4-18-91

NEWSLETTER OF THE AMERICAN SOCIOLOGICAL ASSOCIATION SECTION ON

SCIENCE, KNOWLEDGE and TECHNOLOGY

Volume 4, Number 1 April 1991

FROM THE EDITOR

In addition to relevant announcements, I am also eager to receive essays and reports of the kinds illustrated in this issue by the contributions of Daniel Lee Kleinman and William Sims Bainbridge. Send your material to Professor Maurice Richter, SKAT Editor, Sociology Department, The University at Albany, 1400 Washington Ave., Albany, NY 12222. I can also be reached by FAX (518-442-4936), home phone (518-869-6720) or E-mail (MR274@ALBNYVMS.BITNET).

NOMINATIONS SOUGHT FOR TWO NEW AWARDS:

This is a repetition of an announcement made in the last issue of the newsletter. The deadline has been extended to May 1.

At the 1991 ASA meeting, SKAT will initiate two annual awards:

(1) Hacker/Mullins Student Award and (2) Robert K. Merton Professional Award. The student award is named in honor of Sally Hacker and Nicholas C. Mullins, both of whom made distinguished contributions to teaching. The award selection is based upon an article from the dissertation or an article based upon the dissertation. The award carries a modest monetary prize ($100), a year's membership in the section and a place on the program.

The professional award, named in honor of the founder of the specialty, is an award of honor and prestige. Selection for this award is based on a piece of work published within the past five years. The award is based on the work, not the person (it is not a career or service award). The awardee should be a member of the section in the year in which the award is made. The recipient of this award will receive a plaque. It is significant that this ASA award is the first to honor Merton. Both awards will be presented at the business meeting.

An awards committee comprised of Willie Pearson, Jr. (Chair), Thomas F. Gieryn and Adele Clarke will select the winning candidates. Send nominations and supporting documents to Willie Pearson, Jr., Department of Sociology, Wake Forest University, Winston-Salem, NC 27109, FAX (919) 759-6074.

CALL FOR SESSION PROPOSALS

SKAT needs session organizers for the 1992 Pittsburgh meetings. Session organizers propose a topic and evaluate papers submitted for the session. We will have two or three sessions plus one-hour roundtables. Please send session proposals to Susan Cozzens, Department of Science and Technology Studies, Rensselaer Polytechnic Institute, Troy, NY 12180-3590.

AN INVITATION TO STUDENTS:

The student representatives on the SKAT Council would like to know what student members think about SKAT activities and about how SKAT Council can best represent student interests. We are planning a student orientation party at the 1991 ASA meeting in Cincinnati, and might perhaps organize a session on funding opportunities for dissertations. What else should we arrange? Please send questions and suggestions soon to Rosa Haritos, Department of Sociology, Box 58, 415 Fayerweather Hall, Columbia University, New York, NY 10027.

MEETING ANNOUNCEMENTS

International Society for the History, Philosophy and Social Studies of Biology: Northwestern University, Evanston, Illinois, July 11-14, 1991. For program information, contact Peter Taylor, Program Coordinator, STS Program, 632 Clark Hall, Cornell University, Ithaca, NY 14853, or by BITNET: BJTJ@CORNELLA. For information concerning registration and accommodations, contact David Hull, Philosophy Department, Northwestern University, Evanston, Illinois 60208-1315, or the Society Secretariat at the address below. For information concerning the society meeting, dues, or newsletter, contact Peggy Stewart, IS/HPSSB Secretariat, Science Studies Center, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061-0247 or by phone (703) 231-8471, FAX (703) 231-9307, or BITNET:BLUE@VTVM2.

CALL FOR ESSAYS

I invite contributions to a volume of essays - for scientists and science educators, feminists, and people in the social studies of science - on feminist perspectives on the content of different fields in the natural sciences. Anticipated schedule: first call, essays due by July 15, 1991; possible second call, due by October 15, 1991. For further information call or write to Bonnie Spanier, Chair, Women's Studies Department, University at Albany, SUNY, Albany, NY 12222 (518-465-5535, home).

THE POLITICS OF SCIENCE: ONE RESEARCH AGENDA

Daniel Lee Kleinman
Department of Sociology
University of Wisconsin-Madison

My research is motivated by two related concerns: the growing domination of social life by experts and the general absence of democratic lay participation in decisions regarding science and technology. My ability to address these concerns has been greatly enhanced by recent work in the sociology of science. This work has successfully displaced the Mertonian contention that science is fundamentally distinct from other social realms. The idea of a completely

insulated meritocratic realm has been replaced by the idea, as Pierre Bourdieu says, that "science is a field like any other...."

While this work has been an important jumping off point for my research, I believe it is inadequate in a number of ways. In general, work by the group of researchers who could be called constructivists has generally paid insufficient attention to the political character of science--the centrality of relations of power in science. Thus, while uncovering the social nature of knowledge or fact construction, constructivist work has typically failed to explain, for example, why one side in a struggle over fact, category, or knowledge construction wins and another loses.

My research is fundamentally concerned with the political character of science. One issue on which I have done work is the politics of discourse in debates over science and technology.

In my current dissertation research, I look at the politics of science from a different perspective. In that research, I use the tools of political sociology to explain why research policymaking in the United States became so fragmented and decentralized in the period after the World War II. I tie my analysis of historical materials to contemporary debates about how to organize research to enhance American economic competitiveness, and draw on the framework I develop in the course of analyzing the immediate postwar period to analyze the prospects for the establishment of a more comprehensive research policymaking agency in the US in the near future.

Conceptually, my dissertation work draws heavily on recent institutionalist research on state policy. Following this work, I see power as central to explaining policy outcomes and argue that power must be understood in an institutional context, whether that be the organization of the state, of professional associations, or firms. I add to the growing literature that attempts to move beyond the state-society dichotomy and argue that in the case I study, the power of social actors is funneled through their relations with state actors. In addition, I provide a corrective to the implication in much research on policy and the state that the only social actors of importance are capital and labor. My research suggests that what actors are important will depend on policy domain and that in the area of science policy it seems safe to assume that scientists will be more important than labor. Finally, in this work I reassert the importance of social connections and the informal in making policy in the United States. The rejection of instrumentalism by many marxists and others has led to focus on structures and institutions. This is an important corrective. And indeed, state-centered and institutional research has reintroduced individuals into the analysis of policymaking. However, generally this work underplays the importance of social connections and their operation.

To take a concrete example, in one chapter, I explore how during World War II a small but elite group of scientists led by Vannevar Bush parlayed their existing social connections and credibility into a powerful institutional space in the federal government. I further explore how, over the course of the international conflict, this space and the success of science in fighting the war provided the basis for developing a matrix of social connections and credibility which enabled this elite group of scientists to play an important role in shaping postwar research policy. In another chapter, I look at how barriers created by American state structure and party organization led to a five year delay in the passage of postwar science legislation.

I expect my future research to address what I see as another shortcoming of recent work in the sociology of science: the failure to adequately link the micro and macro levels. In future research, I hope to link the larger political economy with the process, products, and discourse of a specific scientific laboratory. Understanding the institutional is not only important in understanding science policy, but also in understanding the process of science at the lab level. We need to consider the links between business, foundations, and the government in shaping

research agendas and, indeed, shaping fact construction on the lab floor. In all of these areas, I believe the work of Bourdieu could be quite useful. His conceptualization of different varieties of capital--scientific, social, cultural, economic--and how one form can be transformed into another, conceptualized in an institutional context, may be quite useful in helping us understand the politics of category construction and, indeed, the politics of science more generally.

I hope to hear directly from anyone who is working in related areas.

THE PROBLEM OF SPACEFLIGHT: A PERSONAL REFLECTION

William Sims Bainbridge
Department of Sociology and Anthropology
Towson State University
Towson, Maryland 21204-7097

Nearly twenty years ago, I stood on the sand of a Florida beach in the midnight darkness, to see the last human beings leave Earth for the Moon. After hours of delay, the orange flash of the huge engines of a Saturn-V signalled the launch of Apollo 17. My first reaction, after snapping a roll of photographs through my Nikon's big lens, was a profound sense of the fragility of three human bodies aboard the command module. In an instant, their flesh could be torn to shreds by sharp metal and the power of raging fires. Then I reflected on the fact that the Apollo Program had been cancelled. The stairway to the Moon, that had been climbed frequently over the previous four years, was dismantled that December in 1972.

Twenty years earlier, I had become emotionally committed to the conquest of outer space. The factors were many, I suppose. My father's father thought of himself as a scientist as well as a surgeon, and both my mother and her father were avid readers of science fiction. I remember watching a lunar eclipse when I was eight or nine, and giving the nurses lectures on the solar system when I had my tonsils out. At a similar age I received a private tour of a nuclear physics laboratory, my parents being kept out because as adults they needed security clearance.

At boarding school I proudly calculated the size of the moon without relying upon any existing data; this involved observations of the length of the month, the force of gravity at the Earth's surface, and the size of the Earth (estimated during a family trip to Scotland), followed by a series of measurements of the Moon's angular diameter obtained by squinting at it between parallel strips of tape on a distant window. I recall well the joy and the shock when the Soviet Union launched Sputnik I. My school sent me to New York to audition for the quiz program, Sixty-Four Thousand Dollar Question concerning astronautics, but I expressed scorn for the American educational system during the interview and did not get on. I enrolled at Yale with advanced standing in physics, planning to develop fusion powered rocket engines.

I then encountered two of the many varieties of alienation. First, I found that serious natural science requires a tremendous amout of tedious, exacting work. My specific downfall was a chemistry course in semi-micro qualitative analysis. At the beginning of each laboratory, we would line up, each holding a tiny spoon, and receive a small quantity of unidentified powder; at the end, each of us had to announce what the substance was and explain what chemical tests we had applied to find out. Either I was utterly lacking in talent for this sort of work, or my spirit rebelled, because I simply could not do it. In childhood I had become committed to a totally illusory image of science, and in late adolescence I encountered the terrible truth. The gap between expectation and reality could not have been greater.

Another kind of alienation concerned the gap between the individual and the group. As a child, I had believed that studying science would enable me to fly to the stars, personally. But the men who flew in the early space missions had not designed the vehicles, and it became clear to me that space programs were vast bureaucracies in which few individuals could achieve individual creativity. Still gripped by the desire to create technology myself, I entered a period of somewhat painful exploration, in which I composed electronic music and built harpsichords. I suppose the many pieces of computer software I have published over the last few years are a continuation of the desire to create technology myself, without the stifling captivity of a bureaucracy.

This brief autobiography is meant to illustrate some of the contradictions that hover around any personal commitment to something as vast and difficult as spaceflight. All sociologists possess personal commitments to one thing or another; otherwise they would be immobilized by anomie. Of course, as Weber long ago lectured us, a value commitment does not necessarily mean a bias that will distort research, and I hope that colleagues with very different personal commitments will find merit in the books and articles I have written on the space program.

My major theme has been commitment on a larger scale, the question of how a society could dedicate itself to achieving spaceflight. My chief proposition is that ordinary utilitarian motives are not enough, and that transcendental motivations, such as provided by a social movement, are required. As presented in my doctoral dissertation for Harvard, which became my first book (The Spaceflight Revolution, Wiley-Interscience, New York, 1976), the story has elements of irony and tragedy, laced with deep moral ambiguity.

Proponents of spaceflight like to believe, on the one hand, that spaceflight is the inevitable result of technological progress, and on the other hand, that the social benefits will convince almost anyone to support space exploration. I have often heard people say that "mankind" has an innate drive to explore, and thus that space exploration serves natural human instincts. The problems with this thesis are many. Certainly, sociologists seldom employ the concept of instinct today, and many of us believe that humans lack well-defined instincts beyond the urge to suck. Even if there is a natural urge to explore, there are many kinds of exploration, including dimensions of spiritual or aesthetic experience as well as the physical movement upward. Those untutored in the social sciences frequently attribute to whole societies the feelings and needs experienced by single individuals, but it is a long way from a person's desire to see what is over the next hill to the collective enterprise of exploring the universe.

Spaceflight, it is said, can provide innumerable practical benefits in the short term, and the technological infrastructure needed to exploit them will provide the basis for interplanetary travel. But every benefit space offers can be provided in a different way by terrestrial means. For example, a system of cheap automated weather observation stations on the ground can provide much more information than weather satellites do. And consider the competition faced by communication satellites; cables are still being run across the oceans, and fiber-optics can carry far more data than satellite radio links.

In any case, history clearly shows that ordinary institutions of society were not interested in space exploration, and that enthusiasts were unable to convince many people of the practical benefits until after satellites were already in orbit. The old Verein fur Raumschiffahrt - the German Society for Space Travel - tried to get bankers interested around 1930: no deal. Nor were industrialists, scientists, or government officials interested. Even in those days of early optimism, the costs of spaceflight were clearly too high, and the benefits too uncertain, to justify investment for ordinary motives. The only alternative for the fledging spaceflight movement was a military detour to the stars.

The German branch of the movement, in the person of young Wernher von Braun, was able to convince the Germany army to invest in liquid-fuel rocket technology. This would have been impossible but for the fact that the treaties ending World War I had placed severe restrictions on German artillery and aviation but did not mention rockets. (Note: The proper form of engine for ballistic missles is the solid-fuel rocket, not the more powerful and cantankerous liquid-fuel variety.) Von Braun took the military for a ride on machines intentionally developed as prototype spaceships but sold, I believe with conscious deception, as weapons. Other countries did not press forward with liquid-fuel rocket weapons until after von Braun had created his V-2, and the particular social and military conditions faced by Germany were crucial for its development.

Today, the chief American ballistic missiles are solid-fueled, and they are too small to play much of a role in spaceflight. Efficiently designed to destroy cities, hurling multiple warheads halfway around the world, the Minuteman is a poor vehicle for space exploration. But the Atlas and Titan liquid-fuel ICBMs of the late 1950s, that orbited men in the 1960s, were bigger for the simple reason that nuclear warheads of the 1950s were bigger than today's svelte bombs. Had liquid-fuel rocket technology not been promoted by the spaceflight movement, military rockets would always have used solid fuel, less well adapted (if not quite hopeless) for spaceflight. Had the development of rocketry been delayed even a few years, the warheads would have become so light that launchers big enough for serious space missions would never have been needed for military purposes.

While we are considering counterfactuals, we should mention the alternatives to the ICBM. One, of course, is international friendship. Another is the long-range bomber aircraft. Still another is the cruise missile, such as the old German "buzz bomb." There are so many alternatives to the large, liquid-fueled ballistic rocket, that its development was far from inevitable. Thus the manipulation of military consciousness by the spaceflight movement was essential if warfare was to develop the technological basis for space travel.

My analysis has an optimistic side, because it asserts that a few individuals, pressing the right ideas at the right time, can decisively shape history. Indeed, my dissertation was an argument against the doctrine of technological determinism. But my analysis has a pessimistic side, as well, because it asserts that even a "good" technological development may have extremely negative side effects. Without the spaceflight movement we would not have seen the grand sights transmitted by Voyager II, but we also would not have suffered the threat of ICBMs.

The military detour is over. Whatever one thinks of the Strategic Defense Initiative (SDI or "Star Wars"), one must now recognize that few of its components will contribute directly to the development of spaceflight. The "space race" that energized progress in the 1960s was unfortunately won twenty-two years ago, and the Soviet space program is in even worse shape than that of the United States. Over the past twenty years they have sustained the pretense of a manned, scientific space program by lofting crew after crew into low Earth orbit, using essentially the same booster that launched Sputnik I back in 1957, but the benefits have been practically nil outside the political arena. And now the Soviet Union has nearly run out of money for spaceflight.

In recent years, my space-oriented research has focused on the cultural sources of possible future transcendental social movements dedicated to the colonization of the solar system. One book used surveys and factor analysis to examine the competing ideologies of science, technology and society presented in science fiction literature (Dimensions of Science Fiction, 1986, Harvard University Press, Cambridge, Massachusetts). From the early novels of Jules Verne and H.G. Wells, through the Hard Science fiction of the 1940s, the most recent New Wave or Cyberpunk stories, science fiction has boosted the cause of spaceflight. The "SF" subculture has also shown itself capable of generating wild, counter-cultural movements, placing the goals of astronautics in romantic, radical, human contexts.

Periodically, I publish rogue articles or book chapters suggesting that a space-conquering religion might arise from the milieu of scientistic cults that currently lurks in the limbo shadows of technocratic society. This is not a major theme of my three books in the sociology of religion, but study of innovative processes in new religious movements convinces me that a real potential exists for a religious movement that would drag humanity to the stars.

This year, I am publishing a new book, based on about 4,000 questionnaires, that examines the structure of spaceflight ideology in American culture (Goals in Space SUNY Press, Albany, in press). The chief work was done at Harvard, where I administered a pair of questionnaires to students, the first gathering open-ended expressions of spaceflight values, the second transforming those responses into fixed-choice items that could be the basis of statistical analysis. I used factor-analytic and block-modelling techniques to identify the clusters of concepts that represented distinct values that could be fulfilled by human expansion beyond the Earth. While I hope that some sociologists are interested in my results, particularly for what they say about American values and the future of technology, frankly my chief aim was to provide the Spaceflight Movement with a doctrinal text from which members could extract effective justifications for the space program.

I know that colonization will be difficult, and I have taken the pains to learn about the environments of the solar system that conceivably might become homes for humans. The Moon is low in hydrogen, but Mars has every element we might need. Jupiter's moons are bathed in lethal radiation, but the outer satellites of Saturn (Rhea and beyond) would be safe, as probably would be the cold moons of Uranus and Neptune. Setting aside Freeman Dyson's mad, glorious plan to attach cities to comets, colonization would have to start with the Moon and Mars.

Once extraterrestrial colonies became economically and technically self-sufficient - given an investment for Mars of, say, one decade of USA annual gross national product - they would probably become politically and culturally independent, as well. Anyway, I hope so. This old Earth is going to become a very dull place, assuming we don't blow ourselves up, as the bureaucracies of transnational corporations and blending welfare states (e.g. Europe in 1992) smears all the colors of the terrestrial human portrait together. But, as Dyson argued long ago, the ineluctable separations between planetary societies will preserve social and cultural differences. Once the solar system is colonized, Earth can slump into its dotage, as the young societies of space prepare to leap outward to the stars.

Well, okay. Maybe you don't like this vision. But then, let me ask a sociological question: By what processes can present industrial society evolve into a radically different form? Very few sociologists consider questions of social evolution any more, and fewer still - outside the greatly diminished ranks of Marxist optimists - consider what our society might become, centuries in the future. Spaceflight will either open the heavens to human habitation, thus producing a vast new range of social phenomenon for us to study, or it will come to a halt, signalling a very different set of future conditions in which sociologists will have to work. Either way, the spaceflight movement is worthy of sociological investigation.

SOME RECENT (1990) PAPERS BY SECTION MEMBERS

Ahmad, Aqueil. "Institutionalization of the S&T Policy Process in the States," Southern Sociological Society - North Central Sociological Association Convention, Louisville, KY, March 21-25, 1990.

Clarke, Adele E. 1990. "A Social Worlds Research Adventure: The Case of Reproductive Science." Pp. 25-30 in Susan Cozzens and Thomas Gierynn (Eds.) Theories of Science in Society. Bloomington: Indiana University Press.

Clarke, Adele and Elihu Gerson. 1990. "Symbolic Interactionism in Science Studies." Pp. 179-214 in Howard S. Becker and Michal McCall (eds.) Symbolic Interaction and Cultural Studies. Chicago: University of Chicago Press.

Clarke, Adele. 1990. "Controversy and the Development of American Reproductive Sciences." Social Problems 37 (1): 18-37.

Clarke, Adele. 1990. "Women's Health Over the Life Cycle." Pp. 3-39 in Rima Apple (Ed.) The History of Women, Health and Medicine in America: An Encyclopedia Handbook. New York: Garland Press.

Clarke, Lee. Oil spill Fantasies, Atlantic Monthly, Nov. 1990.

Eve, Raymond A., and Francis B. Harrold. The Creationist Movement in Modern America, Twayne Press, 1990.

Goldberg, Albert I. "The failure to establish an authoritative professional association:industrial engineering in Israel," American Sociological Association, Washington, DC., 1990.

Hilgartner, Stephen, "The Dominant View of Popularization: Conceptual Problems, Political Uses." Social Studies of Science 20 (3):519-39. (August 1990).

Hilgartner, Stephen, "Industrializing Genome Mapping: Skill and Scale in the Human Genome Initiative." Paper presented at conference on Rediscovering Skill in science, Technology, and Medicine, at the Science Studies Centre, University of Bath, UK, September 1990.

Kleinmen, Daniel Lee. "Dense Webs: Business and the Debate Over Postwar Research," Paper presented at the Visiting scholars Seminar, Hagley Museum and Library, Wilmington, DE, June, 1990.

Kleinmen, Daniel Lee. 1990. "We Can Say No to Science, Technology." Milwaukee Sentinel. May 9th.

Rose, Eugene A. (With Tom Dietz): "Situating Risk Perceptions in Their Social Context: A Framework for Future Inquiry," paper presented at meeting of Society for Risk Analysis, October 1990.

Rose, Eugene A. (with Randall Kleinhesselink, Noriyuki Matsuda and Rodney Baxter): "A Comparative Analysis of Perceived Current Regulation and Preferred Future Regulation of Risks in Japan and the United States," paper presented at meeting of Society for Risk Analysis, October 1990.

Wilke, Arthur, and Aqueil Ahmad. "The Extent and Intensity of Conflict in Indian Research Settings," Journal of Scientific and Industrial Research, Vol. 49, Aug. 1990.