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STS AND COMMUNITY SERVICES AT THE UNIVERSITY OF QUEBEC AT MONTREAL

I recently undertook a visit to learn more about STS activities at the University of Quebec at Montreal (UQAM) and in Quebec more generally. Over the course of a several day visit, I spoke with a number of faculty to learn what was happening at UQAM and why was it happening there. The University of Quebec system was initiated in 1969, with nine campuses throughout the Province. It hardly needs saying that the late 1960s and early 1970s were significant years in both higher education and in Quebec history, marked by separatist sentiments in Quebec and student protests throughout North America and Western Europe. So the time for innovation in higher education was "ripe."

In Quebec, the Catholic Church had previously been the dominant institution affecting secondary and higher education of the Francophone population. Prof. Karen Messing (Prof. of Biology and Action Research Group on the Biology of Work) noted that inspiration for the new University system arose in part from populist, anti-clerical aspects of the social ferment. The first group of professors saw themselves as building a new University with a new social mandate--the University would be supported by the people through taxation, and its mission would be to serve the people in a very direct way.

The faculty was represented by a CNTU (Confederation of National Trade Unions) labor union, and some driving forces in the early years were active trade unionists. This accounts for the special "protocol" with the labor organizations, which is a model for similar arrangements with women's organizations and environmental organizations. More about this follows later.

The University's mode of organization also facilitates the formation of working groups for non-standard teaching and research. Unlike most universities, there are no formal "colleges" separating scientists, humanists, technical professionals, etc. Instead there are two over-lapping forms of organization.

First, faculty members are organized into standard departments chaired by a director elected by faculty for a two-year term. The

Director is a member of the faculty and the union, not the administration. In addition there are programs consisting of "modules" of faculty and students. Like departments, some programs can offer degrees. For example, the STS program offers the B.A. Only departments can hire permanent faculty; programs make use of departmental faculty and can hire only fixed-term faculty. But this also makes it possible for new program "modules" to be created by students and faculty as new needs arise, without incurring long-term obligations. Faculty members form the departments and fixed term faculty can move in or out of program modules, and some well-established programs can also eventually become departments.

Dr. Messing also noted that the climate and norms of UQAM favor experimentation. Expectations for faculty productivity are relatively clear; and because supports are provided for their attainment, the familiar American tenure anxieties are not generally experienced. Faculty who perform well can expect favorable tenure decisions, and junior faculty can become involved with more experimental program efforts without fear that they will be jeopardizing their careers. In fact, such efforts are "in the air" and encouraged.

Teaching and Research in Community Services

A unique feature of UQAM, and one that merits close attention and emulation in other public sector universities, is the system of community services. This system embodies the commitment to serve the general public in a direct way.

From the beginning, UQAM felt that its unique contribution to society lay in teaching and research, but that standard "discipline-based" teaching and research might not make the most direct contribution. Various groups and interests in society may end up being "underserved" by standard formats and routines of teaching and research. So the Office of Community Services was formed to establish liaisons with the non-profit sector in order to reach mutual understanding about its knowledge and learning needs and the best ways that the university could contribute to serve them. Currently there are formal programs with labor, women's, and environmental organizations.

University-Labor Programs

The first cooperative program of community service was established between UQAM and the two umbrella associations of labor organizations in Quebec, the CNTU and the FLQ (Federation of Labor of Quebec), the "Protocol d'entre UQAM-CNTU-FLQ." Mr. Michel Lizee is the coordinator of university-labor projects. He noted that from the beginning all sides recognized that there were inadequacies in prior discipline-based models of teaching and research for the goals of community service. The standard discipline based three-credit course (even if delivered on sight to a labor group) might not contain the specific knowledge and skill objectives sought by the workers. Standard research might advance the interest of science, using workers merely as "subjects" without an explicit commitment to serve their interests. On the other hand, faculty members were very concerned about potential conflicts with academic and scientific freedom and responsibility in university courses designed to serve the needs of specific groups in society.

The solution was to develop separate teaching and research activities for the labor groups. The courses are all non-credit short courses; the research is conducted in special action-research groups. All activities are under the direction of a joint committee of the University and the two labor federations and hence are not under direct University authority, although all three partners retain veto power.

The University currently supports Community Services by offering the equivalent of 20 three-

credit courses in non-credit versions. Regular faculty participate as a standard part of their workload. While there are differences between departments, on the whole this form of non-credit extra-mural teaching is encouraged throughout the UQAM community.

Extramural action research projects are also funded by internal funds, and regular faculty members may be assigned to such projects as a part of their workload. An example of such a group is Prof. Messing's Action Research Group on the Biology of Work, which among other achievements has led to her publishing a series of important papers analyzing the freedom of work environments from hazardous levels of toxic chemicals.

University-Women's Organizations Programs

On the same model, the University has more recently established a program of teaching and research in conjunction with a federation of women's organizations. Ms Lynn Kurtzman coordinates this program.

Topics of current interest include the new technologies of reproduction, e.g., frozen embryos, surrogate mothers, genetic screening. Representatives of women's committees of the labor federations have also identified workplace issues such as office automation, job satisfaction, and women's access to traditionally male work roles. Action research in this area has included inquiries into hazards in the workplace and ergonomic studies to facilitate women performing tasks usually assigned to men.

I asked whether there was concern for the interests of women in the more socially marginal groups, the groups most "underserved" by knowledge and research. Ms Kurtzman said that efforts were made to serve such groups, e.g., female heads of single parent families. Through the federation of women's groups, University personnel provided technical skills and training, especially in training and organizing so that leadership could emerge on a local basis.

Community Services and STS

Because UQAM has a STS research institute (CREST--the Center for the Social Evaluation of Technologies) and a bachelors degree-granting STS program, the question of the relationship between STS and Community Services arises.

Mr. Lizee noted the distinction between activities that take some group of interests as an "object of study" and those that make a commitment to those interests, for example, the distinction between labor studies (which takes labor as an object of study) and labor education (which seeks to provide multidimensional knowledge and skills for organized workers). The leaders of Community Services perceived STS as an academic program with science and technology as "objects of study." Some STS program faculty at UQAM were also involved in Community Services, but there is no aura of a "special" relationship--beyond that existing between any academic unit and community services--between the two programs.

Mr. Pierre Gladu (Director of Community Services) indicated that this arrangement kept the lines clear, and he preferred this. Instilling a client-centered conception of teaching and learning throughout the University, one based on real learner needs, rather than academic norms and conventions, was in his view a "lost cause." It is wiser, he felt, for Community Services to concentrate on their own efforts than to attempt to urge other programs or departments (including STS) to adopt this client-centered mode of thinking. Other academic units can in this way remain as "academic" as they wish, developing client-based activities as the need arises.

He also noted that the battle for "relevance" in teaching and research has changed over the past fifteen years; it is no longer a matter of an

"ideology" regarding the nature of knowledge and learning, but more of a case-by-case struggle to represent certain interests or make determinations of fact. While students had in the early years been an unsettling influence in the traditional university, today they are more conservative and insecure, wanting to be pointed in a safe direction. While fifteen years ago many academics were keen to take on concrete and socially relevant applied research projects, today they are less certain. Of course academics still wish to make social contributions, but now they are not clear about how to do so without harming their academic career prospects.

The STS Program at UQAM

The STS program at UQAM is only two years old. Camille Limoges, a former STS faculty member of the University of Montreal and subsequently Deputy Minister of Science and Technology in the P.Q. Government, is the new Director, and he is initiating some curriculum changes to make the program "tighter" from an academic point of view. In his view a STS major requires such a breadth of knowledge that there is little room for course electives. New courses are being introduced in the economics of innovation and in environmental problems.

What is an undergraduate STS major at UQAM expected to learn? Prof. Limoges distinguished knowledge and skill requirements. With regard to knowledge, he stated that all majors should have a broad base in science, a critical reading knowledge, so that they could read the science and engineering aspects of emerging issues and not be "snowed." They need to be able to grasp what is central to new issues, both in social and technical terms. They need to be able to read expert analyses (e.g. technology assessments, environmental impact statements, cost-benefit analyses) and to see where such expertise is vulnerable to intellectual attack. They need to understand major social, political, and economic processes which give rise to new technologies in society, how decisions are made under uncertainty, the power of various groups.

Concerning skills, Limoges stressed writing skills. Students need to be able to absorb large quantities of information, yet prepare brief summaries useful for decision makers. The course sequence for the STS major includes three courses focused on such skills, where students analyze technology-dominated issues and learn to organize ideas and to write reports.

In a capstone course students work on a project with an organization, e.g. the Quebec Science Council, The Institute for Research on Health and Safety, or The University-Industry Center on Computer Science. The students become involved in genuine issues and prepare reports, some of which are published.

Prof. Limoges did not fully accept the distinction between academic and client-centered teaching and research, at least in the terms laid out by Mr. Lizee and Mr. Gladu. Limoges perceived a closer potential relationship between STS and Community Services than that which would be experienced by other academic units. I am curious about how this relationship will develop.

In the Spring 1989 there were thirty-five STS majors at UQAM, and twenty-five more have been accepted for fall, for a total of sixty. The first group of seven degree students graduated in December. Where will they go from here?

Prof. Limoges stated that of the seven, three will go to graduate school (one in philosophy, two in environmental sciences), three will seek employment, e.g. as staff members of government councils, and one older student will retain the job he has held for some time. He expects that this approximate ratio--50% to graduate school and 50% to the job market--will hold constant for future graduates, adding that much ground work has been done to prepare graduate degree programs in Quebec and government agencies to accept STS undergraduate majors. As an established academic leader and former Deputy Minister, Prof. Limoges seems uniquely qualified to "pave

the way" for graduates of the UQAM STS program. Prof. Limoges added that UQAM has no plans to initiate a doctoral degree program in STS.

Limoges who is currently President of the ACFAS, the Quebec equivalent of the AAAS in the U.S., is familiar with efforts to reform science education in American and Canadian schools, such as Project 2061 of the AAAS. He noted that while some other STS scholars at UQAM were interested in the public understanding of science and technology, unfortunately no one was interested in the role of science education in the schools. I now turn to that topic.

University-School Relations in STS in Quebec

An important aim of the U.S. STS community is to assist in establishment of ties between university-based STS scholars and teachers in the schools. I think we have had a fair measure of success in this, even though more needs to be done. Are such ties being established in Quebec?

There is considerable STS activity among secondary educators in Quebec. In preparation for my visit I discovered that a major conference on STS and social responsibility themes in Canadian science education was held in October 1989, jointly sponsored by the Ontario and Quebec Science Teachers Associations--L'ENSEIGNEMENT DES SCIENCES--L'AVENIR DU CANADA. This conference appears to be similar to our Technological Literacy Conference--keynote speakers included Project 2061 Director James Rutherford and Penn State social critic Ivan Illich. A good network--one crossing Canada's French-English language barrier--is being established among STS-science educators at the secondary level.

However, with the exception of Prof. Limoges, none of the UQAM faculty I met were familiar with either programs or personnel of STS efforts at the secondary level. And Prof. Limoges was quick to explain that he was familiar with such programs only by dint of his previous role in the Quebec government; he would not have learned of such efforts as a University scholar in STS. I had experienced a similar gap in Canada's STS "network" during an earlier visit to the University of Waterloo in 1988. Another October 1989 conference on "Technology and Ethics" at the University of Guelph attempted to bridge this gap, by including a strand of programs on education under the direction of Dr. Clive Beck (Ontario Institute of Education), a leading ethics and values educator, along with leading STS scholars such as Paul Durbin (Univ. of Delaware). Nonetheless, the ties between university and school-based STS educators appear to me to be better established in the U.S. and Western Europe than in Quebec or elsewhere in Canada. They could be improved through the formation of a multi-level national STS professional organization similar to the National Association for Science, Technology and Society (NASTS) in the U.S.

Conclusion

The programs relating science, technology, and the public interest at UQAM appear to me to be unique and important, and worthy of attention and even emulation by university-level programs in the United States and Western Europe. The STS community and NASTS can help to spread the word about these important programs by inviting leaders at UQAM to make presentations at national STS meetings in the U.S. and by assisting in establishing further individual and inter-institutional ties through the "networking" process at these meetings.

Leonard J. Waks
The Pennsylvania State University

A shorter version of this article appeared in *NASTS NEW* 2 (October 1989): 1-2.

COURSE SYLLABUS

SCIENCE, TECHNOLOGY AND RELATIONS BETWEEN THE SEXES

SOC-4050
Department of Sociology
Baccalaureat in Science, Technology and Society

Louise Vandelac (Sociology)
Karen Messing (Biology)
Université de Québec à Montréal

Course Description: Basic concepts concerning relations between women and men. Study of the interactions between sex, gender, science, and technology. Analysis of science as an institution; how disciplines have developed in a sex-biased way, sex stereotyping in career development, in creation of scientific relationships, in publication practices. Critical examination of the discourses, institutions, and practices of science as a sexualized social order, starting from different approaches to social criticism of science using techniques and perspectives developed by feminist analysis. Reflections on the issues and impacts of transformations in biology, biotechnology, medicine, and office technology on female-male relations.

Course Objectives: This course is obligatory for the bachelor's degree in STS and is intended to explain the place of social relations between the sexes in scientific and technical institutions, practices, and discourse. This course introduces the principal theoretical tools and methodologies of critical analysis of the social relations between the sexes and feminist approaches to the sciences and technologies. It will deal with concrete applications in ethics, studies of controversy, and social evaluation of technologies.

After an attentive examination of the place of women in the sciences and technologies, the course will explain the principal mechanisms of social differentiation of the sexes in science and technology, analyzing socialization, education, and discriminatory measures. We will comment on various androgenetic and sexist conceptions which have influenced the develop-ment of science and technology. We will give particular attention to the nature-nurture debate and to the biological and genetic arguments used to marginalize or exclude women from certain scholarly disciplines. We will emphasize the impact of science and technology on women and on male-female relations in the spheres of production and reproduction. The contribution of women to science and technology will be emphasized.

Course Content: During the first lecture period the course calendar and the determination of grades will be agreed on with students as a function of their interests and background.

Proposal Concerning Evaluation of Students: (N.B. At the University of Québec, regulations state that the modalities for evaluation of student performance must be agreed on by students and professor during the first three weeks of the course, and may not thereafter be changed without unanimous consent.)

Critical reading of an article, chosen from a list supplied by the professors--25%. Take-home with 2 questions (chosen from 4 supplied by the professors) on the material given in the first half of the course--25%. Paper on a question related to the course material, chosen in consultation with the professors. Critical reading of several articles--50%.

Criteria for correction: Clarity of presentation, scientific quality of the analysis, diversity of source materials, exactness of data.

COURSE SCHEDULE

Week 1 Introduction of participants. Presentation and discussion of the syllabus.

Week 2 History of women and social relations between the sexes in occidental societies, particularly since the 1800s. Basic concepts in feminist analysis of male-female relations.

Readings:

Marilyn French, *La fascination du pouvoir* (Paris: Fayard, 1988), pp. 198-278.

Nicole Laurin-Frenette, "Présentation. Les femmes dans la sociologie," *Sociologie et Sociétés* 13 (No. 2): 3-18.

Louise Vandelac, "Les études sur les femmes, les féminismes et les rapports de sexes: les enjeux et la passion du savoir." Repertoire des 200 cours, Femmes, feminismes, rapports de sexes, Groupe interdisciplinaire d'enseignement et de recherches féministes, *UQAM* (1989): 7-11.

Week 3 Key concepts in feminist analysis; gender, sex, science and technology.

Readings:

Pierre Thuillier, "La cause des femmes et l'écologie," *La Recherche* 15, no. 151 (janvier 1984): 80-83.

Pierre Thuillier, "La science est-elle sexiste?" *La Recherche* 13, no. 130 (février 1982): 235-37.

Colette Guillaumin, "Pratique du pouvoir et idée Nature. (1,2) *Le discours de la Nature. Questions féministes* no. 3 (mai 1978): 5-28.

Week 4 Evolution of the participation of women in science and technology before 1960. Marginalization of women in science and technology: biological determinism, socialization, education, segregation in the institutions of science and technology. Limits and usefulness of demonstrations of the presence of some women in science and technology.

Readings:

Autumn Stanley, "Women Hold Up Two-Thirds of the Sky: Notes for a Revised History of Technology," in Joan Rothschild, ed., *Machina Ex Dea: Feminist Perspectives on Technology*. The Athene Series (Elmsford, N.Y.: Pergamon Press, 1983), pp. 5-37.

Judith A. McGaw, "Women and the History of American Technology," *Signs* 7, no. 4 (1982): 798-828.

Sally Gregory Kohlstedt, "In From the Periphery: American Women in Science, 1830-1880," *Signs* 4, no. 1 (1978): 81-96.

Louise Michele Newman, "The Problem of Biological Determinism (1870-1890)," Chapter 1 and "The Evils of Education (1870-1900)," Chapter 2, in Newman, ed., *Men's Ideas/Women's Realities*. The Athene Series (Elmsford, N.Y.: Pergamon, 1985); pp. 1-47, 54-104.

Janet Sayers, "Sexual Equality as Reproductive Hazard," in *Biological Politics: Feminist and Anti-Feminist Perspectives* (London: Tavistock Publications, 1982), pp. 7-27.

Week 5 Women in modern scientific institutions: access to education and to certain kinds of courses in relation to sex. How women are marginalized in present-day science: analysis by steps in a career path.

Readings:

Isabelle Lasvergnas-Grémy, "Mais où sont passées les femmes de sciences," *Les cahiers de l'ACFAS* no. 22 (1983): 31-49.

Evelyn Fox-Keller, "Women, Science, and Popular Mythology," in Joan Rothschild, ed., *Machina Ex Dea* (Elmsford, N.Y.: Pergamon Press, 1983), pp. 130-46.

Suzanna Rose, "Women Biologists and the 'Old Boy' Network," *Women's Studies Int. Forum* 12, no. 3 (1989): 349-54.

Francesco Arena, "Présence des femmes en sciences et technologie au Québec," *Cahiers de recherches sociologiques* 4, no. 1 (avril 1986): 33-53.

D. Mergler. "La science au masculin: réflexions d'une scientifique sur 'A l'école des sciences," (Rapport du Conseil des sciences du Canada) in *Women and Sciences*, RFR/DRF 15: 13-16.

Week 6 Case studies: (1) Mathematics and women: importance of mathematics for science; mechanisms of marginalizing women; how to adapt mathematics teaching for women. (2) Women and technology: office mechanization without user consultation and its consequences: keypunch operators; glove factory workers.

Readings:

R. Mura, R. Cloutier, and M. Kimball, "Les filles et les sciences," in L. Dans Lafortune, ed., *Femmes et mathématique* (Montréal: Remue-menage, 1986), pp. 101-35.

C. Teiger and C. Bernier, "Intéret de l'analyse ergonomique du travail pour la mise en évidence des compétences méconnues: le cas des taches de saisie dans le tertiaire informatis," in C. Brabant and K. Messing, eds., *Le sexe faible ou le travail trop ardu*. Cahiers de l'ACFAS, 1990.

Week 7 Biology and female-male differences: chromosomes, embryonic development; how to differentiate inherited and acquired sex differences; some scientific errors.

Readings:

R. Hubbard and M. Lowe, eds., *Genes and Gender II: Pitfalls in Research on Sex and Gender* (New York, N.Y.: Gordian Press, 1978).

Mid-Semester Break.

Week 9 How science perceives women. Case studies: women exposed to testosterone; brain lateralization; sociobiology and rape.

Readings:

H. Longino, and R. Doell, "Body, Bias and Behavior," in S. Harding and J. O'Barr, eds., *Sex and Scientific Inquiry* (Chicago: Univ. of Chicago Press, 1983), pp. 165-86.

D. Janson-Smith, "Sociobiology: So What?" in Brighton Women and Science Group, *Alice Through the Microscope* (London: Virago Press, 1980).

R. Bleier, *Science and Gender* (Elmsford, N.Y.: Pergamon Press, 1984), Chapter 4, pp. 80-114.

Week 10 Feminist critique of science: choice of questions; starting hypotheses; choice of methods; interpretation and generalization of results.

Readings:

Evelyn Fox-Keller, "Feminism and Science," *Signs* 7 (1982): 113-26.

Karen Messing, "The Scientific Mystique: Can a White Lab Coat Guarantee Purity in the Search for Knowledge about the Nature of Women?" in M. Lowe and R. Hubbard, eds., *Woman's Nature: Rationalizations of Inequality* (Elmsford, N.Y.: Pergamon Press, 1983), pp. 75-88.

Sue V. Rosser, "Good Science: Can It Ever Be Gender Free?" *Women's Studies Int. Forum* 11, no. 1 (1988): 13-19.

Jeanne Lapointe and Margrit Eichler, "Le traitement objectif des sexes dans la recherche," *Social Sciences and Humanities Research Council of Canada* (1985): 5-32.

Helen E. Longino, "Science, Objectivity, and Feminist Values," *Feminist Studies* 14, no. 3 (automne 1988): 561-74.

Week 11 Feminist approaches to science. How to avoid sexism in science: Is feminist research merely non-sexist? Some techniques developed by feminists: The use of subjectivity.

Readings:

Karen Messing, "L'importance d'écouter les travailleuses et travailleurs quand on fait la formation en santé et en sécurité du travail," *Travail et santé,* mars 1989, 15 pp.

Karen Messing, "Putting Our Two Heads Together," in J. Ristock, ed., *Feminist Organizing in Canada* (Toronto: Univ. of Toronto Press, 1990).

Roberta Mura, "À la recherche de la subjectivité dans le monde des sciences: point de vue féministe, *Les documents de l'ICREF*, Institut canadien de recherches sur les femmes, no. 21, novembre 1988, 42 pp.

Week 12 Domestic technology.

Readings:

Joan Rothschild, "Technology, Housework, and Women's Liberation: A Theoretical Analysis," in Joan Rothschild, ed., *Machina Ex Dea: Feminist Perspectives on Technology*. The Athene Series. (Elmsford, N.Y.: Pergamon Press, 1983), pp. 79-93.

L. Vandelac, ed., *Du travail et de l'amour*. (New York, N.Y.: St. Martin's Press, 1985, 1988), pp. 313-66.

C. LeBourdais, P. J. Hamel, and P. Bernard, "Le travail et l'ouvrage: Charge et partage des tâches domestiques chez les couples québécois," *Sociologie et sociétés* 19 (1987): 37-55.

D. Tierney, P. Romito and K. Messing, "And She Ate Not the Bread of Idleness: Exhaustion is Related to Domestic and Salaried Working Conditions among Québec Hospital Workers," *Women and Health* (January 1990).

Week 13 Reproductive technology.

Readings:

Louise Vandelac, "Le face cachée de la procréation artificielle," *La Recherche* 20, no. 213 (Sept. 1989): 1112-24.

Monetee Vacquin, "Frankenstein ou les délires de la raison," in Francois Bourin, ed., pp. 160-221.

Bernard Edelman, "Le droit et le vivant," *La Recherche*, no. 212 (juillet-aout 1989): 966-76.

Jean-Yves Nau, "Le prix de l'oeuf humain," *Le Monde* (novembre 1988).

Jean-Pierre Berlan, "Science, affaires et démocratie," *Le monde diplomatique* (décembre 1988): 20-21.

Marie-Angèle Hermitte, "L'affaire Moore, ou la diabolique notion de droit de propriéte," *Le monde diplomatique* (décembre 1988): 20-21.

Week 14 Feminist Research: Use of science and technology to promote equality of the sexes in the workplace. Employment "ghettos" and their effects on women's and men's health and safety. Sex and genetic discrimination at the point of hiring: an analogy. How to adapt jobs for a wide variety of body types.

Readings:

K. Messing, "Do Women Entering Men's Jobs Encounter Special Risks to Their Health and Safety," *Tradeswomen* (Winter 1989-90).

D. Mergler, et al. "The Weaker Sex? Men in Women's Working Conditions Report Similar Health Symptoms," *JOM* no. 29 (1987): 417-21.

D. Tierney, and K. Messing, "New Tricks for Old Dogs: Genetic Testing Makes Victim-Blaming Scientific?" *Alternatives: Perspectives in Science, Technology and Environment* (August/September 1987): 31-37.

Week 15 Review and synthesis.

STS in USSR

While *glasnost* and *perestroika* are making headlines in the political and cultural spheres, behind the scenes there are important but less heralded changes taking place in the relationships among science, technology, and society. This has been brought home to North Americans by a recent two-week visit to the United States by Vitaly Gorokhov of the USSR Academy of Sciences.

Professor Gorokhov was born in Moscow in 1947 and received his first degree in engineering from the Moscow Radiotechnical College before going on to do work in philosophy at Moscow University, the Institute of History of Natural Science and Technology, and the Institute of Philosophy of the Academy of Sciences. From 1977-1980 he was responsible for the section of *Voprosy Filosofii* (Problems of Philosophy), the leading philosophical journal of the USSR, dealing with questions on philosophical and social problems of science and technology. From 1978 to 1988 he served as senior lecturer and then professor of philosophy at the Moscow Coalmining Institute. Since 1988 he has directed not only the Philosophy and Technology Research Group at the Academy of Sciences, but also held a chair in the methodology of science and technology at the Radio Higher Educational School of the Moscow Aviation Institute.

His United States visit, sponsored by the Philosophy & Technology Studies Center of Polytechnic University (New York), grew out of an agreement (negotiated by Professor Wolfgang Schirmacher, Director of International Programs at the Center) to hold cooperative symposia and to collaborate on a series of Russian, English, and German publications. It began with Gorokhov's arrival on Jan. 24th, after which he spent four days at Polytechnic doing research at the Center and giving a presentation on the preconditions for engineering ethics in a new course on this topic.

Following were visits to Hartford University (arranged by Professor Bernard denOuden) and Rensselaer Polytechnic University (with Professor Langdon Winner). Gorokhov then participated in the 5th National Technological Literacy Conference of the National Association for Science, Technology, and Society in Washington, D. C., February 2-4, 1990. Afterwards he spent three days with the STS Program at Pennsylvania State University and two at the University of Delaware (with Paul Durbin), before returning to New York in anticipation of departing for Moscow.

Gorokhov is the director of the Philosophy and Technology Research Group (seven full-time researchers complemented by a number of part-time associates) of the Institute of Philosophy (headed by Professor Viatcheslav Stepin) of the USSR Academy of Sciences. The Institutes of Philosophy, Sociology, Psychology, and Anthropology constitute the Humanities Studies Center, under the direction of Professor Ivan Frolov, who is also the editor of *Pravda*.

Although "STS" is not a recognized term in the Soviet Union, the research program of the Institute of Philosophy in fact

includes three research projects that together constitute a comprehensive approach to science, technology, society issues. One focuses on the "science of science," or science as a social process; a second concerns epistemology and the sociology of knowledge; and the third is Gorokhov's own research in the philosophy of technology.

Gorokhov's research group in the philosophy of technology concentrates on investigations of (1) the methodology of the engineering sciences, (2) the socio-cultural dimensions of technological activity and modern design, (3) the structure of engineering thinking and the philosophy of artificial intelligence and the computer sciences, and (4) philosophical problems of engineering education. Together with other members of his team he is editing a series of translations on *Philosophy of Technology in West Germany* (just published), *Philosophy of Technology in the United States* (forthcoming), *Philosophical Problems of Artificial Intelligence* (forthcoming), and *Classics in the Philosophy of Technology* (forthcoming).

Gorokhov himself has published books (in Russian) on *Systems Engineering and Management* (1979), *A Methodology of Systems Engineering* (1982), *Methodology of the Scientific and Engineering Disciplines* (1984), and a *History of the Engineering Profession and its Role in Modern Culture* (1987). This last book is scheduled for English language publication by the Moscow publisher MIR in 1990 under the title *Engineering: Art and Science*. Gorokhov's article on "Development of Systems Engineering Theory" is available in English in J. M. Gvishiani, ed., *Systems Research II: Methodological Problems* (New York: Pergamon, 1985), pp. 182-96.

Also completed is another book on *P.K. Engelmayer: Russian Engineer and Philosopher of Technology*, which should be published shortly. The need for North American and European scholars to become more aware of the work of Engelmayer, one of the original contributors to the development of the philosophy of technology, can be met by Gorokhov's important historico-philosophical research.

During his talks in the United States Gorokhov emphasized the need to overcome mythological thinking and ideological stereotypes with regard to engineering in both the Soviet Union and in other countries. The precondition for professional responsibility among engineers, he argued, is a sense of community that transcends narrow technical specialization, and includes a self-understanding appropriate to technical development.

In an outline of the history of technical self-understanding, Gorokhov distinguishes five historical stages. First comes handicraft technology and mythopoeic thinking. Second is the generalization and popularization of the techniques of handicraft, as in Beckmann's *allgemeine Technologie* and the French *Encyclopedie*. Third is scientific technology or scientific engineering, as developed by G. Monge and others at the École Polytechnic. Fourth is systems technology and the integration of human factors and the social sciences into engineering rationality. Finally, there is philosophy of technology, including epistemological and ethical reflection as integral to engineering design thinking and action.

To appreciate the significance of Gorokhov's work, it is necessary to have some appreciation of its institutional context. The Soviet Academy of Sciences is the successor to the Russian Academy of Sciences founded by Tzar Peter the Great in St. Petersburg in 1724. In its early decades it was composed primarily of invited foreign scholars, but in 1742 M.V. Lomonosov began to create an indigenous presence. During the last half of the 18th century activities stressed mathematics and the natural sciences. During the 19th century, branches were added concerned with Russian language and linguistics and historical-philological sciences.

After the Communist revolution, Lenin directed that the Academy (now with a new name) contribute to the construction of socialism. During the 1920s and 1930s this entailed promoting development and education in all the major fields of science and organizing scientific research throughout the country. According to *The Great Soviet Encyclopedia*, 3rd edition (1970), as translated into English and published by Macmillan (1973), "During the Great Patriotic War, the Academy of Sciences aided the destruction of the enemy in every possible way" (vol. 1, p. 57). The "postwar years were marked by the further growth of the academy and the expansion of its network of scientific research institutions," and in the 1960s "in the period of full-scale construction of communism" "new and vast tasks have confronted the Academy" (*ibid.*). In sum,

> The fundamental tasks of the [Academy] are developing fundamental research in natural and social sciences and long-term scientific research immediately connected with the further development of production; uncovering means of technical progress which are new in principle; and aiding the most complete utilization of scientific achievements in the practice of communist construction in the USSR (vol. 1, p. 55).

To carry out these tasks the Academy is composed of major sections: in physical-technical and mathematical sciences, in the chemotechnical and biological sciences, in the earth sciences, and in the social sciences (including history, philosophy, law, economics, literature, and linguistics).

The *perestroika* that is taking place within such an institution--through the recent (1987) introduction of research in philosophy and technology studies--thus carries significant import. Professor Gorokhov is to be commended for his work in this regard, and in working to bring it to our attention through the initiation of a multidisciplinary dialogue with scholars in both the United States and Western Europe.

--Carl Mitcham
Philosophy and Technology
Studies Center
Polytechnic University (New York)

For another report growing out of Gorokhov's participation in the 5th Biennial Conference of the Society for Philosophy and Technology in Bordeaux, France, in June, 1989, see Langdon Winner, "*Glasnost* and Engineering," *Technology Review* (February-March 1990), p. 70.

OPEN FORUM

SOCIOLOGICAL STUDIES IN HUMANISM AND TECHNOLOGY

Peter Lang Publishing, Inc., is pleased to announce a new scholarly series entitled *Sociological Studies in Humanism and Technology.* This series will be devoted to an exploration of the active interrelations of social and cultural phenomena to technology. Some of the proposed topics in the series will include:

* Technological factors and social change--an examination of societies at different levels of socioeconomic complexity;
* Technology and work;
* Technology and values--the quest for progress;
* Technology and medicine--social and ethical issues;
* Technology and public policy; and
* Technology and the environment.

The editors invite scholars to submit proposals or completed manuscripts in English on topics related to the effect of technology on social structure, values, institutions, and social change.

Please send your proposal or manuscript with a curriculum vita to: Mitra Das and Shirley Kolack, Department of Sociology, University of Lowell, Lowell, MA 01854.

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CALL FOR PAPERS

THE ENVIRONMENT AND THE MECHANIZED WORLD

American Society for Environmental History Conference

February 28 - March 3, 1991 - University of Houston

At the conference participants will consider a wide range of issues relevant to the modification of the natural world by agriculture, commerce, industrialization, and urbanization. While papers are solicited especially on the general theme of the conference, proposals are welcome on all aspects of environmental history, including questions concerning science, philosophy, ethics, public policy, gender, and ethnicity.

Proposals for individual papers, works in progress, panels, or workshops should include a one-paragraph abstract for each presentation and a one-paragraph resume for each participant. Send proposals by September 15, 1990, to: Martin V. Melosi, Program Chair, ASEH Conference, Department of History, University of Houston, Houston, TX 77204-3785. Phone: [713] 749-2967.

RUST NEWS

The Roskilde University (Denmark) Program in Technology Policy and Social Development recently began publishing an excellent newsletter on Science and Technology Studies. **RUST News** is edited by Lars Fuglsang and is published in English. Two numbers have been issued to date, and among the many articles and news items are essays on STS in Spain and in Japan, reports of various STS conferences from around the world, reviews of STS-related books and publications, STS program descriptions, and much more. To receive **RUST News** write to: Lars Fuglsang, Editor, Program in Technology Policy and Social Development, Roskilde Univ. Center, P. O. Box 260, DK-4000 Roskilde, Denmark. Telephone: +45 46 75 77 11; Fax: +45 46 75 66 18; Telex: 43158 RUBIBL DK.

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RESEARCH POLICY INSTITUTE
Graduate Program on Science and Technology Policy
University of Lund, Sweden

The RPI Graduate Program on Science and Technology Policy of the University of Lund is now accepting applications for their next group of Master of Social Science students. The next program runs from September 1, 1991 to February 1993, and applications are due by November 1, 1990. The aim of the program is to provide both a theoretical and practical understanding of science and technology policy in an international context. For further information on the program or an application form, write to: Research Policy Institute, University of Lund, Box 2017, S-220 02 Lund, Sweden. Telephone: 046-10 48 07; Fax: 046-14 69 86.

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1992 BEIJING INTERNATIONAL CONFERENCE ON PHILOSOPHY AND TECHNOLOGY

Tentative plans for an international STS studies conference on the theme of *Technological Progress and Social Development* to be held in Beijing in 1992 have recently been announced. The conference is being organized by the Philosophy, Sociology and History of Science and Technology Division of Tsinghua University with the sponsorship and support of the Chinese Society for Dialectics of Nature and the International Union of Philosophy of Science. Specific topics to be addressed at the conference will include:

* Social and ethical problems in current technology;
* Value judgments and methods in technology assessment;
* Technological innovation and economic development;
* Philosophies of technology in different cultural and social contexts;
* Technology and modern man: who is the master?; and
* Philosophy and sociology of technology: the current state and prospects.

For further information on possibly attending this conference, write to professor Gao Dasheng, Department of Social Sciences, Tsinghua University, Beijing 100084 Peoples Republic of China.

NASTS

SIXTH ANNUAL TECHNOLOGICAL LITERARCY CONFERENCE

The National Association for Science, Technology and Society (NASTS) will hold its Sixth Technological Literacy Conference February 1-3, 1991, in Washington, D.C. The Planning Committee has put together an exciting program featuring three special symposia: Women in Science, Technology, and Medicine; Minorities in Science, Technology, and Medicine; and International Representation in Science, Technology and Medicine. These symposia will address the conference theme of **Broadening Participation in Science, Technology, and Medicine.** In addition, NASTS will highlight its five signature themes--Education and Information; Technology, Industry and Work; Environment; Health and Bio-Medicine; and Moral, Ethical, and Philosophical Perspectives--with plenary sessions and guest lectures.

All STS educators are invited to fill in the program with proposals for workshops, tutorials, poster and paper sessions, exhibits, panels, and other events. Proposals from teachers, educators, scientists, authors, academics, curriculum designers, policy analysts, and religion professionals are invited for: hands-on workshops and activities directed to the STS community (1 hour workshop); discussion papers on topics relevant to STS as well as the 5 conference themes (20 minutes); innovative and participatory events of all kinds for interdisciplinary audiences; interactive exhibits from corporate, public interest, and education groups; multi-disciplinary panels designed to explore STS topics; technical tutorials for teachers on cutting edge science and technology (30-45 minutes); and roundtable (10 minutes) and poster sessions. Each presentation should contain significant opportunities for discussion among the session participants. Each session will be assigned a moderator who will facilitate interaction. Proposals for complete sessions that include presentations by any number of presenters (3 or more) to fill a l-hour slot will also be considered. Such proposals should include a moderator for the session and concrete steps to involve the audience. The proposal deadline is October 15, 1990.

This year's call is being announced earlier in the year to meet a concern that NASTS may be missing the participation of teachers, faculty, scientists and others who require advance notice to request funding from their respective institutions to attend the conference. In late summer the main conference brochure will be issued. This brochure will contain details on registering for the conference and for the hotel. Early conference registration (which includes a one-year membership in NASTS) will be $90 before December 15. Hotel rooms will be around $85/night, single or double.

To obtain more information on NASTS and a formal proposal form, contact: TLC-6 Manager, The Pennsylvania State University, 117 Willard Building, University Park, PA 16802. Telephone [814] 865-9951.

LEHIGH UNIVERSITY PRESS

RESEARCH IN TECHNOLOGY STUDIES SERIES

Volume 1

In Context: History and the History of Technology--
Essays in Honor of Melvin Kranzberg

Stephen H. Cutcliffe and Robert C. Post, Editors

IN CONTEXT presents fourteen essays written in honor of Melvin Kranzberg, the prime mover in the founding of the Society for the History of Technology and its quarterly journal *Technology and Culture*. Reflecting on the past, present, and future of the history of technology as a scholarly discipline, the contributors all share in the perception that technology cannot be understood or properly analyzed apart from its sociocultural surroundings--an approach that has been termed "contextual."

278 pages, illustrated, bibliography, notes--$38.50.

Volume 2

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Steven L. Goldman, Editor

The idea of progress remains a prominent feature of political language, as well as of the language of scientific research and technological innovation. What are the features of Western culture and of the practices of science and technology that anchor the idea of progress in the face of more than half a century of intellectual criticism? Can Western societies be said to have progressed over the past three hundred years, and to what extent have science and technology been responsible for that progress? If science and technology were institutionalized differently, or if science and technology policy were more rationally determined, would they then be socially progressive? In *Science, Technology, and Social Progress*, a distinguished group of writers prominent in their fields brings to light the answers to questions like these.

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From Artifact to Habitat: Studies in the Critical Engagement of Technology

Gayle L. Ormiston, Editor

Nine prominent figures in the current study of technology offer perspectives that enhance our understanding of technology and the pervasive role it plays in our lives by presenting a broad array of critical positions on and approaches to the ubiquity and mediacy of technology. The contributors draw on current debates in the general field of science and technology studies, the philosophy of technology, and psychology and cognitive science; they approach certain questions related to technology and the study of technology today from the perspective of articulating and examining those assumptions, ideas, and values that inform our conceptions, both naive and sophisticated, of technology.

221 pages, bibliography, notes, index--$35.00

Forthcoming:

Volume 4. ***Critical Perspectives on Non-Academic Science and Engineering***

Paul T. Durbin, Editor

ORDER FROM: Lehigh University Press, 440 Forsgate Drive, Cranbury, New Jersey 08512

Forthcoming Meetings and Conferences

September 6-8, 1990. *Representing and Understanding the Natural World: Science in Western Culture*, Norman, Oklahoma. Centennial celebration conference will focus on 4 themes within the framework of the past 5 centuries: (1) Science, Language, and Image; (2) The Construction of Scientific Knowledge; (3) Science and the Exercise of Power; (4) The Human Place in Nature. Contact Kenneth L. Taylor, History of Science Dept., Physical Sciences 622, Univ. of Oklahoma, Norman, OK 73019; [405] 325-2213; Bitnet: AA0214@UOKMVSA.

October 4-7, 1990. *Science and Literature: Bridging the Gaps*, Society for Literature and Science Annual Conference, Portland, Oregon. Contact: Robert Markley, Conference Director, Dept. of English, Univ. of Washington, Seattle, Washington 98195, [206] 543-7982; or Lissa Roberts, Program Committee, History of Science Department, San Diego State University, San Diego, CA 92182.

October 18-19, 1990. *Interface '90: Fourteenth Annual Humanities and Technology Conference*, Metro Atlanta. Contact: Herb Smith or Tom Wiseman, Dept. of Humanities and Social Sciences, Southern College of Technology, Marietta, GA 30060; [404] 528-7202.

October 18-21, 1990. *Annual Meeting of the Society for the History of Technology*, Cleveland, OH. Contact: Lindy Biggs, Program Chair, Dept. of History, Auburn Univ., Auburn, AL 36849; [205] 844-6645; Bitnet: HIST@AUDUCVAX.

October 18-21, 1990. *Society for the Social Studies of Science*, 15th Annual Meeting, Minneapolis, Minnesota. Contact: Thomas F. Gieryn, Dept. of Sociology, 774 Ballantine Hall, Indiana University, Bloomington, IN 47405, to be held in conjunction with *Philosophy of Science Association*. Contact: Linda Wessels, Dept. of History and Philosophy of Science, 130 Goodbody Hall, Indiana University, Bloomington, IN 47405; [812] 855-8746 or 3622.

November 2-7, 1990. *Setting the EE Agenda for the '90s*, 19th Annual Conference of the North American Association for Environmental Education, San Antonio, TX. Contact: NAEE Conference Headquarters, Bruker Nature Center, 5995 Horseshoe Bend Road, Troy, OH 45373, or Bora Simmons, Proceedings Chair, Northern Illinois University, Laredo Taft Field Campus, Box 299, Oregon, IL 61061; [815] 732-2111.

November 6-9, 1990. *Technological Development & Science in the 19th & 20th Century*. University of Technology, Eindhoven, The Netherlands. Paper proposals by June 1, 1990. Contact: Peter Kroes, Faculty of Philosophy and Social Sciences, University of Technology Eindhoven, P. O. Box 513, 5600 MB Eindhoven, The Netherlands.

February 1-3, 1991. *Broadening Participation in Science, Technology, and Medicine*, National Association for Science, Technology and Society, 6th Annual Technology Literacy Conference, Washington, D.C. Contact: NASTS Headquarters, 117 Willard Bldg., Pennsylvania State Univ., University Park, PA 16802; [814] 865-9951, or Stephen Cutcliffe, Program Chair, STS Program, 327 Maginnes Hall, Lehigh Univ., Bethlehem, PA 18015; [215] 758-3350.

February 14-19, 1991. *Science, Technology, and Society in the NEW International Environment*. Annual meeting of the American Association for the Advancement of Science (AAAS), Washington, D. C. Contact: AAAS, 1333 H. Street, N.W., Washington, D.C. 20005.

February 28-March 3, 1991. *The Environment and the Mechanized World*, Annual Meeting of the American Society for Environmental History, University of Houston, Texas. Proposals by September 15, 1990. Contact: Martin V. Melosi; ASEH Program Chair, Dept. of History, Univ. of Houston, Houston, TX 77204-3785; [713] 749-2967.

March 8-10, 1991. *The Discovery of Technology and Technologies of Discovery*, 6th Biennial Meeting of the Society for Philosophy and Technology, Univ. of Puerto Rico, Mayaguez. Session and paper proposals due by October 1, 1990; contact: Joseph Pitt, Dept. of Philosophy, V.P.I. and State Univ., Blacksburg, VA 24061. For local arrangements contact: Elena Lugo, Center for the History and Philosophy of Science and Technology, Univ. of Puerto Rico, Mayaguez, Puerto Rico 00709.

July 11-14, 1991. International Society for the History, Philosophy & Social Studies of Biology, Northwestern University, Evanston, IL. Session and paper proposals by October 31, 1990, and January 31, 1991, respectively. Contact Peter Taylor, ISHPSSB Program Coordinator, STS Program , 632 Clark Hall, Cornell University, Ithaca, N.Y. 14853; Bitnet: PJTJ@CORNELLA. For program and registration information contact: David Hull, Philosophy Dept., Northwestern Univ., Evanston, IL 60208-1315.

MANKIND, ETHICS, TECHNOLOGY, AND THE ARTS

RECENT PUBLICATIONS

BROWN, LESTER R., ET AL. STATE OF THE WORLD-1990. WASHINGTON, D.C.: WORLDWATCH INSTITUTE, 1990. XVI, 253 P. PAPERBACK: $9.95.

The Worldwatch Institute's annual State of the World-1990 was released this winter. In the quest for "progress toward a sustainable society" this year's compilation, the Institute's seventh, includes essays on global warming, food, clean air, and poverty among other topics. Specific titles and contributors include: "The Illusion of Progress," by Lester R. Brown; "Slowing Global Warming," by Christopher Flavin; "Saving Water for Agriculture," by Sandra Postel; "Feeding the World in the Nineties," by Brown and John E. Young; "Holding Back the Sea," by Jodi L. Jacobson; "Clearing the Air," by Hilary F. French; "Cycling Into the Future," by Marcia D. Lowe; "Ending Poverty," by Alan B. Durning; "Converting to a Peaceful Economy," by Michael Renner; and "Picturing a Sustainable Society," by Brown, Flavin, and Postel. The concluding essay outlines the Institute's view of a sustainable society relying on renewable energy sources, recycling, and less damaging agricultural practices. With Earth Day 1990 refocusing attention on environmental concerns, State of the World-1990 is more timely than ever. In addition to its adoption in over 800 college-level courses, State of the World has been selected as an accompanying text for Race to Save the Planet, a thirteen-part telecourse and a ten-part public television series schedule to air in the fall of 1990.

CASEY, TIMOTHY AND LESTER EMBREE, EDS., LIFEWORLD AND TECHNOLOGY. WASHINGTON, D.C.: THE CENTER FOR ADVANCED RESEARCH IN PHENOMENOLOGY AND UNIVERSITY PRESS OF AMERICA, 1990. $37.95.

An anthology of essays devoted to the theme of the embeddedness of technology in everyday life and the broader philosophical ramifications and questions raised by this embeddedness. The collection deals with this theme from a variety of philosophical and human scientific perspectives as represented by phenomenology, pragmatism, hermeneutics, analytic philosophy, deconstruction, history, linguistics, and political science. Contents include: "Texts and Things: Holding on to Reality," by Albert B Borgmann; "Architectura Architecturans: World(s) in the Making," by Ronald Bruzina; "Designing Excellence: Some Functional and Aesthetic Considerations," by Tim Casey; "Patterns of Discovery or Social Construction of Technology: The Invention of the Turbojet," by Edward Constant; "A Perspective on the Rationality of Scientific Technology or How to Buy a Car," by Lester Embree; "The Religious Dialectic and Technology," by Frederick Ferré; "Sartre and Technological Being-In-the-World," by Thomas Flynn; "Literacy, Mediacy and Technological Determinism," by Larry Hickmann; "From Recorded Speech to the Record of Thought," by Ivan Illich; "The Hidden Life of Technological Artifacts," by John McDermott; "Technology and Liberation," by Algis Mickunas; "On Going to Church and Technology," by Carl Mitcham; "Translating Technology: Artifact to Habitat," by Gayle Ormiston; "Technology and the Objectivity of Values," by Joseph Pitt; "Nazi Biomedical Technologies," by Robert Proctor; "Media as Lifeworld," by Wolfgang Schirmacher; and "Living in Electronic Space," by Langdon Winner.

IHDE, DON. TECHNOLOGY AND THE LIFEWORLD: FROM GARDEN TO EARTH. INDIANA SERIES IN THE PHILOSOPHY OF TECHNOLOGY. BLOOMINGTON: INDIANA UNIV. PRESS, 1990. XIV, 226 P. HARDCOVER, $35.00; PAPERBACK, $14.95.

Ihde explores the role of technology in daily life by analyzing the role of tools and instruments and the ways technologies are societally embedded in our multicultural contemporary world. He begins by asking the reader to imagine a non-technological "garden" and then advances three "programs" for understanding human technological involvement. "The first program analyzes the diversity of human-technology relations and shows the extent to which technology is nonneutral. The second program takes up the issue of technology as a cultural instrument, in part through a discussion of indigenous technologies, technology transfer, and neocolonialism. The third program maps the topography of technologies around the world, introducing the concept of pluriculturality." Ihde concludes with a call for environmental stewardship in which science and technology are used to conserve the earth. (Adaptation of author's abstract.)

ORMISTON, GAYLE L. AND RAPHAEL SASSOWER, EDS. PRESCRIPTIONS: THE DISSEMINATION OF MEDICAL AUTHORITY. CONTRIBUTIONS IN MEDICAL STUDIES, NO. 27. WESTPORT, CONN.: GREENWOOD, 1990. XVII, 193 P. BIBLIOG. HARDCOVER: $39.95.

The essays in this collection address the notion of whether "health-care practice [can] afford to be bound by a foundation or an ethics? If foundations are necessary, then what kind of principles are required? And if principles are required, how fixed or stable can they be?" The volume contains a multiplicity of "prescriptions" that offer suggestions, if not concrete answers, to these thought-provoking questions in the philosophy of medicine. Contents include: "Democratizing Medicine," by Joseph Agassi; "Contemporary Bioethics and the Demise of Modern Medicine," by Robert M. Veatch; "Humanizing Health Care Practice Through a More Humane Technology of Concepts," by James W. Dicoff and Patricia James; "Increasing Health Consumerism: Can It Be Done?" by Marilyn L. Stember; "The New Reproductive Technologies: Ethical, Social, and Public Policy Concerns," by Michael A. Grodin; "Psychoanalysis as Religion: Psychoanalytic Theory as Ideology, Psychoanalytic Practice as Cure of Souls," by Thomas Szasz; and "Seduction in Tongues: Reconstructing the Field of Metaphor in the Treatment of Schizophrenia," by Nathaniel Laor.

RAVETZ, J. R. THE MERGER OF KNOWLEDGE WITH POWER: ESSAYS IN CRITICAL SCIENCE. LONDON: MANSELL, 1990. X, 326 P. HARDCOVER, $49.50.

STS scholars have long recognized that traditional views of a neutral science present an inadequate picture of this important societally embedded activity. Just as technology is inherently value-laden, so too is science. Social, political, and professional conditions, publication and peer pressure, corporate connections, grantsmanship, and belief systems all shape scientific activity. Among the many scholars who have contributed to our enhanced understanding of a socially conditioned science has been Jerry Ravetz. His Scientific Knowledge and its Social Problems (1971), which dealt with the "industrialization" of science, is widely recognized as a pathbreaking classic in the philosophy of science. In this collection of essays, most of which have been previously published, Ravetz pulls together his thoughts on a wide range of science-society topics, including among others recombinant DNA, military technology, Francis Bacon, Gaia, and a new mathematical notational system for expressing scientific uncertainties. He concludes with a reiteration of his earlier call for a self-conscious "critical science" with a commitment to the welfare of humanity as its core.

SCHNEIDER, STEPHEN H. GLOBAL WARMING: ARE WE ENTERING THE GREENHOUSE CENTURY? SAN FRANCISCO: SIERRA CLUB BOOKS, 1989. XIV, 317 P. HARDCOVER, $18.95.

Schneider, a climatologist with the National Center for Atmospheric Research in Boulder, Colorado, has written a volume designed to help the general public understand the basic science and the policy implications of global atmospheric change. He describes the greenhouse effect and its relationship to global temperature, provides a history of the earth's climate, examines how climate models work, and offers an assessment of what the likely impacts will be if indeed we are entering a period of global warming. In brief, it is Schneider's belief that "we are already a decade or two into the greenhouse century; a decade or two more should prove that beyond a reasonable doubt" (p. xii).

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Science, Technology and Society Program
327 Maginnes Hall #9
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Science, Technology & Society is a newsletter devoted to the general area of science, technology, and society studies. It is a joint project of the Lehigh University STS Program and the Technology Studies Resource Center and publishes short articles on the theoretical and speculative aspects of curriculum development, in-depth program and course descriptions, reviews of texts and audio-visual aids, and an annotated bibliography of current books and articles. An "Open Forum" section exists for readers with questions, comments or announcements regarding STS activities or needs. Our goal is to help generate new courses, and provide an information exchange, in the STS field.

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