

4S REVIEW

Spring 1983

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Society for Social Studies of Science

Society for Social Studies of Science

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FACT AND OPINION**"MANY HAPPY RETURNS"**

The 4S Newsletter has now gone through twenty eight issues and seven years of publication. In the process, it has developed from a cautious six-page "flyer" to a self-confident and established publication of ten times the size. This gradual evolution has accorded well with the growing stature of our society. The Society for Social Studies of Science has taken on a life and a vitality which more than vindicates the hopes of those who met in San Francisco in 1975, and of the ad hoc committee which had previously drafted a charter for the still-to-be-invented society.

Our membership stands at between 400 and 500, and shows signs of increasing steadily. Individual members come not only from a great variety of disciplines (including anthropology, chemistry, economics, history, philosophy, physics, political science, and sociology) but also from many countries (Australia, Belgium, Canada, Israel, Mexico, Norway, the United Kingdom, and the United States, among others). The range of sessions, and the discussion, at our annual meetings is correspondingly lively. The John Desmond Bernal Award, established through the generosity of the Institute for Scientific Information, is setting an international standard of excellence in the field. Our society is beginning to play an active role as an affiliate of Sections L (History and Philosophy of Science) and X (General) of the American Association for the Advancement of Science. 4S is a member of the Consortium of Social Science Associations, and enjoys a close collaborative relationship with several cognate societies ranging from the History of Science Society to the European Association for the Study of Science and Technology.

It is within this context that we may understand the decision of the Publications Committee to take another step toward our firmly-held goal of providing 4S with its own journal. The change in name to 4S REVIEW signals our ambition - to publish a scholarly journal of news, information, reviews, bibliography and original contributions which will both reflect and advance the intellectual work of the congeries of distinct disciplines which make up our field. That ambition is also signaled by the increase in the editorial staff, and the restructuring of our editorial board (see cover two: opposite). May I invite you to correspond directly with the Editor or any of the Associate Editors concerning possible contributions, and discussing those features you would like to see emphasized as the 4S REVIEW continues on its evolutionary pathway? And may I also ask your active support to our Secretary-Treasurer, Lowell Hargens, as he begins the work of recruiting institutional subscribers to the 4S REVIEW?

With this first issue of the 4S REVIEW our society celebrates an important birthday. Your intellectual support and practical aid in the days ahead will assure the 4S REVIEW of "Many Happy Returns."

Arnold Thackray
Maundy Thursday 1983

SOME IMPRESSIONS OF THE
SEVENTH ANNUAL MEETING OF 4S
PHILADELPHIA, 28-31 OCTOBER 1982

A participant to the 4S meeting at Philadelphia would have been struck by the range of topics, the critical analysis of problems and scholarship brought to bear on the topics discussed. Being an outsider, I was particularly struck by the number of scientists reading papers and participating in the lively and informative discussion which followed the presentation of each paper.

As I sat and listened to the discussion, my mind went back to 1962, when 20 years earlier, I had first visited Philadelphia to attend the International Congress of History of Science, which was held at Cornell and Philadelphia. At that time the number was limited and few were interested in social studies of science and I realized the significant changes which had taken place since then. Many of the topics discussed or the questions raised were unthinkable then. Those were the days of Euphoria and S&T developments were to usher a new Utopia.

What surprised me was that even though 16 themes were identified in pre-conference papers, there was no central focus, linking various themes of the conference. The scientists in general could not be made aware of some of the basic problems facing science and technology in its interface with society or some of its critical features and dimensions and the nature of contemporary crisis. Further, the public could not be enlightened on these issues and thus involved in well informed debate and discussion of the issues. In the absence of the latter, the public gets swayed by populist cliches or obscurantist ideas to the great disadvantage of science and the possibility of rational solutions of social problems involving scientific knowledge and technology.

Many of the issues which dealt with specific techniques, could have been discussed elsewhere, such as, bibliometrics, techniques of science or citation indices and their application to history and sociology of science. Many of the papers under various themes were technique oriented. One would have wished to know the conceptual framework of the techniques used, the social framework in which these were evolved and the purposes these served, particularly under such themes as policy making, error, correction and high risk technologies.

The session on "Creationism and its Challenge" was timely and interesting. It represented the concern of the scientists to this challenge. The papers in the session were very scholarly and looked into some of the critical problems, posed with detailed study and care. The papers in some respects were limited, however. For instance, the excellent paper on evolution and high school biology texts, brought about the changing approaches to evolution in the recent history of the USA as reflected in biology textbooks, under pressure from different interest groups. The value of this paper would have been considerably enhanced had it linked these changes with the changes in political climate in the USA in these periods and the political and social linkages of the various pressure groups, who stood and campaigned for creationism. The latter approach would have transformed academic debate into a social debate, would have brought

the public into the debate and may have generated greater support for the scientists.

Another question, which could have been raised at this session, relates to the wider dimension of creationism, i.e. the relation of creationism to similar concepts which are being revived and have emerged in other parts of the world--the UAE for instance, has recently banned the teaching of evolution. Fundamentalism in the Islamic World, revivalism and "spiritualism" of religious adventures in India and obscurantist and mystical concepts in the name of nationalism or ancient traditions in other parts of the world represent a trend. A treatment, which would have linked creationism with these, would have placed the concept and its emergence in proper perspective. As it is, it looked as if it were a peculiar problem of the USA.

I was also struck by the absence of discussion on the theme: "Science, Technology and War," one of the themes identified for the Seventh Annual Meeting. It was particularly surprising in view of the investment in research, development and large scale manufacture of destructive weapons and the dangers that is posing to mankind. The immediate effect of these policies is the cut in the budgets of education, civilian research and social programs. In addition, it is also posing a serious threat to free communication in science and imposing restrictions on scientists. The absence of discussion on the theme is all the more surprising in view of the concern of the scientific community in the USA with these developments.

Several themes appear significant and particularly relevant at present and could have been discussed at the conference, but unfortunately the opportunity of benefitting from discussions was missed. One problem is the technological impact on man and society, particularly the problem of organizing technology as an extension of man, as is becoming evident from microprocessor revolution. That revolution is likely to affect education, techniques to be used, modification of its content and nature, the level and range and the number of people who can be included, employment patterns, changes in manufacturing technology, organization and control in factory systems, obsolescence of present industry and changes likely to follow. In a deeper sense, the same type of problems arise as a result of developments in genetic engineering, when scientists are tending to change their roles from that of manipulators to that of creators. These changes are raising a number of problems: choice of problems for research, the degree of freedom scientists should have in pursuing their research, or the control which should be exercised on them.

Discussion of these issues is also important since people, who are not well informed about the nature of problems, are concerned and worried about these developments as a result of misinformation or a one-sided picture. The latter has been taken advantage of by those who would like to thwart or jeopardize major scientific and technological projects.

The 4S Conference in the USA should concern itself, of course, with the problems of the country. I was struck with the complete absence in the deliberations, however, of any reference to developing countries. Can science in the USA be completely isolated from those of developing countries, particularly when a large number of scientists from these countries have contributed to American science and a number of problems are interlinked? Arnold Thackray's erudite, scholarly and thought provoking address brought to mind the need for this

linkage. For instance, the period which he covered was also the period of the establishment of the Asiatic Society in India, the controversy between Orientalists and modernists in India and their linkage in the scientific community and political groups in the U.K., and possibly through them to those of the USA.

A comparative study of the USA and India would particularly be rewarding, in view of the fact that both were colonies of Britain. Independence of the USA diverted and increased British interests in India, leading to British conquest and control of India, which provided raw material for the industry and market for British goods. Consequently, in the study of the linkage of science and technology with society in the 18th, 19th and 20th centuries, a comparative study of Britain, the USA and India is likely to yield rich dividends.

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IMPRESSIONS OF THE SEVENTH ANNUAL MEETING OF 4S

It was beautiful weather in the beautiful city of Philadelphia. And the conference was organized very well. But having four societies meet together (4S was joined by the Philosophy of Science Association, the History of Science Society, and the Society for the History of Technology) makes for big crowds. And the intellectual appetite gets numbed when there are (at least) 12 different sessions to choose from at any one moment. The average conference participant commits himself to a few sessions, shops around a bit in other sessions, and is easily distracted by the books on display or by old and new colleagues to be met.

Perhaps this is as it ought to be, and is it only my not being accustomed to American-style big conferencing that makes me uneasy. In terms of intellectual exchange and of community-building atmosphere, however, I am certain that the much smaller meeting in Atlanta, Georgia, last year, was much more productive.

What is good about having joint meetings, on the other hand, is the possibility to "visit out" and broaden one's perspective. One such opportunity -- and one which was taken by most participants -- was the PSA Symposium on Commensurability, Comparability and Communicability, at which Thomas Kuhn gave a paper on his original and present views on incommensurability.

Kuhn distanced himself from radical interpretations by emphasizing that he had always spoken of local incommensurability. But his point remained the absence of a common measure, as between the sides and hypotenuse of right-angled triangle. One may understand statements in another paradigm, but will not be able to translate them. Translation manuals (like Quine's proposal) that try to work with identical referents cannot succeed. An alternative description of the same referents can be produced (e.g. of Priestley's treatises in terms of modern chemistry), but it would not tell the same story.

This analogy between language and paradigm: both cut up the world in specific and untranslatable ways, can be extended further by comparing the understanding of another paradigm (or of another culture, for that matter) with learning a language. This shifts the attention from the incommensurability issue to the question how paradigms grow. One way of answering that question is to look at idiolects within a language and ask when meaning variance becomes so important that one would start speaking of a different language. Examples from the history of science would be 'gold' (an idiolect, because meaning variance has remained limited) and 'water' (where a new language has grown, since the gap between water as a basic element or principle of fluidity, and water as a chemical compound existing in different states, including ice, cannot be bridged within one language).

Kuhn's point was still sufficiently radical for a classical rebuttal, by Philip Kitcher, who argued that science can provide the referents to make translations possible. Kuhn himself was clearly presenting thought-in-progress: the example of 'water', at the end of his paper, led him to remark that lay audiences may still speak the "old" language while the scientific community has gone over to the "new" one. This, surely, implies that there is more to scientific language change than Kuhn was talking about now -- perhaps he should let himself be inspired by Ludwik Fleck again?

A step out of the 4S slot that I took was to attend a HSS session on the development of hybrid scientific fields in the 20th century. Robert Kohler's paper on the rise of chemical microbiology in the 1920s and 1930s, and to a less extent, Karl Hufbauer's paper on astrophysics, could easily fit into the specialty studies of the sociology of science. In a sense, the historians are repeating what the sociologists did ten years ago: how to delineate the specialty to be studied, how to disentangle -- and then integrate again -- personal factors and more structural factors, how to generalize (if at all). The sociologists did not solve these problems, the historians may be limited by their focus on reconstructing history. But their limitation may also be their strength: their shared background of methods and issues appears to be larger and better articulated. At least, that is how it seemed to an outsider comparing the pointed discussions during the session with the haphazard remarks and debates about side-issues of some of the 4S sessions.

Looking back at the 4S sessions, they certainly provided a good overview of what has been done, and sometimes is being done, these last years. Although papers might bring up interesting items, my overall impression was that nothing really new was happening, at least not in terms of contributions to the conference. The different approaches, ranging from discourse analysis to social stratification, scientometrics and science indicators, have found their niches and continue to produce new bits of work. If there are challenges and exciting insights and approaches, they did not become very visible at the conference.

Next year, 4S goes back to the smaller format of meeting, when it convenes on its own in Blacksburg, VA. That may be an occasion to test whether the field really has little to show at the moment, or that it just got lost in the big jamboree of the Philadelphia meeting.

Arie Rip, University of Leiden,
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BOOK REVIEWS

Nancy Mandelker Frieden, *Russian Physicians in an Era of Reform and Revolution, 1856-1905*. Princeton: Princeton University Press, 1981. 379 pp.

This is a work of consummate scholarship. Drawing upon an impressive array of sources (archival material, official statistics, professional journals, memoirs, belles-lettres), Frieden has created a richly-textured portrait of the coming of age of the Russian physicians in the half century after the Great Reform. The book is particularly valuable because its author is conversant with the literature, both theoretical and empirical, in the comparative history of medicine. Whether the subject is abstract models of medical development or the minutiae of physicians' fight against cholera, the author provides a heuristic juxtaposition of Russian and non-Russian experience.

The study focuses on what Frieden terms the three "major interests" of the Russian physicians: professionalization, social reform and political change. In the author's view, these three concerns were not of equal importance to the physicians. Their primary passion was professionalization; social reform and political change were derivative interests.

But the professionalization with which we are dealing here is quite idiosyncratic -- a fact which the author repeatedly underscores. Addressing the reader steeped in the Western literature on the subject, Frieden delineates clearly the atypical aspects of her case. Russia lacked a tradition of medieval medical guilds and did not develop strong corporate institutions.¹ Moreover, the occupational context of the Russian physician differed radically from that of most of his European counterparts: he was trained in government supported institutions, worked for the central or local government, and was licensed by the state. He was, as Frieden put it pithily, "defined, employed and controlled by the state" (p. 109). This occupational context understandably shaped the Russian physician's choice of professional objectives. In contrast to his colleagues in many countries of Europe, he did not press for higher medical qualifications, for it was the state which controlled education and licensing and the first-order goal was to reduce state interference in professional life. What the Russian physician did seek as part of his professional identity was the right to govern himself, the right to establish medical associations that would be relatively free from official supervision, and the foregoing of an ethos of service to the state which would be the emblem of the profession. Self-government, the author records, was never satisfactorily achieved, but the other two desired attributes -- association and service -- did become entrenched. In their wake, the physician ceased to see himself as "state servitor" and achieved the self-consciousness of a "proud professional." In this case, Frieden urges, professional self-consciousness emerged without its widely regarded prerequisite--autonomy. This finding points to questions which Frieden does not raise: to what extent is the traditional insistence on autonomy as the prerequisite for professionalization culture-bound? How useful is it to retain the Western model of professionalization when dealing with societies in which state patronage is an integral part of professional life?²

In discussing the commitment of the Russian physician to the improvement of public health and welfare (social reform), Frieden has to confront not an inapplicable model but received wisdom in the field of Russian history. The

commitment of the Russian physician to social reform had traditionally been explained as the outgrowth of "the ideals of the sixties," the period of great reform in Russia. Frieden challenges this interpretation. She presents the Russian physician as a pragmatist whose devotion to improving public health arose from the fact that his occupational concerns were centered on the public sector. In the reformist forays of the Russian physicians which she examines in greatest detail (the development of a program of health education, the campaign to abolish capital punishment, and famine relief), the author does see an ethic of service to the state, but she relates that ethic to the physicians' concern with their professional status and role. Indeed, at one juncture, Frieden comes close to saying that the doctors were interested in social reform not for its own sake, but as an instrument for professional development. "The refinement of the service ethos arose without apparent planning or conscious aim, but has the mark of an ingenious strategy to ingratiate the profession with the authorities while steering a course toward greater autonomy" (p. 129). That is, the author sees the "exaggerated service ethos" performing the role for physicians in Russia which the development of scientific expertise performed for physicians on other countries (p. 128). Frieden's point is not without interest. In depicting the physicians as skillful manipulators of the ideology of state service in order to relate their own technical work to broader public values, she departs in a welcome way from the stereotypical image of the autocratic state dictating terms to a passive, subservient community of physicians.³ But Frieden's conclusion that the purpose of the physicians' adopting a strong service ethos was to move toward autonomy seems unwarranted. The vocal commitment by physicians to improve the public weal may equally well have been a bid for greater status, for greater deference from the authorities, or for a larger role in social planning -- but these goals are not equivalent to the goal of achieving autonomy. It may well be that even for the most thoughtful of authors, the challenge of living with an a-typical case is not an easy one to meet.

If Frieden's examination of the basis for the Russian physician's interest in social reform flies in the face of conventional wisdom, her consideration of the physician's concern with political change does so no less. In this instance, the author's target is the legendary image of the physician-radical who allied himself with the radical intelligentsia in the revolutionary movement of 1905. Frieden argues against this image first on empirical grounds: there were remarkably few Russian physicians who became enmeshed in radical political activity. She explains that the "we-they" mentality necessary for such radical activity was greatly modified in the case of the physicians who were dependent upon the state for guidance and rewards (p. 314). In the second instance, the author submits that those Russian physicians who became involved in radical politics did so not "for political or ideological reasons, but because they considered this the only means to achieve their professional goals" (p. 18). "If they could achieve neither reform in public health nor improved professional status . . . perhaps the political framework within which they worked had to be changed (P. 198). This reduction of political to professional goals -- like the reduction of social reform goals to professional objectives discussed earlier -- is at the heart of Frieden's interpretation of the development of Russian medicine. To her credit, she provides the reader with sufficient evidence to enable him/her to form an independent judgment of this interpretation. Finally, as part of the same argument, Frieden contends that by the very nature of their work, physicians in Russia may have been disinclined to radical activity. They were by temperament pragmatists who sought manageable

goals and moderated their zeal in the name of furthering their work. In a speculative vein, the author suggests that such behavior may be endemic to physicians everywhere. Here she seems to be on shaky ground. One may perhaps want to argue that private practitioners are disinclined to pursue radical politics, but surely the concern with public health -- as George Rosen pointed out over forty years ago -- is intimately connected with social criticism.⁴ If the Russian physicians for the most part eschewed radical politics, they did so not because of the content of their work, but rather because of the occupational context within which they worked. Frieden's own evidence points in this direction: she records that physicians shied away from pressing their social and political programs so long as they had no alternative to government employment; only when employment by the zemstvos (local self-governing councils) provided such an alternative were some physicians emboldened to take action.

It is impossible in the space of a single review to do justice to such a complex and important book. It is equally impossible that even the most laudatory of readers should have no quarrel with a work of this breadth. My own reservations about Frieden's book revolve around a single -- but critical -- point: the delineation of the boundaries of the medical profession. Frieden tells the reader early on that the term "Russian physician" will be confined to physicians who worked primarily in public positions, were of Russian (not Jewish or foreign) heritage and lived in areas with predominantly Russian populations" (p. 16). While the author acknowledges that this demarcation rules out of court many interesting segments of the profession, she justifies her boundaries on the grounds that publicly-employed physicians, especially zemstvo physicians, shaped the dominant ethos of the profession.

In the spirit of Frieden's own work, it seems imperative to identify this view as a canard and to correct it. To be sure, Russian public physicians did become the most vocal part of the profession and did claim to speak on behalf of the profession as a whole. But, as Peter F. Krug has pointed out in his excellent dissertation, the take-over of the medical profession by the public physicians occurred in part by default. In the last decade of the nineteenth century the leaders of the St. Petersburg medical establishment (clinicians and academics), who were committed to curative medicine and who identified with the trans-national community of physicians, retreated from the leading Russian medical association, the Pirogov society and began to publish in their own journals. This left the Pirogov society in the hands of the public physicians who were committed to preventive medicine.⁵ Frieden does devote a paragraph to the split between the physicians of the preventive and curative orientation, but she concludes the discussion saying, "the profession appropriated the zemstvo physician as a convenient symbol" (p. 129). To say this is to take the part for the whole.

The point is worth making, I believe, because the academic medical establishment did not disappear; the tension between preventive and curative medicine did not vanish; and the commitment to public medicine did not become the emblem of the profession as a whole. My own research on the history of Soviet medicine in the 1920s and 1930s suggests that these unresolved tensions resurfaced with great vigor after the Revolution when the Bolshevik medical reformers attempted to bring into being a radically new and very advanced system of social medicine.⁶

Notes

1. The reasons for the failure of the Russian physicians to achieve corporate status has been the subject of some discussion by historians of Russian medicine. Frieden takes the traditional view that the hostility of the autocracy was in greatest measure responsible for that failure. An opposing view has now been advanced by John Hutchison who argues that considerable responsibility for the failure may be ascribed to the physicians themselves who were disunited and fractious in the face of a formidable autocracy that was certainly "no friend of the professions." John F. Hutchison, "Society, Corporation or Union? Russian Physicians and the Struggle for Professional Unity (1890-1913)," *Zeitschrift für Geschichte Osteuropas*, Neue Folge Band 30, Heft 1 (1982), pp. 37-53.
2. In her study of the Russian psychiatric profession, Julie Brown comes to the conclusion that Western definitions of professionalization are culture-bound and of little heuristic value in dealing with the development of psychiatry in Russia. Julie V. Brown, "The Professionalization of Russian Psychiatry: 1857-1911," Unpublished Ph.D. dissertation, University of Pennsylvania, 1981.
3. The notion of ideology as interactive discourse which encompasses both what the state or government has to say about science and what individual scientists have to say about science was first advanced in Mark B. Adams, "Science, Ideology, and Structure: The Kol'tsov Institute, 1900-1970," in Linda L. Lubrano and Susan Gross Solomon (eds.), *The Social Context of Soviet Science* (Boulder, Colorado: Westview Press, 1980), p. 174.
4. George Rosen, "Disease and Social Criticism," *Bulletin of the History of Medicine* X (1941), pp. 5-15.
5. Peter F. Krug, "Russian Public Physicians and Revolution: The Piragov Society, 1917-1920," Unpublished Ph.D. dissertation, University of Wisconsin, 1979.
6. Susan Gross Solomon, "The Institutionalization of Soviet Social Hygiene." Paper presented to the American Association for the Advancement of Slavic Studies, October 1978, Columbus, Ohio. Susan Gross Solomon, "Perceptions and Misperceptions: Western Views of Soviet Medicine," (forthcoming).

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Seymour H. Mauskopf and Michael R. McVaugh, **The Elusive Science: Origins of Experimental Psychical Research.** Baltimore: Johns Hopkins, 1980. 368 pp.

For those who have little or no acquaintance with this highly unorthodox field, psychical research (also known as parapsychology) is the systematic study of telepathy, clairvoyance, mind over matter and similar phenomena. Although these subjects have long been the province of charlatans and dogmatists, there has also been a vigorous tradition of careful, experimental inquiry. That tradition began in England and France around the turn of the century, but had reached a dead end by the late 1920s. Extensive experimental work by Soal in England and by Coover and Troland in the U.S. had failed to produce any convincing evidence for the reality of mental telepathy.

In 1930, however, a young biologist-turned-psychologist named J. B. Rhine began card guessing experiments at Duke University. Within a short time he discovered several undergraduates with remarkable clairvoyant powers under controlled conditions. First published in the 1934 monograph Extra-Sensory Perception, Rhine's work galvanized the worldwide community of physical researchers while at the same time attracting widespread coverage in the mass media. This was no flash in the pan, however. Over the next 40 years, Rhine was successful in recruiting a large number of active researchers to the field, in converting most physical researchers to his methodology, and in establishing the institutional base for a sustained program of experimental investigation. He was somewhat less successful in achieving the full scientific legitimacy that he so ardently desired.

Mauskopf and McVaugh, historians at Duke and the University of North Carolina respectively, have written what will long stand as the definitive history of parapsychology from 1915 to 1940. Their sources are unparalleled. They had complete access to the extensive archives of Rhine's correspondence and laboratory notes, as well as the papers of the American Society for Psychical Research and the (British) Society for Psychical Research. Their geographical location also made it convenient to interview many of the participants in these developments.

Heavily influenced by Kuhn, their principal thesis is that Rhine's early work constituted a new paradigm which transformed what had previously been a disorganized amateur activity into a "coherently structured professional and research enterprise." Their argument is convincing but not intrusive. For the most part, this is straight tell-it-like-it-was historiography with no theoretical axe to grind. The story is well told, although perhaps in more detail than a casual reader might desire.

The first three chapters describe the intellectual background and social context of Rhine's work, from a predominantly internalist point of view. Chapter four is an intellectual biography of Rhine up to the publication of ESP. It is particularly good in documenting the relationship between Rhine's interest in the paranormal and his religious doubts and cravings. Chapter five, a version of which previously appeared in Isis, is a fine-grained analysis of the paradigmatic character of Extra-Sensory Perception. While emphasizing Rhine's novel contributions, it also demonstrates that he was immersed in and borrowed heavily from the longstanding tradition of experi-

mental psychical research. The remaining chapters deal with the public response to Rhine's work, further intellectual and institutional developments, reactions of the psychical research societies, relationships with orthodox psychologists, and progress toward acceptance by the wider scientific community. The book concludes with an unusual afterword by J. B. Rhine and his wife Louisa in which they criticize the work for a number of shortcomings and omissions.

Mauskopf and McVaugh take great pains to be dispassionate and objective, and they largely succeed. Still, there is a distinct undertone of sympathy for Rhine and his mission. That is excusable. One of the reasons for Rhine's success is that those who have known him or have read his work extensively cannot help being impressed with his highminded enthusiasm and sincerity.

Despite the book's commitment to a social view of intellectual history, I was struck by the degree to which the development of this field depended on the extraordinary talent, energy and charisma of one man. I was also impressed by the fortuitousness of many of the conditions that made Rhine's work possible. What would have happened, for example, if Rhine had not gotten the appointment at Duke where both the president and the chairman of the psychology department were sympathetic toward psychical research? While chance and personality are certainly features of any specialty's development, I suspect that they stand out here because of the intellectual precariousness and fragility of the field. If conditions had been only slightly different, a professional parapsychology might never have developed.

I do have a couple of complaints about this otherwise fine book. In their afterword, J. B. and Louisa argue that Mauskopf and McVaugh did not capture the spirit of their activity in the 1930s and 40s. I tend to agree, although perhaps for different reasons. My impression is that Rhine and his coworkers were caught up in a very intense and exclusive group life during this period, similar to that which accompanied the rise of many more legitimate specialties. Since the authors interviewed many of the participants, I would have expected a fuller description of this phenomenon.

And speaking of Louisa Rhine, an assessment of her contributions would have been welcome. A biology Ph.D. herself, Louisa shared J. B.'s enthusiasm and commitments from the very beginning. Yet she virtually disappears from the book after chapter four. Perhaps this is justified, but there remains a nagging suspicion that she is not getting the credit she deserves.

Finally, I agree with the Rhines that the period from 1940 to the present certainly merits a good deal of attention. While no book can cover everything, I do hope the authors will pursue this subject to give us another book on the later period.

This book is a must for anyone interested in the occult or in problems of scientific legitimacy. It can also be profitably read by those interested in specialty development.

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Augustine Brannigan, *The Social Basis of Scientific Discoveries*. Cambridge: Cambridge University Press, 1981. 212 pp.

Given that the notion of discovery lies at the very heart of both professional and lay conceptions of science, it is surprising that recent developments in social studies of science have given it little attention. It has long been recognized, of course, that discoveries are consequential: they can be responsible for the start of whole new lines of investigation and the redirection of vast amounts of resources, intellectual as well as financial; the occurrence of discovery can occasion rank acrimony over priority allocation and yet can be cast aside dismissively as no more than a matter of chance.

Brannigan's book provides a comprehensive review of the variety of perspectives brought to bear on the topic of discovery by philosophers, sociologists, psychologists and historians. He sees these contributions as two kinds. "Mentalistic" models of discovery conceive of new ideas coming into the mind of the scientist. Brannigan shows how such models adopt the Reichenbach distinction between contexts of discovery and justification, and how their explanation of discovery hinges on the specification of prior mental states as causally determinative of the occurrence of discovery. "Cultural" models of discovery, by contrast, assign causal status to cultural growth or the "state of the environment;" it is under the rubric of "cultural" models that the phenomenon of multiple discoveries has been explained in terms of "the time was ripe for the discovery."

Brannigan subjects both mentalistic and cultural models to insightful criticism. He demonstrates the inadequacies of these models by arguing that both concentrate on discovery as an essentially mental event, whose character has been largely assumed unproblematic by analysts. It has been generally assumed that the folk theories of discovery employed by scientists and others provide a literal description of what discovery in fact consists. Brannigan shows that the reductionism of mentalistic models fails to distinguish between events recognized by a particular community as a discovery and instances of learning by someone who comes upon what is already known by others. In addition, the argument reveals how many of the models involve explanatory tautology. The notion of genius is invoked as sufficient explanation for the occurrence of discovery, but the "fact" of discovery is frequently used to construe the presence of genius in the first place. Similarly, the idea of appropriate cultural environment is invoked to explain the instance of discovery, even though "appropriateness" is retrospectively constructed in the light of the assumed "fact" of discovery.

The first four chapters of the book are thus devoted to a hard hitting and unremitting critique of existing theories. It is characteristic of similar critiques that they fail to provide well illustrated alternatives. But in this case, we are given a well argued and meticulously documented alternative. Brannigan terms this alternative "the attributional model." The suggestion is that instead of concentrating on "what makes a discovery happen" we turn attention to how it is that certain achievements become identified and

labelled as discoveries. This means that the analyst is not at liberty to adopt folk evaluations of discovery as accurate (or inaccurate), but has to examine in detail how such evaluations are done. Apart from the deficiencies of mentalistic and cultural models, Brannigan adduces two central arguments to recommend his alternative. First, he notes that the ways in which discoveries have been explained (by members) occur over a protracted period and involve a variety of historically and contextually circumscribed alternatives. Second, he notes that the value assigned to a new finding or theory in science sometimes varies dramatically over time. The criteria of validity of discovery (as much as those of fraud, error, etc.) are thus to be viewed as fundamentally judgemental matters. They are deployed in the course of members' efforts to produce and recognize discovery.

The attributional model is illustrated with a series of detailed examples: the case of Mendel and the discovery of segregation (dealt with in almost too much detail for the reader unacquainted with the controversy); the discovery of America; the discovery of oxygen; and the Piltdown fraud. These cases are used to demonstrate how the status of "discovery" is essentially equivocal, how it varies with time and context, in short, that it is attributed.

It is clear that Brannigan's argument is strongly influenced by the ethnomethodological injunction to treat as topic those features of explanation which are routinely taken as resource. However, one appealing feature of the argument of this book is that the recommended approach is not couched in disdain for the sociological enterprise as a whole. For example, Merton's work on multiples is taken to task for internal inconsistencies and conceptual loopholes, and Brannigan formulates his alternative model as a more adequate sociological account, rather than as an alternative to sociological inquiry.

Nonetheless, as Mike Mulkey points out in a lucid synopsis of the argument in the Preface, Brannigan's approach represents a significant revision of existing sociological approaches to scientific discovery. In some matters of detail it is not yet clear how the approach differs from that of writers in the "new" sociology of science. Clearly, the latter have not addressed the topic of discovery directly. But Brannigan seems close to them when he espouses both methodological relativism and ontological realism. He says his approach is "not inconsistent with" the work of Bloor and Barnes (p. 79), but there are features of his argument which suggest he would not wish to adopt the determinism characteristic of explanations of scientific action in terms of actors' interests.

Gus Brannigan's contribution is a useful clarification of a new perspective to be developed with respect to the phenomenon of discovery. It is an important book which deserves wide attention.

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Marc De Mey, *The Cognitive Paradigm*. Dordrecht: Reidel, 1982. 314 pp.

"With object perception as an exemplar for scientific vision and thought, we have more than a heuristic device" (p. 255). This is not a novel idea in epistemology, but it needed to be brought up to date. Dr. De Mey does this superbly. With quite exceptional lucidity, he explains how the study of computer models of human perception and reasoning throws quite a new light on the philosophy, psychology and sociology of science. There has always seemed real profundity in N. R. Hanson's use of the ambiguous pelican/antelope figure as a metaphor for the gestalt switch between competing theories. It is exciting to see how this metaphor can be extended and consolidated by the latest research on pattern recognition, machine translation, and other artificially intelligent devices.

The fundamental new development is summed up in the "cognitive" principle, which De Mey states as follows: "Any form of information processing, whether natural or artificial, requires a device that has, in some way or another, an internal model or representation of the environment in which it operates" (p. xv). In the theory of artificial intelligence, this internal model is called a frame, defined as "a collection of questions to be asked about a hypothetical situation; it specifies issues to be raised and methods to be used in dealing with them" (p. 204). In theories of perception, this model generates expectations of what will be seen - not, of course, in complete detail, but within certain general categories derived from previous experience. In scientific epistemology, the frames are the Kuhnian paradigms that delimit the puzzles to be solved by normal science, and act as blinkers against revolutionary theoretical conceptions.

Summarized thus, the cognitive view would probably be familiar to most contemporary epistemologists. The real power of De Mey's book is in chapters 10 and 11, where he shows how some of the insights that have been laboriously discovered by computer programmers can be applied to psychological and philosophical questions. A frame, for example, must not be thought of as a complete representation, down to the finest details: it normally represents the environment at a particular level of generality, within a nested hierarchy of other frames. Thus, in reading, the frames for words are nested within the frames for sentences, which are enclosed within more general frames for paragraphs. Attention focussed on the frames at a certain level can be oblivious to defects at a lower level; the sentence remains meaningful, even when its words are misspelled; an incomprehensible sentence need not obscure the gist of the paragraph. This is the justification for disregarding minor items of disconfirmatory evidence in the validation of general scientific theories - a point that has always presented insuperable logical difficulties in more formal philosophies of science. Again, the practical procedures by which puzzles are solved are not hierarchical but heterarchical. Sometimes a new piece can be fitted into a jigsaw puzzle because it has the right shape - i.e. answers a question in a low-level frame of meaning - while at other times the criterion for trying it is whether it seems to contribute to the picture as a whole. This seems an extraordinarily instructive way of talking about the growth of knowledge, with psychological implications beyond mere analogy. Is it possible, as Hofstadter and Dennett have argued,¹ that the human brain is systematically programmed to facilitate this sort of data processing and problem solving?

There can be no doubt that this point of view will turn out to be immensely fruitful in scientific epistemology. Other scholars will surely apply it to historical cases, as De Mey does to Harvey's discovery of the circulation of the blood. They will also want to use it to explicate other epistemological programs, as De Mey does those of Piaget in the final chapter. This could be the start of a real breakthrough in science studies.

But so far it is only a breakthrough on the psychological front. De Mey gives a very convincing analysis of the way that new understanding dawns on the individual scientist, but does not quite succeed in relating this process to the advancement of science as a collective enterprise. The generic scheme by which successive stages in information processing are related to successive metascientific theories (p. 34) is instructive, but not compelling. The chapters in Part 2, on the social structure of science, like the earlier ones on various standard philosophical and sociological themes, are as thoughtful and as beautifully clear as the rest, but they can only be recommended as review articles, for they do not seem to carry his main argument into new territory.

The reason for this is clear: he is unwilling to tackle the question that he quotes from me at second hand²—"to discover a unifying principle for Science in all its aspects" (p. 81). This is disappointing, for he has in his own hands most of the ingredients for at least one possible answer to this difficult question.

In the first place, he discusses the diverse "micro-worlds" that are used to guide cognition in ordinary life, as we progress from one domain of action to another, from the breakfast table to the highway, from the office to the supermarket. He quotes from William James, "each world, while it is attended to, is real after its own fashion; only the reality lapses with the attention" (p. 21). He is also well aware that these world models are not idiosyncratic. They are social entities, like the scientific paradigms to which they are analogous, as he emphasizes on p. 99; indeed, they must be shared by many individuals if there is to be any possibility of communication between them in a particular social context. In other words, if you are actually in the supermarket with me, we must both be having the same supermarket dream! De Mey would surely accept the sociological phenomenology of Schutz and Luckmann³ which emphasizes the intersubjectivity of such representations, and the apparent objectivity this gives to them for all who share them. The supposed objectivity of science cannot be any stronger than what we all hold in common about the everyday "life world," but it need not be any less so.

The second ingredient is public communication, which is central to the scientific enterprise. De Mey's account of the social structure of science is focussed on the analysis of the "literature" according to specialties, citation networks, and other indicative characteristics. Despite the usual caveats concerning the relative weights to be attached to the formal and informal channels respectively, he clearly does not dissent from the conception of science as "public knowledge," that is, as information generated expressly for public dissemination and ultimate storage in a public archive.

Although scientific knowledge has a significant tacit component, it belongs in essence to Popper's "Third World" of printed books, diagrams, maps, etc., or, as Bruno Latour would put it, it is communicated by means of "inscriptions." The cognitive view must be that scientific perception and cognition must be shaped by this medium of communication.

A third ingredient in a unified conception of science is the cooperative/competitive ethos of the scientific community. Merton's norm of "organized scepticism" is an essential factor in science, primarily because it strengthens the critical element in the cognitive processes of the individual. Accurate observation and strict rationality are not, as most philosophers optimistically assume, dominant human traits. The deficiencies of observation are well known, and indeed are convincingly explained by the cognitive paradigm. Current research in educational psychology⁴ confirms the findings of social anthropology⁵ that the various frames that make up the total world picture of any individual or group are seldom logically consistent with one another, even within the thoughts of a single person. But their implicit contradictions of fact and theory are only made apparent as a result of systematic investigation and critical argument. It is a nice question whether the cognitive view can discover an analogue for this social process in the mechanisms of individual perception and ratiocination, but this must surely be a matter on which De Mey would be well-informed.

The final ingredient comes from the work of Piaget, although not directly from his program of showing that "an understanding of the cognitive dynamics in children provides a key to understanding development in science" (p. 228). The point is that our emotional attachment to the material reality of the life world arises when the sensorimotor experience of the pre-linguistic child is reinforced by the intersubjective medium of language. This seems to be the mechanism by which abstract scientific paradigms are introjected from the domain of social knowledge into the mental domain of the individual student or scientist, and become relatively permanent frames for subsequent scientific cognition. It is this intimate blend of personal experience (e.g. through experimental work, solving normal puzzles, etc.) and social interaction that gives to scientific ideas a sense of realism that goes beyond mere objectivity.

It would be an abuse of the reviewer's privilege to try now to formulate the requisite "unifying principle" for science. Nevertheless, it seems to me that one can find in the "cognitive view" the main ingredients for a recipe for science, where psychological, philosophical and sociological tastes are intimately combined.⁶ Although De Mey does not put all these ingredients into his mixing bowl, they are all within easy reach on his kitchen shelf. Every serious student of the social phenomenon of science is therefore advised to read this book with the closest attention.

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Nathan Reingold and Ida H. Reingold (eds.), **Science in America: A Documentary History, 1900-1939**. Chicago: University of Chicago Press, 1981. 490 pp. \$37.50.

Nathan Reingold is well known among historians of science as one who took the history of American science seriously long before it was popular to do so. That it is now a well-respected specialty is as much a reflection of Reingold's work as anything, and those of us who write on the subject owe him much. His career has taken him from the National Archives and the Library of Congress to the Smithsonian Institution, where from the mid 1960's he has edited The Papers of Joseph Henry, which has done much to redirect our understanding of American science in the 19th century. His articles in this area began appearing in the 1950s but his most comprehensive overview appeared in 1964, as Science in Nineteenth-Century America: A Documentary History (Hill and Wang). Here he presented letters and other documents, together with his own extensive commentary, that did much to open the field for research. Many of us working on the history of American science have used this book in our teaching and were shocked several years ago when it was allowed to go out of print. But we were soon mollified by the news that he (with Ida H. Reingold, a distinguished mathematician) was preparing a similar documentary history for the first half of the 20th century. We knew it would take the Reingolds several years to prepare this book. After all, the documentary riches in university and other archives relating to American science in this period are almost overwhelming. Between 1900 and 1939, American scientists adopted the typewriter and carbon paper, but had yet to use the long-distance telephone with any regularity. From the millions of documents they went through, the Reingolds have selected a few hundred -- they do not give a number and I have not counted -- from forty-two major (and not-so-major) manuscript collections for presentation here. The result is a useful volume that will interest readers from a wide variety of fields.

In crusading for the history of American science as a specialty, Nathan Reingold has always stressed the importance of the social history of science, and this perspective is evident throughout this book. But the Reingolds are no simple "externalists" and in their "front matter" -- their Preface and Introduction -- they stress that they are concerned with the interplay of individuals, ideas, institutions and ideology within the framework of a scientific community. At times this context is The Scientific Community writ large, while at other times they focus on the interactions within a smaller setting centered around a discipline or even a narrower research problem. In any event, the book is broadly conceived, and the documents included here all serve one (or more) functions: "(1) to show the scientist at work or reflecting on the work; (2) to show interactions between members of specific research communities or between members of different research communities; (3) to show the scientists consciously responding to their environments or, at least, acting against a backdrop of events and institutions outside the bounds of the scientific disciplines" (p. xi).

The documents are organized in 13 chapters, focussing on: three institutions in each of three different periods -- the Carnegie Institution of Washington in the very early 1900s, the National Academy of Sciences around 1915, and the Institute for Advanced Study at Princeton in the late 1930s; the reactions of the scientists and their community to American entry into World War I and the War's aftermath; several specific disciplines -- astronomy, chemistry, physics,

mathematics, general biology, genetics, and scientific medicine -- as they developed before 1915; and two broadly-conceived disciplinary clusters -- biology and the physical sciences -- in the years after the first World War. Each chapter is introduced by a short introduction, which usefully lays out many of the issues the documents will raise and introduces the major protagonists. Also useful is the volume's Introduction, which discusses (among other topics) the way in which the archetypical locus for scientific research in America changed during the period in question. In doing so, the Reingolds stress the heritage of the 19th century, which saw the federal government support much science in each of several specialized bureaus. In the 20th century, of course, this tradition was largely swamped -- at least before World War II -- through the influence of private philanthropy, which endowed large universities and specialized research institutions. Here the Reingolds illuminate the way in which science interacted with the society that supported it and their speculations here on the deference shown scientists at different times in the history of a democratic society are especially interesting.

Many themes emerge from the documents and their presentation that will interest readers of 4S REVIEW. I cannot go through all, so here I will concern myself solely with three, as examples. One is the importance of private philanthropy for the development of 20th century American science, a topic already mentioned. This subject is of course a major focus of the chapters on the Carnegie Institution and the Institute for Advanced Study, which was supported by the Bamberger family of Philadelphia. But it also appears, in connection with the Rockefeller philanthropies, in documents relating to the rise of scientific medicine, and to the American scientists' reaction to World War I. Here the way in which philanthropy helped shape American science emerges, as those institutions that could not get access to foundation support -- like the Committee of 100 for Scientific Research of the American Association for the Advancement of Science -- withered and eventually died, while those that were funded thrived. Other scholars, like Robert Kohler and Stanley Coben, have looked at the importance of philanthropy for 20th-century American science and the prominent place this topic takes in the Reingold book should stimulate further work.

A second major theme relates to the relations between American scientists and European universities. In the 19th century, of course, thousands of Americans flocked to Europe -- primarily Germany -- to get advanced education then unavailable in America. By the early 20th century, the situation had changed and, in 1901, Theodore W. Richards of Harvard was offered a Professorship at Göttingen. The Reingolds print letters between Richards and his friends and colleagues that illustrate how Harvard, and the scientific community at large, reacted to the offer and arranged for Richards to stay in America. In the early 1910s, however, Norbert Wiener studied at Cambridge, England, and Göttingen, and in the mid-1920s travelled through Europe, and his letters reflect insightfully on the development of American science and its relations with that being done in Europe at the same time. (In addition, his letters are a special joy to read, as his descriptions of England and Germany and of his European hosts -- written for his friends and family -- are insightful and charming and often humorous.) In the 1930s, with the rise of the Nazis, many European scientists began coming to America, and the Reingolds include several letters relating to Albert Einstein's arrival at the Institute for Advanced Study. But this is one topic that they might well have explored further.

The importance of the scientific administrator for 20th-century science is a third major theme that emerges here. The most prominent ones who the Reingolds discuss here are, perhaps, Robert S. Woodward of the Carnegie Institution and Abraham Flexner of the Institute for Advanced Study, though if George E. Hale -- who resurrected the National Academy -- is counted as an administrator, his achievement clearly ranks with theirs. In illustrating how Woodward was able to redirect the direction of Carnegie Institution's research efforts, and how Flexner had to yield to Einstein's desires on several issues, the documents included here do much to indicate just what scientific administrators can and cannot do.

Despite the strengths of this book, it unfortunately cannot be used for teaching, unlike Nathan Reingold's 19th-century volume. Its price, of course, is too high, but the way in which the Reingolds present the documents restricts their accessibility all too greatly. That is, they explicitly chose to keep their editing to a "decent minimum," and while most individuals mentioned in the letters are identified, the Reingolds otherwise provide the reader with little guidance in interpreting each document. Though one can readily understand their choice, there are many points at which even a reader familiar with 20th-century American science wishes the Reingolds had told more of what they know.

Finally, the Reingolds were ill served by their copy editors or proofreaders. Certainly someone should have caught such repeated mistakes as Adolph Hitler and Francis B. Galton and James McKean Cattell. Such errors are annoying.

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RECENT PUBLICATIONS**SOCIOLOGY OF SCIENTIFIC KNOWLEDGE****A Source Book****Edited by H. M. Collins**

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SPECIAL ISSUE:
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*A bibliography of early modern algebra,
1500-1800*

Berkeley Papers in History of Science,
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Compiled by Robin E. Rider. 175 pp. June 1982.
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Compiled by Roger Hahn. June 1982. \$5.00.

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The *Calendar* lists chronologically the archival locations of documents or letters exchanged from 1771 until Laplace's death in 1827. Citations to published versions of the documents and notices in auction catalogues are included when applicable. The index of names refers both to correspondents and to persons mentioned in the documents.

ALBERT EINSTEIN

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THE CENTENNIAL SYMPOSIUM IN JERUSALEM



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SOCIETY NEWS

**LOCAL ARRANGEMENTS COMMITTEE--8TH ANNUAL MEETING
PRELIMINARY ANNOUNCEMENTS**

Late autumn in the mountains will be providing the site for the 4S meeting next November in Blacksburg, Virginia, USA. Blacksburg is a small university community with a resident population of 20,000, and an additional 20,000 students. Daily temperatures this time of year can range from below freezing to moderately warm. Evenings are chilly.

The community is served by Roanoke airport, and there are both direct and connecting flights daily from other major cities, including Washington, New York, Atlanta, and Chicago. The airport is approximately 65 kilometers from Blacksburg. Regular limousine service is available. Cab service is also available but expensive. Automobile rental can also be arranged. Blacksburg is easily accessible by ground travel on the Interstate System (I-81).

The main conference center is the Marriott Hotel, which is adjacent to the Virginia Tech campus and a shopping mall. Maximum room prices are \$45/single, \$50/double. There is also a Holiday Inn and a Sheraton Hotel within four kilometers of the Marriott.

Detailed travel and accommodations materials will be provided in the next issue of the 4S REVIEW.

**PLEASE SEE PRELIMINARY ANNOUNCEMENT FROM PROGRAM COMMITTEE
--ON PAGE 28--**

1983 4S MEETINGS**BLACKSBURG, VIRGINIA****NOVEMBER 4-6**

An exciting program is taking shape for the 1973 4S meetings to be held at the Marriott Inn in Blacksburg, Virginia, near the campus of the Virginia Polytechnic Institute and State University, popularly known as "Virginia Tech." The meetings will take place Friday, Saturday, and Sunday, November 4th, 5th, and 6th.

While the program has not yet been made final, the following list of prospective sessions should give some idea of the range of topics that will be covered:

- Is There a Logic of Technological Development?
- Sociology of Technology
- Psychology of Science
- Comparative Analysis of Science-Related Controversies
- Closure of Scientific Controversy
- Is the "Scientific Community" a Myth?
- Women in Science
- Nuclear Weapons and Public Policy
- Evolutionary Selection of Ideas
- Dynamics and Use of Scientific Literature
- Public Relations of Science
- Peer Review and Evaluation
- Funding and the Development of Specialties

Although some of the sessions will be filled by the time you read this, others may still be open. Furthermore, discussants may be needed for some sessions: let your interests be known. Papers, abstracts, and inquiries should be sent as soon as possible to:

Professor Ron Westrum (Program Chair)
Department of Sociology
Eastern Michigan University
Ypsilanti, Michigan 48197

Telephone 313-487-1073 or 313-487-0012

THIS SHOULD BE A MOST INTERESTING MEETING.
PLEASE MAKE PLANS TO ATTEND!

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 Bloomington, Indiana 47405
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REPORT FROM SECRETARY-TREASURER--FUNDS AND MEMBERSHIP

--1982--

Budget Report and Financial Condition

	Budgeted	Realized	Balance
<u>INCOME:</u>			
Membership Renewals	\$ 4,700	\$ 4,747.65	\$ 47.65
New Members	1,500	1,525.00	25.00
Annual Meeting	2,000	-0-	(2,000.00)
Bernal Prize	1,000	1,000.00	-0-
Mailing Labels	-0-	175.00	175.00
Totals	\$ 9,200	\$ 7,447.65	\$(1,752.35)

EXPENSES:

Newsletter	\$ 4,400	\$ 4,724.40	\$ (324.40)
Duplicating/Postage	1,000	1,282.24	(282.24)
Secretarial	750	750.00	-0-
Telephone	200	327.82	(127.82)
Annual Meeting	2,000	480.50	1,519.50
Bernal Prize	1,150	1,294.76	(144.76)
Miscellaneous	300	332.37	(32.37)
Totals	\$ 9,800	\$ 9,192.09	\$ 607.91

Financial Condition on 31 December 1982

Balance, 1 January 1982-----\$10,498.00
Income for 1982----- 7,447.65
Expenses for 1982----- (9,192.09)
Balance on 31 December 1982- \$ 8,753.56

Membership Data

Location	<u>Members as of 12/31</u>	
	1981	1982
<u>UNITED STATES:</u>		
Professional	235	249
Student	26	40
Institutional	13	16
<u>INTERNATIONAL:</u>		
Professional	73	85
Student	3	10
Institutional	13	16
<u>GRATIS:</u>	12	14

ANNOUNCEMENTS:FEDERAL AGENCIES**NATIONAL SCIENCE FOUNDATION
PROGRAM ON ETHICS AND VALUES IN SCIENCE AND TECHNOLOGY**

New consolidated guidelines, for both project and individual awards, are now available. Preliminary proposals, now requested of all applicants, are next due on May 1, 1983. Guidelines are available from Forms and Publications, NSF, Washington, D.C. 20550. For further information, contact Rachelle Hollander at EVIST 202/357-7552.

**NATIONAL SCIENCE FOUNDATION
DIVISION OF POLICY RESEARCH AND ANALYSIS**

The National Science Foundation's Division of Policy Research and Analysis is sponsoring a workshop on "Federal Funding and the Growth of Knowledge in Subfields and Specialties of Science." The workshop will be held May 26, 1983, in Room 540 of the National Science Foundation. Five pilot case studies which examine the social and intellectual growth of subfields or specialties in relation to their funding histories will be presented and discussed. Through interaction between policymakers and the social studies of science community, the workshop is intended to: (1) formulate a set of policy-relevant questions raised by the pilot studies; (2) assess the data and methods available to address those questions; and (3) identify the characteristics of case studies or other approaches which could be used to answer the questions.

Attendance at the workshop is open. If you plan to attend, or if you would like to discuss research ideas in this area, please contact Susan Cozzens at the National Science Foundation, Room 1229, Washington, D.C. 20550, or by phone at (202) 357-7826.

The Division is also planning a colloquium on "Federal Funding and the Direction of Scientific Research" for late June, but a date has not been set. Contact Ms. Cozzens to be put on the mailing list for information about this gathering.

ANNOUNCEMENTS: FUTURE CONFERENCES

**AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
NATIONAL SCIENCE FOUNDATION--EVIST PROGRAM
PROFESSIONAL ETHICS SYMPOSIUM**

What standards should we use to judge the scientific and social merits of scientific and technical claims? To discuss this question, a symposium on "Expert Claims and Social Decisions: Issues for Professional Ethics and Accountability" has been scheduled for the upcoming Annual Meeting of the American Association for the Advancement of Science in Detroit, Michigan. The session will be in the Westin Hotel in Detroit's Renaissance Center, room LaSalle-A, on Friday, May 27, 1983, from 2:30 P.M. - 5:30 P.M.

Speakers will report on current research concerning professional responsibility in the areas of biological monitoring in the workplace, psychological testimony in the courtroom, and computer modelling for government use. They will discuss measures to introduce accountability into public policy processes involving scientists and engineers.

For further information about the session, contact Rachelle Hollander, Program on Ethics and Values in Science and Technology, National Science Foundation, 1800 G Street, N. W., Washington, D.C. 20550.

**DENISON COLLEGE
SUMMER CONFERENCE ON THE
HISTORY AND PHILOSOPHY OF BIOLOGY**

A cross-disciplinary conference on the history and philosophy of biology will be held on the campus of Denison College, Granville, Ohio from July 18-23, 1983. This conference is open to biologists, historians, philosophers, and members of science-studies disciplines. Those people who wish to read papers are invited to submit abstracts of reports of work-in-progress (1-2 pages, three copies) by March 15. Suggestions for workshop topics and leaders are also welcome. Thirty minutes from the Columbus airport, the Denison campus is easily accessible with connections from most major cities. Accommodations are available on the campus: costs will be approximately \$18.50 per day, double occupancy including meals and \$21.50 single occupancy with meals. Report proposals, workshop suggestions, and inquiries may be directed to Prof. Richard Burian, Dept. of Humanities-Communications, Drexel University, Philadelphia, PA 19104. On the last day of the conference a group will meet to discuss developments in cognitive psychology and the philosophy of psychology; those interested in these sessions may contact Prof. Philip Glotzbach, Dept. of Philosophy, Denison College, Granville, OH 43023.

JOINT EASST/STSA CONFERENCE

**Imperial College, University of London
Friday, September 16 to Sunday, September 18, 1983**

Choice in Science and Technology

(Preliminary Notice)

Conference Theme

Choice is implicit in much of the discussion of issues, theoretical and practical, in social studies of science and technology. What 'paradigm choice' exists when one paradigm is about to be replaced by another? What evidence is there that external funding can alter the internal view of the relative prestige of areas of research? Can a developed nation eschew the use of a major technology or merely moderate the extent of its use? Can a developing nation choose an alternative technological path? These questions raise issues of choice calling for commentary from areas at least as diverse as Philosophy, History and Sociology of Science, and Science Policy Studies. Moreover, choice, its nature, extent and locations, is the core of the challenge not only from students to the teacher of Science, Technology and Society Studies but also for practitioners involved in making implicit or explicit choices. Why should students bother if when in employment, they never have the opportunity to choose?

Conference Sessions

Provisional Plenary Sessions: Choice in Laboratory Life; Choice in Industrial Life; Choice for the Market Place; Choice in Funding Research; Choice for War; Choice for Developing Nations; Choice in Theory and Choice in the Curriculum.

Group sessions will be organized to meet the interests of participants, who will be invited to submit a synopsis of the contribution they wish to make. Contributors selected for the programme will be invited to submit a short paper for inclusion in the Conference Papers, which will be issued to all participants. Provisional final dates for receipt of synopses is 1 June 1983 and for papers is 12 August 1983.

Cost

It is planned that the Conference Fee will be not more than \$20. A reduced Conference Fee will apply to members of EASST or STSA. Accommodation will be available in University Halls of Residence for the nights of 16 and 17 September and, particularly for overseas participants, a limited number of rooms will be available for the night of Thursday 15 September.

Further Information

To ensure receipt of full details of the Conference and an application form please return tear off slip, or write, to: Miss Helen Stiffin, Rowntree Fellow, STSA Support Centre, Newcastle-upon-Tyne Polytechnic, Lipman Building, Newcastle-upon-Tyne, NE1 8ST, United Kingdom.

Full details and application forms will be sent out during April 1983.

ORGANIZING BODIES

European Association for the Study of Science and Technology

The goal is to stimulate the scientific and scholarly study of Science and Technology including their historical development and their role in Society by: (1) improving communication in the field in Europe, (2) increasing visibility of the field in Europe and also to policy makers and the general public, and (3) stimulating and supporting teaching at all levels.

Membership is open to individuals, organizations and institutions.

Science Technology and Society Association

The association aims to promote study and research of the social implications of scientific and technological development. While it is United Kingdom based it has members in a number of other countries. Like the organization which was its progenitor, SISCON, it is centered on the needs of teaching of STS but has much broader contacts. Membership is open to individuals and institutions.

ANNOUNCEMENTS: FELLOWSHIPS

UNIVERSITY OF BATH--UK

Fellowship for Research on

INDUSTRY, TECHNOLOGY, AND EXPERIMENTAL SCIENCE:

The Fortunes of Applied Research in 19th Century Britain

Applications are invited for a three-year Graduate Fellowship at the University of Bath, for research leading to the Ph.D., from those interested in some aspect of the interactions of science, technology and industry in Victorian Britain. Applicants should have a good first degree, preferably (but not necessarily) in social history or history of science/technology. The fellowship includes a living allowance and U.K. tuition fees. A successful overseas applicant may qualify for additional financial support to offset the difference between home-based and overseas tuition fees. Contact: Dr. D. C. Gooding, Science Studies Centre, University of Bath, Bath BA2 7AY, England. Applications must be filed by 15th July 1983.

NATIONAL ENDOWMENT for the HUMANITIES

OFFERS FELLOWSHIPS for 1984-85

The National Endowment for the Humanities announces the availability of three categories of fellowships for 1984-85: Fellowships for Independent Study and Research, Fellowships for College Teachers, and Constitutional Fellowships.

Fellowships for Independent Study and Research are for scholars, teachers, and others who can make significant contributions to thought and knowledge in the humanities and want time to enlarge their contributions and enhance their scholarly abilities. Both younger and senior scholars are encouraged to apply.

Fellowships for College Teachers are for teachers whose day-to-day responsibilities lie in the teaching of undergraduate students, particularly in two-year, four-year, and five-year colleges and in universities that do not have PhD programs. The program is predicated upon an equal respect for study and research directed toward scholarly publication and study and research directed toward course content and teaching. Proposals may therefore have either aim.

Funds permitting, 120-130 fellowships will be available for 1984-85 in each of these programs. In addition, a small number of Constitutional Fellowships will be offered through a special competition held in anticipation of the 200th anniversary of the founding of the U. S. Constitution. Applications may come from any college or university teacher or any independent scholar, and proposals may address the history of the founding period, constitutional principles, comparative constitutional government, individual rights, the character of democracy, American Federalism, American political institutions, Constitutional interpretation, or any other topic that would be appropriate to the observation of the Constitutional Bicentenary.

All NEH fellowships are for periods of six to twelve months and stipends range up to \$25,000. The application deadline for 1984-85 is June 1, 1983, for all fellowships; awards will be announced by approximately December 1, 1983; and successful applicants may begin tenure of their Fellowships as early as Jan. 1, 1984. Application guidelines and materials are available from the Division of Fellowships and Seminars, Room 316, National Endowment for the Humanities, Washington, D.C. 20506.

**UNIVERSITY OF BATH, UK
Science Studies Centre**

Students who have or expect to obtain good degree results (equivalent to U.K. first-class honours) and who wish to do research in science studies for a higher degree at Bath, are invited to enquire about the possibility of graduate support grants covering fees and maintenance. The university may have additional funds available. Contact: Dr. H. M. Collins, Director, Science Studies Centre, University of Bath, Bath BA2 7AY, England.

ANNOUNCEMENTS: POSITIONS AVAILABLE

**MICHIGAN TECHNOLOGICAL UNIVERSITY
Science, Technology, and Society Position**

Michigan Technological University has a position in Science, Technology, and Society. Assistant or Associate Professor to join a growing STS program; a tenure track position starting September 1, 1983. Ability to teach in any one of the social sciences and in an area linking science and/or technology-engineering and society is essential, as is a clearly demonstrated commitment to research in technology and/or science and their social, geographic or policy relationships. Research and teaching interests should be centered primarily in the United States in recent or contemporary times.

To assure consideration, applications should be received by May 1. Send letters of application, three letters of recommendation, vita and publication reprints to George H. Daniels, Chair, Search Committee, Department of Social Sciences, Michigan Technological University, Houghton, Michigan, 49931, phone: (906) 487-2113.

ANNOUNCEMENTS: WORKSHOPS**WORKSHOP ON ETHICAL ISSUES IN THE HEALTH PROFESSIONS
AND THE BIOMEDICAL SCIENCES****June 19-24, 1983****Vassar College****Sponsored by THE HASTINGS CENTER****ORGANIZATION**

The purpose of the Workshop is to bring together, for both formal and informal interchanges, those concerned with exploring some of the major ethical problems in health care. The basic assumption behind the idea of the Workshop is that ethical issues in health care cut across a number of varied professions and disciplines; and that it is valuable for those concerned with the issues to explore these problems in both a cross-disciplinary as well as a disciplinary way.

The Workshop will be organized in such a way that occasions will be provided (1) for some common, selected problems to be discussed by the participants as a whole; and (2) for those with an interest in particular health care professions to spend time together working on problems within these professions or areas of interest. Morning sessions will thus be devoted to lectures on major general topics of biomedical ethics, followed by mixed, small discussion groups made up of persons from different fields and professions. Afternoon seminars, by contrast, will bring together those with a common interest in the same field, to allow them to work together systematically on issues of special relevance to one of the health professions or biomedical sciences. One of the evening sessions will be given over to pedagogical problems of teaching ethical issues in health care at both the undergraduate and professional school levels. Time will also be available to meet participants for discussion of areas of interest not listed on the program.

ELIGIBILITY AND COSTS

The Workshop is open to anyone with a serious interest in ethical issues in health care and the biomedical sciences. We expect that the participants will come from various professions—medicine, nursing, social work, health and administration, as well as from such fields as philosophy, law, religion, and sociology, to name a few. We also anticipate that the participants will have varying interests and responsibilities within the field of health care as educators, administrators, researchers, and clinicians. However, this list does not exhaust the possibilities, and we expect others with either a theoretical or practical interest in medical ethics to apply. The Workshop fee is \$300, in addition to room and board charges.

FOR ADDITIONAL INFORMATION, WRITE TO:

WORKSHOP ON ETHICAL ISSUES IN
THE HEALTH PROFESSIONS

The Hastings Center

360 Broadway

Hastings-on-Hudson, New York 10706

(Telephone: 914-478-0500)

ANNOUNCEMENTS: CURRICULA MATERIALS**Center for the Study of Ethics in the Professions
Illinois Institute of Technology****Modules Selected for Applied Ethics Education**

With support from the Exxon Education Foundation, IIT's Center for the Study of Ethics in the Professions is producing a series of instructional modules in applied ethics. They are intended for use in a wide range of undergraduate, graduate and continuing education courses. Each module consists of an essay, illustrative case studies, and a bibliography. After a widely publicized call for proposals, writers and topics were chosen by a rigorous selection process. Drafts of the modules will be tested and evaluated by cooperating faculty at institutions throughout the country.

Following are the authors and subject areas of the nine modules in preparation:

Whistleblowing: JAMES C. PETERSEN (Sociology) and DAN FARRELL (Management), Western Michigan University

Risk-Benefit Analysis: MARK SAGOFF (Philosophy), Center for Philosophy and Public Policy, University of Maryland

Engineering Codes of Ethics: HEINZ C. LUEGENBIEHL (Philosophy), Rose-Hulman Institute of Technology

Engineers' Responsibilities for Supplying Trustworthy Information on Policy Issues to the Public: NORMAN BALABANIAN (Engineering), Syracuse University

Technology Assessment: A Historical Approach: RONDO CAMERON and A. J. MILLARD (History), Emory University

Professional Responsibility for Harmful Actions: MARTIN CURD and LARRY MAY (Philosophy), Purdue University

Who Owns Your Ideas? Professional Autonomy and Organizational Control of Knowledge: ERIC J. NOVOTNY (Political Science), Communications Satellite Corporation (COMSAT)

The Moral Status of Loyalty: MARCIA BARON (Philosophy), University of Illinois -- Urbana

Conflicts of Interest: PAULA WELLS (Engineering), Wells Engineers Inc., and HARDY JONES (Philosophy), University of Nebraska

The modules should be available for general distribution in late 1984.

ADVISORY PANEL

Carl Ahlers, Executive Director (Research and Engineering Support), Cummins Engine Company

Vere Chappell, Professor (Philosophy), University of Massachusetts

Alan H. Goldman, Professor (Philosophy), University of Miami

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PROJECT STAFF

March S. Frankel, Project Director

Vivian Weil, Series Editor

Julie Siegel, Editorial Assistant

ANNOUNCEMENTS: INFORMATION ON OTHER SOCIETIES

EUROPEAN ASSOCIATION FOR THE STUDY OF SCIENCE AND TECHNOLOGY

EASST was founded in 1981 to stimulate communication, exchange and collaboration in the field of studies of science and technology in Europe. One reason to establish an interdisciplinary scholarly society is the merging of history, philosophy, sociology and psychology of science in recent years. Another reason is the importance of connecting these perspectives with economics and political and policy studies of science and technology. Thus, cross-disciplinary interaction, and cross-fertilization between humanistic and policy-oriented studies in the field are important aims. Finally, the variety of scholarly, cultural and political styles in Europe is both a challenge to communication and exchange, and itself an important aspect of studies of science and technology in Europe.

Activities of EASST are:

- the publication of a quarterly Newsletter
(inspection copies can be obtained from the secretary of EASST)
- the organization of a regular open conference of a general nature
(in September 1982, the first general conference was held in Deutschlandsberg, Austria; in September 1983, the second general conference will be held in London)
- the participation in the organization of small workshops and conferences.
(these are deemed especially important for informal communication and exchange)

At the same time, relations are being sought or strengthened with existing disciplinary societies and national and international bodies. EASST will complement these societies and bodies, not compete with them.

To become a member of EASST, the membership form at the back should be sent to the secretary, and the membership dues for 1983 (£4, DM16 or its equivalent) should be paid.

A special offer, valid during 1983, is a 25% reduction on new subscriptions to *Social Studies of Science*, a leading journal in the field, published by SAGE, 28 Banner Street, London EC1Y 8QE, Britain. When entering the new subscription, EASST membership should be quoted.

For further information, write to Arie Rip, EASST secretary,
Chemistry and Society Programme, University of Leiden,
P.O. Box 9502, 2300 RA Leiden, Netherlands

[41]
MEMBERSHIP FORM

EUROPEAN ASSOCIATION FOR THE STUDY OF SCIENCE AND TECHNOLOGY

Name:

Mailing address:

Professional affiliation and/or field of research:

Membership form to be sent to: Arie Rip, EASST secretary
Chemistry and Society Programme,
University of Leiden, P.O. Box 9502,
2300 RA Leiden, Netherlands

Membership dues for 1983 (£ 4, DM 16, or its equivalent) have been paid by one of the following means (indicate the method chosen):

☐ by postal giro, to account no. 5438630, in the name of
Arie Rip/EASST, Bergschenhoek, Netherlands

or

(for those in Britain or outside Europe, where payment by check is more convenient)

☐ by check, made out to EASST and sent to Prof. John Ziman,
Imperial College, 53 Prince's Gate, Exhibition Road, London SW 7 2PG, England

or

☐ other means: . . .

ANNOUNCEMENTS: INTERNATIONAL DEVELOPMENTS

Our colleague, Professor Ubiratan D'Ambrosio (University of Campinas, Brazil), has informed us of the following developments:

- (1) Last August the "Sociedad Latinoamericana de Historia de las Ciencias y la Tecnologia" was founded in Mexico. For further information, contact:

Dr. Juan José Saldaña G.
Facultad de Filosofia y Letras
UNAM - Iztapalapa
Apartado Postal 21-873
04000 Mexico, DF - Mexico

- (2) The National Council for Scientific and Technological Development of Brazil (CNPq) sponsors a "Nucleo de Historia da Ciência e da Tecnologia" with headquarters in the Department of History of the University of Sao Paulo (USP). Its main project is a Social History of Science in Brazil. The coordinator is:

Professor Shozo Motoyama
Departamento de Historia, FFLCH
Universidade de São Paulo
Caixa Postal 8105
CEP 05508
São Paulo, SP, Brazil

- (3) The "Sociedade Brasileira de Historia da Ciência" has been organized recently. Further information can be obtained from:

Professor Simão Mathias
Instituto de Química
Universidade de São Paulo
Caixa Postal 20780
01000 - São Paulo, SP
Brazil

ANNOUNCEMENTS: FROM OTHER JOURNALS

SOCIAL STUDIES OF SCIENCE

An International Review of Research in the
Social Dimensions of Science and Technology

EDITORS

David Edge, Science Studies Unit, University of Edinburgh-UK
Roy MacLeod, Department of History, University of Sidney

How does science change and affect society? How does the social activity that is science produce its results? How is it structured? How has it developed? What is its role in public policy?

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4S REVIEW

Journal of the Society for Social Studies of Science

The **4S REVIEW** is published four times each year, beginning in the spring of 1983 with Volume 1, Number 1. The **4S REVIEW** succeeds the **4S Newsletter** which concluded with Volume 7, Number 4.

4S REVIEW is sent to all members of the **Society for Social Studies of Science**; membership is on a calendar year basis. There are three categories of membership: **Professional**, \$15; **Students**, \$5; **Institutional** (including libraries), \$25.

Correspondence concerning membership and subscriptions should be sent to:

Lowell Hargens
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Department of Sociology
Indiana University
Bloomington, Indiana 47405

Correspondence concerning manuscripts for publication, reviews, opinions, and news should be sent to the appropriate editor:

Jerry Gaston, Department of Sociology, Texas A&M University,
College Station, Texas 77843

Lawrence Stern, (Book Reviews), Department of Sociology, College
of the Holy Cross, Worcester, Massachusetts 01610

Steve Woolgar, (News), Department of Sociology, Brunel University,
Uxbridge Middlesex, UB8 3PH, United Kingdom

Terry Shinn, (News), Groupe d'Étude des Méthodes de L'Analyse,
Maison des Sciences de L'Homme, 54 Boulevard Raspail,
75270 Paris, France

David Miller, (News), School of History and Philosophy of Science, University of
New South Wales, Kensington, N.S.W., 2033 Australia

Thomas Gleryn, (Bibliography and Literature), Department of Sociology,
Indiana University, Bloomington, Indiana 47405

4S REVIEW

**Department of Sociology
Texas A&M University
College Station, Texas 77843**

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