

4S Society for Social Studies of Science

Spring 1982

Volume 7 Number 1

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4S Society for Social Studies of Science

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PROGRESS REPORT

PREPARATIONS FOR THE SEVENTH ANNUAL MEETING

University of Pennsylvania
Philadelphia
October 27-30, 1982

As of March 1, 1982, the 4S Program Committee (Thomas F. Gieryn--Chair; Judy McGaw; Roberta Balstad Miller; Michael J. Mulkay; Sal Restivo; Spencer Weart; Ron Westrum) has received fifteen proposals for papers to be presented at the 1982 Meetings in Philadelphia. In addition, the organization of four sessions is underway:

"Philosophical and Sociological Orientations to Scientific
Discovery"

"Critical Perspectives on Science and Society"

"Biographical Approaches in The Social History of Science"

"Fraud in Science"

Since we hope to have twelve distinctively 4S Sessions, it is clear that the program is very much wide open. We shall extend the deadline for submission of abstracts to April 15, 1982. Please send all proposals to:

Thomas F. Gieryn
Department of Sociology
Indiana University
Bloomington, IN 47405

While the Committee will referee proposals on any topic of interest to the 4S Membership, we especially encourage submissions on the 16 topics listed on page 17 of the last 4S Newsletter (Fall/Winter 1981).

Minutes of the 4S Council Meeting

Atlanta, Georgia Nov. 5, 1981

Present: Council Members - B. Barber, D. Chubin, L. Hargens, M. Mulkay,
A. Thackray
4S Newsletter editor - J. Gaston
Visitors - D. Price, A. Rip

- I. President Barber called the meeting to order at 10:15 A.M., and announced the results of the 1981 election of 4S officers.

President elect	--	Arnold Thackray
Sec.-Treas. elect	--	Lowell Hargens
Council members elect	--	Rae Goodell Walter Hirsch* John Holmfeld Linda Lubrano Spencer Weart

*Will complete A. Thackray's term on the Council.

- II. D. Chubin reported on arrangements for the Atlanta meetings. The Council expressed its thanks for Chubin's excellent work in chairing both the local arrangements committee and the program committee.
- III. J. Gaston reported on the developing publication policy of the 4S Newsletter. The Council discussed means of encouraging members to submit material for publication, including research papers. The Council affirmed the importance of having a substantial publication outlet for the well-being of the Society, and agreed on plans to gradually transform the Newsletter into a journal. Council members dedicated themselves to the advertisement of publication opportunities in the Newsletter.
- IV. The Secretary-Treasurer reported on 4S membership and financial status as of October 31, 1981 (The final 1981 report appears below). The Council discussed means of expanding 4S membership, and authorized the Secretary-Treasurer to make further expenditures to advertise the society to non-members. Special attention was paid to the problems of recruiting students for 4S membership.
- V. The Council discussed the appointment of new members to 4S committees. It was decided that committee memberships should be reported each year in the 4S Newsletter so that the Society's membership might have a clearer knowledge of ongoing 4S activities and appropriate persons to contact about questions and problems (See pp. 4-8, 4S Newsletter Vol. 6, No. 4).
- VI. The Council discussed arrangements for the 1982 4S meetings to be held in Philadelphia, PA, October 28-31. A. Thackray informed the Council that

the Philosophy of Science Association and the Society for History of Technology have decided to join the History of Science Society and 4S for another joint meeting of all four societies in Philadelphia. The chair of the local arrangements committee for the Philadelphia meetings is Henrika Kuklick of the Department of History and Sociology of Science, University of Pennsylvania.

The Council discussed possible sites for the 1983 4S meeting. J. Gaston suggested that a future meeting might be held at Texas A & M University, and the Council asked him to look into the possibility, in consultation with the Committee on Future Meetings.

The Council also discussed the possibility of holding a future meeting in Europe. It was decided to discuss this possibility with European members in attendance at the Atlanta meetings (which discussion led to the establishment of a sub-committee on a European Meeting: see p. 6, 4S Newsletter Vol. 6, No. 4).

- VII. A. Rip reported on recent developments in science studies in European, and suggested the possibility that 4S might become affiliated with the recently formed European Assn. for the Study of Science and Technology (EASST).

The meeting was adjourned at 12:25 P.M.

Final 1981 4S Budget Report

<u>EXPENSES</u>	<u>AMOUNT BUDGETED</u>	<u>EXPENSES</u>	<u>BALANCE</u>
Newsletter	4400	3455.90	944.10
Duplicating and Postage	700	444.86	255.14
Secretarial	700	700.00	0.00
Telephone	100	48.90	51.10
Miscellaneous	200	116.26	83.74
Annual Meeting	2000	1454.32	545.68
Bernal Prize	<u>0</u>	<u>1121.00</u>	<u>-1121.00</u>
TOTAL	8100	7341.24	758.76

<u>INCOME</u>	<u>EXPECTED INCOME</u>	<u>ACTUAL INCOME</u>
Membership renewals	4650	5785.00
New Members	1000	565.00
Annual Meetings (1980 and 81)	2000	2412.27
Mailing labels	--	300.00
Bernal Prize (from I.S.I.)	--	1000.00
Balance from 1980	<u>5800</u>	<u>7777.27</u>
Total	13450	17839.54

INCOME 17839.54

EXPENSES 7341.24

BALANCE 10498.30

CHARTER

Society for Social Studies of Science (Revised)

I. Preamble

This organization is called the Society for Social Studies of Science. Its purpose is to promote research, learning and understanding in the systematic social analysis of science. The Society is an independent organization which cooperates with other organizations having similar interests.

II. Organization

A. Membership.

Membership in the Society includes all scholars interested in the social and policy aspects of science who have paid their current dues.

B. Offices and Election.

1. The Society has the following elective officers: a president, a secretary-treasurer, and seven other council members. The term of office are: president--two years; secretary-treasurer--three years, council members--two years.
2. Four voting members of the council constitutes a quorum. Voting members of the council consist of the elected officers. Ex-officio members of the council, as specified below, are non-voting members.
3. There shall be a standing committee on annual meetings.
4. There shall be a standing committee on publications.
5. A nominating committee consisting of the president as chair and four other members of the Society designated by the president, no more than two of whom are officers, shall present to the Society at least six months before the annual meeting at least one nominee for each office to be filled.
6. Further nominations by petition signed by five members shall be presented to the president at least four months before the annual meeting.
7. Election shall be by mail ballot, the results to be announced at the annual meeting.
8. The retiring president shall serve for two years as an ex-officio council member, but shall be otherwise ineligible for election in that period.
9. Four members of the council shall be elected in odd-numbered years, three in even-numbered years.
10. All officers must be members of the Society.
11. If an elective office becomes vacant, the council shall appoint a replacement who will serve until the next annual election, at which time a person will be elected to serve out the remainder of the term.

III. Duties of Officers

A. The President.

The president of the Society or a designated member of the council shall preside at all meetings of the Society and the council. The president also is responsible for the program at the annual meeting.

B. The Secretary-Treasurer.

The secretary-treasurer shall keep the records of the Society and shall receive and have custody of funds of the Society. The accounts shall be subject each year to an audit by members chosen by the president of the Society or by a certified public accountant. At the end of each three-year term the accounts must be audited by a certified public accountant. The secretary-treasurer shall be responsible for communicating the agenda of coming council meetings to members through the newsletter and for presenting any responses or suggestions received from members at such council meetings. The secretary-treasurer shall perform such other duties as the council shall assign.

C. The Council.

The council shall set membership dues and have control and management of the funds of the Society. It shall act as a committee on time and place of meetings, and perform such other duties as the Society may delegate to it. The council may adopt any rules and regulations for the conduct of its business not inconsistent with the Charter of the Society. The council will regularly communicate its actions to the membership.

IV. Committees

The council shall recommend standing committees to the Society membership for its approval or rejection in annual meetings. Proposals for changes in the standing committee structure may also be moved by any member of the Society in annual meetings. Officers of the Society may be appointed by the president to sit as ex-officio members of any committee.

The president may appoint ad hoc committees as circumstances dictate or the council recommends. With the approval of the president, committees may be established that include non-members.

V. Activities

A. Meetings.

The annual business and other meetings of the Society shall be held at such time and place as are determined by the council. Adequate notice of such time and place shall be given to members of the Society. Special meetings of the Society may be called by action of the council. Meetings of the council shall be called by the president or at the request of a quorum of the council.

B. Publications.

The Society, acting through the council, will seek to publish appropriate literature (including a newsletter) for distribution to the membership and for sale.

C. Facilitation of the Society's Activities.

The Society, acting through the council, may receive and disperse funds in order to carry out its activities.

VI. Amendments

Proposed amendments to this Charter may be submitted at any time by any member to the council of the Society for consideration at its next meeting. Recommendations of the council shall be reported at the annual business meeting of the Society and such recommendations shall be approved, revised or rejected by majority vote at that meeting. Recommendations, if approved, shall be put to a mail ballot of the Society for ratification by a majority of those voting.

"Kuhn - The Conservative and Radical Interpretations
Are Some Mertonians "Kuhnians" and Some "Kuhnians" Mertonians?*"

T. J. Pinch
University of Bath

Introduction

It is now twenty years since Kuhn produced his seminal work, The Structure of Scientific Revolutions (SSR) (Kuhn, 1962). In that time there has been much debate and discussion over the validity of the Kuhnian analysis.¹ Kuhn himself has formented the debate by expanding upon and, in many cases, revising the notions put forward in SSR (Kuhn, 1977). It is not my intention here to add to this literature by presenting another discussion of the merits of Kuhn's original ideas. Rather I note that this debate has not proceeded in a vacuum. Sociologists of science (and others) have attempted to show the fruitfulness of Kuhn's ideas for empirical work and in some cases have incorporated such ideas into their investigations of science. It is the growth of empirically-orientated work, informed by the Kuhnian perspective, which gives rise to the present note. It is my claim that this body of work provides two distinct interpretations of Kuhn's ideas-which I shall refer to as the "conservative" and "radical" interpretations - and that these two interpretations must be distinguished when so-called "Kuhnian" sociology of science is discussed.

The Conservative Interpretation

The conservative interpretation of Kuhn is best exemplified by the meaning given to the term "paradigm." This, of course, has always been the problematic term of SSR. As Masterman (1970) noted, there are twenty-one different usages of paradigm to be found in SSR. Despite the variety of meanings given in Kuhn's original work a distinct usage of the term has emerged within the conservative interpretation. There it can be said that paradigm has been used in such a way as to facilitate the separation of the description of scientists' social activity from the description of their cognitive activity. In contrast, as we shall see below, within the "radical interpretation," paradigm has been taken to be a term which emphasizes the integration of, and holistic nature of cognitive and social activity in science.

A pertinent example of the conservative interpretation of paradigm can be found in Kuhn's own attempts to clarify the ideas of SSR. In a Postscript to SSR published in 1969 and an essay entitled "Second Thoughts on Paradigms" (written in 1969 and published in 1974) Kuhn elaborated upon the meaning to be given paradigm. "A Paradigm", he wrote, "is what the members of a scientific community, and they alone, share" (Kuhn, 1974: 460). A paradigm, it seems, is that set of

*I am grateful to H. M. Collins and G.D.L. Travis for helpful comments on an earlier draft of this paper. This is a revised version of a paper presented at the Sixth Annual Meeting of the Society for Social Studies of Science, November 5-7, Atlanta, Georgia.

ideas, beliefs, values and techniques which are shared by a specifiabale social school, group or community. Kuhn's association of paradigms with specific social groups ensures that they can be located by reference to the social characteristics which define such groups alone. In other words, paradigms can be located by the tools of sociometric analysis. For instance, the communication patterns and citation behavior of a group of scientists could be used to identify the existence of a paradigm.

Within this interpretation, paradigm is to be treated as another term (like "invisible college", "specialty" and "discipline") and descriptive of social networks in science. This use of "paradigm" entails a firm dividing line between the cognitive and social elements of science. The work of Hagstrom (1965) on "specialties", of Price² and Crane³ on "invisible colleges", Mullins (1972, 73) on social networks and the development of specialties, and Small (1977) on co-citation analysis is consonant with this interpretation of paradigm. Although these authors do not place the paradigm notion at the centre of their research they have drawn attention to the general import of Kuhn's ideas. Thus we find that Crane, in her article on "invisible colleges", writes:

Kuhn (1962) has argued that groups of scientists develop shared definitions of their work, paradigms which interpret findings and guide new research. In other words, scientists adjust to the problems of dealing with knowledge in their fields by forming social organizations of various kinds, based upon shared communication and shared interpretations of the situation (Crane, 1969: 335).

And Mullins commenced his article on the development of the specialty of ethno-methodology by noting:

Since the pioneering work of Kuhn and Price, evidence has been gathering that revolutionary changes in the theoretical orientations of scientific disciplines develop within the boundaries of definable social groups (Mullins, 1973: 245).

Small in his study of collagen research writes:

There seems to be little doubt that the co-citation clustering methodology has identified, at least in this case, a research specialty with all the characteristics ascribed to "invisible colleges" ... If Kuhn's theory is correct, and if the set of highly cited documents in a cluster is a representation of the paradigm for the specialty ... (Small, 1977: 159).

In the work of these authors the separation of the cognitive and intellectual dimensions from the social dimensions is sometimes made explicit. For instance Mullins has written in the context of his study of the phage group:

These normal activities may be classified as intellectual and social. In the former category are: (1) paradigm development; (2) problem success and (3) "puzzle solving." In the second, social category, are: (4) communication; (5) co-authorship; (6) collegueship and (7) apprenticeship (Mullins, 1972: 51).

Small also implies a separation of cognitive and social elements when he writes:

The underlying assumption for a citation model of specialty development is that a shift in the cognitive and/or social state of a specialty is reflected in a shift in the citation patterns of the specialists (Small, 1977: 14).

It is often claimed that the aim of such analyses is to map out the details of the relationship between intellectual and social dimensions. To quote Mullins again:

Not only must intellectual and social structural variables be adduced, but the specific relationship between the intellectual and social structural variables must be demonstrated (Mullins, 1972: 52).

Despite their avowed interest in intellectual dimensions, in practice these authors mostly focus attention on the problem of the typification, identification and development of the social group within which the paradigm is to be located. The parallel cognitive and intellectual developments usually play a secondary role in such studies.⁴ The content of the science being dealt with seems to figure mainly as background information provided in order to make the account as a whole gell.⁵

The resonance between the socio-metric style studies and Kuhn's own (1972) definition of "paradigm" has been commented upon by Kuhn himself:

If the term paradigm is to be successfully explicated, scientific communities must first be recognized as having an independent existence.

In fact, the identification and study of scientific communities has recently emerged as a significant research subject among sociologists. (Kuhn goes on to footnote the work of Hagstrom, Price and other noted American sociologists working in the sociometrics tradition) (Kuhn, 1974: 460-1).

In addition to showing how the "paradigm" notion might be operationalized in terms of it being shared by an identifiable social group or community, Kuhn, in 1972, provided an analysis of the constituent elements of paradigms which further facilitated the separation of the social and intellectual dimensions of science. He advocated the use of the new term "disciplinary matrix" to replace his old usage of paradigm. This term encompasses the share elements possessed by the social group. In referring to this new definition Kuhn wrote:

"Disciplinary" because it is the common possession of the practitioners of a professional discipline; "matrix" because it is composed of ordered elements of various sorts, each requiring further specification (Kuhn, 1974: 463).

In the Postscript to SSR Kuhn identified four such components. These are (1) symbolic generalisations (e.g., formulas such as $f = ma$); (2) metaphysical paradigms (beliefs in the cogency of certain models); (3) values (including notions of correct scientific behavior); and (4) exemplars (concrete puzzle solutions). Some of these components can readily be identified as "cognitive" (e.g., symbolic generalisations), however, others (in particular, shared values) seem to refer more to the "social" dimensions of scientific activity. By breaking down the paradigm notion into components Kuhn facilitated further the separation of the cognitive and social elements of science. And, of course, once such components have been separated out it is easier to focus attention on just one.

Studies of scientific values or the norms and moral imperatives of science (e.g., Gaston, 1978) which seem to have little room for cognitive elements of science, are perfectly compatible with this interpretation of Kuhnian paradigms. We should thus not be surprised when advocates of this approach refer with approval to Kuhn's work. For instance Cole and Cole have written:

.... Kuhn acknowledges the important role that social variables play in the evolution and transition from one scientific paradigm to another .. He implicitly [I would say explicitly, by 1972] suggests the importance of the values of scientists and the socialization process. The variables that are viewed by Kuhn as being most powerful in explaining scientific development are primarily intellectual, although his ideas and pre-suppositions are compatible with a sociological orientation [we can take it here that Cole and Cole have in mind their Mertonian tradition as the "sociological orientation"] (Cole and Cole, 1973: 5).

I am not suggesting that Kuhn's notion of paradigm has played a predominant part in what might be termed Mertonian analyses of science⁶ (despite the Mertonians approval of Kuhn the systematic development of his ideas is notably absent from their work);⁷ I suggest, however, that the conservative interpretation of the paradigm notion (in which the intellectual and social dimensions can be separated) is consistent with such work. Indeed Robert Merton himself, in his recent "episodic memoir" on Kuhn, has drawn attention to the congruence between his own ideas and those of Kuhn.⁸ He writes:

.... Kuhn and I are at one in the significance attached to the value system of science together with its institutions as a salient (which means far from exclusive) context for cognitive decisions ... (Merton, 1977: 107).

In view of the compatibility of Merton's work with the conservative interpretation of Kuhn it would seem to be misguided to drive a wedge between "Kuhnian" sociology of science and "Mertonian" sociology of science. If such a disjunction is to be made it must also be made clear that it is only the radical interpretation of Kuhn's ideas which are inconsistent with the Mertonian perspective. Kuhn, himself, has recently chastised those sociologists (mainly British) who use his work "uncritically" to argue against Merton. In referring to the Mertonian approach he writes:

Recently that group has been repeatedly and sometimes stridently criticized by sociologists ... drawing on my work and sometimes informally describing themselves as "Kuhnians" ... they think it absurd to conceive the analysis of values as a significant means of illuminating scientific behavior (Kuhn, 1977: xxi).

Kuhn goes on to say "how seriously misdirected I take that line of criticism to be" (ibid).

I would not agree that there is no disjunction between Merton's approach and the work of Kuhn. Such a disjunction, however, only clearly appears when Kuhn's ideas are given a radical interpretation.⁹

Before turning to this radical interpretation I will look at some analyses made by European sociologists of science which have been influenced by Kuhn's ideas, and which in some cases are explicitly posed as challenges to the Mertonian tradition. It will be shown that such work can be seen to be consistent with the conservative interpretation of Kuhn and thus could be regarded as nearer to the Mertonian perspective than might have been expected.

The fostering of the "Conservative interpretation" within European (mainly British) work can be seen in the analytic efforts to separate out cognitive and social elements of scientific activity. Ironically this approach can be found in work which is most strongly directed against the Mertonian perspective. For instance, Richard Whitley, in a well-known programmatic statement advocates a:

"translucid" box sociology of science [which] seeks to answer ... how do social and cognitive factors interact to produce scientific knowledge? ... [such an answer] necessitates the separation of the evaluation of the cognitive products of scientific activity from that activity (Whitley, 1972: 63-4).

Admittedly Whitley's purpose in the separation of scientific activity from its "cognitive products" is different from that of the Mertonians. He wishes, laudably, to redress the balance towards an analysis of the cognitive aspects of science - aspects which he claims the Mertonians have largely ignored. However, by separating the cognitive and social aspects of science at all, Whitley is fostering the conservative interpretation. This can be seen more clearly in Whitley's (1975) description of scientific activity in terms of five components - an analysis which appears to be an attempt at a systematic extension of Kuhn's

own efforts to break the paradigm notion down into its constituent elements. These elements range from "research techniques" to "metaphysics."¹⁰ Weingart (1974), in a similar exercise, has specified the different elements of a paradigm and outlines their hierarchical relationship. These analytical endeavors, although they may facilitate better comparisons between different empirical studies, seem to undermine the power of the paradigm concept as a means of integrating the social and cognitive aspects of science. As such, these pieces of work fall within the "conservative interpretation," despite their origins in the European anti-Mertonian tradition.

There is a further category of British work which seems to form part of the "conservative interpretation." I refer to the studies of the development of scientific specialties - studies which have leaned heavily on Kuhn's paradigm notion. These studies can be seen in many ways to parallel the American sociometric attempts to analyse the development of specialties (and the work of Mullins in particular). The difference between the British work and that pursued in N. America has been one of emphasis. Whilst in the American work the emphasis has been placed on the typification of the social network or group amongst which the paradigm is shared, in Britain the emphasis has been placed on the cognitive developments which make up the paradigm.

The genesis of the British tradition in these studies can be found in some of Mulkay's early writings. For instance, in considering how the paradigm notion can be used in empirical research, Mulkay wrote:

One reason for the failure of sociology to build on Kuhn's work is a series of ambiguities in the latter's definition and use of the central term "paradigm." For example, although paradigms are defined as particular intellectual achievements involving theory, observation, instrumentation and application, Kuhn regularly uses the term to refer to certain intellectual and technical assumptions which are shared and prescribed within specific groups of men. I suggest that it is in this latter sense of intellectual prescriptions, or technical and cognitive norms, that Kuhn's notion of paradigm is most important for the sociological study of scientific innovation (Mulkay, 1971: 207).

Mulkay's emphasis on cognitive norms shared within specific social groups seems to be in close agreement with the conservative interpretation of paradigm. The whole approach of mapping out the cognitive (and social) norms shared by a network of scientists in the development of a specialty is based upon the separability of the cognitive and social aspects of science. Thus we find that Gilbert, who has worked in this tradition, introduces his study with an explicit reference to these aims:

In recent years it has become clear that a sociological study of academic science should pay attention to the relationship between the social institutions of science and the scientific knowledge which is produced ... By considering in some detail the emergence of one area of research, this paper tries to isolate some of the social and intellectual factors which affect the direction of scientific progress. Particular attention is paid to the growth of knowledge, the web of social relationships in which researchers work, and the interaction between these two (Gilbert, 1976: 187).

Law's (1973) study of X-ray protein crystallography and Edge's and Mulkay's (1976) study of radio astronomy seem to share similar aims and hence form part of this tradition. In that they depend upon a separation of social and cognitive factors, these studies may be placed within the "conservative interpretation."

The similarity between Merton's approach and that followed in the above studies has been noted by Law and French (1974) who argue that both approaches are essentially normative sociologies of science. They advocate, as an alternative an interpretative sociology of science. They also draw attention to the problematic place of Kuhn's work in regard to empirical studies of science. They write:

Kuhn's work occupies an ambiguous position in relation to this distinction [between normative and interpretative]. Thus, his concept of paradigm ... has been taken as the basis of a particular normative interpretation of the sociology of science. [They refer to Mulkay's work]. Yet Kuhn's work can also be read in an interpretative sense, and it is our view that when this has been undertaken systematically it will lead to a powerful and flexible view of scientific ation (Law and French, 1974: 582).

Whilst I would agree with Law and French that Mertonian studies and those discussed immediately above do share a normative framework, and that it is a particular reading of Kuhn which has sanctioned such work, I have reservations concerning the classification of other work as interpretative. This is because of a confusion between interpretative sociology and interpretative methods in sociology. Those British studies (Law, Edge and Mulkay, Gilbert) which can be said to have provided a normative account of science have relied heavily on interpretative methods in that they have attempted to understand actors' meanings (in the case of science this must mean the content of scientific knowledge). Also, whilst it is true that most work I shall go on to describe within what I call the "radical interpretation" does use interpretative methods (and this may, indeed, be a way of typifying such work) an interpretative sociology need not necessarily ensue (of course, Law and French had no way of predicting this in 1974).¹¹ Because of such ambiguities I regard the categorisation of work in terms of "conservative" and "radical" interpretations of Kuhn, as preferable to the normative-interpretative disjunction pointed out by Law and French.

The Radical Interpretation¹²

Within this interpretation "paradigm" is taken to be a term which emphasises the combined socio-cognitive nature of scientific activity. With this usage of the term it makes little sense to break scientific activity down into its constituent social and cognitive parts because each part only makes sense within the context of the paradigm as a whole. Because this interpretation of paradigm is consonant with the "muddled and mixed-up" usage originally given to the term of Kuhn in SSR, it is difficult to pinpoint neat formulations of it. However, the essence of this interpretation can be found in some of the writings of Barnes. For example, in a passage on the development of the paradigm of Daltonian atomism which leans heavily on Kuhn's ideas, Barnes writes:

Techniques were bound up with language and belief to form systems of actions, best understood as such. Thus the operation of weighing was related to a theory of the balance and the significance of its result, and this theory was necessary to an understanding of the observation language in which the results of weighing were expressed. Technique, theory and language of observation were intelligible only in terms of each other, and this is how they were learned (My emphasis) (Barnes, 1974: 50).

It is the description of science as ideas bound up with action which lends this interpretation of Kuhn its excitement.¹³ Science for Barnes and in the "radical interpretation" is above all about doing things and learning how to do things. Passages of SSR resonate implicitly with this interpretation. For example, Kuhn wrote:

... the process of learning a theory depends upon the study of applications, including practice problem-solving both with a pencil and paper and with instruments in the laboratory. If, for example, the student of Newtonian dynamics ever discovers the meaning of terms like "force," "mass," "space," and "time," he does so less from the incomplete though sometimes helpful definitions in his text than by observing and participating in the application of these concepts to problem-solving (Kuhn, 1962: 47).

The paradigm concept within the radical interpretation provides a means for understanding not only scientific actions but also the actions of "primitive" tribes. This connection is made explicit by Barnes, who, in a discussion of paradigms informed by anthropology, writes:

I want to create a further link [between the understanding of science and primitive tribes] by extending the notion of a paradigm. The notion of a set of categories, theories and procedures learnt in connection with concrete examples, accepted by the entire reference group and applied to deal with problems in concrete situations can be extended, I think, to various beliefs held through whole societies ... cannot the term be extended to, say Azande consulting witchcraft oracles or Kalabari diagnosing disease? This behavior seems to me to fall within the definition of problem solving activity conducted within a set of rules given by a social consensus in an open ended way (Barnes, 1969: 97).

The association of Kuhnian ideas with the understanding of primitive tribes in the wider context of the "rationality debate"¹⁴ is part of the flavour of the radical interpretation of Kuhn.

Another closely related nexus of ideas comes from the writings of Wittgenstein (1953) and the interpretation given them by Peter Winch (1958). The combination of the cognitive and social, or ideas and action (which form the basis of the radical interpretation of Kuhn's ideas) is stressed by Peter Winch. In a passage discussing the term theory of disease Winch writes that this development:

... involved the adoption of new ways of doing things by people involved, in one way or another, in medical practice. An account of the way in which social relations in the medical profession had been influenced by this new concept would include an account of what that concept was. Conversely, the concept itself is unintelligible apart from its relations to medical practice (Winch, 1958: 122).

The Wittgensteinian/Winchian notion of a "form-of-life" can be seen as equivalent to Kuhn's term "paradigm." Examples of the mix of the ideas of Wittgenstein, Winch and Kuhn can be found in the work of Collins and Bloor.

In an early study of the construction of a TEA laser by physicists, Collins uses a Wittgensteinian/Winchian reading of Kuhn to criticize those North American sociologists of science who rely on sociometric techniques to locate and identify paradigms. Collins writes:

I will argue here that the boundaries of those "social circles" of scientists which have been found are not likely to correspond with the boundaries of groups sharing a paradigm unless the term be construed in a restricted sense (Collins, 1974: 165).

Collins, like Barnes, argues for the importance of looking at science as social action. After noting the above quotation from Winch, Collins writes:

Crane and others have missed the point that learning to become part, or helping in the conceptual development of, a particular paradigm group is "doing" something, in the same sense that absorbing the conceptual structure that makes, say, logical inference "natural" is learning "to do" something (Ibid: 168).

This same emphasis on "doing" and practice is stressed by Bloor in his paper "Wittgenstein and Mannheim on the Sociology of Mathematics." Bloor argues that even the most "cognitive" of sciences, mathematics, can be understood sociologically by looking at how mathematical rules are used in practice and how they are learnt. Bloor, drawing on Wittgenstein, writes:

Wittgenstein has ... taken the basic arithmetical process of using a formula and shown that necessity of embedding it in standardized social practice (Bloor, 1973: 189).

Although Bloor does not make the connection explicit, it is clear that this description of mathematical activity in terms of the use of a formula within "standardized social practice" is very similar to Kuhn's description of scientific activity carried out within the confines of a paradigm.

The radical interpretation has formed the basis for several empirical studies of science. Although the work of Barnes and Bloor has been largely programmatic Collins has developed his ideas in the context of a series of empirical studies. In addition to the TEA laser study mentioned above, he has looked at the search by physicists for large fluxes of gravitation radiation (Collins, 1975) and at areas of parapsychology.¹⁵

Another author who seems to have used the radical interpretation as the basis for empirical work is Wynne. For instance, in his study of the reception of Barkla's J-Rays by orthodox physicists Wynne (1976: 308) cites Kuhn and refers to the "ultimately arbitrary commitments underlying orthodox beliefs and practices [in science]" - an interpretation of Kuhn which is in line with the radical views outlined above.¹⁶

Including my account of the "radical interpretation" I wish to point to one further area where it differs from the "conservative interpretation." As has been mentioned already, the concerns of the "rationality debate" has been influential in the formation of the "radical interpretation." As a result considerable attention has been paid to the problem of scientific rationality and in particular to the form in which the rationality problem has been raised by the Kuhnian notion of "paradigm incommensurability." Incommensurability, within the radical interpretation has been taken to refer to the impossibility of finding rules of scientific rationality by reference to which it is possible to read off the progress of one paradigm over another. For instance, neither experimental

evidence nor proofs can be used to demonstrate that one paradigm is better than another if the two paradigms are held to be incommensurable. This has led to an emphasis on studies of scientific controversy where paradigm conflict might be explored. It has also led to an explicit embrace of the epistemological relativism in regard to scientific knowledge which is entailed by this view of paradigm incommensurability. If one paradigm cannot be said to be an advance on another in terms of criteria of scientific rationality then all paradigms are, in this sense equally valid. Despite different nuances of interpretation Barnes (1972, 1974), Bloor (1976) and Collins and Cox (1976) all advocate some form of relativism.

In contrast, within the conservative interpretation paradigm incommensurability has been played down and the main focus of empirical work has been on areas of scientific agreement.¹⁷ Kuhn himself has again brought his own position closer to this interpretation in his post-SSR writings.¹⁸ For instance, in his 1969 Postscript Kuhn (1970: 205-207) resists the relativist implications of his position and affirms his belief in scientific progress. More recently Kuhn has written that the issue of meaning change and paradigm incommensurability "names a problem rather than an isolable phenomenon" (Kuhn, 1977: xxii). By taking incommensurability to refer to a rather abstruse philosophical problem, Kuhn seems to be denying the license to investigate such a problem empirically. In that those working within the conservative interpretation have been reluctant to discuss the incommensurability problem at all their epistemology has tended towards what I term "laissez-faire realism." In other words, in the last analysis they are happy to leave the roots of scientific knowledge in the real (Natural) world and thus they share the epistemological views held by most scientists. To quote from Kuhn's recent writings again:

[In SSR] I repeatedly insist that members of different scientific communities live in different worlds and that scientific revolutions change the world in which a scientist works. I would now want to say that members of different communities are presented with different data by the same stimuli (Kuhn, 1974: 475).

The above quote, which seems to entail a change of emphasis in Kuhn's epistemological position, is to be found in a footnote. In that epistemological problems seem to be only incidental for the conservative interpretation, and given that they choose not to emphasise the incommensurability issue, it is perhaps not surprising that they are happy to subscribe to some version of scientific realism.¹⁹

Concluding Summary

In this note I have outlined two interpretations of Kuhn's SSR. These interpretations are to be found in the growing body of empirically-orientated work which claims some sort of debt to the Kuhnian analysis. That which I refer to as the "conservative" interpretation is typified by attempts to separate out cognitive and social components of science.²⁰ In the "radical" interpretation the emphasis is placed on the integration of the social and cognitive. These differences are exemplified by the way in which the term "paradigm" has been

used within the two interpretations. We have also seen that writers within the radical interpretation have placed great emphasis on "paradigm incommensurability" and equated it with ideas familiar from the "rationality debate." For the "conservative interpretation," on the other hand, this has been a fairly low key issue.

Although the conservative/radical distinction mirrors in some ways the dichotomies drawn between North American and European; Mertonian and Kuhnian; and Normative and Interpretative sociologies of science there are important differences. For instance, I have pointed out the congruence between Mertonian and (conservative) Kuhnian ideas; I have also drawn attention to the fact that certain European sociologists of science share an interpretation of Kuhn which is predominant in North America; and finally I have noted that interpretative methods have been used in empirical studies informed by both interpretations. In view of such differences I would claim that the conservative/radical disjunction does provide fresh insights into developments in post-Kuhnian sociology of science.

Finally, I have argued that Kuhn himself has over the years made his own position on sociology of science issues consistent with the conservative interpretation (Pinch, 1979). In view of this and the close socio-cognitive links which are now apparent between Merton and Kuhn I suggest that the term "Kuhnian" sociology of science, as a description of a particular body of work be laid to rest.

Notes:

1. See for example, H. Martins, "The Kuhnian 'Revolution and Its Implications for Sociology," in Nossiter (ed.) Imagination and Precision in the Social Sciences. London: Faber and Faber, 1972, 11-58; and D. Shapere, "The Structure of Scientific Revolutions," Philosophical Review, 73, 1964, 383-94.
2. See, for example, D. J. de Solla Price and D. de Beaver, "Collaboration in an Invisible College," American Psychologist, 21, 1962, 1011-18.
3. See, for example, Diana Crance, Invisible Colleges, Chicago: University of Chicago Press, 1972.
4. However, there are signs that the intellectual developments are getting increased attention within such analyses. See, for example, D. Sullivan, D. H. White and E. J. Barboni, "The State of a Science: Indicators in the Specialty of Weak Interactions." Social Studies of Science, 7, 1977, 167-200.
5. Of course, the focus on social rather than intellectual developments mirrors the quantitative methods adopted in such studies. The content of scientific knowledge can really only be investigated using qualitative methods, see D. Edge, "Quantitative Measures of Communication in Science: A Critical Review" History of Science, 17, 1979, 102-34.

6. I do not want to suggest that Mertonian approach is a monolithic structure. Indeed Robert Merton's own writings display a wide interest in a range of sociology of scientific knowledge issues. See for example, his Science, Technology and Society in Seventeenth-Century England, New York: Harper. Also many of the authors referred to above would not regard themselves as "Mertonians."
7. The same is largely true of British sociologists attempts to import Kuhn's ideas.
8. Merton and (Zuckerman) however, also criticize Kuhn for placing too great an emphasis on the normative structure of science (Merton, 1977: 107).
9. The reception of Kuhn's work by the Mertonian and the European sociologists of science is summarized by Mulkay in his recent "Sociology of Science in the West," Current Sociology 28, 1980, 1-184 (see especially pp. 11-12). Mulkay writes that "Kuhn has supplied no more (and no less) than a flexible interpretative resource which sociologists have used and revised in a great variety of (not always compatible) ways ..." (p. 12). The present note can be seen as identifying these interpretative elements that have been used by different groups of sociologists.
10. My own earlier study of the hidden variables controversy in quantum mechanics falls within the "conservative" camp since I attempt to use Whitley's notions of "metaphysical components" and "research techniques" to explain the debate. See T. J. Pinch, "What Does a Proof Do if it Does not Prove?", in E. Mendelsohn, P. Weingart and R. D. Whitley (eds.) The Social Production of Scientific Knowledge, Sociology of the Sciences Yearbook, Vol. 1, Dordrecht: Reidel, 1977, 171-215.
11. Collins, for example, whose work can be regarded as part of the "radical interpretation" and who uses interpretative methods, nevertheless does not seem to advocate an interpretativist sociology. Indeed, he seems to come close to the position of social realism when he writes:

It seems more sensible for the sociologist of scientific knowledge ... to assume that the things that he or she finds out about scientific knowledge are "objective" - that is, he or she should go about finding out things about the social world of the scientist in the same spirit as the scientist goes about finding things about the natural world (Collins, 1981b: 216).
12. The idea that different interpretations of Kuhn can be discerned in recent British work in the sociology of science has been suggested by Peter Halfpenny, "Explanations in Sociology of Science." Paper read to Bath Science Study Seminar, University of Bath, February 1, 1977.
13. This quotation comes from Collins and Pinch (1982).

14. See, for example, B. Wilson (ed.) Rationality, Oxford: Blackwell, 1972; R. Horton and R. Finnegan (eds.) Modes of Thought, London: Faber and Faber, 1983.
15. See, Collins and Pinch (1979). Our forthcoming (Collins and Pinch, 1982) explicitly advocates the radical interpretation of Kuhn outlined above, and also reiterates some of the present argument.
16. It would be tedious to refer to all the empirical studies which lean toward this interpretation. However, many of the most recent studies are gathered together in a special issue of Social Studies of Science (Collins, 1981a).
17. Joseph Ben-David has recently noted this in the context of outlining the differences between the sociology of science traditions in Britain and America. When discussing Kuhn's influence on the American group he writes:

Kuhn's ideas about the developmental phases of scientific knowledge aroused the greatest interest ... Much less attention was paid to Kuhn's philosophical relativism and its implications for a sociology of knowledge ... (Ben-David, 1978: 204).
18. For an analysis of Kuhn's shift in position since SSR in the context of his latest book (Kuhn, 1978), see Pinch (1979).
19. It is difficult to find explicit statements embracing scientific realism since most authors working within the "conservative interpretation" tend to avoid epistemological statements altogether - hence my term "laissez-faire realism."
20. The unfruitful approach of analytically separating out cognitive and social factors has been argued against by Latour and Woolgar (1979).

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Our European Correspondent Trevor Pinch writes; New European Organisation for Science Studies.

In 1981 a new European organisation for science studies EASST (European Association for the Study of Science and Technology) was formed. This membership organisation was conceived by former PAREX "bureau members" Peter Weingart (Bielefeld, Germany), Claire Salomon-Bayet (Paris, France), Gerard Lemaine (Paris, France), Michael Mulkay (York, England), Arie Rip (Leiden, Netherlands). The need for a new European organisation has been felt by many Europeans for sometime now and this need was registered in the response to an exploratory circular concerning EASST sent out in Spring 1981. It is hoped to hold the first general meeting of the organisation in September 1982. Until that time the council of EASST will consist of the former PAREX bureau members.

In general it is hoped that the new organisation will extend further the useful work carried out by PAREX in increasing communication, exchange and collaboration amongst Europeans. The new organisation will attempt to stimulate activities in the field and hopes to promote the understanding of science and technology in society. Specific activities will include: communication; EASST Newsletter (continuation of the PAREX Newsletter) circa three issues a year; umbrella for as many workshops and small conferences as possible; biannual general meeting and conference (first one to be held in September 1982, place to be announced shortly); the formation of relationships with other national and international organisations with a view towards sponsoring thematic symposia, collaborations etc. (On the immediate agenda are plans to enter discussion with 4S with a view to organising a 4S-EASST meeting in Europe, possibly in July 1983.)

We hope to provide readers with more information on EASST as and when developments occur. It is to be hoped that items from the new EASST Newsletter will be duplicated in the 4S Newsletter.

For further information on EASST write to the EASST Secretary, Arie Rip, University of Leiden, Wassendarseweg 76, Postbus 9502, 2300 Ra Leiden, Netherlands.

Announcements

Two Special Issues of Science, Technology, and Human Values
Exploring Indicators of Quality in Science

As new research goals and priorities evolve in the changing political climate, major decisions are being made regarding the allocation of limited resources for the fullest range of scientific inquiry. At the heart of this situation is the way in which the quality of research is judged. In a speech shortly after his appointment as Chief Science Advisor to Reagan, George Keyworth said:

"...in setting our priorities in the support of science and technology we have two bases upon which to define these priorities: excellence and pertinence..."

"Admittedly all these considerations imply value judgements. And value considerations are difficult and fallible even when they involve a consensus of experts."

In issues #38 and #39 (Winter 1982 and Spring 1982) Science, Technology, and Human Values investigates and evaluates the philosophical, political, and social bases of indicators of quality in science. Many of the authors included in these special issues suggests ways in which existing measures may be altered or new ones created.

Contents include:

Harvey Brooks, on assessment policy;
Sissela Bok, on the effects of secrecy in science;
Robert S. Morison, on a new form of indicator;
Bruce Mazlish, an historian's perspective on assessment of quality;
Kenneth Prewitt, on public attitudes toward the quality of science;
Peter Weingart, on the social assessment of science;
Lewis Branscomb, on industry evaluation of research;
Daniel Yankelovich, on science and the quality of life;
"Congressional Perspectives on the Quality of Science and Technology," including essays by George E. Brown, Don Fuqua, Orrin G. Hatch, and Doug Walgren;
And many other essays and reports.

Founded in 1972 to link a growing community of persons interested in the relation of science and technology to their social context, Science, Technology and Human Values brings its readers thoughtful, provocative articles on emerging ideas and reviews the latest research and writing on this subject. Science, Technology, and Human Values is a quarterly international journal co-sponsored by the John F. Kennedy School of Government, Harvard University, and the Program in Science, Technology and Society, Massachusetts Institute of Technology, and published by the MIT Press.

Technological Forecasting and Social Change

An International Journal

Volume 20, Number 2, September 1981

The Five-Year Outlook on Science and Technology in the United States

Edited by Daryl E. Chubin and Frederick A. Rossini

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THE ISRAEL COLLOQUIUM
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1981—1982

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|-----------------------------------|---|---|
| 1. Tuesday, Nov. 24
Tel-Aviv | On the Empirical Application of Mathematics and Some of its Philosophical Aspects (in English) | STEPHAN KÖRNER,
Bristol and Yale Universities.
Commentator: HAIM GAIFMAN,
The Hebrew University. |
| 2. Tuesday, Dec. 29
Tel-Aviv | Cognitive Illusions (in Hebrew) | AMOS TVERSKY, Stanford University.
Commentator: AVISHAI MARGALIT,
The Hebrew University. |
| 3. Thursday, Jan. 7
Jerusalem | The Problem of Knowledge and Power in the Sciences (in English) | EVERETT MENDELSON,
Harvard University.
Commentator: YARON EZRAHI,
The Hebrew University. |
| 4. Thursday, Feb. 4
Jerusalem | Scientific Research and Social Evolution (in Hebrew) | YUVAL NE'EMAN, Tel-Aviv University.
Commentator: SHALHEVET FREIER,
The Weizmann Institute of Science. |
| 5. Tuesday, Feb. 23
Tel-Aviv | Gamow's Theory of α -Decay (in English) | ROGER STUEWER,
University of Minnesota.
Commentator: HARRY LIPKIN,
The Weizmann Institute of Science. |
| 6. Tuesday, March 23
Tel-Aviv | Principles and Implications of Eigen's Theory of pre-biotic Evolution (in Hebrew) | SHNEIOR LIFSON,
The Weizmann Institute of Science.
Commentator: HENRI ATLAN,
The Hebrew University. |
| 7. Thursday, May 6
Jerusalem | Herman Cohen's Theory of Science (in Hebrew) | AMOS FUNKENSTEIN, Tel-Aviv University and The University of California in Los Angeles.
Commentator: NATHAN ROTENSTREICH,
The Hebrew University. |
| 8. Tuesday, June 8
Tel-Aviv | The Concept of Revolution and Revolution in Science (in English) | I. B. COHEN, Harvard University.
Commentator: ZEV BECHLER,
Haifa University. |
| 9. Thursday, June 24
Jerusalem | The Construction of Scientific Knowledge as a Group Activity: An Example from the Age of Gentlemen-Specialists (in English) | MARTIN RUDWICK, The Hebrew University.
Commentator: S. S. SCHWEBER,
Brandeis University and
The Hebrew University. |

In collaboration with Robert S. Cohen and Marx Wartofsky of the Boston Colloquium for the Philosophy of Science. Selected papers from this Colloquium will be published by Humanities Press.

Lectures begin at 6:30 p.m. (gathering for coffee at 6:00 p.m.). In Tel-Aviv: Gilman 449, Tel-Aviv University. In Jerusalem: The Van Leer Jerusalem Foundation. For further information: Dr. Edna Margalit, The Colloquium Coordinator, P.O.B. 4670, Jerusalem.

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Zetetic Scholar

An Independent Scientific Review of Claims of Anomalies and the Paranormal

Marcello Truzzi, Editor

The ZETETIC SCHOLAR is an attempt to enhance communication between critics and proponents of claims of the paranormal. It is concerned not only with adjudication of such claims but also with the sociology and psychology of the disputes themselves. The ZETETIC SCHOLAR will seek a balance between science's proper skepticism towards extraordinary claims and its need for objectivity and fairness of inquiry.

The ZETETIC SCHOLAR's central concern is not advocacy but a desire to help the scientific community reach sound judgments based upon the empirical facts. Both advocates for paranormal phenomena and their critics have all too often failed to engage in reasoned and responsible dialogue; both sides have largely communicated only with their own supporters. The ZETETIC SCHOLAR will seek to build bridges between those willing to engage in scientific discourse on the issues. We agree with C.S. Peirce that our first obligation as scientists is to do nothing that might block inquiry.

The ZETETIC SCHOLAR is establishing a network of serious and responsible researchers into claims of the paranormal. The nucleus of this network consists of a panel of distinguished Associate and Consulting Editors, representing a wide spectrum of opinion, including: Theodore X. Barber, *Unborn Chastities*, Henry Collins, *Richard de Mille*, Peter Diaconis, *Mythic Ebon*, Christopher Evans, Robert Galbreath, *Michel Gauquelin*, C.E.H. Hansel, *Bernard Heuvelink*, Ellic Howe, Ray Hyman, *J. Allen Huneb*, David M. Jacobs, *Joseph G. Jorgensen*, *Seamus H. Murphy*, Edward J. Moody, *Robert L. Morris*, *William Nagler*, *John Palmer*, *William F. Penick*, *Charles T. Farr*, *Roy Wallis*, *Jarvis Webb*, and *Ron Westrum*.

The first issue of the journal was published in June 1978, and ZETETIC SCHOLAR is now published twice annually. The first five issues have included articles and bibliographies (an important feature of the journal) on a wide variety of topics including: the relation between skepticism and the paranormal; science and parapsychology; UFOs; solar and lunar effects; protoscience and pseudoscience; biorhythms; vampires; lycanthropy; anomalies and their evaluation; scientific ethics; Velikovsky and his critics; science and astrology; Uri Geller and science; the search for the sasquatch; talking dogs; cryptozoology; Carlos Castaneda; dowling; and more. Dozens of books are reviewed each issue and the extensive bibliographies and the special 25 Dialogues between proponents and critics of the paranormal make the journal a unique and indispensable research tool for anyone seriously concerned with the subjects covered.

Department of Sociology
Eastern Michigan University
Ypsilanti, Michigan 48197

(313) 487-0144

WHAT DO ALL THESE PEOPLE HAVE IN COMMON?

J. Allen Huneb - Allen G. Debus - Richard de Mille - The Amazing Randi - Paul Feysend - Victor Ebon - K. Ramakrishna Rao - Jerome Clark - James - Uther - John Palmer - Anthony Flew - Dane Rudhyke - G.O. Abell - Thomas A. Selack - Daniel Cohen - Robert G. John - Joseph Agassi - Irvin L. Child - Allan Hendry - Anthony Standen - Robert L. Morris - Peter Diaconis - Roy Wallis - Charles T. Farr - Alvin Michel - Mario Bunge - John A. Keel - Michel Gauquelin - Michael Persinger - Bruce Macabrie - Geoffrey Dean - Seymour Munkapoff - H. M. Collins - John B. Loff - Victor Girdner - Christopher Scott - Elaine Hendry - Rex G. Starford - Stanton Freckner - J. Fraser Nicol - Harold I. Brown - Robert Stoffer - Ron Westrum - Roberto Fatsone - Hans J. Eysenck

They have all expressed their views in ZETETIC SCHOLAR, the only scientific journal dedicated to bringing you responsible, scholarly, and fair-minded dialogues between proponents and critics of claims of the paranormal and other things extraordinary or anomalous.

ZETETIC SCHOLAR brings together leading scholars from the natural and social sciences, history, philosophy, and journalism with other persons concerned with the rational adjudication of issues involved with deviant science claims found among the rational sciences. ZETETIC SCHOLAR is also concerned with the broader analytic questions in the history and philosophy of science related to the demarcation criteria used to separate science from so-called pseudoscience and to the sociology and psychology of esoteric belief systems. In addition to articles and extensive bibliographical features in each issue, ZETETIC SCHOLAR includes special 25 Dialogues in which proponents and critics directly exchange views and analyses of one another's perspectives. These dialogues are an on-going process within ZETETIC SCHOLAR, may include dozens of participants from many academic disciplines, and may continue through several issues of the journal.

ZETETIC SCHOLAR is dedicated to a skeptical but informed approach. A proper scientific attitude necessitates skepticism towards extraordinary claims with the burden of proof being upon the claimant. The more extraordinary the claim, the stronger the evidence needed for scientific acceptability. But weak evidence remains evidence and may itself represent an anomaly of potential scientific value. And those who seek to discredit such evidence must also bear the burden of disproof if they wish such evidence to be scientifically dismissed rather than merely ignored. And such critics have the normative responsibility to deal with such strange claims in a responsible and expert manner once they choose to get into the arena to discuss such claims. Scientists must necessarily ignore many exotic claims, but if they choose to confront them, they must do so in keeping with the normal canons of professional science and scholarship. ZETETIC SCHOLAR is dedicated to helping those scientists and scholars who do choose to confront extraordinary claims and seeks to help bring rigor and expertise into this arena that has too long been dominated by advocacy rather than objective inquiry. ZETETIC SCHOLAR advocates scientific method rather than current orthodoxy or unorthodoxy in substantive science. Its skepticism extends into orthodox as well as unorthodox science where that is warranted by scientific method. Towards this end, ZETETIC SCHOLAR has assembled distinguished Editorial Board representing a full spectrum of scientific opinion on the topics examined. The pages of ZETETIC SCHOLAR are open to all who can meet its scientific and scholarly level of discussion. As such, it is not intended as a popular magazine for the general public but as a scholarly journal for those with a scientific orientation. We welcome all those who wish to participate in this exciting venture.

Unless otherwise requested, new subscriptions

Zetetic scholar

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Issue #8 is scheduled for publication in
late August 1981.

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- #1 (1978): Out of stock but xerox-reduced copies available upon request. Partial contents: "Skepticism, Science and the Paranormal"; "On the Extraordinary: An Attempt at Clarification"; "Solar and Economic Relationships: An Updated Report"; "Castaneda: Trickster-Teacher, a Conversation with Richard de Mille"; & Special Bibliographies on "Crank, Crackpot or Genius? Pseudoscience or Science Revolution?"; "Debunking the Paranormal: A Basic Book List"; "Uri Geller and the Scientists"; and "Debunking Biorhythms." 61 pages. \$8.00 (reduced xerox copy).
- #2 (1978): Issues still available. Partial contents: "Anomalies: a Bibliographic Introduction with Some Cautionary Remarks"; "What Factors Can Account for UFO Experiences?"; "Prescriptive Epistemic Ethics"; & Special Bibliographies on "Scientific Studies of Astrology"; "Vampires"; and "Velikovsky and His Critics." 154 pages. \$8.00.
- #3/4 (1979): Out of stock but xerox-reduced copies available upon request. Partial contents: "Close Encounters with Canid Communications of the Third Kind"; ZS Dialogue on Velikovsky's theories with 9 participants; ZS Review Symposium on astrology with 8 participants; & Special Bibliography on "Lycanthropy." 138 pages. \$12.00 (xerox).
- #5 (1979): Issues still available. Partial contents: "Attitudes of College Professors toward Extra-Sensory Perception"; Dialogue on "Statistical Problems in Psi Research"; "Thirty Years after Kenneth Arnold: The Situation Regarding UFOs"; "A Visit to the Centre de Cryptozoologie"; "Liberalism and Symbolism in Anthropological Understanding: The Sasquatch Image"; & Special Bibliography on "Scientific Studies of the 'Lunar Effect' and Human Behavior." 124 pages. \$8.00.
- #6 (1980): Issues still available. Partial contents: "Psychic Research: New Dimensions or Old Delusions?"; "Scientists and Anomalous Phenomena: Preliminary Results of a Survey"; ZS Dialogue on "Pathological Science" with 15 participants; ZS Dialogue on "Failure to Replicate Remote-Viewing Using Psychic Subjects" with 11 participants; ZS Dialogue on "Seven Evidential Experiments" for psi, with 15 participants; "What's New On the New Religions?" & ZS Dialogue continuations and bibliographic supplements. 186 pages. \$8.00.

...and all issues contain random bibliographies, book reviews and book notes plus letters and reader responses to past dialogues.

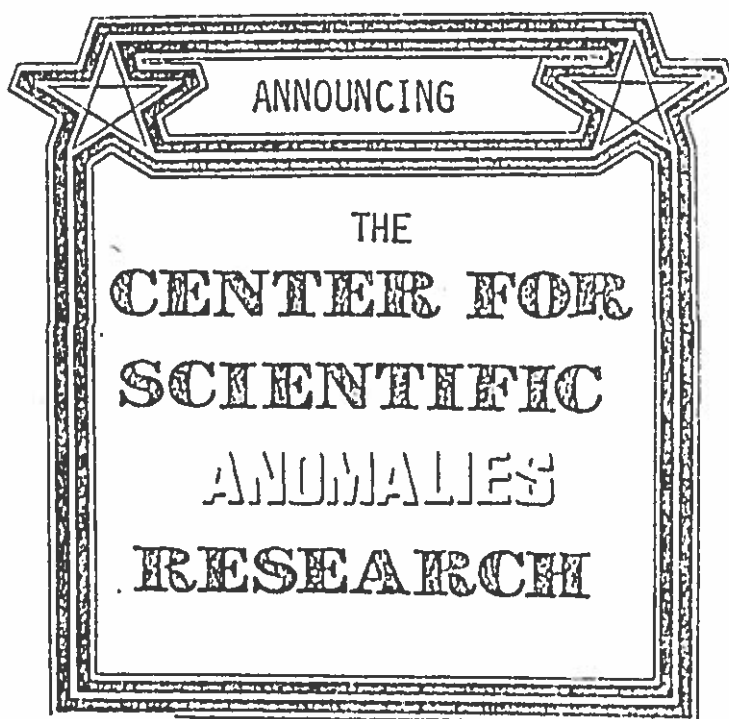
ZETETIC SCHOLAR subscription rate (2 issues per year) for individuals is \$17 (U.S. and Canada) and for libraries, institutions and foreign subscribers is \$18. No foreign currency or non-U.S. bank checks, please. New subscriptions begin with the current issue (when available) unless otherwise requested. Foreign subscriptions are sent surfacemail. Subscriptions must be pre-paid. Foreign airmail is \$10 per annum extra.

All correspondence should be sent to:



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I am pleased to announce the formation of a new private Center for Scientific Anomalies Research (CSAR) which will bring together scholars and researchers concerned with furthering responsible scientific inquiry into and evaluation of claims of anomalies and the paranormal. The Center will:

- * Advance the interdisciplinary scientific study of alleged and verified anomalies.
- * Act as a clearinghouse for scientific anomaly research.
- * Publish a journal (ZETETIC SCHOLAR), a newsletter (THE CSAR BULLETIN), research reports, and bibliographies.
- * Promote dissemination of information about scientific anomaly research.
- * Create a public network of experts on anomaly research through publication of a CSAR DIRECTORY OF CONSULTANTS.
- * Sponsor conferences, lectures and symposia related to anomaly research.
- * Promote improved communication between critics and proponents of scientific anomalies.

In addition to the Director of CSAR, Dr. Marcello Truzzi, and its Associate Director, Dr. Ronald Westrum, both sociologists at Eastern Michigan University, CSAR is sponsored by a group of distinguished scientists who have agreed to act as its Senior Consultants. These thus far include:

- Prof. George O. Abell (Dept. of Astronomy; University of California, Los Angeles),
- Dr. Theodore X. Barber (Cushing Hospital; Massachusetts Dept. of Health),
- Prof. Daryl J. Bem (Dept. of Psychology; Cornell University),
- Prof. Mario Bunge (Foundations & Philosophy of Science; McGill University),
- Dr. Persi Diaconis (Dept. of Statistics; Stanford University)
- Dr. Eric J. Dingwall (East Sussex, England),

- Prof. Gerald L. Eberlein (Institut für Socialwissenschaften;
Technischen Universität München),
Prof. Hans J. Eysenck (Institute of Psychiatry; University of
London),
Prof. Paul Feyerabend (Dept. of Philosophy; University of
California, Berkeley),
Prof. I.J. Good (Dept. of Statistics; Virginia Polytechnic
Institute and State University),
Prof. Morris Goran (Dept. of Physical Science; Roosevelt
University),
Dr. Bernard Heuvelmans (Centre de Cryptozoologie; Le Bugue,
France),
Prof. Ray Hyman (Dept. of Psychology; University of Oregon),
Prof. J. Allen Hynek (Dept. of Astronomy; Northwestern
University),
Dean Robert G. Jahn (School of Engineering/Applied Science;
Princeton University),
Dr. John Palmer (Dept. of Parapsychology; John F. Kennedy
University),
Prof. Robert Rosenthal (Dept. of Psychology & Social Relations;
Harvard University),
Prof. Thomas A. Sebeok (Research Center for Language and
Semiotic Studies; Indiana University),
Prof. Peter A. Sturrock (Institute for Plasma Research; Stanford
University), and
Prof. Roy Wallis (Dept. of Social Studies; The Queen's
University of Belfast).

In addition to this board of Senior (Science) Consultants, CSAR is also sponsored by a board of Senior Resource Consultants consisting of persons recognized for their special knowledge and informational skills in relation to bibliographic and archival resources. Thus far, the Senior Resource Consultants include:

- Mr. William R. Corliss (The Sourcebook Project),
Mr. Peter Haining (author-editor),
Mr. Michael Harrison (author-editor),
Mr. Robert Lund (American Museum of Magic),
Dr. J. Gordon Melton (Institute for the Study of American Religion),
Mr. Robert J.M. Rickard (The Fortean Times),
Mr. Leslie Shepard (author-editor), and
Ms. Rhea A White (Parapsychology Sources of Information Center).

The primary focus of the Center will be on the study and evaluation of bodies of anomalous observations rather than upon esoteric theories seeking to explain already known phenomena. The orientation of the Center is exclusively scientific, places the burden of proof on the claimant, and recognizes the need for a degree of proof commensurate with the extraordinary character of the phenomenon claimed. But the Center also wishes to promote open and fair-minded inquiry that will be *constructively skeptical*. We recognize that scientific anomalies, where valid, may be instruments and driving forces for reconceptualization and growth in scientific theory. Critically and constructively approached, legitimate anomalies should be welcomed by science rather than perceived as ill-fitting nuisances. History clearly demonstrates that tomorrow's science is likely to contain surprises, and tomorrow's theories are likely to explain some of what are today viewed as controversial anomalies. Also,

tomorrow's explanatory theories may be in areas of science not now perceived as relevant to the anomalies being considered. Thus, "anomalistics" must necessarily be an interdisciplinary endeavor.

ON THE ORGANIZATION OF CSAR

CSAR is still in its formative stage. Those associated with CSAR may be Consultants and/or Members. Consultants will be persons with demonstrated expertise in some area of anomaly research. Consultants will vary widely in their opinions, and need not necessarily become Members of CSAR. Persons who apply for Consultant status and are approved for inclusion, will be listed in the CSAR DIRECTORY OF CONSULTANTS. The object is simply to produce a network of experts whom those interested in anomaly research might contact. Consultants will be of two types: Research Consultants and Resource Consultants. Research Consultants will normally be professional scientists with advanced training in research. Resource Consultants will include others with expertise about anomalies, such as philosophers, historians, science writers, conjurors, or even professional psychics. The key criterion for designating someone a Research Consultant will be evidence of expertise in research and methodology. The key criterion for designating someone a Resource Consultant will be evidence of special information or knowledge that might be useful to others doing scientific research into anomalies. Since these Consultants may differ both among themselves and with the goals of CSAR, in no way does a recognition of such expertise constitute an endorsement of their views by CSAR.

Members will be persons who make up the financial support for the Center. Consultants may choose to become Members but need not do so. Membership is open to all who agree with the scientific goals of CSAR. Members will receive the journal and newsletter of CSAR and will have special privileges including access to research reports and bibliographies of the Center. Non-members may subscribe to ZETETIC SCHOLAR but will not be able to subscribe to the newsletter. The policies and governance of CSAR are not under the control of its Members, but suggestions and criticism are always welcome by the governing board.

We are not yet calling for the enrollment of members. This should take place early in 1982 and will be announced in the next issue of ZETETIC SCHOLAR. Between now and then, CSAR is undertaking the formation of its initial network of Consultants. Those wishing to apply for Consultant status or who wish to contact CSAR with suggestions, questions or comments, should write to:

Dr. Marcello Truzzi, Director
CSAR
P.O. Box 1052
Ann Arbor, Michigan 48103

CSAR is currently sponsoring two major research projects --one on the use of alleged psychics by law enforcement agencies, the other on industry engineers' attitudes towards and experiences with unidentified flying objects. Two of the first reports emerging from these projects are being published in ZETETIC SCHOLAR #8, and further reports will follow in future issues. As with all such reports, CSAR sponsorship does not mean endorsement of the findings by CSAR or its Senior Consultants. The reports are the responsibility of their authors.

The Seventh Annual AAAS Colloquium on R&D Policy will be held 23-24 June 1982 at The Shoreham Hotel in Washington, D.C. Topics to be addressed include R&D in the FY 1983 budget, an assessment of the Reagan Administration's evolving science and technology policy, the growing role of defense R&D, and the impacts of budget cutbacks and changing R&D priorities on universities, research institutes, national laboratories, and industry.

Speakers will include top administration science officials, leading Congressional figures in the science and technology areas, industrial executives, and representatives of the scientific and engineering communities. Registrants will receive a copy of Research and Development: AAAS Report VII, by Willis H. Shapley, Albert H. Teich, and Jill P. Weinberg in advance of the meeting. For further information and registration forms, contact, Office of Public Sector Programs, American Association for the Advancement of Science, 1776 Massachusetts Avenue, N.W., Washington, D.C. 20036.

The next AAAS Annual Meeting will be held in Detroit, Michigan, 26-31 May 1983. Deadline for submission of symposium proposals is 1 August 1982. For proposal forms and further information contact the Meetings Office, AAAS, 1776 Massachusetts Avenue, N.W., Washington, D.C. 20036.

MICHIGAN TECH PROFESSORS ESTABLISH ENERGY JOURNAL. HOUGHTON--Energy and Society, the first interdisciplinary journal dedicated to exploring the broad spectrum of contemporary social issues raised by energy production, distribution, and consumption, will be launched this year by two social scientists at Michigan Technological University.

Editors George Daniels and Mark Rose, both associate professors in MTU's Science, Technology, and Society program, report that the new publication will serve as a forum for innovative perspectives from both social scientists and experts in engineering, science, government, and business whose work illuminates energy issues. Drawing on expertise in areas ranging from political science, economics, and anthropology, to nuclear power and aeronautics, journal articles will deal with such vital subjects as:

- the myriad causes of fuel shortages;
- the impact of changes in energy availability and cost on personal behavior, government, the economy, and the entire structure of society;
- the role of high-energy technologies in fostering broad social change;
- the effects of energy shortages, technological developments, and the location of major energy resources on foreign policy and international relations; and
- the environmental implications of current energy use, technological developments, and the use of alternative forms of energy.

Energy and Society was designed to highlight the information needed by all those whose work, study, research, planning, policy decisions, or business choices are affected by energy issues, say the editors. Regular features will include review essays, interviews with important figures in contemporary research and energy decision-making, research articles probing topics of interdisciplinary import, and news of upcoming conferences and works in progress. Special issues edited by guest editors will focus exclusively on single topics of major interest.

Subscription reservation forms can be obtained by writing to SAGE Publications, Inc., P.O. BOX 5024, Beverly Hills, Calif., 90210. Manuscript submission information can be obtained from: George H. Daniels and Mark H. Rose, Editors, University Program in Science, Technology, and Society, Michigan Technological University, Houghton, Mich. 49931.

Humanity and Society announces a special thematic issue on Technology and Society for 1983. Case studies and theoretical papers are sought analyzing social conflicts over: (1) the course of technological development; and (2) the effects of technological development on social structure.

Articles based on dissertations recently completed or in progress are especially welcomed. Please send proposals and/or manuscripts to: Henry Etzkowitz, Visiting Professor of Sociology, Department of Sociology, University of Colorado, Boulder, CO 80309. First deadline: May 1, 1982.

CHARLES A. DANA COLLEGE PROFESSORSHIP IN THE HISTORY OF SCIENCE

The newly created position of Charles A. Dana College Professorship in the History of Science at Trinity College is supported by an endowment grant from the Charles A. Dana Foundation. The holder of the position shall be known as the Dana College Professor of the History of Science.

This professorship has been established pursuant to the College's policy of experimenting with senior, non-departmental positions whose incumbents devise and teach courses which transcend typical departmental offerings, appeal to students majoring in a wide range of fields, and are often cross- or interdisciplinary in nature. (Other recent College Professorships have been in the Humanities and the Arts.) The professorship reflects Trinity's belief that the history of science (and preferably of technology, as well) should be generously represented in the liberal arts curriculum. Though the College has regularly offered courses in the philosophy of science and in the policy implications of science and technology, it has treated the history of science only sporadically. By means of the new professorship it seeks to remedy this deficiency.

By their nature college professorships cannot be defined with great precision; indeed, it is important that the holders of such positions be accorded ample latitude to experiment with varied approaches and subject matters. There are, however, broad guidelines within which the Dana College Professor of the History of Science will be asked to function.

First, a significant part of the professor's instructional efforts will be directed to undergraduates with little or no background in science or the history of science. Typically, at least two introductory-level (no prerequisites) courses in the history of science will be offered each academic year. Intended to serve the purposes of "general education," they presumably will enroll large numbers of students whose primary work is in the arts, the humanities or the social sciences. The professor will also have ample opportunity to teach intermediate and advanced undergraduate courses in the field (including seminars), and may also, depending on qualifications and interest, offer instruction in such related subjects as the history of technology, general intellectual history, the philosophy of science, or science and public policy. At least one of the introductory courses will address the needs of students in the Guided Studies Program in the Humanities, a special curriculum for unusually talented freshmen and sophomores which, through a set of interrelated courses, examines the development of European history, literature and thought from classical antiquity to the present. The incumbent may also be invited, from time to time, to teach a freshman seminar. It is assumed that a preponderance of the instruction will be concerned with the history of science since the Renaissance.

Second, it is important that the Dana College Professor of the History of Science be willing to involve him- or herself in the life of the College, in keeping with Trinity's character as a residential institution in which intellectual interchange among members of the faculty and between faculty and students is emphasized. In addition to offering courses and holding suitable office hours, the incumbent may be asked periodically to participate in such activities as public lectures and symposia. He or she will not, however, be obligated to

serve on faculty committees or to perform other administrative work. In order to facilitate full participation, it is anticipated that the incumbent will reside in the Hartford area.

Third, the Dana College Professor of the History of Science must be willing to make a major commitment to undergraduate teaching. Trinity prides itself on the quality of its classroom instruction. While all members of the faculty, including College Professors, are expected to engage in productive scholarship and writing, their foremost obligation is as teachers. Consequently, in evaluating candidates for this position, the search committee will pay close attention to their potential effectiveness in both lecture and discussion courses, as well as to their scholarly attainments. It is assumed that the person appointed to this professorship will share Trinity's conviction that superior teaching is central to the purposes of a liberal arts college. College professors ordinarily teach the same number of courses as other Trinity faculty, though adjustments may be made for cause.

The Dana College Professor of the History of Science will be given an initial non-tenured appointment of from three to five years, effective September, 1982; the appointment is renewable by mutual agreement. Salary will be commensurate with the incumbent's qualifications and experience, and may be expected substantially to exceed the average salary of full professors at the institution. For further information contact: Andrew G. De Rocco, Dean of the Faculty, Trinity College, 300 Summit Street, Hartford, Connecticut 06106.

[Editor's Note: Although the deadline for applications is 22 March 1982, and therefore likely to arrive before the Newsletter is received, the information warrants publicity even if deadline is past.]

THE UNIVERSITY OF WISCONSIN. The University of Wisconsin Press announces a new series of books, Wisconsin Publications in the History of Science and Medicine, under the general editorship of William Coleman, David Lindberg, and Ronald Numbers. The series will be broad in coverage, both chronologically and topically, and will include the history of technology and the social relations of science. Although the editors are particularly interested in receiving book-length manuscripts by single authors, they will also consider edited collections that are devoted to a well-defined topic and editions and translations that include substantial interpretative or historiographic materials. Authors are invited to discuss current or future projects with any of the editors, c/o Department of the History of Science, South Hall, University of Wisconsin, Madison, WI 53706.

UNIVERSITY OF PENNSYLVANIA.

Center for History of Chemistry. Description. Assistant Director. The American Chemical Society and the University of Pennsylvania have joined together to establish a national Center for History of Chemistry, to be based in the Edgar Fahs Smith Memorial Collection in Philadelphia. The assistant director of the Center will be responsible for running the Center's programs and publications on a day to day basis. Candidates should possess competence in chemistry or chemical engineering, and in the history of science and technology. Ph.D. or equivalent record of accomplishment required, together with bibliographic skills and interest in archives, in information retrieval, and in administration. Pursuit of own research encouraged. Renewable contract (minimum three years); 12-month appointment. Applications including the names of three referees should be submitted by 30 April 1982 to Center for History of Chemistry, Edgar Fahs Smith Hall D-6, University of Pennsylvania, 215 South 34 Street, Philadelphia, PA, 19104, U.S.A.

Center for History of Chemistry. Description. Archivist. The American Chemical Society and the University of Pennsylvania have joined together to establish a national Center for History of Chemistry, to be based in the Edgar Fahs Smith Memorial Collection in Philadelphia. It is hoped to appoint an archivist, who will be active in the Center's program of locating, preserving, cataloguing, and making known the records of modern chemistry, chemical engineering and chemical industry. Master's degree in relevant subject, or equivalent, required. This is a two-year position, and might suit someone in A.B.D. status. Send c.v. and letter of inquiry, naming two referees, to Center for History of Chemistry, Edgar Fahs Smith Hall 3-6, University of Pennsylvania, 215 South 34 Street, Philadelphia, PA., 19104, U.S.A.

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

A conference on Energy in American History, sponsored by the Virginia Tech Center for the Study of Science in Society, will be held in Blacksburg, Virginia, on October 1-3, 1982. Papers and commentaries by historians invited to address conceptual, technological and policy issues in the history of energy will be presented. Anyone interested in attending should contact Arthur Donovan, Director, Center for the Study of Science in Society, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

The Center for the Study of Science in Society at Virginia Polytechnic Institute, Blacksburg, Virginia will sponsor a workshop on "The Demarcation between Science and Pseudo-Science" from April 30 - May 2, 1982. The aim of the workshop is to explicate and test different disciplinary approaches to the demarcation problem. Speakers will include: Henry Bauer (VPI), Tom Gieryn (Indiana), I. J. Good (VPI), Adolf Grunbaum (Pittsburgh), Karin Knorr (VPI), Seymour Mauskopf (Duke), Mary Jo Nye (Oklahoma and The Institute for Advanced Studies, Princeton), and Ron Westrum (Western Michigan).

Further information can be obtained from Rachel Laudan, Center for the Study of Science in Society, VPI and SU, Blacksburg, Virginia 24061.

International Union of History and Philosophy of Science

Division of

Logic, Methodology and Philosophy of Science
(President: J. Los; Secretary: J. Cohen)

*SECTIONS:

1. Proof Theory and Foundations of Mathematics
2. Model Theory and its Applications
3. Recursion Theory and Theory of Computation
4. Axiomatic Set Theory
5. Philosophical Logic
6. General Methodology of Science
7. Foundations of Probability and Induction
8. Foundations and Philosophy of the Physical Sciences
9. Foundations and Philosophy of Biology
10. Foundations and Philosophy of Psychology
11. Foundations and Philosophy of the Social Sciences
12. Foundations and Philosophy of Linguistics
13. History of Logic, Methodology and Philosophy of Science
14. Fundamental Principles of the Ethnics of Science (invited addresses only)

PROGRAM COMMITTEE: R. Barcan Marcus (Chairman), A. Levy, J. J. C. Smart, V. A. Smirnow, P. Weingartner, N. Yosida.

CHAIRMEN OF SECTIONAL COMMITTEES: 1. S. Feferman, 2. P. Eklof, 3. J. E. Fenstad, 4. D. Martin, 5. Ch. Parsons, 6. W. Stegmüller, 7. R. Jeffrey, 8. A. Grunbaum, 9. I. T. Frolov, 10. P. Suppes, 11. M. Hollis, 12. M. Cresswell, 13. E. McMullin, 14. E. Agazzi.

LOCAL COMMITTEE: C. Christian, H. Czermak, G. Dorn (Secretary), G. Frey, R. Haller, E. Morscher, W. Stegmüller, I. Tammelo, P. Weingartner (Chairman), G. Zecha.

CONGRESS SESSIONS: The Congress Sessions will consist of symposia and addresses by invited speakers, in addition to contributed papers. Abridged versions of the contributed papers will appear in the "Abstracts of the Congress" which will be available at the Congress. These abridgements must not exceed 4 typed pages of maximal size 30X 22 cm or 12X8 1/2 inches, including name, address, and title of section on the top. Deadline for contributed papers: January 20, 1983. Language: Any major international language, preferably English.

*PLEASE ADDRESS ALL COMMUNICATIONS TO: Paul Weingartner or Georg Dorn, (7th International Congress of Logic, Methodology and Philosophy of Science), Institut fuer Philosophie, Universitaet Salzburg, Franziskanergasse 1/1, A-5020 SALZBURG, Austria, Europe (Telephone: Internat. Code for Austria + (62 22) 44 5 11, etx. 411).

DUKE UNIVERSITY, SUMMER, 1982, THE SUMMER SESSION AND THE SCIENCE, SOCIETY
AND HUMAN VALUES PROGRAM

Term I
(May 13-June 26)

ETHICS AND THE PROFESSIONS

Term II
(June 29-August 12)

HISTORY OF NUCLEAR ENERGY:
CIVILIAN AND MILITARY
APPLICATIONS

These programs are offered only in the summer. As an interdisciplinary experience, they involve faculty and student participants in lively intellectual inquiry and stimulating interchange in a social as well as an academic setting. Students may register for either or both of the terms. These four courses may be counted toward the required five courses for the Program in Science, Society and Human Values at Duke University.

COURSES

TERM I

ETHICS AND THE PROFESSIONS.

This summer program is designed for preprofessional students and others interested in the ethical problems faced by professionals in contemporary society. It consists of two courses to be taken concurrently during the first term. The first course, RELIGION 166 "PROFESSIONS AND SOCIETY," treats ethical dilemmas and moral responsibility from the perspectives of ethical theories, professional ethics and the professions in society. The second course, PHILOSOPHY 167S "PROFESSIONAL ETHICS," consists of two seminars, one to be taken the first half of the term followed by another the second half. These discussion classes on business ethics, legal ethics, medical ethics and technological ethics will be taught by three faculty members. Guest lectures and discussions will be presented by members of the Duke professional school faculties and by practicing members of the professions.

This year the first course will begin with the presentation of several case studies. The lectures, along with films, visiting speakers and group exercises, will examine moral traditions and ethical theories to illuminate the issues, suggest models and methods of decision-making, and provide resources for dealing with ethical dilemmas.

The program is taught this summer by Dr. Thomas E. McCollough of the Department of Religion, Dr. George W. Pearsall of the School of Engineering, and Dr. Harmon Smith, Jr., of the Divinity School and the School of Medicine.

TERM II

HISTORY OF NUCLEAR ENERGY: CIVILIAN AND MILITARY APPLICATIONS.

Two courses will be taught concurrently and will focus on the ways in which technology shapes policy and policy shapes technology. After an historical survey of atomic research in the early 20th century and the development of the atomic bomb in World War II, the courses will pursue parallel lines of

development in civilian and military applications with a view to understanding both sides of the current public debates over these controversial technologies. The civilian portion, HISTORY 187/CIVIL ENGINEERING 141 "HISTORY OF NUCLEAR ENERGY: CIVILIAN APPLICATIONS," will investigate the creation of the Atomic Energy Commission and its successor agencies, the atoms-for-peace program, nuclear power plants, atomic wastes, safety measures, accidents (including Three Mile Island), regulation, the economics of nuclear power generation, expropriation of technology, breeder reactors, and other topical issues. The military portion, HISTORY 188/CIVIL ENGINEERING 142 "HISTORY OF NUCLEAR ENERGY: MILITARY APPLICATIONS," will examine the atomic bomb, the hydrogen bomb, intercontinental ballistic missiles, nuclear-powered ships, fallout, civil defense, arms and testing limitations, targeting, ABM systems, tactical nuclear weapons, the neutron bomb, and nuclear proliferation.

Some study of the science and technology of nuclear energy is necessary in such a curriculum, but there are no prerequisites and no need for any special technical background; technical issues will be examined only in enough depth to make the policy issues understandable. The goal of the course is to identify and understand the main policy issues surrounding this technology and to grasp such related themes and issues as the relation of science and technology; the complexity of management and decision-making in large-scale technical enterprises; and the philosophy, logic, and ethics of risk, deterrence, and proliferation.

Several field trips are planned in conjunction with the courses, including: one to a nuclear research and development laboratory (such as Oak Ridge), one to an operating nuclear power plant (such as McGuire), one to a power plant construction site (Shearon Harris and/or Clinch River), and one or two more to other research and development and operational facilities.

These courses will be taught by Dr. Henry Petroski of the School of Engineering and Dr. Alex Roland of the Department of History.

COSTS

The tuition for each of the two-course (6 s.h.) offerings is \$936 and a health fee of \$24 per term is required. Air-conditioned dormitories and cafeteria meals are available on campus — costs vary depending on the type of accommodation and meals selected.

For further information, please contact:

Summer Session
121 Allen Building
Duke University
Durham, North Carolina 27706
(919) 684-2621

DEADLINES FOR NEWSLETTER MATERIALS

Vol. 7:2--Summer 1 June 1982

Vol. 7:3--Fall 1 Sept. 1982

Vol. 7:4--Winter 1 Dec. 1982

Vol. 8:1--Spring 1 March 1983

4S *Society for Social
Studies of Science*

The 4S Newsletter is published four times each year, beginning with V.6:3 at the Department of Sociology, Texas A&M University, College Station, Texas 77843 and sent to all members of the Society for Social Studies of Science. Membership is on a calendar year basis. Membership dues (\$15 for professionals, \$5 for students) and institutional subscriptions (\$25) should be sent to: The Secretary/Treasurer, 4S, Department of Sociology, Indiana University, Bloomington, Indiana 47405.



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Texas A&M University
College Station, Texas 77843

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