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CALL FOR NEWS

Material for inclusion in the Spring issue of the 4S Newsletter should be sent by 1 March 1977, to the Managing Editor, Department of History and Sociology of Science, E.F. Smith Hall D6, University of Pennsylvania, Philadelphia, PA 19174, U.S.A.
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Perspectives. The following perspectives on the First Annual Meeting of the Society represent both solicited and unsolicited reactions. The scope and tone of these perspectives vary almost as much as the disciplinary orientations of their authors. They are both indicative and wholly unrepresentative of the impressive congeries of disparate programs of research on science which underlie our common commitment to 4S. The editors would welcome the contribution of other views to the "record" of the First Annual Meeting, both for their current interest and for their future role as eyewitness testimony to an historic gathering.

The 4S/ISA Conference – An Impression

Harry M. Collins
School of Humanities & Social Sciences,
University of Bath

To an innocent Briton, staring wide-eyed at a bit of the American sociological "scene" for the first time, the 4S/ISA Conference provided the same sort of re-orientation experience that one's first fieldwork provides – things are much more complicated than they look from a distance.

Frankly, I expected to be confronted with a solid American phalanx of norms, citations and exponential curves, into which the Europeans would be allowed about as much real penetration as the grains of rice flung at a bride – a symbol of fertilization, but afterwards you all go back to your own beds! The surprise was that the mood of the meeting was far from solid, and when attempts were made from the floor to maintain homogeneity, manifest displeasure was expressed by Americans. There is obviously more to the American scene than the literature and the evidence of citation practices reveal!

It was then, for me, a good conference for meeting and hearing people one had met only in print, for discovering the unsuspected heterogeneity of American sociology, and for meeting the unsuspected individuals working here and there, often in isolation, with whom one was immediately "on a wavelength." There was never enough time to get down to serious discussions of similarities and differences in view points presented in the papers. The conference was too crowded with papers, and the discussion group too large; perhaps things should be split up a bit next time.

The gratifying impression was disturbed during the excellent banquet and, I am sure, was a consequence of my taking too much wine. As speaker after speaker rose to address the company, I realised that what I had taken to be a random scatter of dining tables were in fact patterned in the form of a normal curve, with Derek Price at top dead centre, and the group of giggling British and a few other deviants sitting at the outermost tip of the tail. In spite of an ever more pressing call of nature while Derek was speaking (a purely contingent concomitance of circumstances, let me hasten to add), I dared not leave till he had finished for fear that one further outward step would send me sliding
Perspectives (Continued).

asymptotically toward the wilderness of infinity, never more to be vouchsafed so much as a glimpse of the centre. Somehow I hung on - visibly shaken my colleagues tell me - and the nightmare dissolved as the evening wore on. The last vestiges did not fade until the next day, when my own paper was greeted with, if not unpredictable, above all, friendly criticism.

The way things are it seems likely that 4S will come to play a dominant role in the social study of science. I hope the heterogeneity and international flavour can be maintained and nurtured. And I hope that the relatively small number remaining for the final, predominantly European, day was not a purely symbolic gesture.

In Search of Definition:
A Review of The First Annual Meeting of The Society For The Social Studies of Science

Dorothy Nelkin
Program on Science, Technology, and Society, Cornell University

I was asked to comment on this first annual meeting of 4S as "renaissance social scientist, i.e., non-sociologist, non-historian". Since it is fashionable to be "born again" these days, I assume this request reflects a serious concern about the scope and diversity of interest within our nascent professional society. 4S was conceived by sociologists of science, but as it is developing, even in its postpartal stage, it clearly reflects a much broader perspective. The interest in a more diverse definition of social studies of science can be deduced from the many disciplines represented among the 150 registrants at the meeting and the 500 members of the society.*

The meeting organizers apparently had diversity in mind when they selected session subjects: the social and cultural context of science, its structural characteristics, comparative social organization, and problems in the social studies of science. Most of the research papers, however, reflected a rather narrower range of interests. Clearly no conference can include every subject, and I raise the following questions only to suggest the range of issues that I felt to be of concern among many of those who attended the conference, and who are deeply involved in social studies of science from perspectives other than the traditional currents in the sociology of science.

The most systematic session was on the structural characteristics of science, clearly a well-defined area of sociology with methodological consistency. But what about the session on the social and cultural context of science? I

*About 12% engineers and physical scientists, 4% biomedical scientists, 6% psychologists, 30% sociologists, 17% other social scientists, 24% arts, humanities (mostly history), 8% other (e.g., administrators, education).
expected at least some discussion of recent historical research on the social and cultural assumptions underlying the development of scientific theories. Indeed, Arnold Thackray posed this as an important issue in the introductory session. I anticipated some philosophical or sociological analysis of the pervasive influence of scientific rationality in contemporary society. I expected some discussion of science education, and of the socialization of scientists, for these are an important part of the social context of science. Elkana's excellent paper differentiating "images of science" from actual "bodies of knowledge" opened up many possibilities. But even those papers concerned with the use of sociological knowledge in public policy tended to dwell on the internal characteristics of science, giving too little attention to the political and ideological factors that influence how science is perceived and utilized.

In the panel on comparative social organization, I missed work on science in the developing world. To what extent is the structure of scientific organization influenced by traditional organizational forms? Is there a process of organizational adaptation? Are research directions and priorities related to local needs; or are they set by an international community of science? I felt that the universalistic assumptions about science tended to preclude direct concern with comparing the effect of different cultural, political, and organizational factors on scientific development.

The growing political science literature focusing on science policy and its bearing on productivity and innovation was hardly reflected at all, except perhaps in the paper by Szalai who specifically criticized the "ideocentric" bias in American sociology of science and the tendency to ignore the "bed and board realities" of scientific research. Yet these realities are not matters of peripheral interest; surely economists and political scientists concerned with these realities have something to contribute to our understanding of the organization of science and perhaps even its theoretical development.

One of the more interesting realities is the effort to place controls or limits on scientific investigation through self-imposed moratoria (the Asilomar conference on recombinant DNA research), or through the imposition of external controls as in the restrictions on fetal research, or the efforts by public bodies (the courts, Congress, and even local city councils) to regulate research activities. Other "real" problems are raised by the development of public interest science and the discussions of professional responsibility and codes of ethics. What are the implications of recent public disputes among scientists (e.g., concerning nuclear safety, Red Dye #2, DDT) for the cognitive development of certain disciplines, as well as for public attitudes towards science? Much has been said in an ideological context about the relationship of knowledge and power, and about the various uses of science for political purposes. Are these not researchable areas?

In the very first session, Derek Price (using a somewhat less elegant metaphor than usual) described the "elephant to be examined" as science and technology. So what happened to technology? Does the total neglect of this topic at this first meeting mean that participants uncritically accept the prevailing distinction between science and technology? Is not this distinction one of the basic problems worthy of critical analysis?
I was also struck by the limited concern with marginal fields of science. One paper by Collins on parapsychology dwelled on the problems of replication, using the case to understand some cognitive problems within science. But there are many other questions: Why do such fields develop? What is their social and epistomological structure? How are they received by "normal" scientists? Sociologists are well aware of the methodological utility of studying marginal or deviant groups; investigations of astrology, creationism, and other marginal groups can illuminate aspects of "normal" science.

Latour proposed another interesting tool through which to understand normal science: using anthropological methods, he investigated science as "action," studying the smallest units of research activity, its patterns of gestures and informal communication. In the early development of an organization that has formed on the basis of common interest in a topic, such methodological innovation is crucial.

It is clear that all topics cannot be included at a single meeting, and one has to start with the frame of reference that is already established among its organizers. I set out these questions in the hope of influencing the scope of papers delivered at future meetings. The notion of a wider scope may be distressing to some 4S members. As I meandered around the halls asking people what they thought about the meeting, two quite contradictory opinions emerged. Those in the traditional sociology of science thought the field was "losing focus." Others, however, claimed the conference to be too focused.

I personally feel that diversity at this stage is important and that 4S must work to broaden its areas of concern. The annual meeting must be an intellectual outlet to meet diverse expectations regarding the content of, and the approach to, the field. A procedural format is needed to reconcile variety with the obvious need for focus and definition else the diverse membership, potentially our source of strength, will drift away. Moreover, I believe we need to develop a more critical role, investigating science not only as an idealized activity, but as it relates to social and political values and as it is expressed in technology. This critical role will invariably create the kind of tension that is already of concern to many 4S members. The keynote speaker, Joseph Ben-David, regretted the conflict between diverse perspectives in the field, as the "internalist" school confronts the "externalists" or "relativists". Yet, intellectual progress in our field must come from cross-pollination of conflicting views as well as from cumulative investigation of narrow areas of consensus. Perhaps this tension should be fostered as we nurture the newborn 4S towards a healthy adolescence.

Synopsis of 4S Conference

Thomas F. Gieryn
Sociology of Science Program,
Columbia University

Few of the proceedings, debates, frivolities, and other activities at the first annual gathering of the Society for the Social Studies of Science would have surprised anyone familiar with our literature on specialty formation and inter-
disciplinary scientific communication. The self-exemplifying character of the 4S Conference is, for one sociologist, the prominent memory of three packed days. Our actions in Ithaca provided many examples of our ideas about such occasions.

If we are to believe the 4S members who have made the study of scientific specialties their specialty, our successful coming together signifies a mature level of social institutionalization. The discussion of an official Society journal during the Business Meeting indicates that we are past the stage of an invisible college and are well on the way to establishing a new collective research identity. The imperfect nature of that institutionalization, however, is evident in the selective attendance by members of only two or three of the many disciplines which can list social studies of science within their cognitive domains. Almost no psychologists, economists, or political scientists, and precious few anthropologists or philosophers were on hand, in contrast to the substantial numbers of sociologists and historians.

Bruno LaTour's informatively amusing paper caricaturing science as a battlefield populated by researchers armed with normatively prescribed modes of ammunition extends in a new direction the interest of 4S members in the varieties and consequences of dissensus in science. The dialogues and often satirical criticism following just about every paper at the Conference demonstrate that the 4S is following the modal pattern of scientific societies which adopt a pluralistic position with regard to intellectual aims and methodological strategies.

A prominent debate at the Conference exemplifies a common type that appears more nearly grounded in social or ideological conflict rather than in basic intellectual disagreement. One subset of participants criticized another subset for its assumed failure to consider the substantive cognitive structure of science while studying the social structure of science. It might have been of interest to re-examine writings in the sociology of science of three or four decades ago to note their programmatic emphasis on the interaction between cognitive and social structures, and the occasional studies of such interactions. In the rapid give-and-take during the Conference, some participants evidently overlooked the possibility that what was posed as a choice between two different orientations was in fact a historical series of phases, each phase emphasizing one or another aspect of science and perhaps each a needed antecedent for investigating current problems in the sociology of science.

Much debate was centered less on theoretical and empirical issues than on problems of meta-theory of the kinds represented by Gerald Holton's "themata" and Yehuda Elkana's "images of science." The members of the 4S could not fully agree on acceptable sources of knowledge, the legitimacy of certain sorts of data, and the practical applications of information and knowledge. To recall briefly only two of these thematic debates: "naturalists" criticized "formalists" for taking liberties with the reality of things by alleged "number-crunching" (a term favored by some) that is assumed to capture any aspect of the social and cognitive workings of science. Second, the longstanding image of the philistine "positivist" was reintroduced by "relativists" maintaining that science does not occupy a privileged position in the arena of knowledge-producing institutions.
Perspectives (Continued)

Not surprisingly, the debates over the characterization of the social studies of science were inconclusive, and like the person who peers into a three-sided mirror to find an array of slightly different images of himself, we were forced reflexively to consider the extent to which such philosophical arguments were productive. As each argument came to a close, it was as though each participant took solace in that phrase from Pope's An Essay on Man: "All discord, harmony not understood."

John Law's work on x-ray protein crystallographers describes how participants in a new interdisciplinary specialty draw upon the cognitive and technical resources of their parent disciplines. In the same way, specialists in the sociology of science exhibit recent theoretical trends in the discipline of sociology at large. A peculiar development requiring the attention of some sociologists observing the sociology of science is the nearly total absence of Americans working on ethnomethodologically inspired topics, even though the theoretical orientation is well established in at least one region of the country. Papers dealing with scientific accounts, the fine structure of scientific communication, and practical reasoning almost all came from English sociologists, notably Stephen Woolgar's engaging piece on scientific accounts of the discovery of pulsars and Harry Collins' work on parapsychologists. Does the English taste for conversational analysis emerge indigenously from roots in language philosophy or the writings of Wittgenstein? To what extent do English sociologists of science adopt the perspective of American ethnomethodologists for work in their specialty? Or, to list possibilities no further, has phenomenologically inspired micro-sociology established itself in English general sociology and is only now diffusing to empirical studies of science? No doubt, multiple processes are at work. In any case, several sociologists of science at the Conference did open up new modes of discourse by drawing on works in the parent discipline of sociology that are not explicitly concerned with scientific institutions. Two examples are John Law's application of Robert Merton's theory of deviant behavior and allusive use in several papers of the ideas of Clifford Geertz.

Problem-choice in science was a leitmotif woven through much of the discussion. Since the Conference found little systematic knowledge about processes of problem-selection, and participants did not agree on the ordering of research programs, this might provide a self-exemplifying case for examining problem-selection in science. Stuart Blume's paper reminds us again that stimuli for research on particular problems can come from sources both external and internal to the institution of science, a conception with its own long history. Two research programs that emerged at the meetings at Cornell seem to have their distinct sources. Those who undertake studies of science in response to governmental agencies requiring information useful for science policy place their emphasis upon variability in scientific output and the organizational efficiency of research institutes. This group might include Alexander Szalai and Janos Parkas, and in a different way, Karin Knorr and Frank Andrews. A second research program, having little expressed concern with immediate pragmatic applications, is adopted by participants who chose their research topics in response to cognitive developments within the social studies of science itself. Sal Restivo's paper on Needham's paradigm for the study of Chinese science illustrates this second
research strategy. Investigators in this latter group suggested that scientific output (even if a working definition of this were agreed upon) is not much affected by organizational management and control, and that productivity is a function of how well scientists do their work and not a function of how well sociologists of science do their work in advising policy-makers. The contrast between these orientations may be overdone even in this short discussion, but there were suggestions that differences in the research interests of 4S participants derive from different social contexts and different cognitive paths that led them to the social study of science.

The often-mentioned recent book on radio astronomy by David Edge and Michael Mulkey suggests that problem-choice in science is constrained by prior adoption of distinctive techniques or instruments. The technique of sociologists of science receiving most attention at the Conference was citation analysis, now into its second decade of sustained application by historians and sociologists. Discussion following papers by the Indiana group (Mullins, Hargens, Hecht, and Kick) and the Philadelphia group (Griffith, Small and Crane) typically questioned the technique of citation or co-citation analysis and rarely addressed the empirical findings of the papers. The issue remains whether citation analysis can produce conclusions about cognitive and social structures of science that are translatable into terms and concepts not specific to the technique itself. Are the clusters of scientists linked together by patterns of co-citations identifiable by other modes of inquiry? Not everyone is of one mind on this question, but most agree that Kenneth Studer and Daryl Chubin's paper on the development of reproductive endocrinology demonstrates that citation analyses can effectively supplement other techniques in the historical sociology of scientific knowledge.

This account would be deficient if nothing were said of individuals whose personalities colored the occasion in distinctive ways. No doubt, the leading characters could be recognizably portrayed by the depicive novelist, but sociologists prefer to deal with patterned social roles. Any gathering of scholars will have its "loyal opposition," a role taken up in this case by Everett Mendelschn, who let pass almost none of the premises, biases, and orientations with which sociologists of science have grown comfortable. His adversary Derek Price played the Conference Dutch Uncle, full of severe criticism while making us all feel quite pleased with ourselves for having achieved the 4S Conference. The incisive Alexander Szalai proved to be Simmel's stranger who more than once called attention to the tacit provincialisms of participants from the host country. The stimulating Conference would have sunk to an insipid state were it not for these and other unignorable figures who cause us to look to the second 4S gathering not with weariness but with eager anticipation.
Abstracts of Presented Papers.

Andrews, Frank and Knorr, Karin (ISB, University of Michigan, Ann Arbor, MI 48109):

The International Comparative Study on The Organization
And Performance of Research Units:
Nature of The Study And Some Empirical Results on
Social Position, Motivation, And Productivity

The paper presents information about a six-nation research project investigating the organization and performance of research units. In Part 1, the nature of the project is briefly described. The project is coordinated by Unesco, with data coming from Austria, Belgium, Finland, Hungary, Poland, and Sweden. Using standardized questionnaires, data have been obtained from over 10,000 respondents representing 1222 research units—about 200 units in each country. The information includes a wide range of organizational variables and measures of research performance, and permits analyses both at the level of the research team and the individual scientist. Besides being a research project, the study is intended as an R&D management tool for policy-makers. Parts 2 and 3 present examples of empirical results emerging from the project. One of these shows that the production of publications by individual scientists is substantially related to the social (supervisory) position of the individual in the research unit. The other shows that motivation level can be considered as a characteristic of the team and that teams with higher motivation tend to score higher on most (but not all) indicators of scientific performance.

Blume, Stuart (9 Mansfield Place, London NW3, England):

Initiative Taking in Research Policy:
Some Sociological Indications

In many countries bodies funding basic scientific research are becoming more 'interventionist'. This paper considers the implications of research in the sociology of science for the characterization of appropriate modes of stimulating scientific change by policy initiative.

Case studies suggest that where new research areas are emerging in the scientific community they do seem to have similar needs at each stage of development which have to be recognized and met. However, it also appears that organizational factors impact differently in different areas of science, depending upon specific phenomena confronted, research techniques used, etc. Similarly, the scope for interesting scientists in specially selected problems, or problem areas, will also vary between sciences. Additional problems arise when, as is often the case, problems are selected by policy-makers principally on account of their practical importance. These include both the tacit 'relabeling' of on-going research and the problematic correspondence between practical issues and the conceptual frameworks of scientific disciplines.
Abstracts of Presented Papers (Continued).

Collins, H.M. (University of Bath, Bath, Avery, England):

Upon the Replication of Scientific Findings:
A Discussion Illuminated by the Experiences of Researchers
into Parapsychology

The purpose of this paper is to demonstrate that the findings of science are socially tractable, and thus to clear the way for the programme of the sociology of scientific knowledge. The replication of experiments is examined to show that one result rather than another might be discovered in the laboratory despite the apparent unique quality of replicated findings. The paper asks how a series of replications might be recognised among all the other activities in the world. A series of stages of demarcation are set up and their ambiguity illustrated by reference to parapsychology. Two case studies given particular attention are those involving emotional responses of plants and the Schmidt random number generator. It is concluded that replication should be seen as a means of accomplishing objectivity rather than demonstrating it.

Elkana, Yehuda (Van Leer Foundation, P.O. Box 4070, Jerusalem, Israel):

Images of Knowledge:
Qualitative Indicators and Science Policy

The body of knowledge does not specify what problems are interesting, important, worthwhile, on the frontiers of knowledge, risky, etc. All these issues are determined by culture-dependent, socially determined images of knowledge specifying the sources, aims, legitimacy or kinds of knowledge. A theory of images of knowledge developed elsewhere is summarized here. The images serve as qualitative indicators measuring to what extent science and scientific activity fit the avowed aims of knowledge and whether the hierarchy of sources of knowledge is adhered to. As a result these qualitative indicators should be the basis for a rational science policy. In order to develop such a science policy, the images of knowledge have to be studied historically in addition to and in interaction with the body of knowledge. Some historical examples are presented.

Griffith, Belver (Drexel University, Philadelphia, PA 19104):

A Philadelphia Study of the Structure of Science: The Structure of the Social and Behavioral Sciences' Literature

Co-citation analysis, already applied to the natural sciences' literature, was applied to the social and behavioral sciences' literature, as represented in the Social Sciences Citation Index. The major finding was that the analysis could cluster documents so that related works appeared together
Abstracts of Presented Papers (Continued).

Griffith (Continued).

...and could display relationships among documents and among clusters of documents which reflect scientific content. In contrast to the natural sciences, the social and behavioral sciences utilized older documents and placed greater emphasis on scholarly monographs. This proved true even in those areas most closely related to biological sciences, such as parts of experimental psychology. Generally, published work in the social and behavioral sciences seems especially influenced by exceedingly small groups of researchers, represented often by quite old documents, which are not readily displaced by new research. These facts raise questions regarding the operation and function of the social and behavioral sciences.

Herzog, Arnold J. (Georgetown University, Washington, DC 20057):

Social and Cognitive Factors Influencing the International Transfer of Scientific Knowledge

This paper reports on an on-going effort to study the social factors which facilitate the transfer of scientific knowledge to small, relatively peripheral countries. The major theoretical concern of the project is the extent to which (i) the social structure of a scientific field is influenced by (ii) the cognitive nature of the field (particularly its state of paradigm development), and/or (iii) the field's economic relevance.

The current work is a longitudinal study of one specialty, geology, as practiced in the Republic of Ireland. A survey of the entire Irish science establishment was conducted in 1970. The author observed considerable variation across fields with respect to communication-related behaviors. Of the explanatory hypotheses examined, only two survived the analysis. The first posits a relationship between the field's communication network and the cognitive nature of the task. The second hypothesis links communication behavior with the economic relevance of the field's work.

In 1970, the two factors were confounded. Fields characterized by low paradigm development were economically relevant, whereas those in the high paradigm group were not. However, since 1970, geology has shifted dramatically along the economic relevance dimension. It has become highly relevant to the Irish economy. New data have been collected this past year from the Irish geological research community for the purpose of conducting a critical test of the two hypotheses.
Abstracts of Presented Papers (Continued).

Knorr, Karin (University of California, Berkeley, CA 94720):

Policy Makers' Use of Social Science Knowledge:
Symbolic or Instrumental

In the literature on the utilization of social science knowledge, the concept of legitimation stands for the position that social decision makers mainly seek research results to back up decisions already taken. The present paper seeks to validate this thesis by drawing from 70 face-to-face interviews with medium level decision makers in federal and municipal government agencies. Four kinds of utilization interests are established which seemingly predominate in financing of social science projects by political decision making bodies: a census-function, a motivation-function, an acquisition-function and a rationalization function. In addition to this, the role of social science results in actual decision making can be described as a decision-preparatory, decision-constitutive, decision-substitutive and legitimative. Based upon theoretical considerations as to the specific problems of post-industrial societies and upon quantitative data obtained from respondents, the paper argues that the thesis of a primary legitimative role of social science results has to be replaced by a thesis of a predominantly instrumental use for the purpose of securing legitimacy for political decisions. The predominance of motivation problems as articulated by our respondents and their being connected to decision-preparatory research utilization suggests that there is a special need for instrumentally applying research results induced by a growing lack of legitimation of political action. With respect to this, the social sciences have, to a vast degree, taken on the role of transplanting participation as an 'early warning system' of democratic planning from the level of communicative debate to the level of technical anticipation. The instrumental use we are talking about, however, does not follow the pattern of technical implementation established in the natural or technological sciences. Rather, it refers to an indirect, diffuse, difficult to localize, and possibly delayed discursive processing of social science knowledge in the stage of political program development and decision preparation.

LaTour, Bruno (Salk Institute, San Diego, CA 92112):

Including Citation Counting in the System of Actions of Scientific Papers

For the "quotologists", the scientific paper (S.P.) is a point and has no content. Viewed from critical sociology, the S.P. is the artificial rationalization of the real process of science. In this paper, a different approach is taken. First, the S.P. is defined as a continuum including most of the informal communications. Second, the S.P. is defined as a multidimensional system of operations on former literature. Each operation modifies the state of the assertions and is made possible by the backing up of an infraliterature obtained through the instruments. A list of the states, the operations, and of the strategies which link them is provided. An example is given on one article and then on a network of argumentations. The importance of citations is extremely reduced, the importance of the written literature considerably increased, and its complicated structure in part disentangled.
Abstracts of Presented Papers (Continued).

Mullins, Nicholas, Lowell Hargens, Pamela K. Hecht, and Edward L. Kick
(Indiana University, Bloomington, IN 47401):
The Group Structures of Two Scientific Specialties:
A Comparative Study

Using block modeling of data from a sociometric questionnaire, we analyze
the patterns of social structure shown by authors of two highly cocited
clusters of biological-science papers. Analysis of anecdotal data, back-
ground information, and data on citations support the findings from the
block models. The density of contacts and the patterns of sociometric and
citation data show that the authors of papers in the two cocitation clusters
form distinct social groups. Each group has a center-periphery pattern with
some differences that appear to reflect differences in the timing and
spread of intellectual development within the groups.

Novakowska, Maria (Marszalkowska 140-100, Warsaw 00-061, Poland):
Informal Structures in Formal Organizations
(On an Example of Scientific Community)

The paper presents a model of the basic mechanisms underlying the development
of a scientific community. The state of the community at any given moment is
identified with an assignment of various positions to scientists. The two
basic concepts are those of admissibility of a scientist for a given position,
and of preference of a scientist in the class of all assignments. The funda-
mental assumption asserts that admissibility of a scientist for a position,
treated as a function of time, cannot have more than one peak. One of the
consequences is the dilemma in which a socially fair assignment of positions
to scientists cannot be stable, while a stable assignment cannot remain fair.

The tendencies to keep the status quo and to introduce changes lead to forma-
tion of monopolies, and these in turn, to alienation of some groups of
scientists.

Restivo, Sal (Rensselaer Polytechnic Institute, Troy, NY 12181):
Problems and Prospects in the Needham Paradigm for Social Studies
of Chinese and Modern Science

This paper is a critical reconnaissance of Joseph Needham's multi-volume
Science and Civilization in China (1954-) and selected other writings. It
focuses on Needham's ideas about the social relations of science in China.
The Needham Paradigm (basic queries, rationales, assumptions, hypotheses,
and world view) is outlined, criticized, and evaluated as a source of research
leads and valid knowledge about science and society in China. This explor-
atory critique draws on ideas from the history, philosophy, and sociology of
science. A major portion of the paper is devoted to considering Needham's
comparative history of science as an exercise in the cross-cultural anthro-
pology of knowledge.
Abstracts of Presented Papers (Continued).

Studer, Kenneth E. and Daryl E. Chubin (Cornell University, Ithaca, NY 14853):

The Heroic Age of Reproductive Endocrinology:
Its Development and Structure

The essential gonadal hormones, the ovarian oestrogens, progesterone and testosterone, as well as the pituitary and other gonadotrophins were all discovered or characterized during the period between the two world wars. A case study of this "heroic age" contrasting the accounts of protagonists of this era with a citation analysis of their research yields two different views of the intellectual development and structure of this biomedical problem domain. It is suggested that these views derive from the respective biases implicit in participant-accounts and in bibliometrics. To temper, if not reconcile, these views requires an understanding of intellectual history (traditions, models, and techniques) as well as a knowledge of the broader cultural context in which biomedical research is conducted and sustained.

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Our First President.

Introduction of Robert K. Merton
Written for the Occasion of his Presidential Address
Nelson Polsby
Department of Political Science
University of California, Berkeley

Ladies and gentlemen: It's a great privilege for me to be welcoming you tonight to the first Presidential address of the Society for Social Studies of Science. When I was asked to perform the pleasant chore of introducing Robert Merton, it occurred to me that I was faced with a dilemma, a paradox, if you like, very much like one Bob Merton identified many years ago.

On the one hand, as a scholar whom we all admire so much, what he really deserves is an introduction that offers a comprehensive survey of his distinguished career in teaching, research and public service, a fully worked out set of categories, distinctions, rubrics, perspectives and contexts that can capture each of the ramifications of his influence on higher education, social policy and intellectual life. On the other hand, to a 4S crowd, Bob Merton really needs no introduction at all. What to do?

What is called for, it seems to me, is an introduction of the middle range, one that says a little bit about Robert Merton in the context of his role here tonight, and one that says a little bit about us as companions and colleagues of Robert Merton in the social study of science.
Merton's first three publications as a student of science occurred in 1935, when he was a 25-year-old graduate student at Harvard. Their titles are a pleasant reminder that the enormous territory he has surveyed since then was stalked from a very wide beachhead: "The Course of Arabian Intellectual Development, 700 - 1300 A.D. (with Pitirim Sorokin) in eight pages, incidentally, albeit the generous pages of ISIS; "Fluctuations in the Rate of Industrial Invention" and, finally, to close out the year 1935, "Science and Military Technique." This was about Merton's beloved 17th century England, a time and place that became the setting for a doctoral dissertation entitled Science, Technology and Society in 17th Century England, published originally in 1938, and now, happily in print once again in two 1970 editions.

I am not going to recite the other sixty-five or-six items in Merton's bibliography on the sociology of science. A great deal of what he has had to say over the last 40 years, as we all know, is in current use. He presides today over the Columbia University program in the Sociology of Science. His students and grand-students are now legion. So, incidentally, are his honorary doctorates, a distinction that college presidents usually hand around to one another, or give to politicians, rich people, generals and admirals rather than life-long scholars. He has also been paid the fairly recent compliment of having come under considerable fire as the owner and operator of something that goes by the rather unattractive name of "The Mertonian Paradigm." I mention this because I do not want to give anyone the impression that social studies of science is all serious business. Far from it. Merton, in his own contribution to 17th century English belles lettres, a book entitled On the Shoulders of Giants, makes the same point, when he argues, from copious texts, that (at least since 1126) a dwarf perched on the shoulders of a giant can see farther than he otherwise would, but a louse on the head of a philosopher can not.

Many of us here--probably a healthy majority--have seen farther with Merton's help. Far more impressive, however, is the fact that time and again, Merton has himself seen farther than scholars who at that very moment were peering into scholarly distance by taking what advantage they could of Merton's scholarly eminence. In short, Merton exemplifies not only the norm of scientific generosity but also the homely American virtue of--when occasion demands it--standing on your own two shoulders.

He has not promised to do this particular stunt tonight; even so I think we all recognize that this is a very special occasion. We are here together, to do something magical, to will ourselves into being as a social collectivity, to dedicate ourselves as a group to the study of a marvelous congeries of human artifacts. Science is itself a tribute to what human beings, in all their ingenuity and at the height of their powers of imagination and steadfastness, can do. And so to study science, this wonderful social creation, as a social creation, offers us a superb vantage point from which we can contemplate, and take pleasure in, the realization of the highest potentialities of our species. In addition, from the very same promontory, the social scientist of science can observe more familiar terrain: of human beings at work, worrying about their place in the world, seeking and giving and withholding approval from one another; honoring age, and discarding the old; nurturing and scarifying the young; the entire pageant is there before us.
Council Meeting. The 4S Council met on 3 November 1976 in Ithaca, NY. The Secretary-Treasurer has submitted the following summary:

1. Council noted with regret the absence of President Robert K. Merton due to illness.
2. The Secretary-Treasurer noted a membership of 501 as of 1 November and a cash balance of approximately $3,000.
3. An ad hoc Ways and Means Committee was appointed to explore means of supplementing 4S income. Chairman: J. Gaston.
4. Council unanimously agreed to recommend to the 4S business meeting a motion to expand the size of Council from 7 to 9, and a motion to make the Committee on Annual Meetings and the Committee on Publications into standing committees.
5. A request by V. Shelanski for the 4S membership list in order to provide members with a gratis copy of the Newsletter on Science, Technology & Human Values was approved.
6. The Publications Committee reported on the extensive negotiations under way to establish a 4S journal. It was agreed that the following principles should guide the committee's continuing efforts: 1) the editor(s) of a 4S-sponsored journal must be accountable to the Council for maintenance of its policies and shall serve for terms set by Council; 2) the journal must maintain a conscious balance among the methodological approaches and disciplinary perspectives that are represented within 4S.

The meeting was adjourned at 10:00 p.m.

The next meeting of Council will take place on 4 February 1977 at E.F. Smith Hall, University of Pennsylvania, Philadelphia, PA 19174. The preliminary agenda for the meeting is as follows:

1. Approval of minutes of 3 November Council meeting.
2. Approval of agenda
3. Discussion of proposed charter changes
   a) mailing to membership on enlargement of Council
   b) other proposals discussed at First Annual Business Meeting
4. Secretary-Treasurer's report (R. McGinnis)
   a) membership
   b) budget
5. Report on Committees (President Hagstrom)
   a) nominations
   b) publications
   c) annual meetings
   d) program
6. Report of Committee on Annual Meetings (N. Mullins)
   a) 1977 meeting site
   b) 1978-1979 prospects
7. Report of Publications Committee (A. Thackray)
8. New Business
   a) proposal regarding ISI (N. Mullins)
Business Meeting. The first annual 4S Business Meeting was held on 5 November 1976 in Ithaca, NY. Secretary-Treasurer McGinnis presided in the absence of President Merton. Almost one hundred members of 4S were in attendance. Among major topics of discussion not reported elsewhere in this Newsletter were (1) sites for future 4S meetings; (2) Council proposals to amend the Charter so as to increase the Council size from seven to nine and to give Standing Committee status to the Publications and Annual Meetings Committees; (3) a proposal that the participation of scholars in developing countries in 4S activities, particularly annual meetings, be actively promoted; and (4) the Society’s request for affiliation with Section X (miscellaneous) of the AAAS.

Nicholas Mullins reported that negotiations were in progress regarding the sites for the 1977 and 1978 meetings. [It has since emerged that Cambridge (Massachusetts), Montreal, and Washington, DC, are likely sites.] After some discussion the motion to enlarge the Council was passed. A possible need to create the position of vice-president and to separate the office of secretary-treasurer into two was noted and referred to Council for consideration. The motion to make the Publications and the Annual Meetings Committees Standing Committees passed unanimously. Following extended discussion Michael Moravcsik’s motion that, "It is the strong desire of this Society that participation in its activities be available to interested people in all countries of the world," was passed.

Forthcoming issues of the Newsletter will carry a full report on the results of the negotiations to select sites for the 1977 and 1978 annual meetings, a statement by Moravcsik, a further report on publications, and a breakdown of 4S membership by field of training and major research interest.

Publications Committee. The Publications Committee has been conducting a vigorous investigation of the various options open to 4S. As part of this process of exploration and education the Committee held an open meeting at Cornell University on 5 November 1976. The twenty-odd people present and contributing included representatives of the Office of Science and Society at the National Science Foundation (Alexander Morin, William Blanpied); the editors of the Journal of the History of the Behavioral Sciences (Barbara Ross), the Journal of the History of Biology (Everett Mendelsohn), the Newsletter on Science, Technology and Values (Vivien Shelanski) and Social Studies of Science (David Edge and Roy MacLeod); and representatives of publishing concerns and others in key capacities in various scholarly organizations.

Among the not-necessarily mutually exclusive options discussed were:

1. Continuing the present 4S Newsletter and allowing it to evolve slowly as the Society gains experience

2. Seeking a consolidation of the 4S Newsletter with one or more existing, older Newsletters (e.g. STFP News; Newsletter on Science, Technology and Values)

3. Seeking to join an inter-society consortium publishing a common Newsletter (discussions have been initiated between the History of Science Society, the Society for the History of Technology and the Philosophy of Science Association)
Publications Committee (Continued).

iv. Creating a new journal to serve the Society (perhaps with a first issue in January 1978)

v. Arranging for an existing journal (e.g. Minerva; Social Studies of Science) to become the official journal of the Society, on a trial or a permanent basis

vi. Establishing a monograph series.

The possible advantages and disadvantages of each course of action were extensively discussed. The Publications Committee found the comments and perspectives of members, editors and publishers most helpful and welcomes further inputs arising from this published report (Letters should be addressed to Arnold Thackray, Chairman, or to any member of the Publications Committee). It is hoped that the implications of the various options can be explored and refined sufficiently for the Committee to recommend a course of action to the Council of 4S for adoption at its next meeting (4 February 1977).

MEETINGS: RECENT

ISA. A business meeting of the ISA Research Committee on the Sociology of Science took place on 5 November 1976 in Ithaca, NY. The topics discussed were membership and the meeting of the Committee planned for next year in Budapest. The Secretary of the Committee explained that membership was open to everyone who is actively engaged in research and publication in the field. Applications are examined by a membership committee constituted during the year preceding the World Congress of Sociology. The membership fee is $2 per year. Alexander Szalai reported on plans to organize a meeting next fall in Budapest. Final decision concerning the meeting and its date will be taken on the basis of preferences of the members who are being asked about it in a questionnaire. All those interested in participating in this meeting — even if they are not members — and those interested to join the Committee, should write to: Peter Weingart, Secretary of the Research Committee on the Sociology of Science, Universitatsschwerpunkt, Wissenschaftsforschung, Universitat Bielefeld, P.O. Box 8640, 48 Bielefeld, West Germany.

SSHA. The first meeting of the Social Science History Association was held in Philadelphia on 29-31 October. As the purpose of the Association is to foster synthesis of the methods and substance of history and the social sciences, papers were delivered on a wide range of topics. SSHA is structured, however, as an association of interdisciplinary "networks", each focused on specific problems. Of special interest to the members of 4S were the papers given in sessions sponsored by the network called the Committee on the History and Epistemology of the Sciences of Man (CHESM). Stefan Collini's "Sociology and Idealism in Britain 1880-1920" defined the barriers to communication between sociologists and philosophers. In his paper "American Cultural Critics and the Search for a Scientific Conscience: From Andrew Dickson White to Robert K. Merton," David Hollinger described various efforts to establish science as a moral, cultural and academic ideal. Henrika Kuklick, in her "Boundary Maintenance in American Sociology: Limitations of the Concept of 'Professionalization'," linked the fluctuating definitions of the field to changing academic structural constraints. "Explanation and Understanding in the Social Sciences" by Mihailo Marcovic was an attempt to demonstrate that the defining properties of the natural sciences can be found equally in the social sciences.
Membership in the Social Science History Association is $15 per year and includes a subscription to the journal *Social Science History*; graduate student dues are discounted to $8 per year. Enquiries concerning membership should be sent to Jerome M. Clubb, Executive Secretary, Social Science History Association, The Institute for Social Research, The University of Michigan, P.O. Box 1248, Ann Arbor, MI 48106. Manuscripts for *Social Science History* should be sent to James Q. Graham, Acting Managing Editor, Department of History, Bowling Green State University, Bowling Green, OH 43402. Those interested in participation in the CHESM network should write to Henrika Kuklick, Department of History and Sociology of Science, University of Pennsylvania, Philadelphia, PA 19174. The 1977 meeting of SSHA will be held in Ann Arbor on 23-25 October.

**MEETINGS: FORTHCOMING**

**AAAS.** The Annual Meeting of the American Association for the Advancement of Science will be held 20–25 February 1977, in Denver, Colorado. The Theme of the meeting is "Science and Change: Hopes and Dilemmas." Of special interest to 4S members will be the Public Lectures, General Interest Panels, and the sessions on Education, Economic and Social Sciences, Science and Public Policy, and History and Philosophy of Science. For program details and reservation information, see the 5 November 1976 issue of *Science*, pp. 599-608.

**MSS.** An integrated session on "Social Control in Science" is being organized for the Annual Meeting of the Midwestern Sociological Society, 13-16 April 1977, in Minneapolis. The problem of social control can be approached in various ways, e.g., as formal and informal organization of scientists, as multiple social roles of scientific gatekeepers, as criteria for the distribution of research resources, as social processes in scientific discovery, or as feedback from the users to the producers of new knowledge. Papers will be considered for their representativeness of major perspectives in sociology of science and their potential to induce a lively debate at the meeting. The deadline for the receipt of papers (20 minutes maximum) or proposals and abstracts for Sociological Abstracts is 1 February 1977. Write for information and submit papers to Ingrid Deich, Department of Social Science, University of Missouri, Rolla, MO 65401.

**NSB.** The National Science Board (NSB), the policy-making body of NSF, is scheduled to meet on 3-4 February 1977, Room 540, 1800 G Street, Washington, DC. Much of this meeting will be open to the public in keeping with the spirit of the Government in the Sunshine Act, which becomes formally effective in March 1977. The Board is developing and refining its procedures for open meetings prior to full and formal implementation of the provisions of the new Act. If any portions are closed, they will be closed by formal vote of the NSB in accordance with the Government in the Sunshine Act. Requests for information on the meeting, its schedule or agenda, may be directed to the Office of the National Science Board, 1800 G Street, N.W., Washington, DC 20550 (phone 202/632-5840).
RESEARCH IN PROGRESS

**EVIST: Announcement.** The Ethics and Values in Science and Technology Program of the National Science Foundation is now a member of the family of programs, including Public Understanding of Science and Science for Citizens, in the Foundation's Office of Science and Society within the Science Education Directorate. A new Program Announcement is in preparation and will be published in March 1977. This Announcement will contain explicit information about program priorities. For interim use a brief document has been prepared outlining current staff thinking about future program directions. A copy of this document is available upon request from William Blanpied, Program Manager of the EVIST Program. Preliminary proposals are welcome. They should be no longer than five pages. Each should state the objectives of the project and briefly describe (i) how the project will advance EVIST program objectives; (ii) the research or organizational design; (iii) anticipated products and dissemination plans; and (iv) plans for internal monitoring and evaluation of progress and outcomes. A tentative budget and a brief statement of the qualifications of important project staff and consultants should be appended. If the project involves workshops, forums or conferences, criteria for the selection of topics, speakers, and participants should also be included. Preliminary proposals should be sent directly to: Ethics and Values in Science and Technology Program, Office of Science and Society, National Science Foundation, Washington, DC 20550.

**EVIST: Abstracts of Funded Projects.** The following project summaries represent a sample of grants funded by the EVIST Program from 1 July 1975 to 30 September 1976. In some cases, the project received joint support from NSF and the National Endowment for the Humanities. As always, the names and addresses of the principal investigators are given to facilitate inquiries regarding their projects.

Anderson, Robert M. (Purdue University, West Lafayette, IN 47908), "BART - A Case Study of Moral/Professional Ethical Questions." This project will generate an in-depth case study of the events surrounding the dismissals of three engineers from the San Francisco Bay Area Rapid Transit District (BART), whose concern about the potential safety of the automatic train control system being designed for BART led them to actions which resulted in their dismissal. Ultimately a number of diverse organizations became involved in the case, including professional societies, a variety of regulatory committees and commissions, the state legislature and state courts. A careful study of the many printed documents relevant to the case will be made. Interviews will be conducted with the principals of the case. The various stages of the case will be reconstructed in a step-by-step fashion. The motives, beliefs, perceptions, and behavior of the individual engineers, the BART organization, the professional and technical societies, the executive, legislative and judicial branches of government will be examined. Three types of materials will be developed: (i) a set of case study materials suitable for use in classroom situations, (ii) a brief monograph for a general readership, and (iii) a series of short articles for publication in scholarly and popular publications.
EVIST: Funded Projects (Continued).

Caldwell, Lynton K. (Indiana University, Bloomington, IN 48401), "Studies of the Impact of Natural Resource Technologies on the Values of Two Contrasting Socio-Cultural Communities." This project will generate two in-depth comparative studies of the impact of science-based technologies upon the values, life-styles, and environmental conditions of contrasting social/cultural communities: the Reserve Mining operations on Lake Superior, and the Garrison Diversion Project in North Dakota. Although they differ in physical, geographic, and cultural factors, the cases nevertheless present comparable sets of complex ethical or value problems, including the assumptions and preferences of the social groups directly affected by the technological developments, and the ethical and human value

Crowe, Lawson (University of Colorado, Boulder, CO 80309), "Ethical and Human Values Assessment Procedure: A Pilot Project." This study addresses the ethical and human value implications of five specific scientific research projects. It attempts to identify the valutational elements involved, the decision-making background from which those elements emerge, the practice of scientists in dealing with them, and the alternate possibilities to all of these which might be found by applying concepts drawn from the humanistic tradition. Five humanists, drawn from the fields of philosophy and literature, are paired with five scientists engaged in research projects in molecular biology, behavioral genetics, developmental psychology, and solar energy. By means of a program of one-to-one cooperative laboratory research, interdisciplinary seminars and symposia, the humanists and scientists will attempt to develop criteria and standards which apply humanistic, epistemological and valutational systems to scientific research. Besides a series of position papers, the specific research product sought is an "Ethical and Human Values Assessment Procedure" which could enable scientists working in various areas to identify and to assess the ethical dimensions of their research.

Durbin, Paul T. (University of Delaware, Newark, DE 19711), "A Guide to Historical, Philosophical, Science-Policy and Sociological Studies of Science, Technology, and Medicine: Their Relevance to Ethical and Values Implications of Science and Technology." This project has a dual aim. By producing a guide to nine fields—philosophy of science, philosophy of technology, philosophy of medicine, history of science, history of technology, history of medicine, sociology of science, sociology of medicine, and science policy studies, it is intended that (i) an interdisciplinary whole can be put together from the fragments of the disparate fields; and (ii) the relevance of these fields to the solution of ethical and value questions associated with science, technology and medicine can be demonstrated. The heart of the guide will be a set of nine state-of-the-field articles written by leading scholars and overseen from beginning to end by a distinguished supervisory board which will work closely with the authors throughout. Each article will include a selective but authoritative bibliography. The articles will be of such a quality and nature as to appeal to professionals in adjacent fields and to a broader audience. The project has as background a number of recent bibliographical and survey projects in specific fields; these will be brought together to emphasize integrative possibilities as well as relevance to ethical and value questions in science and technology.
EVIST: Funded Projects (Continued).

Kronick, Jane C. (Bryn Mawr College, Bryn Mawr, PA 19010), "Community Responsibility: A Case Study of the New Zealand Accident Compensation Act as a Value Response to Technological Development." This case study of the New Zealand Accident Compensation Act, as amended and implemented in 1974, will document an entire sequence of value changes in response to the rising accident rate accompanying expansion of technology. The project will: (i) provide a precise historical account of a case of the crystallization of values and beliefs evolved in relation to technological change in society, (ii) examine the diffusion of the new understanding into related institutional areas such as welfare, health, law and politics, and (iii) explore the way in which the new values, in turn, affect the industrial and technological conditions which gave rise to them.

Long, Franklin A. (American Academy of Arts and Sciences, 165 Allandale Street, Boston, MA 02130), "International Symposium on Critical Value Issues in Choosing Appropriate Technologies in Developed and Developing Countries - Boston, May 1977." This international symposium will weigh the relative merits of high and low-technology models for the developed and developing nations and consider whether there exists the basis for an "appropriate technology" suitable for global implementation which would promote balanced development and be in keeping with human and environmental needs. The following aspects of the problem will be explored: the impact of societal and professional values on the choice of technology form and use; conflicting value bases in the debate over the role of technology in society; and the potential for convergence between developed and developing nations in planning and directing the future of technology in society. The symposium will be planned and directed by an interdisciplinary steering committee of scholars associated with the U.S. Pugwash Committee familiar with and interested in the international value dimensions of technology and society. Symposium participants will be drawn from a range of disciplines, perspectives, and national backgrounds. A primary objective will be to advance the debate by seeking potential areas of agreement in the value perspectives of professionals having varying positions on the issues relative to the future of technology in society.

Matzke, Gordon (Oklahoma State University, Stillwater, OK 74074), "An Examination of the Moral Dilemmas of Scientists Participating in the Preparation of Environmental Impact Statements." This project seeks to isolate the moral dilemmas of scientists working on environmental impact statements by examining case studies involving the participation of academic scientists. The particular cases offer the opportunity to compare situations in which there existed a variety of influences on the manner in which scientists investigated phenomena or reported the results of their investigations. The interdisciplinary research team will do a content analysis of the selected impact statements in order to identify value problem areas which will be probed through interviews with scientists and other involved parties. After analysis, the interview data will serve as the basis for the formulation of conclusions and suggestions regarding the ethical dimensions of the involvement of scientists in environmental impact assessment. The relevance of this information to the development of American science will also be considered. Various avenues will be utilized for the dissemination of the research results to relevant public and professional audiences, including scientists who work on these statements.
EVIST: Funded Projects (Continued).

Nelkin, Dorothy (Cornell University, Ithaca, NY 14853), "A Critical Analysis of Value Issues Associated with the Role of Scientific Experts in Decision-Making Processes." This project is focused on contemporary manifestations of the ancient controversy between democracy and elitism. The demands for citizen participation in public decisions involving science and technology reflect, in large measure, basic democratic values and appear to conflict with the increased role of technical experts in the policy process. This study seeks to understand the values and/or interests threatened by new developments, the ways in which scientists and engineers try to cope with the value conflicts that are expressed in technological controversies, and the ways in which policy makers try to incorporate diverse values into the formulation of specific decisions. The investigator will compile an annotated bibliography and examine various experiments in participation, seeking to develop a conceptual framework for an analysis of a number of important policy questions concerning the role of scientists in policy-making.

Sheilanski, Vivien (Harvard University, Cambridge, MA 02138), "Program on Science, Technology, and Human Values." Evidence of the mounting concern with the social and ethical implications of science and technology is reflected in the growth of scholarly research on these issues, the activities of government, the development of courses and curricula in the science/values area, and in the interest of legislators, policy makers, international organizations, and professional societies. Often, persons concerned with these issues are unaware of others with similar interests, and mechanisms are needed to bridge this gap in communications. For the last 3 1/2 years, the Newsletter of the Program on Science, Technology, and Human Values has stimulated interactions between individuals and groups concerned with serious investigations of science/values issues and provided some of the resources necessary for research and teaching in the field. At present, the need is especially acute for information about research and research activities, particularly information which cuts across disciplinary and institutional boundaries: bibliographies of material drawn from all relevant disciplines; identification of suitable teaching materials; information about conferences, important developments, and fellowship opportunities. This project will meet these needs by continuing and enlarging two program activities: the series of quarterly Newsletters and the communications network and reference service.

Weiner, Charles (MIT, Cambridge, MA 02139), "Documentation of Scientists' Response to the Ethical and Human Value Implications of Recombinant DNA Research." This project seeks to acquire and catalogue oral history and other resource materials for the study of one of the most significant science values issues in recent years, the discussion and establishment of guidelines for research on recombinant DNA. Initial work preserved unique source materials about the perceptions, motivations, and actions of scientists concerned with the potential safety hazards of their research. Renewed support is needed to (i) fill in significant gaps in developments leading to the February 1975 Asilomar Conference and the immediate response to it; (ii) document efforts to translate Asilomar guidelines into enforceable safety standards; (iii) catalogue, organize and deposit collected materials, ready for research use; and (iv) prepare and distribute a researchers' and educators' guide to the collected resources.
EVIST: Funded Projects (Continued).

Wertz, Dorothy C. (Research for Social Change, 49 Betts Road, Belmont, MA 02178), "Effects of Cultural Values upon Social Science Research about Women as Workers, 1870-1970." This project involves a study of the relations between social and cultural values and social science research on the subject of women's work outside the home in an industrial society. The study of psychological, sociological, and anthropological research on working women will delineate the effects of societal values upon the goals, methods, and results of social science research, and the effects of research upon societal values. It will provide biographical investigations of researchers to delineate the various social factors from which their values emerged. The study further addresses questions of the "objectivity" of present research, not only about women, but about other areas involving value conflicts and social change, and about whether this research represents an adequate basis for personal or social policy decisions.

Williams, Mary B. (University of Delaware, Newark, DE 19711), "Ethical Issues in the Application of Biological Research." This project involves the continuation of an effort to build a bridge between biologists' ethical concerns and philosophers' investigations into the nature of ethical commitments in order to use the philosophers' results to clarify the biologists' concerns and to use the biologists' concerns to indicate a new type of problem needing ethical analysis. The study is focused on four basic areas of biological research which involve conflicts between the interests of existing people and the interests of future people. The four areas of the green revolution, genetic engineering, exploitation of oceans, and climate alterations, are being studied by: (i) formulating with precision the moral dilemmas at their core, (ii) analyzing the structure of these dilemmas, (iii) discussing methods for distinguishing between false and real dilemmas, (iv) analyzing these dilemmas with respect to the relationship between the persons affected and the decision-making process in which the dilemmas arise, and (v) cataloging and evaluating alternative attempts to resolve the dilemmas.

IN THE LITERATURE

Journals/Newsletters.

Newsletter on Science, Technology & Human Values. The Newsletter on Science, Technology, & Human Values (formerly, the Newsletter of the Program on Public Conceptions of Science) has begun its fifth year of publication. Four issues will appear (under the editorship of Vivien Shelanski) in academic year 1976-1977: October, January, April and June. Designed as a resource guide for research and teaching, the Newsletter focuses on the ethical and social dimensions of contemporary science and technology. Each issue includes timely reports of actions by governmental agencies, meetings and conferences, fellowship opportunities; accounts of research in progress; information on academic curricula.
Journals/Newsletters (Continued).

Newsletter on Science, Technology & Human Values (continued).

and courses; scholarly articles; and an updated and extensively annotated bib-
liography of current literature. Subscriptions for 1976/77 cost $6 and begin
with the October issue. To subscribe or to request additional information, write
to: Newsletter on Science, Technology & Human Values, Aiken Computation Lab-
oratory 231, Harvard University, Cambridge, MA 02138.

Philosophy of Science. Kenneth F. Schaffner, Editor-in-Chief of Philosophy
of Science, announces a special issue of the journal. The issue, tentatively
scheduled for December 1977, will be devoted to "Value Issues in Science,
Technology, and Medicine." This theme will be broadly interpreted to include,
for example, the relations of value theory and science, analyses of the
aims and goals of science, decision-theoretic inquiries into utilities
-especially epistemic utilities), value components of paradigms (or theories),
philosophy of technology assessment, and those ethical and value aspects of
medicine closely associated with medicine's scientific base. Contributors
should follow standard instructions for submissions printed inside the back
cover of the March 1976 issue of the journal. Essays must be received no
later than 1 May 1977 to permit time for review. Manuscripts should be sent
to Schaffner at the Department of History and Philosophy of Science, University
of Pittsburgh, Pittsburgh, PA 15260.

Social Science History. A special issue of Social Science History on the
history and sociology of the social sciences will be published late in 1977.
Suitable manuscripts should be submitted by 1 April to Henrika Kuklick,
History and Sociology of Science, University of Pennsylvania, Philadelphia,
PA 19174.

Review Symposium.

David Bloor, Knowledge and Social Imagery. Routledge & Kegan Paul, Boston &

The last two decades have seen a significant shift in scholarly
attitudes to scientific knowledge. People have become genuinely curious
about its character and the basis of its credibility; and accordingly
they have begun studying it instead of celebrating it. In the history
of science, Whiggism is on the decline, yielding ground to a whole series
of important and fascinating concrete studies which locate scientific
knowledge firmly in its social context and refuse to hedge it around
with externally imposed boundaries and distinctions. And the sociology
of knowledge is at last beginning to deserve its name and unabashedly
taking the knowledge of the natural sciences as part of its legitimate
field of study.
Review Symposium (Continued).

Perhaps there are participants in this trend who are occasionally worried by the weighty philosophical arguments which might be brought to bear against them, or who still wonder whether some aspects of knowledge—the facts perhaps, or patterns of logical inference—might not lie beyond the scope of sociological or contextual historical analysis. If so, they will welcome David Bloor's book. In true underlabourer fashion he deploys his philosophical talents to demolish the arguments of the opposition, to sustain and legitimate a thoroughly naturalistic orientation to all knowledge, and to strengthen the resolve of those who would adopt such an orientation. The result is a splendid piece of writing, admirably clear and straightforward, carefully and honestly argued, forcefully and provocatively developed. It is a polemic in the best sense of the term.

The book opens by stating its commitment to the concrete empirical study of knowledge and belief. We should seek to apply causal explanation to all beliefs, without any regard for the value we set upon them, or our opinion of their truth or rationality. Much of this explanation will be sociological in character since knowledge is a social phenomenon; the authority and objectivity of knowledge, its character as something external to the individual, derives from its status as the valued possession of some collectivity which sets it apart from mere belief. Thus, the work follows current thinking in the sociology of knowledge.

Bloor's next step is to defend this position against philosophical objections, and in this he is eminently successful. Equipped with Knowledge and Social Imagery one should at least be able to fight to a draw with individualistic empiricists, Popperians, Platonists, and other opponents. If fear of philosophers has been holding back the historical and sociological study of scientific knowledge, here is the remedy.

Having routed the opposition, Bloor then goes on to explain it. Why do people tend to set science beyond naturalistic investigation? Why do they sacralize and Platonize its knowledge? Bloor looks to Durkheim's theory of sacredness for his answer, and in a number of suggestive and amusing passages adapts it to his needs. No doubt there are deficiencies in Durkheim's late work on primitive religion and classification. But to the extent that it can throw light on the beliefs of the Zuni or the Sioux, there is no reason to suppose that it cannot elucidate those of modern epistemologists also.

Bloor concludes his book by offering a naturalistic account of mathematical knowledge, allegedly to reassure the faint-hearted that there really is no field of knowledge exempt from such an approach. But here, in fact, Bloor transcends his underlaboring role and embarks upon an original and suggestive analysis. Mathematical thinking, he asserts, develops by the extension and development of models derived from our everyday experience with material objects. Selected models of this kind become socially accepted as appropriate bases for mathematical thought,
and are consequently imbued with the authority and objectivity characteristic of institutions. Upon such models mathematical inference depends at every point. Thus mathematics, like natural science, is both socially sustained and empirically based. This thesis is developed at some length in the latter part of Knowledge and Social Imagery, and the argument requires and deserves very detailed study.

One critical point must be made about the general character of the book. Bloor writes as an empiricist and materialist, and throughout, the major target for his criticisms and polemics is Platonism. There is urgent, passionate advocacy of the desacralization of knowledge, evocative occasionally of the invective of an apostate priest. To those altogether unmoved by essences, and content with a thoroughly mundane view of knowledge, it might appear that empiricism and materialism gain easy victories against feeble opposition, and are illegitimately enhanced thereby. The real alternative to David Bloor's positive standpoint, it could be argued, is idealism in one of its naturalistic variants. When he bases mathematical thought on experience with material objects, it is not the role of experience which is difficult to defend, but the role of material objects.

In my judgment, this same overestimation of Platonism serves to confuse somewhat the exposition of Bloor's account of mathematics (Chapter 5). The account is allowed to emerge from a conflict between the empiricist, psychological theory of J. S. Mill and the Platonic viewpoint of G. Frege; and this makes life hard for the reader. It is all too easy to construe Chapter 5 as arguing only that mathematics starts off from experience, or even, if one is slack, merely that historically it arose from experience. The crucial and profound notion that physical situations continue to serve as models, as mathematical reasoning proceeds, is there all right, but it can be missed, and indeed it could be better argued for. To appreciate its importance and its plausibility, the brief discussion of "Paradoxes of the Infinite" (pp. 121-123) should be turned to.

One final point. Knowledge and Social Imagery is of course a philosophical work, and it has been reviewed as such. Perhaps those carrying out concrete naturalistic studies of scientific knowledge will be tempted to set it aside, on the perfectly reasonable grounds that abstract philosophical discussions are rarely of assistance at the coal-face of enquiry. Have not natural scientists managed very well without Carnap and Hempel and Popper and the rest? I would not wish to oppose such sentiments; but it is worth noting that David Bloor has, in fact, written a very concrete and down-to-earth book, which makes most of its points in terms of specific empirical examples. It may indeed prove useful at the coal-face because it draws its examples from the coal-face, and discusses them in a thoroughly naturalistic yet insightful and often unusual way.

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Review Symposium (Continued).

The purpose of this book is to show that sociology of knowledge can "investigate and explain the very content and nature of scientific knowledge" (p. 1). This is to be achieved through a "strong programme" that would be causal; impartial with respect to truth and falsity, since both need explanation; "symmetrical", so that "the same type of cause would explain say, true and false beliefs"; and reflexive in the sense that it would explain sociological, as well as any other knowledge. This is a most ambitious program. Bloor boldly steps in where Durkheim promised, but never dared, to tread, and where Mannheim did not even promise to tread. However, anyone who expects to find in this book anything resembling Durkheim's brilliant attempt at relating the rituals of a given religion to the structure of the society practicing that religion will be disappointed. Most of the book is taken up by arguments against real and imagined detractors of the sociology of knowledge, and by philosophical demonstrations that all theoretical knowledge is somehow a reflection of society. This latter is, of course, a Durkheimian theme, not one of Durkheimian sociology, however, but of Durkheimian metaphysics.

First there is an attempt to refute the well known objection to sociology of knowledge succinctly formulated by Tom Bottomore -- "if all propositions are existentially determined and no proposition is absolutely true, then this proposition itself, if true, is not absolutely true, but existentially determined" -- by pointing out that the assumption that "causation implies error on which all these arguments depend" (p. 14) is fallacious. However, none of the objections to the sociology of knowledge is directed against causation, but against existential relativism. The criticism summarized by Bottomore was perfectly justified concerning the Marx/Lukacs - Mannheim type of sociology of knowledge, and all of those authors were aware themselves of the difficulty involved in their position. Therefore nothing has been refuted. If Bloor's sociology of knowledge is relativistic, then he still has to answer the criticism; if it is not relativistic, then there is nothing to refute.

The point is that it is not easy to decide where he stands in this respect. Some of the statements in the book are perfectly compatible with a non-relativistic, even strictly demarcationist view of science. The main argument that theories -- true or false -- are not given in our experience, but are made by people and that, therefore, "the theoretical component of knowledge is a social component" (p. 13) is a non-controversial statement, although a trivial one. No one has ever doubted that theories were made by people using the intellectual traditions of their societies and vocations as conceptual tools. The question is what can be done with this piece of common knowledge. Attempts are made (in Chapter 2) to show this by taking various well known examples -- such as Morrell's comparison of Liebig and Thomson as founders of schools of chemistry -- and pointing out that although in all these cases success and failure seem to be determined by purely objective conditions, such as the application of correct scientific methods required to establish true results, the very use and social acceptance of results thus established were socially determined. "For example suppose that no one had been very interested in organic chemistry. Liebig's efforts would have been frustrated, just as the biologist Mendel was frustrated" (p. 31). This may be true, but this is not an explanation of the contents of analytical chemistry, only a comment that had there been no interest in organic chemistry at the
time, Liebig's invention might have had the fate of other inventions made "before their times". This comment, and the remainder of this chapter, could have been made by any sociologist of science, even one who is most skeptical about sociological explanations of the contents of scientific knowledge. In fact, the author could have found plenty of ready-made examples in the literature that would not have required any re-interpretation.

Much of the rest of the book is taken up by demonstrations that knowledge somehow reflects society. Chapter 3, for example, poses the problem of why there is a resistance to sociological explanations of scientific knowledge. "If sociology could not be applied in a thoroughgoing way to scientific knowledge it would mean that science could not scientifically know itself" (p. 40). This seems to me a non-sequitur and, therefore, not a problem at all. It makes about as much sense as to say that "if physics could not be applied in a thoroughgoing way to sociological knowledge it would mean that sociology could not scientifically know itself". As I have pointed out, there is no resistance to the sociology of science, only to certain unsubstantiated claims that sociology can explain the contents of science.

The only detailed attempt to show how knowledge is related to society is in Chapter 4, which deals with the Popper-Kuhn controversy. Popper is linked to enlightenment, Kuhn to romanticism, and Popper's writing is said to be influenced by the threat of totalitarian ideologies to the freedom of science, while Kuhn is confident about the future of science. The relationship of these philosophies to enlightenment and romanticism is only very vaguely established, and the claims of the author are far more modest than those of Mannheim when dealing with similar topics. Bloor does not pretend that there is a necessary, one to one relationship between the philosophical views to be explained and the various elements of the ideologies by which they are explained. Rather, he makes an intelligent, but not very precise, attempt to show that Popper's style of thought is closer to the enlightenment, and Kuhn's closer to the romantic tradition. In fact, he shows that these two traditions could be used in other ways than they are allegedly used by Popper and Kuhn. To me this is more a refutation rather than a demonstration that there is a sociological -- i.e., a regular and recurrent -- as opposed to a unique historical relationship here.

A second hypothesis is that there is in Popper's ideas an element of "mystification" designed "to endow logic and rationality with an a-social and, indeed transcendent, objectivity" resulting from Popper's experience of the totalitarian threat to science (p. 67). I do not see how this assertion can be made of a philosophy that considers all theoretical knowledge as provisional. Its only basis is Popper's belief that scientific theories are ultimately rejected or accepted on the basis of rational choice rather than on that of some still-to-be-determined social or psychological conditions. The author is perfectly aware that Popper's views are not inconsistent in principle with psychological explanations (I would add that they are not inconsistent with sociological explanations either), but Bloor needs to cast Popper into this ill-fitting role in order to revive one of the poorest elements -- elevated to the status of a "law" -- of Mannheim's long defunct juxtaposition of ideology and utopia, namely, that "those who are defending a society or a sub-section of society from a perceived threat will tend to mystify its values and standards, including its knowledge. Those who are either complacently unthreatened, or those who are on the ascendancy and attacking established institutions will be happy... to treat standards and values as more accessible, as this-worldly rather than transcendent" (p. 68).
Review Symposium (Continued).

Of course, neither in this particular case of Popper vs. Kuhn, nor in any other case is there any evidence that those who defend a society or any part of it, are more prone to mystification than those who attack. Is there really less mystification in the image of a united proletariat of the world marching under red banners in step with the march of history than, say, in the Newsweek columns of Milton Friedman? It is probably true that the defenders will concentrate on explicating the rationale of what they defend, whereas the attackers will tend to expose its weaknesses and contradictions (I have no hypothesis about those who are complacent) which, of course, is a trivial circularity. It is possible that Popper's first-hand acquaintance with totalitarian ideas made him more sensitive than Kuhn to the problem of the autonomy ("demarcation") of science from other types of thought, but this does not justify the conclusion that his philosophy is an attempt at mystification and locking scientific inquiry.

The examples in Chapter 6 concerning sociological elements in the history of mathematics are more to the point. These deal with basic differences between the Greek and modern conceptions of number -- and how methods of exposition and usages of the 17th century compare to modern mathematics. Although the examples do not contain explicit sociological hypotheses, they suggest possible relationships between kinds of mathematics on the one hand, and occupational roles and the professionalization of the mathematicians on the other. As a social history, Chapter 6 is still far from the fulfillment of even a modestly strong program in the sociology of scientific knowledge, but it is a step in that direction.

Overall, this is a disappointing book. Most of its arguments and many of its mistakes could have been avoided through elementary distinctions between the great variety of problems and types of hypotheses that go under the name of "sociology of knowledge". These distinctions have been made a long while ago, especially in Robert Merton's "Paradigms for the Sociology of Knowledge" (originally published in 1945, most recently reprinted in R.K. Merton, The Sociology of Science, Chicago, 1973). I also found very disturbing the confusion of philosophical inquiry into the foundations of scientific knowledge with empirical inquiry into the creation, acquisition, and uses of such knowledge. This is, perhaps, a debatable point, but it is certain that, in this case, the confusion has not benefitted empirical inquiry. Nevertheless, the book has some merits. The treatment of empirical material is usually shrewd and balanced, and the author is capable of seeing evidence that goes against his views, although he does not admit the implications of this evidence. There are also lucid discussions of some details and implications of sociology of knowledge, especially in Chapters 2 and 8. And as I have shown, the book manages to make the point that social elements may have an important influence on the contents of scientific knowledge and that persistent probing in this direction may produce results.

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Dissertations: Recent and Forthcoming


Zwerling, Craig S., "The Emergence of the Ecole Normale Supérieure as a Center of Scientific Education in Nineteenth-Century France." Harvard University (advisor: E. Mendelsohn).

JOB VACANCIES

University of California at Berkeley is recruiting an Assistant Professor of History/Historian of modern biology (19th and 20th centuries) to teach undergraduate and graduate students. Applications from Ph.D.'s or those nearing completion of their dissertation will be accepted. Send references and publications to Roger Hahn, Department of History, University of California, Berkeley, California 94720.

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Eisenhower College will have an opening in the fall of 1977 for a historian of science who is also trained in chemistry. The duties of the new person will be to teach beginning chemistry, one advanced chemistry course, and to participate in an interdisciplinary general education program as a historian of science. It is necessary that the applicant be formally trained in the history of science, and it is desirable that he/she be capable of handling materials from the ancient and medieval period. Contact Paul Curtis, Director of the Division of Science and Mathematics, Eisenhower College, Seneca Falls, NY 13148.

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