. Rebecca S. Henderson, University of Washington.

Title: REFEREED ROUNDTABLES

1) Sociology and Neural Network Research

a) How Funding Works: Sponsorship and Innovation in Neural Computing, Jon Guice, University of California, San Diego.

b) Searching for Similarities: Models of the Mind in Social Theory and Biological Neural Networks. Linda J. Pulliam, Southern Connecticut State University.

2) Education's Role in Science and Technology

a) Education and Occupational Sex Segregation: Engineering and College Completion Rates of Men and Women. Lisa M. Rowe, University of Arizona.

b) Scientific Literacy: Is It Functional Need or Institutional Isomorphism? Soyoun Gim, Stanford University

3) Political Aspects of Science and Technology

a) Science, Objectivity and Human Agency: The Irony of Modern Science. Annemarie Harrod, Nashville TN

b) The Politics of Pesticide Use: State Legitimacy in the Malathion Controversy. Wendy Dishman, Venice CA

The European Association for the Study of Science and Technology: Or, Toward a Political Sociology of Technoscience

Paul Hoch

(Jt. Secretary of EASST)

As many will know, EASST recently held a very large (over 500 people) international conference in Sweden with the Society for Social Studies of Science (4S). American participation in this was only about 90 - even after we'd (at your initiative) re-arranged the conference date so as not to clash with the ASA meeting. A big problem for potential American entrants was no doubt the lack of central travel funds available through Washington. This was quite surprizing to me, as in the last year I'd attended international conferences in both philosophy and history of science (in Uppsala and Toronto), and both offered subtantial NSF travel funding. One can only hope that similar funding will one day be available to members of 4S.

In any case the quadrennial conferences of EASST with the latter are beginning to resemble world congresses of social studies of science - though they are fully interdisciplinary, and increasingly more politically than methodologically oriented. In this respect EASST differs strongly from the more disciplinarily-oriented working group within the ASA, and probably also from the general line of 4S. We very seldom recite the usual - originally European - incantations that 'science is socially constructed', as we are much too busy worrying about who constructs it, to do what - and how it can be re-constructed or de-constructed (and not just in words). The mainly American 4S association at one time also had the aspiration to be an interdisiplinary grouping of the various approaches to science studies, but has been faced with the strong competition in America of disciplinary associations in the history & philosophy of science, technology and medicine, which has somewhat circumscribed the participation of these non-sociological groups.

This is much less true for EASST, at least on the European scale, so that it functions much more as an umbrella science studies organisation. Only one member of the current EASST Council would consider himself a mainstream sociologist, and none is located in a sociology department. (Two are in general science studies, three in policy studies and one in in management.) With the entry of sizable contingents from Eastern Europe and the former Third World, EASST currently addresses itself much more to political and policy-related topics. EASST has a substantial American membership and of course strongly welcomes members from beyond Europe. Dues for 1993 can be paid in either sterling (£10) or American dollars ($18) respectively to Lynda Robb, 22 Henrietta St, London WC1E 8NA, ENGLAND; or Wes Schrum (Sociology), LSU, Baton Ruge, LA. 70803, USA. We welcome your full participation.

The National Science Foundation in the 1990s and the Role of the Social, Behavioral and Economic Directorate

by Cora B. Marrett*

Over the years that I have been an observer, fundamental changes in the scientific, social, and political environment in which the National Science Foundation (NSF) functions have taken place. Scientific opportunities are greater than available resources, expectations for more rapid application of new knowledge are increasingly voiced as are calls for a better preparation of our children for an increasingly technological world.

Organizational renewal and adaptation is a continuous process that has occurred at the Foundation over its more than 40 year history. The magnitude of changes over the last few years, however, places a special urgency on the present efforts and may call for bold, new approaches.

Since the establishment of the Foundation, NSF has enjoyed the status of being the premier source of Federal support for basic scientific research. During that period the Foundation has undergone a gradual but dramatic evolution. From its first year of full funding in 1952, NSF's budget has increased more than 100-fold in terms of real buying power. Times have changed for NSF in more ways than simple budget growth. NSF has taken on new areas of research and expanded its presence in traditional fields. NSF has achieved an international reputation in improving education for mathematics and science. The Foundation has developed new ways of supporting fundamental research while continuing to serve as the mainstay for the individual investigator. Over the course of the past four decades, NSF has developed into a model for the evaluation, support, and dissemination of research and education.

As I and many others see it, the continued strength of NSF and its ability to serve the nation depends not only on remaining flexible and adapting to new circumstances, but also on anticipating change and recognizing opportunities. Many of these changes and opportunities are the result of the fundamental nature of research itself. Discovery and application of new research methods and instruments not only result in better understanding of fundamental scientific problems but also lead to new and often expanded research opportunities and questions. Interaction between established disciplines often leads to revolutionary insights and

approaches. Other changes are external to science but of no lesser impact, such as the reordering of our national priorities in the wake of dramatic changes in the political world order.

The two sections that will follow in this report, is what I will call a status report of organizational change and the development of a strategic vision for the 1990s for NSF. In the organizational section I will put special emphasis on the Directorate for Social, Behavioral and Economic Sciences (SBE). The second part will address the changes in and continuation of the goals and activities of the Foundation itself, the strategic vision for the decade that leads us into the year 2000. You must understand that we (the Foundation and SBE) are in a rapidly moving development stage. As ideas from the National Science Board, the Commission on the Future of the National Science Foundation, Congress and the interested public come to our attention, we will take them into consideration.

Organizational Changes

Let me first address organizational changes which have already taken place. In October of 1991, Dr. Walter Massey, the Director of NSF, announced a series of reorganizations. Most of them involved administrative and staff functions. The realignments were designed to increase effectiveness and efficiency of the organization. At the same time, Dr. Massey announced the establishment of a new Directorate for Social, Behavioral and Economic Sciences (SBE). The new directorate was established effective December 29, 1991 in order to enhance the Foundation's role in these important areas of science, to facilitate interaction between related research and data collection and analysis activities of the Foundation, and to foster international research collaboration of benefit to all areas of U.S. science.

Although research in the social, behavioral, and economic sciences had been supported by NSF for a long time the establishment of a separate directorate is the outward formal recognition of these sciences as important, equal parts in the NSF portfolio. I know that many at universities, colleges and professional associations have advocated such an organizational recognition for many years and their advocacy and persistence has been critical for the outcome. I would like to use this opportunity to thank my colleagues for their efforts and at the same time urge them to continue their active involvement in the crucial phase of more precisely defining the role of the new directorate in the changing

environment. I hasten to add that the establishment of the directorate does not necessarily indicate a dramatic increase in funding, especially under the present fiscal stringencies.

The role of SBE is to advance our understanding of science and technology in the United States and the rest of the world, and to advance our understanding of individual, social, and economic behavior and of human interactions in the physical and natural worlds.

The directorate has been structured with three divisions, each of which has a significantly different mandate. The Division of Science Resources studies (SRS) maintains a statistical data base on U.S. science and technology; the Division of International Programs (INT) monitors science and technology in other countries and maintains formal science and technology agreements among the United States and other countries; and the Division of Social, Behavioral, and Economic Research (SBER), has responsibility for advancing knowledge in the social and related sciences. Each of the three divisions is described in greater detail below.

Division of International Programs

The goal of the Division of International Programs (INT) is to ensure that U.S. science and engineering benefit from world-wide scientific progress on a sustained basis by encouraging and facilitating interactions between U.S. scientists and engineers (including those in there early stages of their careers) and their foreign counterparts. INT's foci are on catalyzing new types of partnership between U.S. and foreign investigators, and on increasing knowledge and understanding of research policies and trends abroad for the benefit of the academic, industrial and government sectors. Although projects are supported on a global basis, particular emphasis is given to regions that are, at present, relatively neglected and where the establishment of more purposeful collaborations are regarded as essential to the long term vitality of U.S. science and engineering, including the Americas, Africa, and Eastern Europe and the former Soviet Union. Within this context, INT operates bilateral agreements with counterpart agencies in several other countries, supports post-doctoral fellowships enabling young Americans to conduct research abroad, and supports studies of foreign research policies and trends.

Division of Science Resources Studies

Activities of the Division of Science Resources Studies (SRS) fulfill the legislative mandate of the Organic Act of the National Science Foundation to "...provide a central clearinghouse for the collection, interpretation, and analysis of data on the availability of, and current and projected need for scientific and technical resources in the United States, and to provide a source of information for policy formulation by other agencies of the Federal Government..." To carry out this mandate, SRS collects, analyzes, and disseminates statistics on domestic and international resources devoted to science and technology and produces Science & Engineering Indicators, the biennial publication of the National Science Board. SRS also collects data for and produces other congressionally mandate reports, for example Women and Minorities in Science and Engineering, another that presents the current status of the academic research facilities. In addition, SRS conducts analyses of emerging issues in science and technology, such as changes in the organization of industrial science and technology, linkages between U.S. competitiveness and industrial research and development, and structural and policy influences on industrial science and technology.

Division of Social, Behavioral, and Economic Research

The Division of Social, Behavioral, and Economic Research (SBER) seeks to improve well-being through greater understanding of individual and institutional behavior and functioning. SBER supports both disciplinary and multi-disciplinary research: ranging from studies of human culture--past and present--to explorations of economic, political, legal, and other systems. The Division supports research examining issues in the development of science, engineering, and technology and their impacts on society and research on ethics and values as they relate to science and technology. The division has played a leading role in the development of research on the human dimension of global environmental change and on the economics of global change. It actively participates in other multi-agency research activities, such as those emerging in manufacturing. New initiatives currently underway include research to renew the nation's human and physical infrastructure and research on urban education.

The SBER is divided into five "clusters" of programs, and each one is a potential source of funding for sociologists interested in science, knowledge, and technology. In addition, each cluster defines a set of intellectual orientations that inform research on these important topics.

The Anthropological and Geographic Sciences cluster consists of programs in Geography and Regional Science, Cultural Anthropology, Physical Anthropology, and Archaeology and Archaeometry. Among research that might be supported by Geography and Regional Sciences are studies of the differing science policies of states and nations, geographical and spatial factors in industry setting, and social aspects of transportation and communication technologies. Technology, of course, plays an important role in many studies supported by the programs in Cultural Anthropology and Archaeology.

Cognitive, Psychological, and Language Sciences brings together programs in Social Psychology, Linguistics, and Human Cognition and Perception. Among the research topics for Social Psychology are attitude formation and change, social cognition, personality processes, interpersonal relations, group processes, and the social psychology of health. The Human Cognition and Perception Program focuses on such research topics as learning, memory, concept formation, problem solving, and the quantitative modeling of cognitive and perceptual processes.

Economic, Decision, and Management Sciences joins the Economics Program to the program in Decision, Risk, and Management Science (DRMS). The Economics program seeks to improve understanding of the processes and institutions of the U. S. economy and of the world system, and a high priority is given to interdisciplinary research on political economy and international competitiveness of the U. S. economy. The DRMS program explores fundamental issues in management science, risk analysis, societal and public policy
decision making, behavioral decision making, and decision making under uncertainty.

The Social and Political Sciences cluster has four programs: Sociology, Political Science, Law and Social Science (LSS), and the program for Methodology, Measurement and Statistics (MMS) in the Social Sciences. The Sociology program frequently supports research related to industry, technological change, the social processes that shape science, and the ways in which public institutions and social movements affect science, knowledge and technology.

The LSS program supports scientific research on law and law-like systems of rules, including studies of dispute processing, the regulatory role of law, and legal and social change. The MMS program promotes development, application and extension of methodology for social, behavioral and economic research. In addition to supporting studies of the American electoral and legislative system, the program in Political Science is concerned with the world-wide process of democratization, international political economy, and international conflict.

Of special interest to readers of this newsletter, is the cluster on Science, Technology and Society, which has three elements. First, the Ethics and Values in Science and Technology Program administers funds from all directorates in NSF and supports projects that explore the ethical, value or policy aspects of issues facing members of all scientific and engineering research and educational communities.

Second, the Research on Science and Technology program supports a wide range of projects related to processes of scientific and engineering research and technological change. For example, it could support studies of the factors that shape R & D in academic or industrial settings, the effect on innovation of patents or liability laws, and comparative analyses of national science and technology policies. In addition, it covers studies of human-resource issues, improvement of data and methods, and assessments of the state of knowledge and future needs for research on science and technology.

Third, the Science and Technology Studies program supports research on the nature and processes of development in science and technology (past and present) and the differences in the nature of theory and evidence in various scientific and technological fields. It supports research on the interactions between science and technology and their impact on society, and the interactions of social and intellectual forces that influence science or technology. Also supported are examinations of topics like the social construction of scientific knowledge and institutions, relations among science, government, and other social institutions and groups, and processes of scientific innovation and change.

Cross-cutting these five clusters and their disciplinary programs are a number of "initiatives," of which is perhaps the most important for SKAT members is the one dealing with Human Dimensions of Global Change (HDGC). The HDGC initiative encourages social science research on the myriad ways that human systems affect and respond to global change. Many of the awards

already granted through this initiative focus on ecology and the natural environment, but more generally projects relate to social, economic, demographic, governmental, legal, and institutional aspects of global change.

Strategic Vision for the 1990s

To understand the important role of SBE within the Foundation, we must look at the evolving plan as envisioned by Dr. Massey. Shortly after his arrival as Director of NSF, Dr. Massey began work on a strategic plan that would guide the Foundation in the 1990s. The initial working draft of this plan reiterated NSF's commitment to its traditional support of research and education in mathematics, science, and engineering, and made recommendation for some needed changes in emphasis at NSF in light of the fundamental changes in the economic and political environment in which NSF operates. After careful reflection on this plan, however, Dr. Massey determined that the magnitude of these changes required a more far-reaching consideration of the Foundation's future course.

Dr. Massey presented his concerns to the National Science Board at its August 1992 meeting. He recommended the establishment of a Commission on the Future of the National Science Foundations next step in developing a strategic plan. The National Science Board concurred in that recommendation and appointed fifteen distinguished scientists, industrialists, and academic leaders to serve on the Commission. William H. Danforth, Chancellor, Washington University in St. Louis and Robert W. Galvin, Chairman, Executive Committee of Motorola, Inc. and Chairman, Sematech were the Co-Chairpersons of the Commission which presented its report "A Foundation for the 21st Century" on November 20, 1992.

I read the report as assigning to NSF primary responsibility for strengthening science and engineering, through the support of meritorious research and education in these fields. This role does not depart from the one the agency currently pursues. But the report does not imagine an agency that remains unchanged and largely unresponsive to profound alterations around it. Instead, the Commission draws the image of an active institution that:

- attends to the concerns and needs of the larger society;

- o transcends boundaries -- of disciplines, sectors, nations --that might constrain the pursuit of knowledge and technologies:

- o forges partnerships with industrial and commercial organzations, other governmental agencies, and diverse private institutions to foster excellence in research and education; and

- o treats education in science and engineering at all levels as central to its mission and as intimately linked to research.

During the time of deliberations by the Commission the Foundation also received literally hundreds of letters from the scientific community on the subject of the future of the Foundation. This response was a sign of a most gratifying interest by our colleagues in academia and these letters presented many novel ideas on which we can draw upon as the process continues.

We at NSF will continue to reflect on the recommendations of the Commission, the comments of the academic community, and the continuing guidance from the National Science Board as we assess our activities, present our programs, and plan for the years ahead. Within the Directorate for Social, Behavioral, and Economic Sciences we are entering a process to identify and formulate themes around which we can build our programs and plans for the future. Again, I would welcome and appreciate comments and suggestions from our colleagues in the community of researchers interested in direction of the new directorate. Together, we can meet today's challenges and make social, behavioral, and economic research of increasing importance to NSF and the well being of our Nation.

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*Dr. Cora Bagley Marrett serves as Assistant Director for the Social, Behavioral and Economic Sciences (SBE) at the National Science Foundation. The Foundation seeks to promote public well-being through research and education in science and engineering. Other contributors to this artical are Dr. William Simms Bainbridge, Program Director in Sociology, and Dr. Ann T. Lanier, Senior Science Resources Analyst, Science Resources Studies.

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NEW PUBLICATIONS BY SKAT MEMBERS

Frankena, Frederick, STRATEGIES OF EXPERTISE IN TECHNICAL CONTROVERSIES: A STUDY OF WOOD ENERGY DEVELOPMENT. (Bethlehem: Lehigh University Press, 1992)

Hilgartner, Stephen, "The Social Construction of Risk Objects: or, How to Pry Open Networks of Risks," in James F. Short, Jr. and Lee Clark, eds. ORGANIZATIONS, UNCERTAINTIES AND RISK, Westview Press, 1992

Kiesler, Sara, John P. Walsh and Lee S. Sproull, 1992. "Network-Based Electronic Field Research," in F. B. Bryant et. al., eds., METHODOLOGICAL ISSUES IN APPLIED SOCIAL RESEARCH. New York: Plenum.

Short, James F., Jr., and Lee Clark, eds., ORGANIZATIONS, UNCERTAINTIES, AND RISK, Westview Press, 1992. (contains 17 essays on the sociology of risk.)

Walsh, John P., Sara Kiesler, Lee S. Sproull and Bradford W. Hesse, 1992. "Self-selected and Randomly-selected Respondents in a Computer Network Survey." PUBLIC OPINION QUARTERLY 56:241-244.

Walsh, John P. 1991. "The Social Context of Technological Change." SOCIOLOGICAL QUARTERLY 32:447-468.

DISSERTATIONS IN PROGRESS

Jon Guice, University of California, San Diego. Working Title: "New Powers of Mind: Sponsorship and Innovations in Neural Networks. This dissertation asks: How have groups which have funded research on artificial neural networks both affected and been affected by technical features of the field? The project is internationally comparative (US, Japan, western Europe) and methodologically focused on the processes of communication in research and funding practices.

August T. Horvath Annenberg School of Communication, Univ. of Southern California, "Information Technology and the Transformation of Organizational Structure and Power: A Longitudinal Investigation." The dissertation presents a perspective on organizational communication technologies and investigates an application of a radical administrative information system in a program of organizational transformation at a major public university. The development of the technology is traced using an analysis relying on recent work in the sociology of science and technology, and the development of user reactions are explored with methods from organizational studies, evaluation research and job design. Technological systems are viewed as both outcomes of, and contributions to, power-dependence and communication networks in the organization.

Rosemary Wright, Univ. of Pennsylvania, "Career Processes in Computer Work: The Relative Effects of Gender, Identification and Industry." This research examines three inter-related career processes in computer work: mobility in the form of entrances, exits, and moves between occupations; promotions and their relationship to lateral moves; and earnings differences and career trajectories. The careers of 6,162 computer workers on the NSF SURVEY of Natural and Social Scientists and Engineers are followed from 1982 to 1989. Computer work's engineering culture has important gender effects in career moves; one of these is that controlling for appropriate differences in background and experience, women are more likely than men to leave computer work overall, but less likely to make lateral moves leading to broader experience and subsequent promotion.

Please let the editor (address below) know about YOUR dissertation in progress!

FROM THE EDITOR: Please send your contributions and suggestions to Professor Maurice Richter, SKAT Editor, Sociology Dept., SUNY-Albany, 1400 Washington Ave., Albany, New York 12222; office phone 518-442-4675, home phone 518-869-6720, fax 518-442-4936, E-mail MR274@ALBNYVMS.BITNET.

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